

**THE EFFICACY OF PRANAYAMA, MIRROR WORK
AND GRATITUDE JOURNAL WRITING ON SELF-
COMPASSION IN WOMEN WITH POLYCYSTIC
OVARIAN SYNDROME**

Thesis Submitted for the Award of the degree of

DOCTOR OF PHILOSOPHY

**In
Psychology**

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DECLARATION

I, hereby declared that the presented work in the thesis entitled “**The efficacy of Pranayama, Mirror work and Gratitude Journal Writing on Self-Compassion in Women with Polycystic Ovarian Syndrome.**” in fulfilment of degree of **Doctor of Philosophy (Ph.D.)** is outcome of research work carried out by me under the supervision of **Dr Jahangeer Majeed**, working as Assistant Professor, in the Psychology department of Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.



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CERTIFICATE

This is to certify that the work reported in the Ph.D. thesis entitled “**The efficacy of Pranayama, Mirror work and Gratitude Journal Writing on Self-Compassion in Women with Polycystic Ovarian Syndrome.**” submitted in fulfillment of the requirement for the award of degree of **Doctor of Philosophy (Ph.D.)** in the Psychology, is a research work carried out by **Seena Jose, 41800406**, is bonafide record of her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.



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ABSTRACT

The efficacy of Pranayama, Mirror work and Gratitude Journal Writing on Self-Compassion in Women with Polycystic Ovarian Syndrome

BACKGROUND

The impact of self-criticism specifically in women with Polycystic Ovary Syndrome (PCOS) is relatively underexplored. PCOS is a common hormonal disorder affecting women of reproductive age, associated with both physical and emotional challenges. While there is considerable research on psychological issues such as depression, anxiety, and stress, this study appears to be the first to examine self-criticism in women with PCOS. Additionally, the study assessed levels of self-compassion and explored a straightforward yet effective approach involving Pranayama, Mirror Work, and Gratitude Journal Writing. The primary goal of this research is to evaluate the effectiveness of these practices in reducing self-criticism and enhancing self-compassion among women with PCOS. It also seeks to understand how these interventions might influence other psychological factors like depression, anxiety, and stress. Previous studies have indicated that women with PCOS generally experience lower mental well-being compared to those without the condition. While positive psychological interventions have shown promise in improving mental well-being, their potential to reduce psychological distress and self-criticism, and to increase self-compassion in women with PCOS remains largely unexplored.

OBJECTIVES OF THE STUDY:

- 1) To compare the level of Depression, Anxiety and Stress in women with PCOS and without PCOS.
- 2) To compare the level of Self-Criticism and Self-Compassion in women with PCOS and without PCOS.

- 3) To find the effect of intervention of Pranayama, mirror work and gratitude journal writing on self-criticism and self-compassion in women with PCOS.
- 4) To examine the effect of intervention of Pranayama, mirror work and gratitude journal writing on depression, anxiety and stress in women with PCOS.

HYPOTHESES OF THE STUDY:

Based on the set objectives, the stated hypotheses are as follows:

H₁: Women with PCOS would have significantly high depression, anxiety and stress as compared to women without PCOS.

H₂: Women with PCOS would have significantly high self-criticism and low self-compassion as compared to women without PCOS.

H₃: There would be a significant decrease in self-criticism and increase in self-compassion in women with PCOS after the intervention of Pranayama, mirror work and Gratitude journal writing as compared to the control group.

H₄: There would be significant decrease in stress, anxiety and depression in women with PCOS after the intervention of Pranayama, mirror work and Gratitude journal writing as compared to the control group.

Research Design:

Pre, Post Control Design. The study has used, cross sectional, case control, pre and post design, as well as a predictive approach in assessing the stress, anxiety, depression, self-criticism level and self-compassion.

Exploratory research in phase 1

Classical experimental research in phase 2: Wherein the participants are randomly distributed and pre and post data are collected. It is the type of research where the effects of independent variables on dependent variables are typically observed and documented.

Methodology: The study was carried out in two phases. In Phase 1, data collection utilized a purposive sampling technique. The Depression Anxiety Stress Scale 21 (DASS21; Lovibond & Lovibond, 1995) was employed to evaluate depression, anxiety, and stress, while the Forms of Self-Criticizing/Attacking & Self-Reassuring Scale (FSCRS; Gilbert et al., 2004) was used to measure self-criticism. Additionally, the Self-Compassion Scale (26 items) (SCS; Neff, 2003) assessed levels of self-compassion. The pre-test involved 90 women with PCOS and 90 women without PCOS.

In Phase 2, the researcher used classical experimental pretest-post test design with randomly assigned experimental-control groups. Ninety women with a PCOS diagnosis were randomly divided into three groups, with each group consisting of 30 participants. Within each group, two subgroups were formed: an experimental group and a control group, each consisting of 15 women. In the first group, the experimental participants engaged in a 12-week Pranayama intervention. In the second group, the experimental participants underwent a 21-day Mirror Work intervention, while the third group's experimental participants participated in a 6-week Gratitude Journal Writing program. The control groups in all three units did not partake in any intervention. After the interventions were completed, post-test data were gathered from both the experimental group and the corresponding control groups.

Variables Under Study:

Independent Variables: Pranayama, Mirror work, Gratitude Journal Writing.

Dependent Variable: Depression, Anxiety, Stress, Self-Criticism, Self-Compassion

Sample:

The participants in this study, women who were diagnosed with Polycystic Ovary Syndrome were recruited from out patients of Srushti Fertility Centre and Women's Hospital - Chennai, India. Women who did not have PCOS were recruited from the hospital visitors, patient relatives and from hostels near to the hospital. The sample is an accurate reflection of the broader population.

Inclusion criteria:

- Women diagnosed with PCOS
- Women at reproductive age

Exclusion criteria:

- Women at menopause,
- Pregnant women.
- History of existence of psychiatric disorder.
- Any underlying disease of neoplasm's, adrenal and pituitary glands disorder.
- Those undergoing psychological / Yoga interventions.

Tools Used:

The primary goal of the present research was to assess the “The efficacy of Pranayama, Mirror work and Gratitude Journal Writing on Self –Compassion in women with Poly Cystic Ovarian Syndrome”. This investigation also measured and compared the level of self-compassion, self-criticism along with depression, anxiety and stress in women with and without PCOS. The standardised tools used were thoroughly studied for their reliability and validity, ease of administration, suitability for the age of the respondents, number of items/statements, appropriateness to the parameters to be assessed and the criteria of scoring. After thorough review and study the following scales were selected for the data collection:

- Depression , Anxiety & Stress Scale (DASS21)- (Lovibond SH, Lovibond PF (1995))
- Forms of Self criticizing/Attacking & Self Reassuring Scale (FSCRS (Gilbert et al. 2004)
- Self Compassion Scale -26 items (Neff K.D. 2003)

A generic information document designed to gather demographic information from the participants. All the tests/ scales were compiled in the form of one questionnaire so that it is easy to administer all the scales together.

Procedure

A total of 180 women of reproductive age participated in the study, including 90 women diagnosed with polycystic ovary syndrome (PCOS) and 90 women without PCOS. The participants with PCOS were recruited from the outpatient department of Obstetrics and Gynecology at the Srushti Fertility and Women's Well-Being Center. All participants were provided with a clear explanation of the study's purpose. Informed written consent was obtained, and participants were informed of their right to participate voluntarily, decline participation, or withdraw from the study at any point without consequence. Demographic data were collected via a self-administered questionnaire, completed based on the information the participants were comfortable sharing. To ensure confidentiality, each participant was assigned a unique identification code. A baseline pre-assessment was conducted using paper-and-pen questionnaires to measure depression, anxiety, stress, self-criticism, and self-compassion scores. Following the baseline comparison between the 90 women with PCOS and the 90 without PCOS, the PCOS group was randomly divided into three intervention groups: pranayama, mirror work, and gratitude journal writing. Each intervention group also included a control subgroup of 15 participants to serve as a comparative baseline within the intervention conditions.

Intervention /Administration of the Psychological tools

Researcher had obtained the ethical committee clearance from Govt. of India, Directorate general of health Services, Central drugs Standard Control Organization - through Srushti hospital from Rajeswary Independent Ethics Committee No. ECR/338/Indt/TN/2021 issued under New drugs and Clinical Trials Rules,2019

Researcher is an experienced certified yoga wellness instructor from AYUSH Ministry (Certificate No: P020022442)

The researcher has obtained a licence from Louise Hay Foundation to administer 21 days' mirror work. The researcher has done MSc Counselling and Psychotherapy and is an experienced counsellor

Pranayama

The experimental group consisted of fifteen individuals who were selected at random to participate in pranayama practice on a daily basis for ten minutes for a period of three months. Initial one-on-one training was provided to them at the hospital, as well as whenever they choose to visit the hospital, and weekly online lessons were conducted through Google Meet. Activities such as deep breathing, relaxation, and warm-up exercises were included in the sessions, which were then followed by Pranayama practice in a comfortable posture. Anulom Viloma and Bhramari Pranayama were both detailed instructions that were presented to the participants.

In a WhatsApp group, participants acknowledged their daily practices and discussed their experiences with one another.

A total of fifteen individuals of the control group carried on with their regular activities. After the experiment, both the experimental group and the control group were given post-tests on five different factors. The purpose of this study was to determine whether or not pranayama is effective for women who suffer from polycystic ovary syndrome (PCOS).

Mirror work.

The mirror enhanced self-compassion through 21 days of Louis Hay's mirror work. Fifteen subjects in the experimental group, who were selected through a random technique practised mirror work, while 15 remained in the control group. Post tests for all the 5 variables were conducted for both experimental and control groups. The study evaluated the efficacy of mirror work.

Gratitude Journal writing

Fifteen participants randomly selected for gratitude journal writing, while 15 remained in the control group.

Participants wrote gratitude statements, blessings every day for six weeks. Post tests for all the five variables were conducted for both experimental and control groups.

The study evaluated the efficacy of gratitude journal writing impact on women with PCOS using pre and post-test scores.

Results: Baseline data revealed elevated levels of depression, anxiety, stress, self-criticism and reduced self-compassion among women with PCOS. Following the interventions, significant improvements were observed in the experimental groups, with decreased depression, anxiety, stress, self-criticism and enhanced self-compassion. The control groups showed minimal changes during this period.

Conclusion

Women diagnosed with polycystic ovary syndrome (PCOS) face a range of psychological challenges that are significantly more severe than those experienced by women without the condition. This study found that women with PCOS report higher levels of depression, anxiety, stress, and self-criticism, along with lower levels of self-compassion. These findings underscore the critical need for targeted mental health interventions tailored to address the unique emotional and psychological burdens associated with PCOS. The data suggest a strong link between PCOS and negative self-perception, indicating that psychological factors such as self-image and self-worth are deeply affected by the condition. Therefore, effective management of PCOS should not be limited to physical symptoms but must also include strategies aimed at reducing self-criticism and fostering self-compassion. This study demonstrates the effectiveness of holistic, non-pharmacological interventions—specifically pranayama (breath control), mirror work, and gratitude journaling—in improving mental health outcomes in women with PCOS. These practices significantly reduced levels of self-criticism and increased self-compassion, while alleviating symptoms of stress, anxiety, and depression compared to a control group. The findings highlight the importance of integrating mental health support into PCOS care, advocating for a comprehensive, mind-body approach. Such a holistic strategy has the potential to improve emotional well-being and overall quality of life for women affected by PCOS.

Keywords: PCOS, depression, anxiety, stress, self-criticism, self-compassion, Pranayama, Mirror Work, Gratitude Journal Writing.

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CHAPTER 1

INTRODUCTION

“By giving ourselves unconditional kindness and comfort while embracing the human experience, difficult as it is, we avoid destructive patterns of fear, negativity, and isolation”

- Kristin Neff

1.1. Background of the Study

It is believed that between 5 and 10 percent of women who are of reproductive age are affected by polycystic ovarian syndrome, which is commonly known as PCOS. (Lipton et. al., 2006). According to Azziz et al. (2004), it is marked by a variety of symptoms, some of which include polycystic ovaries, irregular menstrual periods, and hyperandrogenism, which is understood to be the overproduction of male hormones. As to the findings of Nørgaard et al. (2020), there exists a noteworthy association between polycystic ovary syndrome (PCOS) and a multitude of mental health problems, such as depression, anxiety, and a decline in the overall quality of life. As a result of the persistent nature of polycystic ovarian syndrome (PCOS), women who suffer from this ailment frequently have higher degrees of psychological pain, in addition to experiencing adverse impacts on their physical and psychosocial well-being (Hart & Tegg, 2020). It has been suggested by the findings of a study that was carried out by Moran and colleagues (2011) that these psychological symptoms could be the consequence of hormonal imbalances and metabolic problems, such as insulin resistance, that are associated with polycystic ovarian syndrome (PCOS). Kaczmarek et al. (2016), women who have polycystic ovarian syndrome (PCOS) commonly experience heightened levels of anxiety and depression, as well as a lower capacity for self-compassion. Concerns about one's body image and societal expectations, which are made worse by hirsutism and weight gain, further exacerbate mental health concerns, which eventually result in greater rates of sadness and anxiety (Miyake et al., 2011). Teede et al. (2018) note that the complicated impact of polycystic ovarian syndrome

(PCOS) on mental health underscores the necessity of integrated therapy approaches that appropriately address the disorder's medical and psychological components. In order to develop effective treatments and improve the overall quality of life for persons who have polycystic ovarian syndrome (PCOS), it is essential to have a comprehensive understanding of the relationship between PCOS and mental health. (Cinar et. al., 2011)

Numerous studies have demonstrated that women who have polycystic ovarian syndrome (PCOS) are more likely to suffer from mood disorders such as anxiety and depression. A prominent cause for the prevalence of psychological distress is the chronic nature of polycystic ovary syndrome (PCOS) symptoms and their impact on body image, self-esteem, and quality of life, as stated by Jonathan et al. (2015). According to Hahn et al. (2016), it is probable that as many as seventy percent of women who are classified as "Women with PCOS" may have difficulty becoming pregnant. According to Teede et al. (2018), treatments that are effective involve making adjustments to one's lifestyle, such as adopting a different diet and engaging in physical activity. It is possible that the individual would have both physical and psychological benefits as a result of these improvements, provided that they are effective in managing their weight and insulin resistance. Furthermore, research has shown that psychological therapies such as mindfulness exercises and cognitive-behavioral therapy (CBT) can lessen some of the mental health difficulties associated with polycystic ovarian syndrome (PCOS), offering a more comprehensive course of treatment (Miller et al., 2013; Neff & Germer, 2013). In conclusion, let us state that polycystic ovarian syndrome, often known as PCOS, is a complex disorder that has an impact not only on the reproductive system but also on the health of the body and the mind. There is an urgent need for integrated therapy techniques that take into account the components of the syndrome that are relevant to both physical and mental health for patients. Due to the fact that the condition is linked to a high prevalence of health issues, this is the case. Those who work in the medical field have the ability to improve the overall outcomes and the quality of life of women who have polycystic ovarian syndrome (PCOS) by combining medical treatment with the support of trained psychosocial professionals. PCOS is a public health problem in India too that is highly alarming. Due to the fact that it affects a significant proportion of the female population in the country, it is a matter of grave

concern. The percentage of Indian women who are of reproductive age and suffer from polycystic ovarian syndrome (PCOS) is estimated to range anywhere from 8 to 22 percent, according to various estimates. According to a study that was conducted in the year 2020 by Kumar and colleagues, this number is consistent with the prevalence rates that are observed all over the world; yet, it also indicates that there is a significant burden within the country. There is a significant amount of cause for concern over the prevalence of polycystic ovarian syndrome (PCOS) in India, particularly when considering the diverse socioeconomic conditions and healthcare system that exist within the country.

In India, the clinical manifestations of polycystic ovarian syndrome (PCOS) may be strongly influenced by a wide variety of factors, including inheritance, lifestyle, and dietary patterns, amongst others. Yildiz et al. (2012) state that the condition frequently leads to consequences, one of which is infertility. This is a significant problem due to the fact that there are societal and cultural expectations around fertility and having children. A connection between rapid urbanisation and alterations in eating habits has been demonstrated by Reddy et al. (2019). To be more specific, there has been an increase in the consumption of processed meals that are high in sugar and fat content. A metabolic component of polycystic ovary syndrome (PCOS) includes insulin resistance. According to Das et al. (2015), this increases the likelihood of getting cardiovascular diseases and type 2 diabetes. Agarwal et al. (2017) found that the stigma that is connected to infertility and the visible indications of polycystic ovarian syndrome (PCOS), such as acne and excessive hair growth, can have a number of negative repercussions. Two of these implications are low self-esteem and social isolation. It is important to note that these are just two of the potential negative outcomes. According to Gupta et al. (2021), the lack of information and comprehension of polycystic ovarian syndrome (PCOS) in rural and underprivileged areas makes these difficulties even more difficult to deal with. Consequently, this results in a delay in both the diagnosis and the treatments that are attempted. There is cause for concern regarding this matter because it reduces the likelihood that patients would seek treatment. According to the findings of a study that was conducted in the year 2020 by Nair and colleagues, public health campaigns and educational initiatives are extremely important

in order to raise knowledge of polycystic ovarian syndrome (PCOS) and the treatment for it among medical professionals as well as between the general public and the general population. According to Chaudhury et al.'s research from 2021, the incorporation of lifestyle therapies into the management of polycystic ovary syndrome (PCOS) has the potential to alleviate the symptoms of the condition and lessen the hazards to one's health over the long term. For the purpose of providing an effective treatment for polycystic ovarian syndrome (PCOS) in India, it is essential to ensure that patients have access to both professional medical care and healthcare services that are offered at prices that are affordable.

According to Bhattacharya et al. (2018), the enhancement of diagnostic and treatment facilities, particularly in economically disadvantaged regions and rural areas, is a possibility that can be made achievable with help from both the government and non-governmental organizations. Within the context of the efficient management of this prevalent ailment, this aid has the potential to be of critical importance.

In India, the treatment for polycystic ovarian syndrome (PCOS) has gradually evolved over time. It began with basic alternatives and a limited understanding of the condition, but it has since progressed towards a more sophisticated approach that incorporates contemporary medical techniques and lifestyle adjustments. It is clear from the history of PCOS therapy in India that this is the case. In the past, polycystic ovarian syndrome, often known as PCOS, was not extensively recognized or widely understood in India. As a result, there were considerable delays in both diagnosis and treatment. PCOS is a condition that affects the ovaries and produces irregular monthly cycles. Among these criteria were those that were established by the Rotterdam agreement, which played a role in the standardization of the procedure that is utilized to diagnose polycystic ovarian syndrome (PCOS).

Over the course of the past several years, India has witnessed a dramatic movement toward controlling polycystic ovarian syndrome (PCOS) with the implementation of a more all-encompassing strategy. This approach includes the treatment of lifestyle factors such as food and exercise, which are critical in managing insulin resistance and obesity connected to polycystic ovarian syndrome (PCOS) (Chaudhury et al., 2021).

This is one part of the trend. Awareness of polycystic ovarian syndrome (PCOS) has improved as a result of public health campaigns and educational initiatives, which has contributed to a reduction in the stigma associated with the condition and has helped to promote early diagnosis and treatment (Nair et al., 2020). In addition, developments in medical research and the accessibility of specialized care have made it possible for progress to be achieved in the treatment of polycystic ovarian syndrome (PCOS). According to Das et al. (2015), one of these achievements is the utilization of modern reproductive technology for the purpose of providing assistance to women who are battling infertility. Despite the progress that has been made, the treatment of polycystic ovarian syndrome (PCOS) continues to be a challenge in that country. Gupta et al. (2021) state that disadvantaged and rural communities continue to encounter challenges to getting adequate healthcare, which results in delays in diagnosis and treatment that is less than ideal. Keeping in mind that the process of incorporating mental health assistance into PCOS treatment is still under progress is another essential point to keep in mind. Despite the fact that polycystic ovary syndrome (PCOS) is known to have an impact on mental health, a significant number of women do not receive sufficient psychological treatment (Agarwal and Khan, 2017).

The realization that polycystic ovary syndrome (PCOS) is more than just a medical issue was the impetus for this research. There are also significant psychological and emotional repercussions associated with it. A stronger tendency toward self-criticism and a lack of self-compassion are two of the consequences that result from having PCOS, in compared to people who do not have the condition. Bozdogan et al. (2016) found that the prevalence of polycystic ovary syndrome (PCOS) in women ranges anywhere from 6 to 21% worldwide, depending on the diagnostic standards that are utilized. In 2012, the World Health Organization reported that 116 million women around the world, which is equivalent to 3.4% of the total female population, were affected by polycystic ovary syndrome (PCOS), as stated by Haq et al. (2017). According to statistics provided by Skiba et al. (2018), it is predicted that up to 22.5% of Indian women who are of reproductive age have PCOS, which stands for polycystic ovarian syndrome. According to Malik Aslam (2010), around five to ten percent of women in Western countries are affected by polycystic ovary syndrome (PCOS). The

development of polycystic ovary syndrome (PCOS) is characterized by reproductive and metabolic abnormalities, which, according to Moran et al. (2010), increase the likelihood of acquiring further illnesses such as insulin resistance, type 2 diabetes, and infertility. Oligomenorrhea, infertility, hirsutism (excessive production of coarse face and body hair) (Kitzinger and Willmott, 2002), male pattern baldness, acne, and obesity are some of the symptoms that have been identified as being associated with polycystic ovary syndrome (PCOS), according to Ehrmann (2005). An infrequent or absent ovulation, high levels of male hormones, or the presence of many cysts on the ovaries as indicated by ultrasound imaging are the three factors that the updated Rotterdam criteria (2003) state must be present in order to diagnose polycystic ovary syndrome (PCOS). It is feasible to arrive at this diagnosis by eliminating other potential causes, such as Cushing's disease, congenital adrenal hyperplasia, thyroid problems, and androgen-producing tumors. Obesity, hirsutism, metabolic syndrome, irregular menstruation, and moderate to severe acne are some of the clinical indications that appear in women who have polycystic ovary syndrome (PCOS). Several studies have shown that women who have been diagnosed with polycystic ovary syndrome (PCOS) are more likely to experience mental health conditions such as bipolar disorder, depression, anxiety, body dissatisfaction, low health-related quality of life, and sexual dissatisfaction, in addition to experiencing physical illnesses and disruptions (Melissa et al., 2006). According to a meta-analysis that was carried out in 2021 by Yin et al., women who suffer from Polycystic Ovary Syndrome (PCOS) are more prone to have conditions such as anxiety, stress, and depression than women who do not have the condition. According to the findings of a study that was conducted in 2007 by Barnard and colleagues, women who suffer from polycystic ovarian syndrome (PCOS) experience psychological distress and a lower quality of life in relation to their health. The majority of previous research has demonstrated despair and anxiety. The findings of a case-control study conducted by Asdaq and Yasmin (2020) revealed that patients with polycystic ovary syndrome (PCOS) had elevated levels of stress, despair, and anxiety when compared to the control group. It was discovered by Mansson et al. (2008) that anxiety is a significant concern among people with PCOS. According to Kitzinger and Willmott (2002) and Deeks et al. (2011), these symptoms may have a negative impact on her feminine identity, self-image, as well as her dissatisfaction with her

appearance and her inability to successfully balance her professional and personal responsibilities. According to Ehrmann (2005), the physical signs of polycystic ovary syndrome (PCOS) may have negative impacts on emotional and mental health, despite the fact that increasing numbers of medical professionals are becoming aware of the problem. A sizeable percentage of women are unaware that they have polycystic ovary syndrome (PCOS), which is a condition that affects their ovaries. Research conducted by Azziz et al. (2003), Kitzinger & Willmott (2002), and Hull et al. (1987) has demonstrated that polycystic ovary syndrome (PCOS) is a significant factor that contributes to infertility in females. Due to the fact that obesity is more frequent in this particular demographic. There is a possibility that these factors will also result in psychological distress, which may manifest as feelings of hopelessness, anxiousness, agitation, negative self-talk, and disordered behavior. Therefore, it is of the utmost importance that those who have been diagnosed with polycystic ovary syndrome (PCOS) give their mental health the highest attention.

It is possible that a person's capacity to take pleasure in life, to discover a sense of stability in the midst of activities, and to strive toward growing mental resilience are all facets of mental health, according to ideas from the domains of effective psychology. Because of this, the majority of individuals consider mental wellness to be a positive characteristic. Positive prosperity, social change, a degree of independence from anxiety and its crippling manifestations, the capacity to form meaningful relationships and adjust to the demands and stresses of daily life, and an eagerness to learn are some of the characteristics that are associated with mental health, as stated by the American Psychological Association (APA). A great number of people, particularly "women with PCOS," overlook mental health issues because they assume that they can be resolved or that they are something that should be embarrassed of. Because of this, they are unable to receive the assistance that they require. Creating healing requires both helping oneself and allowing others to help you. Both of these things go hand in hand. Through the utilization of various therapies, drugs, and other measures, "women with PCOS" have the potential to lead positive and healthy lives.

1.2. Polycystic ovary syndrome (PCOS)

1.2.1. What is PCOS

Polycystic ovary syndrome (PCOS) is a multifaceted hormonal condition that mostly impacts women in their reproductive years. (Azziz et al. 2006). According to Salari et. al. (2024), around 9.2% percent of women worldwide who are of reproductive age are affected by polycystic ovarian syndrome. Common consequences of this condition include anovulatory infertility, unpredictable menstrual cycles, and excessive body hair growth (Hull et al., 1987; Azziz et al., 2003). For most acceptable symptoms, a clinical diagnosis of PCOS requires the presence of at least two out of the following three basic characteristics: These are biological or physical markers indicating an excess of androgens, malfunction in ovulation, and the presence of polycystic ovarian morphology (Guarnotta et. al. 2020).

The aetiology of PCOS is incompletely elucidated as present (Diamanti-Kandarakis & Dunaif, 2012). The exact aetiology of PCOS is still unknown, however it is believed to result from complex interactions between genetic, behavioural, and environmental factors. The most substantial impact in this matter is thought to be attributed to genetic variables (Podfigurna-Stopa et. al. 2015).

Women with Polycystic Ovary Syndrome (PCOS) not only have bodily disturbances and diseases, but they are also very susceptible to developing mental problems such as depression, bipolar disorder, stress, body dissatisfaction, sexual dissatisfaction, and a decrease in their overall quality of life (Himelein and Thatcher, 2006).

The study conducted by Adamczak, et. al in (2023) in (2023) investigated the relationship between depressive symptoms and PCOS, specifically examining the role of time perspective (TP). The findings suggested that depressive symptoms influenced PCOS indirectly through fostering an optimistic perspective on the future. The occurrence of PCOS is largely connected only to future time perspective. This underscores the need of psychoeducation and supportive communication for patients who are at risk, as it helps to cultivate hope and reclaim mastery over their living circumstances.

According to Barry, Kuczmierczyk, and Hardiman (2011), “Women with PCOS” have a higher prevalence of anxiety and depression compared to women who do not have PCOS. Papalou & Kandarakis (2016) assert that stress is considered a significant element of PCOS.

Physical Symptoms of PCOS: Barry, Kuczmierczyk, and Hardiman (2011) found that “Women with PCOS” have a greater incidence of anxiety and depression in comparison to those without PCOS. Papalou and Kandarakis (2016) argue that stress is a crucial component of PCOS.

PCOS is characterised by a range of physical symptoms that might differ in intensity from person to person. Common signs of this condition may consist of irregular or nonexistent menstrual cycles and excessive hair growth, often known as hirsutism (Dawber, 2005).

Psychological Disturbances with PCOS: Psychological abnormalities are commonly observed in “Women with PCOS”, and these disturbances can have a substantial impact on their overall well-being. Asdaq and Yasmin (2020) found that a significant proportion of persons with PCOS displayed elevated levels of stress, despair, and anxiety in comparison to the control group.

Social Stigma and PCOS: PCOS can subject affected women to social stigma and discrimination due to its visible and invisible symptoms. (Kitzinger & Willmott, 2002).

Infertility and PCOS: One of the most distressing aspects of PCOS for many women is its association with fertility challenges (Cousineau and Domar, 2007). Understanding the links between PCOS and infertility is crucial for providing appropriate support and treatment options to affected individuals.

Body Image and PCOS: The perception of one's body, an integral aspect of the broader self-concept, encompasses feelings of femininity, attractiveness, and the ability to use one's body as a means of social expression and personal connection with the world. This self-perception significantly influences a woman's body image and self-esteem, as suggested by studies (Mock, 1993; Cohen et. al., 1998). PCOS is linked to body image disturbances and reduced self-esteem, which in turn, are connected to decreased levels

of body satisfaction. This lowered body satisfaction is a predictor of depression in individuals with PCOS, potentially affecting their sleep patterns (Lipton et. al. 2006, Yazici et. al. 2004, Petry et. al. 2008, Lechner et. al. 2007, Himelein & Thatcher 2006). Addressing body image concerns and promoting self-acceptance is an important aspect of comprehensive care for individuals with PCOS.

PCOS and Hirsutism: Women with excessive body hair growth, known as hirsutism, have been observed to encounter more significant psychological distress in comparison to the general population (Barth et. al., 1993) and elevated levels of anxiety (Rabinowitz et. al., 1983).

1.2.2. PCOS and Psychological distress

The symptoms of mild psychopathology known as psychological discomfort are those that deviate from an objectively healthy state of being and imply maladaptive coping strategies. In the current research, psychological distress is indexed by symptoms of stress, anxiety and depression.

1.2.2.1. PCOS and Depression

Pilgrim (2007) criticized psychiatric diagnoses in various contexts and argued that depression is the most frequently diagnosed mental illness, where common distress is labelled without the need for referral to psychiatric services. He also noted that before this emphasis on primary care, (Miller & Seligman, 1975) likened depression to the common cold of psychiatry, a condition that is simultaneously familiar and mysterious.

Marcus et al. (2012) defined depression as a prevalent mental disorder characterised by symptoms such as a persistent loss of pleasure or interest, decreased energy, low mood, feeling of guilt or diminished self-esteem, disrupted appetite patterns or sleep and difficulties with concentration. Additionally, they observed that depression often co-occurs with symptoms of anxiety.

Symptoms of depression encompass a range of psychological experiences, including feelings of sadness, worry, and despair. These symptoms also encompass mental states associated with depression, such as challenges with thinking, concentrating, making

decisions, and thoughts of death or suicide. Furthermore, historical descriptions of depression, dating back to Hippocrates and including criteria outlined in the DSM-IV, have included common physical and physiological features such as gastrointestinal problems, sleep disturbances, headaches, changes in appetite, diffuse aches or pains, heightened purposeless physical activity (such as an inability to sit still, pacing, or hand wringing), or slowed movements or speech (to an extent observable by others) (Marcus et al., 2012).

1.2.2.2. PCOS and Anxiety

The term anxiety, in Latin, it appears as *angor*, signifying suffocation or a sense of entrapment, and *anxietas* or *angustia*, describing the experience of shrinking back fearfully or being overly concerned. Consequently, anxiety encompasses a range of behavioural, emotional, and cognitive responses triggered by the perception of danger. It's often referred to as a prestimulus reaction, occurring in anticipation of threatening stimuli (Agarwal, 2019). Anxiety serves as an alerting signal, warning an individual of imminent danger and enabling them to take appropriate measures (Veeraraghavan & Singh, 2002). Anxiety can become excessive or even pathological when it arises without a clear challenge or stressor and when its duration or severity is disproportionate to the triggering event. Such excessive anxiety can result in significant distress and impairment across various aspects of life, including psychological, social, occupational, and biological domains (Trivedi & Gupta, 2010). Furthermore, experiencing high levels of stress can contribute to an increase in anxiety (Misra & McKean, 2000).

Symptoms of anxiety encompass a variety of manifestations, including emotional aspects such as feelings of fear, tension, worried thoughts, and apprehension. They also encompass physical changes like heightened physiological arousal, increased blood pressure, and sensations like nausea and palpitations. These symptoms can lead to the inhibition of ongoing activities and a shift in an individual's priorities (Nes, 2007).

1.2.2.3. PCOS AND STRESS

Hans Selye first brought the concept of stress into the life sciences in 1936, describing it as any external factor or internal impulse that disrupts the organism's balance (Pestonjee, 1992, pp. 15, 17).

Earlier Indian literature by Agarwala, Malhan, and Singh (1979) identified stressors as psycho-social stimuli (psychological stress), with the primary concern being deviations at the psychological level (e.g., anxiety, depression) and behavioural level (withdrawal). Selye identified two forms of stress: (a) eustress, which encourages individuals to excel, tackle challenges, think creatively, and build self-assurance; and (b) distress, which leads to deteriorating performance, disruptions in adaptive bodily functioning, and maladaptive responses, whether physiological, cognitive, emotional, or behavioural (Powell & Enright, 1990, p.19).

Lazarus and Folkman defined stress as a specific interaction between a person and their environment, where the person perceives the situation as challenging or exceeding their resources, thereby endangering their well-being. According to Snöbohm and Heiwe (2013), Brat (2017) observed that heightened stress levels can result in negative effects such as depression, emotional exhaustion, anxiety, social isolation, decreased job satisfaction, lower self-esteem, strained personal relationships, and feelings of loneliness.

Symptoms of stress encompass various physical, mental, and behavioural manifestations. Physically, stress can lead to symptoms such as a rapid heartbeat, elevated blood pressure, hyperventilation, dizziness, tingling, sweating, numbness, and muscle tension, which can manifest as aches, pains, headaches, and tremors. It may also cause migraines, stomach ulcers, nausea, frequent urination, diarrhoea, and physical illnesses like asthma, skin rashes, or even cancer. Mentally, stress might present as difficulty focusing, challenges in making decisions, forgetfulness, increased negative and self-critical thoughts, irrational ideas, and catastrophic thinking, characterized by excessive worrying. Behaviourally, stress can result in avoiding anxiety-inducing situations, withdrawing socially, excessive alcohol consumption, smoking, or drug use, difficulty sleeping or waking early, increased aggression or irritability, a higher risk of

accidents, manic activity levels, heightened obsessional behaviour, loss of sexual interest, and changes in eating habits (Powell & Enright, 1990, p.20).

Bayram and Bilgel (2008) examined the prevalence of depression, anxiety, and stress among a group of Turkish college students. A total of 1,617 pupils participated in this quantitative study by anonymously completing the DASS-42 questionnaire in their classrooms. The results indicated that 27.1% of the subjects encountered depression at moderate to severe levels, 47.1% experienced anxiety, and 27% reported stress of comparable intensity. Female pupils demonstrated heightened levels of worry and tension. In addition, students in their first and second years had higher levels of sadness, anxiety, and stress in comparison to their counterparts in different academic years. The findings indicate that the high prevalence of depression, anxiety, and stress symptoms among college students is alarming. It is imperative to implement both primary and secondary prevention strategies, as well as establish adequate support services tailored to this particular population.

The rapid growth of this endocrine disorder among women of menstrual age and the psychological impact on their mental wellbeing is proven to be closely connected. (Damone et. al, 2018). However, this is the first study to assess self-criticism among women with and without PCOS. Based on the limited availability of the intervention and suggestions of many studies this investigation has attempted to provide possible solutions to curb the mental health complications of “Women with PCOS”. Post analysing the current mental health status of PCOS women, the author felt a need to conduct a detailed study. Therefore, in this thesis the author targets on how the interventions help in combating the mental health of PCOS women.

Self - Criticism can be beneficial, if it is allowing humility and change to positivity by acknowledging the mistakes felt by one, otherwise it will lead to disturbance of psychological well-being.

1.3. Self-Criticism and Self Compassion

1.3.1. Self-Criticism

Self-criticism is defined as a cohesive framework of beliefs, emotions, and viewpoints that individuals may activate against themselves primarily in response to failures or challenges (Gilbert, 2005; Whelton and Greenberg, 2005). Studies have demonstrated that self-criticism is associated with a variety of adverse consequences, including heightened stress levels and the manifestation of symptoms related to mental health issues (Kannan & Levitt, 2013). According to a study conducted by Longe et al. (2010), self-criticism strongly activates the brain's danger processing mechanism. There is a considerable correlation between the existence of self-criticism and lower levels of self-compassion, and this link is large enough to be acknowledged. As a consequence of this, the purpose of this study is to quantify the many types of self-criticism and to provide constructive forms of self-affirmation by employing a method from the field of psychology known as Mirror Work.

Kannan and Levitt (2013) provide a definition of self-criticism as the process of negatively criticising oneself and reviewing one's own behaviours. Self-criticism falls under the category of self-evaluation. Whelton and Greenberg (2005) conducted research that found that this process typically culminates in sentiments of rage and self-contempt

Subsequent research, notably conducted by Gilbert and his associates, suggested that self-criticism can be categorised into two separate forms: the 'hated-self' and the 'inadequate self.' Each of these types has a distinct purpose and produces different impacts on psychological distress, as suggested by Gilbert et al. (2004) and further explained by Halamová et al. (2018).

A type of self-criticism that ultimately functions as a form of self-inflicted punishment is that which is described below. On the other side, the 'inadequate-self' version places an emphasis on acknowledging deficiencies, areas that require work, and prior failings with the goal of strengthening one's own potential for self-improvement.

According to the findings of a study that was carried out by researchers in the area of neuroscience (Henderson et al., 2020), the inadequate-self form is connected to brain processes that are engaged in self-reassurance. Even after taking into account the fact

that they may despise themselves, those who have low self-esteem have a tendency to rely more on self-reassurance, as indicated by the findings of the study that was conducted by Gilbert et al. in 2004. Therefore, it is predicted that the form of self-criticism that is defined by feelings of inadequacy is more strongly related with psychopathological problems than the form of self-criticism that is distinguished by severe animosity towards oneself (Gilbert et al., 2004). However, there is a negative link that exists between both forms of self-criticism and self-esteem, as well as with satisfaction in life and self-compassion. Furthermore, as mentioned by Castilho et al. (2015), they may be utilised to discriminate between clinical and nonclinical populations. As a consequence of this, it is of the highest significance to acknowledge that these many expressions of self-criticism are intimately connected to psychological suffering.

An elevated level of self-criticism has been shown to have a significant correlation with a number of psychiatric disorders, including posttraumatic stress disorder (Cox, MacPherson, et al., 2004) and depression (Luyten et al., 2007). The significance of this connection may be seen from the perspective of diagnostics. Enns et al. (2002) discovered that persons who engage in high levels of self-criticism had a propensity to have fewer good effects when they participate in traditional treatments such as cognitive therapy and cognitive behavioural therapy (CBT).

The findings of research conducted by Shahar et al. (2003) and Zuroff et al. (1999) provide evidence that this phenomenon is presumed to originate from the challenges that individuals who are self-critical encounter when attempting to cultivate substantial interpersonal contacts and establish a therapeutic link that is beneficial to them. People who have a tendency to engage in excessive self-criticism may have been subjected to inconsistent or inadequate parenting during their formative years. It is possible that this might ultimately lead to the development of attachment-related anxiety or avoidance, as suggested by the hypotheses that were proposed by Bowlby (1969, 1973), Cantazaro and Wei (2010), and Naismith et al. (2019).

According to a research that was carried out in the field of neuroscience (Kim, Kent, et al., 2020), it has been demonstrated that self-criticism might have an effect on

attachment processes, which in turn could have an effect on mental representations and reactions to potential threats. It has been hypothesised that persons who have secure attachments may experience higher levels of mental visual imagery while they are participating in self-criticism, whereas individuals who have avoidant attachments may experience lower levels of this phenomena. It is essential to acknowledge that the degree to which an individual's level of self-criticism decreases during therapy has a more significant influence on the results of treatment than the initial levels of self-criticism (Rector et al., 2000). It is necessary to give self-criticism a high priority when it comes to the execution of This is due to the fact that self-criticism is linked to psychological distress and has the potential to influence the results of therapeutic therapies.

There is an increasing number of individuals who are beginning to recognise compassion as a viable therapy for self-criticism and a technique for relieving the suffering that is associated with it. As stated by Gilbert (2010), self-compassion assists individuals in developing a supportive internal dialogue that challenges self-critical attitudes and lowers unpleasant feelings. There are many different definitions of compassion that can be found in the literature, which has resulted in the evolution of a number of programs that are designed to raise the amount of self-compassion that individuals have.

According to Gilbert (2014, page 19), compassion is defined as the capacity to perceive and grasp the pain that oneself and others are going through (engagement), as well as the commitment to take steps to relieve and avoid that suffering (activity). In other words, compassion is a two-fold concept. Compassion-focused therapy, often known as CFT, is a type of treatment that was established as a result of this knowledge. According to Gilbert (2014), cognitive behavioural therapy (CFT) is a conceptual framework that integrates concepts from evolutionary psychology, attachment theory, Buddhist philosophy, and social mentality theory. According to Gilbert (2014), the major objective of Compassion-Focused Therapy (CFT) is to support the transition of individuals from a mindset that is affected by competing social hierarchies to a mentality that is centred around compassion. This shift is intended to be accomplished by facilitating the transition. Imagery, meditation, letter writing, and role play are just

few of the strategies that are utilised in cognitive behavioural therapy (CFT) in order to foster the development of self-soothing capabilities, as well as bravery and wisdom. CFT strives to support the evolution of these qualities in its patients. For clinical groups that are characterised by high levels of self-criticism and shame, it is especially advantageous since these groups may not display favourable responses to typical therapy techniques (Gilbert, 2009; Gilbert & Procter, 2006). This is because these groups may not be able to demonstrate positive reactions to treatment. Taking this approach is very beneficial for the therapy groups that are being discussed.

Additionally, Neff's (2003a, 2003b) perspective on compassion, which is presented as an alternate viewpoint on the topic, is founded on the teachings of Buddha. This perspective is supplied as an alternative viewpoint. Neff's conceptualisation of self-compassion comprises three fundamental elements: mindfulness, which highlights the significance of remaining in the present moment rather than excessively identifying with one's difficulties; connection with others, which encourages social interaction instead of isolating oneself; and self-kindness, which advocates for treating oneself with compassion rather than judgement (Neff, 2003a). According to Neff and Germer (2013), the technique has led to the development of the Mindful Self-Compassion Program, which is a program that is well-organised and has the objective of fostering self-compassion.

During the course of the twenty years that have passed, there has been an increasing amount of interest in the idea of self-criticism within the domains of psychopathology and psychotherapy. The findings of previous studies suggest that individuals who are coping with a variety of psychological issues, including but not limited to anxiety, depression, personality disorders, eating disorders, suicidal tendencies, interpersonal difficulties, and substance abuse, are more likely to engage in self-criticism (Bergner and Bergner, 1995; Cox, Enns, & Clara, 2002; Firestone, 1988; Gilbert & Irons, 2005). This is the case because individuals who are coping with these issues are more likely to focus on their own shortcomings. According to Whelton and Henkelman (2002), self-criticism is a phenomenon that is not restricted by cultural, ethnic, social, or gender barriers. This is the interpretation of the phenomenon. For example, those who engage in self-criticism are more likely to hold pessimistic thoughts about themselves,

according to the results of Whelton, Paulson, and Marusiak (2007). It is possible that these negative notions may appear on a regular basis or that they will continue to be there throughout their whole life course.

According to Whelton and Henkelman (2002), self-criticism is a common occurrence that might vary to a certain amount in terms of how it manifests itself, how intense it is, and how it affects each individual. As a method of self-evaluation, the objective of this research is to investigate the practice of self-criticism as a method of inquiry. Self-criticism, despite the fact that it has the capacity to be advantageous and informative, also has the potential to result in adverse repercussions and implications. Based on the results of psychotherapy researchers who have researched self-criticism (Whelton & Greenberg, 2005), this definition is coherent with the spectrum of experiences that vary from being healthy to being maladaptive. To add insult to injury, it is founded on the findings of the study that has been carried out on the topic. When it comes to the field of psychopathology, the investigation of self-criticism mostly concentrated on the qualities that are related with it, notably depression and perfectionism. There is a theory that suggests that those who suffer from both perfectionism and sorrow engage in considerable amounts of self-criticism. Furthermore, a review of the research on psychotherapy demonstrates that there is a connection between self-criticism and the outcomes of treatment as well as the therapeutic relationship. This is the conclusion that can be drawn from the findings of the review.

Self-criticism is frequently portrayed in literature as either a vulnerability to depression or a fundamental aspect of depression (Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982; Carver & Ganellen, 1983; Gilbert, Clarke, Hempel, Miles, & Irons, 2004; Klein, Harding, Taylor, & Dickstein, 1988; Rector, Bagby, Segal, Joffe, & Lefitt, 2000). These portrayals indicate that self-criticism is a significant factor in the development of depression. Self-criticism is a crucial element in the development of depression.

Self-critical perfectionism is a condition that is characterised by continual and extensive self-assessment, together with worries about the opinions of others, according to Dunkley & Kyriakidis (2008) (p. 1296). This state is characterised by those who are concerned with the judgements of others. The findings of their research indicated that

persons who displayed greater levels of self-critical perfectionism were more likely to experience negative emotions such as guilt, melancholy, hopelessness, and loneliness, while simultaneously expressing a lower level of positive emotions. This was the case despite the fact that they had a lower level of positive emotions.

The individuals in issue displayed a predisposition towards cynicism and scepticism, in addition to demonstrating a heightened sensitivity to mockery. In addition, they displayed ridicule sensitivity. Researchers Dunkley, Zuroff, and Blankstein (2006) found that the self-critical qualities of perfectionism were highly suggestive of daily stress, avoidance of coping mechanisms, a perception of inadequate social support, negative emotions, and diminished positive emotions. In addition, the researchers found that perfectionism was associated with a higher likelihood of experiencing negative emotions. Furthermore, they discovered that perfectionism was linked to a reduction in the amount of pleasurable feelings experienced. Two instances of other correlational research that have also yielded results that are comparable to these are Flett, Hewitt, Blankstein, and Grey (1998) and Gilbert, Baldwin, Irons, Baccus, and Palmer (2006). Both of these studies were conducted in 1998 and 2006, respectively. In addition, self-critical perfectionism has been linked to the practice of self-blame, shifting focus to other activities, and employing fewer problem-solving strategies as a means of coping with stress. All of these deficient coping techniques have been connected to self-critical perfectionism, and they are all instances of insufficient coping mechanisms. Self-criticism can diminish individuals' view of their own skills and result in more incidents of self-blame, particularly in reaction to perceived stress or failure, according to the findings of the research. While aiming for perfection might increase performance outcomes, self-criticism can have the opposite effect. This is especially evident in situations when individuals are working to enhance their performance. Consequently, there is a significant correlation between perfectionism and sadness as a result of this. Zuroff and his colleagues conducted a study in the year 2000 to gain a better understanding of the connections that exist between perfectionism, perceived relationship quality, and the therapeutic alliance. During the course of the investigation, it was found that the patient's participation in the alliance and their viewpoint on the therapeutic connection were two distinct factors that might be used to determine the

chance of that therapy being effective. Patients exhibiting perfectionistic traits demonstrated minimal enhancements in their therapeutic relationship over the duration of treatment. Furthermore, the negative relationship between perfectionism and treatment results was affected by the incapacity of perfectionistic patients to develop stronger therapeutic alliances. People who suffer from disorders that are characterised by self-criticism typically have a difficult time forming meaningful connections with others and frequently endure psychological pain, as indicated by the findings of the study that was examined in this area.

The research that Whelton et al. (2007) conducted with 169 patients was carried out at a community clinic. Participants were recruited from the community. Self-criticism was shown to have a positive link with clients' hostile mood states, whereas it had a negative correlation with their assessments of good affect, according to the findings of Albersnagel (1988). For the purpose of determining this, the Visual Analogue Scale (VAS) was utilised to assess the emotional states of the customers. Patterns that were consistent with one another were exhibited by the linkages at both the nine-week and the twelve-week intervals of the counselling sessions. Not only that, but the findings that were gathered from the Working Alliance Inventory (Horvath & Symonds, 1991) indicated that there is a negative association between self-criticism and client perceptions of the relationship that exists between the therapist and the client. Consequently, this demonstrates that higher degrees of self-criticism are associated with a greater number of unfavourable judgements on the relationship that exists between the therapist and patient. However, after taking into consideration the effect of both hostile and positive affect, it was shown that the ability to critique oneself was no longer a valid determinant of the quality of the working relationship that was later established. As a result of this, it is possible to draw the conclusion that the scores pertaining to the working alliance were influenced by both negative and good affect during certain sessions.

The findings of a study that was carried out by Kannan and Levitt (2013) reveal that self-criticism is an important component that has a significant influence in influencing the result of psychotherapy. There have been a number of studies that have demonstrated a connection between self-criticism and a wide variety of mental health

problems (for example, Cox, MacPherson, Enns, & McWilliams, 2004; Cox, McWilliams, Enns, & Clara, 2004; Faza'a & Page, 2009; Fennig et al., 2008; Kopala-Sibley, Zuroff, Russell, Moskowitz, & Paris, 2012). According to Marshall, Zuroff, McBride, and Bagby (2008) and Rector, Bagby, Segal, Joffe, and Levitt (2000), persons who exhibit high levels of self-criticism are statistically more likely to have fewer favourable outcomes as a result of their engagement in therapy. This association was shown to be statistically significant. On the other hand, the link between self-criticism and treatment results differs from one research study to the next; this is because there have been many different research studies undertaken. The importance of doing a thorough review of the empirical data cannot be overstated when it comes to gaining a more fundamental understanding of the impact that self-criticism has on the overall effectiveness of treatment. Prior to the release of this study, there was no previous thorough review that was available on the issue of the link between self-criticism and the results of psychotherapy.

Individuals who have high levels of self-criticism are more likely to experience sentiments such as failure, regret, inferiority, and humiliation (Blatt & Luyten, 2009; Whelton & Greenberg, 2005). It is also more probable that these individuals would feel ashamed of themselves. These people are more prone to be critical of themselves, which is the reason why this circumstance exists. Generally speaking, when discussing perfectionism, personal standards are often connected with the adaptive or normal aspect of perfectionism, which is associated with extraordinary achievements. Establishing and working towards very lofty goals that one has set for oneself is an essential component of personal standards. It is important to note that self-critical perfectionism, on the other hand, is a manifestation of the pathological and dysfunctional aspects of perfectionism. Individual norms have been demonstrated to have minor or nonexistent associations with psychopathology, however self-critical perfectionism has been found to have a high relationship to psychological suffering (Dunkley, Blankstein, et al., 2006; Dunkley, Zuroff, & Blankstein, 2006; Stoeber & Otto, 2006). These findings were published in scientific journals. The self-critical part that is inherent in perfectionism is what contributes to maladjustment. Therefore, it is not the endeavour to reach high personal standards that leads to poor consequences;

rather, it is the self-critical element that is typical of perfectionism that leads to negative outcomes. There are instances in which the measures of both concepts are utilised interchangeably (Dunkley, Zuroff, & Blankstein, 2006; Shahar, 2015). The findings of Dunkley and other researchers have led them to the conclusion that self-critical perfectionism is closely related to self-criticism, and that the assessments of both concepts are frequently employed interchangeably.

1.3.2. Self-Compassion

Figure 1

Three components of self-compassion



In her foundational work, Neff (2003a) characterizes self-compassion as an intimate and accepting relationship with one's own suffering—one that resists avoidance or emotional detachment. It involves a sincere desire to alleviate personal distress and promote healing through kindness and care. Central to self-compassion is the ability to respond non-judgmentally to personal pain, shortcomings, and failures, while recognizing that such experiences are part of the shared human condition. Neff later clarified (Neff, 2011) that although her concept of self-compassion is rooted in Buddhist psychology, it has been reframed in secular terms to suit scientific discourse.

Self-compassion is increasingly recognized as a powerful tool for managing difficult emotions and enhancing both mental and physical well-being. Defined as compassion turned inward, it entails responding to one's own suffering with the same empathy and

understanding one might offer to others (Neff, 2023). Importantly, self-compassion represents a significant conceptual shift from the self-critical and individualistic tendencies common in many Western cultures (Neff et al., 2007). Its relevance continues to grow as research identifies it as a protective factor across various psychological and health-related domains (Muris & Petrocchi, 2017).

Buddhist teachings, echoed in the work of Gilbert and Choden (2013), suggest that cultivating mindful compassion not only enhances psychological insight but also activates fundamental motivational systems that help regulate emotional complexity in the brain. Self-compassion has been linked to reduced levels of stress, anxiety, and perfectionism, and positively associated with happiness, optimism, wisdom, life satisfaction, and personal accountability (Neff et al., 2007; Heffernan et al., 2010). Moreover, individuals who practice self-compassion are more likely to adopt healthier behaviors, maintain satisfying interpersonal relationships, and take constructive steps in response to challenges.

According to Gilbert and Irons (2005), self-compassion is rooted in an evolved caregiving system in mammals—an attachment-based mechanism that can be activated either through external support or internal nurturing self-talk. When faced with distress, self-compassion serves as a buffer against negative psychological outcomes (Leary et al., 2007). Researchers such as Beaumont et al. (2016) have explored how developing self-compassion may also enhance the ability to offer compassion to others. Compassion-focused interventions commonly address both self-criticism and self-compassion, with research demonstrating reductions in social isolation, improvements in social connection, and greater acceptance of personal limitations (Lathren et al., 2018; Austin et al., 2021).

Self-criticism and self-compassion are often inversely related (Zhang et al., 2019). For individuals with PCOS, who tend to report lower levels of self-compassion and higher levels of psychological distress, cultivating self-compassion may serve as a critical therapeutic strategy.

Neff (2003b) originally articulated self-compassion within the broader philosophical framework of Buddhist compassion (e.g., Brach, 2003), which emphasizes acceptance and empathy. Goetz et al. (2010) define compassion as an emotional response to suffering that involves a genuine desire to help—marked by warmth and concern rather than judgment or detachment. True compassion, unlike pity, fosters connection and shared humanity rather than reinforcing feelings of separateness or superiority. Compassion also requires the courage to face discomfort and suffering directly, a process supported by the practice of mindfulness.

Self-compassion, as elaborated by Neff (2016), comprises three key components:

1. **Self-kindness vs. self-judgment** – responding to personal shortcomings with understanding rather than harsh criticism.
2. **Common humanity vs. isolation** – recognizing that suffering and imperfection are universal rather than feeling alone in one's struggles.
3. **Mindfulness vs. over-identification** – maintaining balanced awareness of painful thoughts and emotions, rather than becoming overwhelmed or suppressing them.

These elements are interrelated, and while they may not always manifest equally, they collectively support a system aimed at reducing personal suffering. Neff (2022) further conceptualizes self-compassion as a **bipolar continuum**, with responses to suffering ranging from uncompassionate (UCS) to compassionate (CS). This aligns with Tay and Jebb's (2018) model of bipolar continua, where individuals can respond to distress with varying degrees of warmth or indifference.

Interestingly, while we often extend compassion to loved ones during their moments of difficulty, we may simultaneously engage in harsh and self-critical dialogue when facing our own struggles. Practicing self-compassion involves reversing this tendency by responding to oneself with the same empathy and support offered to others. This approach promotes emotional resilience and reduces the internal narrative of inadequacy.

Self-kindness is more than simply stopping self-criticism; it is about actively tending to one's suffering with care. It invites a shift in perspective: acknowledging pain not because it indicates weakness, but because it reflects our commitment to our own well-being. Asking ourselves, *"This is really difficult—how can I care for myself right now?"* helps foster emotional healing and motivation, much like receiving compassion from a trusted friend.

The **common humanity** component of self-compassion promotes a sense of connectedness rather than isolation. In moments of failure or adversity, individuals often fall into the trap of believing they are alone in their struggles. This misperception distorts reality, leading to feelings of alienation. Recognizing that hardship and vulnerability are part of the shared human experience allows individuals to respond to themselves with greater acceptance and less judgment.

Finally, **mindfulness** plays a crucial role in cultivating self-compassion. It involves being present with emotional pain in a balanced way—neither ignoring nor exaggerating it (Shapiro et al., 2006). Acknowledging our own suffering mindfully enables us to adopt a compassionate stance, rather than becoming overwhelmed by distress or pushing it away. Without this mindful awareness, we may become so entangled in our pain that we lose the capacity to care for ourselves effectively.

In summary, self-compassion is a multidimensional construct grounded in ancient wisdom and supported by contemporary psychological research. It has profound implications for mental health, emotional regulation, and well-being—particularly for individuals facing chronic conditions like PCOS, where emotional distress and self-criticism are often pronounced. Promoting self-compassion offers a path toward resilience, healing, and a more supportive relationship with oneself.

1.3.2.1. Three Aspects of Self-Compassion

According to Neff's extensive body of work (Neff 2003a; Neff 2011; Neff & Germer, 2013; Neff & Tirsch, 2013), self-compassion encompasses three essential components that are interwoven and mutually influential:

a) **Self-Kindness versus Self-Judgment:** This aspect involves the extension of kindness, care, and empathy toward oneself rather than engaging in harsh self-criticism and judgment. Personal flaws and inadequacies are met with a gentle and empathetic attitude. The language used internally is supportive and understanding, steering clear of relentless self-condemnation for perceived inadequacies or not meeting a standard of 'good enough.' In essence, being self-compassionate entails embracing one's inherent imperfection, acknowledging the capacity for failure, and recognizing that encountering life's inevitable challenges is part of the human experience. When confronted with life's stressors, a self-compassionate response involves pausing to provide oneself with comfort, solace, and protection before rushing to regulate or fix the problem. It's a compassionate approach aimed at alleviating suffering and emotional discomfort rather than adopting a stoic grin and bear it mentality. In summary, a self-compassionate individual tends to show kindness to oneself when confronted with both internal and external sources of pain and difficulty.

b) **Embracing Common Humanity vs. Isolation:** This aspect highlights recognizing one's experiences as part of the broader human condition rather than seeing them as isolating and separating. Instead of seeing one's flaws or shortcomings as attributes of a separate, clearly defined self that can be pinpointed and blamed for failures, the sense of common humanity shifts the perspective. When individuals self-condemn for inadequacies, they often assume that there is a distinct, self-contained entity called me responsible for their shortcomings. However, a more detailed examination shows that personal failings are the culmination of countless past circumstances, including socio-economic backgrounds, past relationships, family histories, and genetics, all converging to shape the "self" in the present moment. Recognizing common humanity in self-compassion entails acknowledging all humans endure suffering and that being human inherently involves mortality, vulnerability, imperfection, mistakes, and significant life challenges. Self-compassion connects one's own imperfections to the common human experience, allowing for a more comprehensive and inclusive perspective on the self. This perspective counters irrational or pervasive feelings of isolation, dispelling the notion that I am the sole individual experiencing suffering or making mistakes.

c) **Practising Mindfulness vs. Over-Identification:** Within the framework of self-compassion, mindfulness has a more precise definition. It involves maintaining a balanced awareness of one's negative and painful thoughts and feelings related to personal suffering. Mindfulness does not ignore or dwell on undesirable aspects of oneself or one's life. Instead, it means being fully open to the present moment, allowing thoughts, emotions, and sensations to arise without judgment, avoidance, or suppression. While mindfulness primarily focuses on one's internal experience (sensations, emotions, thoughts), self-compassion extends compassion to the person who is suffering—the experiencer. To practise self-compassion effectively, it is first necessary to mindfully acknowledge personal suffering. Although suffering may seem obvious, those around us often fail to recognize the depth of pain, especially when it stems from one's internal self-critic. When facing stressors, individuals frequently become engrossed in problem-solving, overlooking the extent to which their "self" is struggling in the present moment. Simultaneously, it's crucial to maintain a grounded awareness that prevents becoming ensnared by the thoughts and emotions fueling the misery, a process Neff (2003b) refers to as over-identification. Over-identification occurs when one becomes entangled in negative reactivity, narrowing focus and amplifying consequences for self-worth. Mindfulness counters the inclination to employ avoidance as a coping mechanism for negative emotions, such as suppressing or ignoring painful thoughts and emotions. Such avoidance strategies can lead to dysfunctional and ultimately ineffective responses, including social withdrawal. Mindfulness, in contrast, encourages the acceptance of the truth of one's experiences, even when they are unpleasant. This balanced stance stems from the process of contextualizing personal experiences within a larger perspective.

1.3.2.2. The Connection between Self-Compassion and Alternative Psychological Approaches

Neff's preliminary work provides a comprehensive overview of how self-compassion relates to other psychological theories and research. She explains that while the origins of self-compassion are rooted in Eastern philosophies, the concept aligns with various Western psychological approaches, such as the (a) Self-in-relation model by Judith Jordan, which bears a close resemblance to self-compassion with its idea of self-

empathy encompassing acceptance, care, and empathy toward oneself, and (b) Humanistic Psychology, where self-compassion resonates with the work of humanistic psychologists like Abraham Maslow's concept of 'B perception,' which involves non-judgmental, forgiving, and loving self-acceptance for personal growth; Albert Ellis' notion of 'unconditional self-acceptance'.

1.3.2.3. The Genesis of Self-Compassion: The System of Nurturing and Caring

Previous literature, in collaboration with Neff's research, suggests that self-compassion is a developed capacity arising out of behavioural systems related to attachment and affiliation. This evolutionary perspective highlights the mammalian behaviour of seeking propinquity and comfort from caregivers to establish a safe foundation for navigating the world. The survival of mammals hinges on the tend and befriend instinct during times of stress or threat, particularly in animals that protect their offspring and live in cooperative groups. As we ascend the evolutionary ladder, the human ventral vagal complex, cingulate cortex and prefrontal cortex play pivotal roles in activating this species-preservative system and developing healthy attachment bonds and self-compassion. Addressing threats involves both individual adaptive and group-adaptive behavioural systems, which can be understood in the context of multilevel selection theory. For humans, a sense of secure attachment and belonging derived from the caregiving system enhances feelings of safety and connection, while diminishing feelings of threat and isolation, which in turn helps to reduce anxiety and depression. Furthermore, self-compassion promotes emotional balance by instilling a sense of worthiness of love and care, contributing to increased happiness (Neff & Dahm, 2015; Neff & Turch, 2013).

A well-organized and imaginative Self-Compassion Intervention program demonstrated its effectiveness and feasibility in helping mentally troubled young adults. (Thomas 2020).

1.3.2.4. PCOS and self-compassion

Women diagnosed with polycystic ovary syndrome were found to have reduced levels of both self-compassion and body compassion, according to a study by Van Niekerk et al. (2022).

Interventions for regulating the psychological well being of ‘Women with PCOS’

During the initial phase of this research, an extensive review of existing literature was conducted to understand the current strategies employed in addressing psychological distress among women diagnosed with Polycystic Ovary Syndrome (PCOS). The findings revealed a predominant focus on pharmacological interventions and lifestyle modifications, such as dietary changes and physical exercise. While these approaches are undeniably valuable, there appeared to be limited scholarly exploration and empirical implementation of certain psychosocial and mind-body techniques, particularly interventions such as **mirror work**, **gratitude journaling**, and **pranayama (breath regulation)**, within the context of PCOS.

This observation gave rise to the hypothesis that these underutilized yet impactful tools could offer significant benefits in regulating psychological well-being among women with PCOS. Each of these interventions—mirror work, gratitude journaling, and pranayama—is inherently **cost-effective, non-invasive, and easily adoptable**, making them particularly suitable for long-term, self-directed mental health support.

To ensure the appropriateness and clinical relevance of incorporating these techniques, the researcher undertook consultations with **experienced gynecologists, licensed psychologists**, and academic **supervisors**. These discussions affirmed the potential of these practices to complement conventional treatments and to address the often-overlooked emotional and psychological challenges faced by PCOS women.

In summary, the deliberate inclusion of **mirror work**, **gratitude journaling**, and **pranayama** in this study stemmed from a combination of identified gaps in the literature, practical feasibility, and expert validation. Their integration reflects a holistic approach to addressing the psychological dimensions of PCOS and contributes to the

growing discourse on integrative mental health strategies in women's health. Each of these intervention is discussed in detail as follows.

1.4. Pranayama

1.4.1. Pranayama Definition

Pranayama is a component of Yoga which deals with regulation of breath, an exercise for physical and mental wellness. There are 3 dimensions of a human being: body, mind, energy. The first 2 are there in the experience of every human. However, to make the body and mind function, there must be some energy; this life energy is called 'prana' in yogic system. Pranayama enhances the body with ample pranic energy (life power)

In the process of Pranayama, the mind is quiet, calm, serene and passively connected thereby reducing the mental stress level and increasing the level of cognition and concentration.

In the yogic way of understanding, the menstrual cycles of a woman should be in sync with the cycles of the moon. However, with the modern lifestyle, it is becoming impossible to do these things and as a consequence, the women suffer menstrual problems. Also in today's time because of the huge levels of information available, modern women can get stressed about many things that women of the past did not know or encounter. To address this issue in a scientific way, yoga can be used.

Cowley (1987) stated there is a prevalence of dysfunctional breathing (DB) up to 83% in anxiety sufferers. Gallego and Perruchet (1991), observed conditioning in an ordinary environment may influence breathing. Shea and Guz, (1992), had made an observation that there exist individual differences in the pattern of breathing in human beings. However, the question, 'Why do people breathe in different ways?' remains unanswered.

1.4.2. Pranayama Intervention

Patients with anxiety and panic disorder commonly showed irregularity in breathing pattern thereby indicating a dysfunction in the normal pattern of breathing. Thenegative

effects of mental stress can be addressed through yoga techniques like pranayama (breathing exercises), which enhance vagal tone and help maintain a calm mind (Thanalakshmi et al., 2020). Breathing exercises have been shown to improve quality of life and alleviate mental health issues such as stress, anxiety, and depression in various conditions (Upadhyay et al., 2021).

Yoga is an age-old Indian discipline that encompasses a set of practices aimed at shaping one's way of living. It is practiced through various methods and styles, including Asana (postures), Pranayama (breathing techniques), and Meditation (concentration techniques), by practitioners. (Saraswati et. al. 2002). Bansiwal and Mahey (2020) mentioned behavioural strategies through yoga, meditation and healthy lifestyle to relieve stress and emotional wellbeing in management of PCOS.

A prospective intervention study within a yoga context explored how body surveillance and body appreciation mediate the relationship between self-compassion and intrinsic motivation for physical activity. The findings revealed that individuals with higher levels of self-compassion exhibited greater body awareness and were more engaged in regularly monitoring their physical condition (Cox et al., 2019). Long-term yoga practice has been shown to positively affect both self-compassion and mindfulness, contributing to emotional well-being (Snaith et al., 2018). Additionally, a 12-week yoga program significantly enhanced the quality of life for women with polycystic ovary syndrome (PCOS), compared to a control group that participated in regular physical exercise (Nidhi et al., 2013). Prabhakari and Gopinath (2019) highlighted the significant benefits of pranayama in improving reproductive outcomes for women with PCOS. Similarly, Bijendar Singh and Laxmi (2021) found that incorporating specific yoga asanas and pranayama into treatment regimens for PCOS showed high effectiveness, offering a viable alternative strategy for managing the condition.

Several studies have examined the role of pranayama in reducing mental stress, anxiety, and tension in individuals with PCOS. For instance, Thakur et al. (2021) found that pranayama could effectively alleviate stress and anxiety among women with PCOS. Aili (2021) further emphasized yoga's capacity to reduce stress, with specific mention of how relaxation techniques combined with yoga enhance overall well-being and

vitality. Trivedi et al. (2023) reported that humming exercises like Bhramari Pranayama serve as powerful stress-reduction tools by improving heart rate variability (HRV) and activating the parasympathetic nervous system, thus reducing sympathetic nervous system activation. Ushamohan et al. (2023) explained how the practice of Bhramari Pranayama establishes multisensory synchrony, facilitating a meditative state through the relationship between breath and self-vocalized acoustics.

Bhramari Pranayama has also been shown to significantly reduce anxiety, stress, and depression in COVID-19 patients in home isolation, while improving sleep quality and general well-being (Dayal, 2023). Among students with PCOS, a pranayama intervention led to a dramatic reduction in test anxiety, with only 33% of the experimental group reporting high levels of anxiety, compared to 66.7% in the control group. Furthermore, the experimental group performed better in exams, highlighting the cognitive and emotional benefits of pranayama (Patil et al., 2021).

Saslow and Aikens (2020) conducted a cross-study on lifestyle and diet interventions aimed at improving outcomes for women with PCOS, focusing on depression, anxiety, energy levels, and menstrual regulation. Their findings indicated that women were particularly interested in lifestyle programs that offered multiple benefits, although they showed lower enthusiasm for specific dietary interventions. Furthermore, participants in a mindful yoga intervention showed a notable reduction in free testosterone levels before and after the program (Patel et al., 2020). However, no study has yet investigated the potential of pranayama to reduce self-criticism, despite its established role in enhancing awareness and fostering positive thoughts.

The primary goal of deep breathing techniques, such as pranayama, is to induce relaxation by concentrating on the breath and enhancing parasympathetic activity through slow inhalation and exhalation (Jerath et al., 2019; Mulhaeriah et al., 2018; Yokogawa et al., 2018). Pranayama, a core component of yoga, involves conscious regulation of various aspects of the breath, including techniques like breath retention and nostril manipulation (Saoji et al., 2019). Unlike deep breathing exercises, pranayama often involves deliberate changes in breathing rate and patterns, such as the practice of nadi shodhana (alternate nostril breathing) and Bhramari (humming),

making it a more dynamic and multifaceted practice (Jagadeesan et al., 2022; Ushamohan et al., 2023).

Research on pranayama has demonstrated its capacity to alleviate symptoms such as fatigue in chemotherapy patients (Dhruva et al., 2012), enhance sleep quality in individuals with COVID-19 (Jagadeesan et al., 2022), reduce blood pressure in hypertensive patients (Thanalakshmi et al., 2020), and improve respiratory function while lowering anxiety and stress levels (Jayawardena et al., 2020). Danhauer et al. (2019) have called for future studies to include active control groups, which would help refine the interpretation of findings related to pranayama interventions.

Yoga, a discipline with ancient roots in India, is increasingly recognized as a complementary and alternative medicine practice that can positively influence the mind-body connection (Visweswaraiah & Telles, 2004). As a holistic system, yoga integrates physical postures (asanas), breathing exercises (pranayama), meditation, and stretching techniques, targeting the mental, emotional, spiritual, and physical domains (Sengupta, 2012; Manchanda & Madan, 2014). The scientific community is increasingly acknowledging pranayama's health benefits, including its potential to enhance mental clarity, alleviate stress, and improve cardiovascular health (Dinesh et al., 2015).

According to the **Chhandogya Upanishad**, pranayama regulates the breath (vayu) in alignment with the body's internal energy (prana). The concept of prana is central to yoga philosophy, as it nourishes the body's physical structure (Annamaya Kosha) through channels known as **nadis**, which connect and energize the chakras, the body's energy centers (Shyam et al., 2014). Research on pranayama's effects on hypertension suggests that it can significantly lower blood pressure, heart rate, and the rate-pressure product (Sharma et al., 2013). Recent studies have also shown that **Nadi Shodhana Pranayama** improves cardiorespiratory efficiency and may benefit individuals with respiratory disorders (Jahan et al., 2021).

Additionally, Bhramari Pranayama has been found to enhance autonomic function, improve pulmonary health, and reduce sleep disturbances, with significant

psychological benefits observed in COVID-19 patients practicing the technique at home (Trivedi & Saboo, 2021). A study by Kuppasamy et al. (2020) demonstrated that healthy teenagers who practiced Bhramari Pranayama for six months exhibited faster reflexes and improved cognitive processing, suggesting that pranayama may enhance the body's response to stress (Maheshkumar et al., 2022).

The term **pranayama**, derived from the Sanskrit words *prana* (life force or breath) and *ayama* (control or expansion), refers to the yogic practice of breath regulation. Key pranayama techniques involve *pūraka* (inhalation), *recaka* (exhalation), *antaḥ kumbhaka* (internal breath retention), and *bahih kumbhaka* (external breath retention) (Nivethitha et al., 2016). The practice is integral to Patanjali's **Yoga Sutras**, where it is positioned as the fourth limb in the Eightfold Path of yoga (Hartranft, 2003). While many studies have examined yoga as a whole, fewer have focused exclusively on pranayama. However, the evidence suggests that pranayama alone can have profound effects on stress reduction, respiratory function, cardiovascular health, and cognitive performance (Büssing et al., 2012; Cramer et al., 2014; Jeter et al., 2015).

In conclusion, pranayama and yoga interventions show promise as effective treatments for PCOS, offering a holistic approach to managing both physical and psychological symptoms. While existing research provides compelling evidence for the benefits of pranayama in reducing stress, anxiety, and improving overall well-being, further studies are needed to fully explore its potential in reducing self-criticism and enhancing emotional resilience, particularly in women with PCOS.

1.5. Gratitude Journal Writing

1.5.1. Gratitude Definition

"A mark of feeling is gratitude. The state of receiving is gratitude (Dispenza, 2014). Gratitude and appreciation are two emotions that may awaken your inner warmth and raise your energy level (Dispenza, 2014). Among the strongest feelings to increase your receptiveness is gratitude (Dispenza, 2014). Being grateful helps a lot. It just means having gratitude for everything.

Research has shown that trait gratitude is positively correlated with better self-esteem, as reported by the subjects themselves (Alkozei, Smith & Killgore 2018). Skrzelinska and Ferreira reviewed the many definitions, evaluations, treatments, and research on thankfulness in their review article from 2022

According to Elosía (2015) and Emmons et al. (2003), gratitude may be defined as a positive feeling, a way of thinking, moral perfection, a cognitive state, a personal characteristic, or an adaptive reaction.

Fitzgerald (1998) distinguished three different aspects of thankfulness: an attitude of appreciation for someone or something, kindness towards someone or something, and a tendency to do constructive acts as a result of kindness and gratitude. A research by Neto (2007) found that an individual's general propensity to forgive was significantly influenced by their level of thankfulness.

1.5.2. Gratitude Journal Writing Intervention

Various interventions, including traditional pen-and-paper methods and gratitude writing exercises, have been developed to promote the expression and experience of thankfulness. According to Davis et al. (2016), more research is necessary to explore the impact of gratitude interventions on clinical groups facing different types of psychological distress. For example, women with breast cancer who participated in a two-week gratitude intervention that included daily journal writing reported improvements in mental health, greater perceived social support, and more effective coping strategies (Sztachńska et al., 2019).

Positive responses to gratitude interventions have been linked to enhanced well-being (Layous et al., 2013). Recent meta-analyses have indicated that gratitude-boosting therapies may positively impact psychological well-being, especially by reducing symptoms of anxiety and depression. However, the size of these effects might be modest. Research by Cregg and Cheavens (2021), Davis et al. (2016), and Dickens

(2017) supports this conclusion. In contrast, Bohlmeijer et al. (2021) found that a six-week gratitude-writing intervention improved well-being but did not reduce distress compared to a self-kindness or control group.

Gratitude interventions, such as journaling, offer a cost-effective way for individuals to boost their positive psychological state. Gratitude practice has been shown to significantly reduce the likelihood of violent behavior in teenagers (Chamizo et al., 2020). Additionally, a study involving football players demonstrated that a gratitude-based intervention improved team morale, mental health, and cohesion (Wong et al., 2022). A pilot study on 81 participants with arthritis found that a combination of mindfulness and gratitude interventions reduced arthritis-related pain and anxiety (Paddison et al., 2019).

Further research by Dunaev, Markey, and Brochu (2018) has shown that gratitude writing can be an effective tool for reducing internalized weight bias and improving body image. Additionally, students who engaged in gratitude journaling exhibited significantly better post-test scores across multiple domains of life satisfaction (Isik & Erguner-Tekinalp, 2017). A study by Wong et al. (2016) compared gratitude writing to expressive writing and found it to be a valuable addition to psychotherapy, leading to increased mental well-being.

According to Watkins et al. (2009), gratitude involves recognizing the value of gifts received from others, which fosters a sense of abundance. Emmons and McCullough (2004) conducted multiple studies on gratitude and found that cultivating gratitude enhances daily psychological well-being. Interestingly, individuals who are able to find the positive aspects of stressful situations tend to thrive better (Tennen & Affleck, 2002). Keeping gratitude journals is one popular method for fostering appreciation (O'Connell et al., 2018). Research by Fekete et al. (2022) suggests that gratitude writing may also help reduce stress and negative emotions.

Therapies focused on gratitude have been shown to improve mental health. Layous and colleagues (2013) hypothesized that cultural factors might influence the effectiveness of gratitude interventions. Gratitude practices are widely accepted across cultures and

have strong emotional connections with people worldwide. Increased gratitude is associated with better subjective well-being (Azad Marzabadi et al., 2021; Dickens, 2017; Emmons & McCullough, 2003), although questions have been raised about the strength of the effects and the appropriateness of using a single technique like gratitude journaling in therapy (Cregg & Cheavens, 2021).

Davis et al. (2016) have suggested that the limited impact of gratitude therapies might stem from an over-reliance on a single technique. They have called for more varied, adaptable, and needs-based gratitude interventions. This study proposes comparing traditional gratitude journaling with a more flexible psychoeducational and menu-based approach to gratitude interventions.

Gratitude is defined as recognizing the positive impact that others have on one's life and has been shown to correlate with subjective well-being (Cregg & Cheavens, 2021; Davis et al., 2016; Emmons & McCullough, 2003). Subjective well-being includes positive affect, active engagement with one's environment, meaningful interpersonal relationships, and a sense of life direction (Seligman, 2018). Several studies have demonstrated the positive relationship between gratitude and multiple dimensions of well-being, including lower stress, better mental health, and improved sleep quality (Azad Marzabadi et al., 2021; Wood et al., 2008).

Emmons and McCullough (2003b) pioneered research on gratitude's role in enhancing well-being, finding that individuals who kept gratitude journals reported improvements in well-being, even in groups with neuro-muscular disorders (effect sizes ranging from $d = 0.51$ to 0.56). Subsequent studies have broadly supported the link between gratitude practices and improved subjective well-being, with effect sizes typically ranging from $d = 0.14$ to 0.31 (Davis et al., 2016; Dickens, 2017). Gratitude interventions, especially for clinical groups, have also been linked to reduced symptoms of anxiety and depression ($\eta^2 = 0.11$ - 0.17 ; Kerr et al., 2015; Southwell & Gould, 2017).

Gratitude writing remains one of the most widely used techniques for cultivating gratitude (Davis et al., 2016; Emmons & McCullough, 2003b; Kaczmarek et al., 2015). This technique involves individuals setting aside regular time to write down things they

are grateful for, typically in a personal journal. While daily journaling has been shown to be beneficial, newer research suggests that writing every other day may be more effective than daily entries (Lyubomirsky, 2007).

In addition to writing, verbal expressions of gratitude, such as thank-you letters or spontaneous acts of appreciation, have also been shown to boost well-being (Berger et al., 2019; Lambert et al., 2010). Some programs also integrate gratitude meditations, encouraging a more reflective approach (Fraser et al., 2022). Modern gratitude interventions have begun to incorporate psychoeducation on the benefits of developing appreciation (Heckendorf et al., 2019; Komase et al., 2021).

However, the effectiveness of gratitude interventions may be limited, as noted in recent meta-analyses (Cregg & Cheavens, 2021; Davis et al., 2016). The research suggests that current gratitude practices do not significantly impact anxiety and only slightly reduce depression ($g = -0.18$ to -0.20). These findings are based on general population studies, and the effects may vary in clinical settings. Gratitude interventions have been shown to outperform a measurement-only condition ($d = 0.31$) in improving well-being, but their effect size is smaller when compared to alternative activities that require participants to alter their daily routines but are not directly related to gratitude practices (Cregg & Cheavens, 2021; Davis et al., 2016; Wood et al., 2010).

Despite these challenges, the majority of research still centers around variations of the original gratitude journaling method, and studies often do not fully explore the range of other gratitude practices (Boggiss et al., 2020; Wood et al., 2010). As Davis et al. (2016) noted, only one study in their meta-analysis employed psychoeducation. This highlights a gap in the research, especially considering the growing body of evidence supporting other gratitude practices (Boehm et al., 2011; Fraser et al., 2022; Komase et al., 2021; Lambert et al., 2010).

In psychotherapy, a modular approach—where therapists select from a range of strategies tailored to a client's needs—has been shown to produce better outcomes than rigid, standardized treatments for mental health conditions like depression and anxiety (Evans et al., 2020; Fisher et al., 2019; Stumpp & Sauer-Zavala, 2022; Weisz et al.,

2012). Applying a flexible, menu-driven model to gratitude interventions may enhance their effectiveness and better address individual needs.

A challenge with gratitude practice is that it may become too routine, leading to diminished effectiveness. Research suggests that the benefits of gratitude journaling decrease as participants engage in it more frequently (Lyubomirsky et al., 2005). As gratitude journaling becomes habitual, it may start to feel more like a chore than a meaningful activity. Davis et al. (2016) propose that to maintain its benefits, gratitude practice should be more engaging and personalized. By offering a broader selection of gratitude activities, we may enhance their impact. Future empirical and longitudinal studies are essential to better understand the effectiveness of gratitude interventions and their potential in therapeutic settings.

1.6. Mirror work

1.6.1. Mirror work Definition

Every time you are speaking a word...You are creating a world. Doing affirmations- Adopting a positive mindset and cultivating gratitude can significantly shape the quality of your life (Hay, 2016).

Louise Hay's Mirror Work is a foundational self-help practice that involves standing in front of a mirror and repeating positive affirmations directed toward oneself (Hay, 2016). According to Hay, the mirror acts as a powerful tool for confronting one's inner dialogue, bringing subconscious self-beliefs to the surface, and actively replacing negative self-talk with compassionate, affirming messages. The process is not just about saying kind words, but about establishing a deeper emotional connection with oneself by maintaining eye contact in the mirror, which helps to foster acceptance, forgiveness, and self-love. Hay emphasized that when individuals consistently look into their own eyes while affirming their worth, they begin to dismantle layers of criticism, guilt, or shame that may have accumulated over years. This daily ritual, often

recommended for 21 days or more, is designed to cultivate a new habit of self-kindness and create lasting internal transformation. Through Mirror Work, Hay (2016) proposed that individuals could heal emotional wounds, boost self-esteem, and ultimately improve their overall mental and emotional well-being.

1.6.2. Mirror Work Intervention

The theory of objective self-awareness, as proposed by Silvia (2002), suggests that mirrors can enhance self-focused attention and increase self-awareness. Petrocchi, Ottaviani, and Couyoumdjian (2016) further hypothesized that self-care affirmations, when repeated in front of a mirror after a brief period of self-criticism, would lead to increased positive affect—particularly in terms of relief and self-comfort—compared to repeating affirmations without the mirror or simply looking at the mirror without engaging in affirmation practices.

The use of a mirror in these practices serves to boost self-compassion by encouraging compassionate self-talk and fostering feelings of kindness and connectedness, especially during moments of personal suffering. Research has shown that mirrors can play a significant role in enhancing positive emotions by encouraging individuals to connect with their inner sense of comfort and security (Muris & Petrocchi, 2017). Moreover, studies have indicated that exposure to a mirror can reduce response times to suicide-related words, suggesting that mirror work can evoke different psychological responses depending on context (Selimbegović et al., 2013).

Mirror Work and Self-Awareness

According to Silvia (2002), mirrors serve as powerful tools for facilitating self-awareness by directing attention inward. This concept has led to extensive investigation in psychological research, where mirrors are used to induce a state of self-reflection and self-directed attention. Objective self-awareness theory posits that individuals compare themselves to personal standards when they are faced with their own reflection. Such comparisons often lead to negative emotional consequences (Duval & Wicklund, 1972). However, studies have shown that mirror exposure can also have the opposite effect, reducing self-critical evaluations.

For instance, Hofmann and Heinrichs (2002) found that individuals who were instructed to list both their positive and negative traits after spending five minutes in front of a mirror reported a more balanced self-description than those who did not use a mirror. These findings suggest that mirrors can help individuals avoid excessive self-criticism and promote a more holistic self-perception.

Applications in Psychological Therapy

Mirrors have also been employed as therapeutic tools to address a range of psychological disorders. In individuals with autism spectrum disorder, mirrors have been used to enhance self-awareness and improve social interactions (Duff & Flattery, 2014). Additionally, Mahoney (1991) developed a technique where clients were encouraged to observe themselves in a mirror while articulating their experiences. This approach facilitated self-exploration and emotional insight, helping individuals develop a more compassionate internal dialogue (Williams et al., 2002).

Vinai et al. (2015) introduced a related technique called self-mirroring, where patients reflect on their own facial expressions while recalling a significant life event. This technique aids in understanding and empathizing with emotional experiences, promoting self-compassion and emotional resilience.

Historical Context: Mirrors and the Self

Historically, mirrors have been closely tied to the concept of the 'Self.' Carl Jung's theories on the psyche emphasized the mirror as a crucial symbol in understanding the depths of one's own identity. According to Joseph (1997), the mirror is not just a metaphor but an essential tool for self-awareness and psychological exploration. Jung believed that engaging with one's reflection was necessary for overcoming false beliefs and reaching a true understanding of the 'Self' (Huskinson, 2004). This concept is echoed in the work of Spiker and Ricks (1984), who demonstrated that language development and self-recognition are intricately linked, further supporting the role of mirrors in the development of self-awareness.

Mirror Work and Facial Expressions

Mirrors also influence our understanding of facial expressions, both our own and others'. Research by Stel et al. (2009) revealed that individuals who are encouraged to inhibit facial mimicry perform better at detecting lies, suggesting that self-awareness of one's facial expressions enhances social perception. Neta, Norris, and Whelan (2009) also found that the natural expression of emotions, as measured by electromyography, can influence how individuals interpret the emotional tone of others' facial expressions.

Further studies have shown that the ability to read facial expressions is linked to one's own expressiveness. Davis et al. (2010) discovered that individuals who underwent Botox treatment, which impairs the ability to express emotions through facial muscles, struggled with interpreting complex emotional expressions. This underscores the profound role of self-awareness and self-reflection in shaping our perceptions of others.

Using Mirror Work to Address Body Image Issues

Mirror exposure has been applied in clinical settings to address body image concerns, particularly for individuals dealing with body dissatisfaction. For example, Hilbert et al. (2002) introduced a technique where participants used a mirror or video to provide neutral, non-judgmental descriptions of their physical appearance. The goal was to reduce negative self-assessments, such as "I am an overweight nobody," and foster a more objective view of their bodies. The results showed that prolonged exposure to one's reflection, paired with neutral descriptions, helped reduce negative emotions related to body image, particularly in overweight and obese individuals.

Mirror Work in the Context of PCOS

Polycystic Ovarian Syndrome (PCOS) is a common endocrine disorder that affects women of reproductive age, often leading to hormonal imbalances, metabolic difficulties, and psychological distress (Azziz et al., 2016). Women with PCOS frequently struggle with body image issues, self-esteem, and mental health concerns, making interventions that promote self-compassion particularly valuable.

Research has indicated that interventions like mirror work, alongside practices such as maintaining gratitude journals and practicing pranayama, can help women with PCOS

cultivate self-compassion and emotional resilience. These techniques focus on reducing psychological distress by encouraging positive self-reflection, self-acceptance, and emotional well-being. The combination of these interventions holds promise for improving mental health outcomes in this population.

Conclusion and Future Directions

While preliminary research supports the efficacy of mirror work and related interventions in promoting self-compassion and psychological well-being, particularly in individuals with body image concerns or conditions like PCOS, further empirical studies are needed to fully validate these findings. Specifically, more research is required to compare different interventions and determine which strategies are most effective in improving mental health outcomes for women with PCOS. By expanding the scope of these studies, we can gain a deeper understanding of how self-awareness and self-compassion practices, like mirror work, can be tailored to meet the unique needs of individuals facing physical and psychological challenges.

1.7. Statement of the problem

In addition to its medical manifestations, polycystic ovary syndrome (PCOS) frequently has a significant influence on the psychological well-being of those who are affected by it. This is especially true in terms of self-criticism and self-compassion in compared to persons who do not have the illness. Self-criticism, which is characterized by harsh self-judgment and negative self-perceptions, is frequently observed among "Women with PCOS." On the other hand, self-compassion, which involves self-kindness and a balanced attitude towards oneself, tends to be lessened. A decrease in quality of life, an increase in stress levels, and a reduction in overall health outcomes are all potential results that can be brought about by the psychosocial repercussions of these emotional states. However, variable self-criticism has not been measured in the context of PCOS women. As a result, this study is the first investigation to report the degree of self-criticism among "Women with PCOS." Additionally, a comparison was made between the level of self-criticism among PCOS women and healthy women of reproductive age who did not have PCOS.

Given the complex nature of polycystic ovary syndrome (PCOS), it is of the utmost importance to implement interventions that attempt to alleviate the psychological discomfort that is experienced by women who are impacted by the condition. Practicing Pranayama, an ancient practice that focuses on controlling one's breath and practicing relaxation techniques, may have the ability to provide therapeutic advantages for one's emotional well-being. In addition, Mirror Work, which is a reflective practice that focuses on self-affirmation and self-acceptance, and Gratitude Journal Writing, which encourages positive thinking and emotional regulation, have the potential to be effective interventions for addressing our dependent variables, which include self-criticism, depression, anxiety, stress, and self-compassion in the context of "Women with PCOS."

Despite the growing recognition of the psychological burden associated with Polycystic Ovary Syndrome (PCOS), there remains a significant gap in the literature when it comes to evaluating the effectiveness of simple, non-pharmacological mental health interventions in this population. While existing studies have explored cognitive-behavioral therapy, mindfulness-based approaches, and general lifestyle modifications to support mental well-being in women with PCOS, very few have examined the potential benefits of low-cost, self-practiced techniques such as Pranayama, Gratitude Journal Writing, and Mirror Work. Each of these interventions has shown promising results in improving psychological outcomes such as stress, anxiety, depression, and self-compassion in other populations, including students, general adult women, and individuals with chronic health conditions. However, their application within the PCOS context remains under-researched. The absence of such studies creates a critical gap, particularly given the accessibility and scalability of these practices, which require minimal resources and can be practiced independently. Addressing this gap is essential for expanding the range of psychological care options available to women with PCOS, many of whom experience emotional challenges that are either untreated or undertreated. This study aims to contribute to the limited body of research by exploring how each of these interventions, administered separately, may benefit the psychological well-being of women with PCOS.

There is a major gap in the literature regarding the efficacy of these interventions in the setting of polycystic ovary syndrome (PCOS), despite the fact that these interventions have the potential to be promising. This research endeavors to evaluate the efficacy of Pranayama, Mirror Work, and Gratitude Journal Writing in reducing self-criticism and enhancing self-compassion in women who have Polycystic Ovary Syndrome. The goal of this research is to solve the gap that has been identified because of this research.

This study compares the psychological distress of women with polycystic ovary syndrome (PCOS) with that of healthy females of reproductive age who do not have PCOS. The comparison mainly focuses on the dependent variables. The purpose of this study is to determine how these comprehensive interventions affect the emotional wellness of women with PCOS. Additionally, the purpose of this inquiry is to provide useful insights into novel therapeutic approaches that have the potential to improve the psychological resilience of the individuals as well as their overall quality of life.

1.8. Theoretical and Conceptual Framework of the Study

The conceptual framework of the current study is based on a number of different theories and empirical findings that pertain to the fields of mental health, self-compassion, and holistic well-being. Additionally, the study takes into consideration the specific issues that are experienced by "the women with PCOS." The foundation of this framework is based on a synthesis of well-established psychological and health-related theories. These theories shed light on the intricate relationship that exists between self-criticism, self-compassion, and the psychological well-being of "Women with PCOS." In order to gain an understanding of the psychological journey that "Women with PCOS" go through, the study makes use of developmental theories. In addition, the theoretical framework makes substantial use of the rapidly developing field of self-compassion, which is built upon the work of Neff and Gilbert.

There are several facets to the concept of self-compassion, including self-kindness and self-criticism, common humanity and isolation, awareness and over-identification, and so on. To understand how "women with PCOS" might change their self-perceptions and emotional responses from self-criticism and isolation to self-kindness, common

humanity, and mindfulness, which may result in decreased levels of psychological discomfort, it is essential to have a solid understanding of these components. This study acknowledges the interconnectivity of the biopsychosocial and bio ecological aspects that are present in the lives of "Women with PCOS." It does so by incorporating elements of holistic well-being. The purpose of this study is to investigate the ways in which interventions such as Pranayama, Mirror Work, and Gratitude Journal Writing can engage these individuals on several fronts, so assisting them in addressing the physical symptoms of polycystic ovary syndrome (PCOS), the emotional effect of the condition, and the environmental variables that may worsen their misery.

The study highlights the significance of active participation and engagement of "Women with PCOS" as major stakeholders in their own well-being. This is particularly important in light of the limited resources and awareness surrounding mental health issues associated to PCOS. The conceptual framework emphasizes the necessity of everyday living practices that are in line with the specific issues that women with polycystic ovary syndrome (PCOS) encounter. It also underscores the need for interventions that empower women with PCOS to take an active part in managing their mental health. Among "Women with PCOS," it is expected that the therapies of Pranayama, Mirror Work, and Gratitude Journal Writing will have a favorable impact on self-compassion, which will ultimately lead to a reduction in the intensity of psychological distress.

1.9. Significance of the study

Most of the previous research on "Women with PCOS" have targeted more on anxiety, depression, stress and QoL as psychological factors in addition to metabolic disorders. Many of the researchers found in previous research papers were from medical professionals and only very few psychologists have participated in research related to PCOS. Due to the huge and colossal growth of health psychology in western world, it ends with us a great opportunity in carrying further research in psychological wellbeing parameters. So, after reviewing, I have observed that many researchers were targeted only towards depression, anxiety and stress, but very few studies were done on self-compassion "Women with PCOS" (Jose.S, 2023). Researchers have done extensive

study on psychological distress but the variable self-criticism is not studied in PCOS women.

The psychological factors which can lead to depression, anxiety and stress and its management have not been studied in depth. Apart from this we can find the emotional part of an individual, and how we can promote them to achieve higher mental health has not been concentrated. Quality of life is mainly based on emotional stability of an individual; therefore, it is necessary to assess the psychological vulnerable factors, which can contribute much to the emotional factors. There is not much study done on the self-criticism and its relationship on self-compassion through which they can better handle the psychological distress with those “Women with PCOS”

Although there are many recommendations on mirror work based on the results it has not been tested empirically. In clinical context, whether gratitude, mirror work can be practiced?. Whether gratitude can be practised in patients with clinical features of psychological distress. Methods using gratitude, mirror work are not well researched in the context of PCOS women. Therefore, this study aimed to measure pre and post - Depression, Anxiety and stress in cases of PCOS, this study also aims to assess self-criticism and self-compassion before and after the intervention of pranayama, mirror work, gratitude journal writing in “Women with PCOS”. We must invest more time in finding more methods and techniques to improve self-compassion, thereby helping the wellbeing of “Women with PCOS”.

1.9.1 Three Interventions given separate

The study adopted three separate interventions—Pranayama, Gratitude Journal Writing, and Mirror Work—administered individually to different participant groups, rather than relying on a single intervention. This was done to ensure that participants had multiple, accessible pathways to support their mental health, recognizing that individuals may respond differently to different types of practices. Instead of limiting the study to one approach, offering three distinct interventions increased the likelihood of engaging participants meaningfully and allowed for broader applicability of the findings. Since all three methods are simple, cost-effective, and easy to practice

independently, the study aimed to explore a range of practical options that could be integrated into the daily routines of women with PCOS. The goal was not to compare the interventions, but to examine whether each, when practiced on its own, could contribute to improved mental well-being in this population.

1.10. Scope of the study

This research could contribute relevance to the present public health issues in women. The outcome of the study would help the “Women with PCOS” to lead a better QoL. The study could help to identify the use of psychological interventions like mirror work, gratitude journal writing and Pranayama. This study may likewise have critical ramifications in understanding how by improving the degrees of certain positive psychological factors, women can be enabled to manage certain setbacks. There exists a scope of understanding the effect of the therapeutic intervention to increase self-compassion level and in reduction of self-criticism level in “Women with PCOS” and to promote the psychological well-being variables of specific areas like anxiety, depression, stress level. The vulnerable psychological factors like body image, self-image social acceptance and assertiveness can be improved by decreasing self-criticism, better addressed by inculcating these methods in PCOS women. This study would also help to identify how to develop self-compassion and to reduce self-criticism, therefore resulting in an improved quality of life. Self-compassion being a self awareness program, by inculcating the psychological methods the attainment of higher self-compassion could indeed result in reducing the psychological distress in PCOS cases. The scope of the study restricted to clinically diagnosed PCOS women from the outpatient department of Srushti Fertility centre & Women’s Hospital (Private) in Chennai, Tamil Nadu, which has 3 branches spread over in Chennai city. This study period spanning from February 2022 to November 2022.

CHAPTER 2

REVIEW OF LITERATURE

One definition of a literature review is "an evaluation of the existing body of knowledge on a particular research topic that is both systematic and critical." The purpose of this evaluation is to provide a full overview of what is known and what gaps still exist in the field. By summarizing, analyzing, and synthesizing pertinent works, theories, and procedures, its major objective is to contextualize a research issue within the larger academic discourse. This is accomplished during the duration of the project. This process involves several key steps: first, defining a clear research question or objective that guides the scope of the review; second, conducting a thorough search of academic databases, libraries, and other scholarly resources to gather a wide range of relevant literature, including books, journal articles, and conference papers; third, applying inclusion and exclusion criteria to select high-quality, pertinent sources, ensuring that the review is focused and relevant; fourth, analysing and synthesizing the selected studies to identify key themes, trends, and debates within the literature; this involves critically assessing the strengths and weaknesses of each study, noting methodological issues, and evaluating the overall contribution of the research to the field.

The review might be organized chronologically, by following the progress of research over time, or thematically, by grouping studies according to common topics or concepts. Both of these organizational methods are effective. A chronological approach demonstrates the development of thought and research methods over the course of time, whereas a thematic structure helps to present the literature in terms of significant subjects and issues, which makes it simpler to discover trends and gaps when compared to a chronological approach. In addition to this, the literature evaluation should indicate any gaps in knowledge and potential future avenues for research, pointing out areas that require additional examination in order to increase understanding. The current study is placed within the context of the existing body of knowledge as a result of this action, which not only helps to prevent the duplication of efforts but also provides valuable insight into the design and technique of future research. Lastly, a summary of the most

important findings is presented at the end of the review. This summary emphasizes the value of the study issue and highlights the necessity of further exploration in the areas that have been discovered. The researcher is required to keep a critical viewpoint throughout the entire process. This is necessary in order to guarantee that the evaluation is fair and objective, taking into account both the positive and negative aspects of the studies that are being evaluated. The purpose of a well-executed literature review is to serve as a basis for new research. It guides researchers by providing insights into effective approaches and common pitfalls, and it enhances their grasp of the subject area. There is also a significant part that it plays in academic writing, where it contributes to the establishment of the originality and relevance of the research by displaying a comprehensive engagement with the knowledge that is already available. However, due to the huge amount of research that is currently available and the requirement for critical evaluation, completing a literature review can be more difficult than it initially appears. Researchers have a responsibility to select sources with great care, taking into account several aspects such as reliability, relevance, and methodological rigor. Additionally, they should be ready to update the review whenever new research is conducted in order to ensure that it remains accurate and relevant. In the end, a literature review is an essential component of academic research. It makes a contribution to the expansion of knowledge by conducting a synthesis of previous research, determining where there are gaps in understanding, and providing direction for future research.

Research that is both effective and methodical can be broken down into many crucial steps. Out of all of these, the literature review stands out as the most important step in the research process. It is a fundamental requirement for a research endeavor that is both reliable and valuable. It plays a significantly important part in the precise planning that is required for successful execution and for the actions that are required for authentic research to be carried out. It is possible to define the literature review as an in-depth and careful analysis of a variety of sources of information, including but not limited to books, articles, research journals, theses, and dissertations that are associated with the research subject that is currently being investigated. In addition to this, it incorporates several additional relevant sources of information that have the potential to shed light on the investigation. The researcher is able to acquire a full grasp of prior

work that is relevant to the research problem and shed light on current patterns and practices within the field of study through the use of this procedure, which represents a vital phase in the process of developing the research topic.

In addition, the researcher is able to define study objectives and hypotheses with the assistance of the literature review, which is an essential step in the process of formulating the research question. The literature review plays a crucial part in the formation of the research methodology, which includes decisions regarding the selection of samples, the selection of relevant research tools, the processes for data collection, the appropriate statistical techniques for data analysis, and the interpretation of the results. The capability of the literature reviews to prevent previous research efforts from being duplicated and to detect gaps in the research that has already been conducted within the subject area is another significant component of the review. For the purpose of providing valuable insights into a variety of aspects, including the research problem, sampling methods, methodology, tools, procedures, statistical approaches, potential challenges, implications, scope for further research, key findings from previous investigations, and limitations associated with prior research efforts, a comprehensive review of the existing literature supplies valuable insights. The purpose of this chapter is to provide a comprehensive overview of the process of doing a literature review. This procedure is essential for comprehending the research problem and directing the subsequent phases in the process of generating the research question. This part presents the relevant literature that has helped to shaping the current research challenge in an organized manner and organizes said literature in a manner that is organized. For the purpose of this study, an attempt was made to conduct a literature review on the topic of comparing women with PCOS to women who do not have PCOS. The literature that is currently accessible on the effects of pranayama, writing in a gratitude diary, and mirror work was also reviewed in this study. The findings are categorized and presented under the following headings:

- a) Depression, Anxiety, Stress and PCOS
- b) Self-criticism
- c) Self-Compassion

- d) Pranayama
- e) Mirror Work
- f) Gratitude Journal Writing

2.1. Depression, Anxiety, Stress and PCOS

- ❖ Himelein and Thatcher (2006) assert that “Women with PCOS” not only experience physical disturbances and ailments, but also face a heightened risk of developing mental disorders such as depression, bipolar disorder, stress, body dissatisfaction, sexual dissatisfaction, and reduced quality of life. According to Barry, Kuczmierczyk, and Hardiman (2011), “Women with PCOS” reported higher levels of anxiety and depression compared to those without the condition. However, both studies are primarily correlational and do not explore underlying causal mechanisms, limiting their ability to inform targeted interventions.
- ❖ In a study by Adamczak, Płotek, Głowińska, Sobol, Wysocka, Polak, Dymanowska-Dyjak, Spaczyńska, Adamczak, and Banaszewskain (2023), studied the association between depressive symptoms and polycystic ovary syndrome, with a focus on time perspective (TP). Findings revealed that depressive symptoms indirectly influenced PCOS, through positive future time perspective. This emphasizes the importance of psychoeducation and supportive communication for at-risk patients to instill hope and regain control over their life situation. Despite its novel psychological angle, the study’s cross-sectional design limits causal interpretations, and cultural differences may affect generalizability.
- ❖ Simon, Keitel, Bigony, and Park-Taylor (2021) explored the connections between attachment styles (anxious and avoidant), coping strategies (hyperactivating and deactivating), and psychological distress in 183 women diagnosed with PCOS. The study employed attachment theory as its theoretical framework and used hierarchical multiple regression analyses to uncover significant relationships among attachment, coping mechanisms, and distress. Mediation effects were also identified in the study, shedding light on the complex interplay between these

variables. While methodologically robust, the study's relatively small and homogenous sample size may limit broader applicability.

- ❖ The study by Light, Chilcot, and McBride (2021) investigated connection of psychological distress and perception of sickness among the “Women with PCOS”. Using a cross-sectional survey involving 487 “Women with PCOS” in the UK, the research measured psychological distress and illness perceptions. The results, analysed through hierarchical multiple linear regression, demonstrated that illness perceptions accounted for psychological distress with 18.6% even after adjusting for various factors. Specifically, experiencing more symptoms, perceiving higher consequences, having lower personal control, and possessing lower illness coherence were linked to higher psychological distress. These findings emphasize the potential significance of addressing maladaptive illness perceptions emphasizing to the need for development of targeted self-management interventions for this category of women to reduce the psychological burden. Nevertheless, the reliance on self-reported data introduces potential bias and does not capture the longitudinal dynamics of psychological distress.
- ❖ In a meta-analysis conducted by Wang, Ni, and Li (2021), women diagnosed with PCOS, exhibited the presence of anxiety and depression was systematically assessed. This study encompassed 24 cross-sectional research investigations, collectively involving 2,316 “Women with PCOS” for depression assessment, 1,698 for anxiety, and 736 for concurrent anxiety and depression. The analysis revealed substantial findings, with a pooled prevalence of 42% for depression and 37% for anxiety among “Women with PCOS”. Furthermore, the study reported mild depression and anxiety level were more prevalent, occurred pooled prevalences of 27.5% and 35%, respectively. Notably, the PCOS women with obesity were more prone for experiencing depression symptoms, as indicated by an odds ratio of 2.098. These results emphasize the significant burden of anxiety and depression in PCOS patients and suggest the importance of exploring contributing factors in future research to better understand and address these mental health challenges in this population. The meta-analysis strengthens

evidence of mental health burden in PCOS, though heterogeneity in diagnostic criteria and tools across studies may affect the reliability of prevalence estimates.

- ❖ Asdaq and Yasmin (2020) conducted a study with 82 PCOS cases and 85 control group. This case control study was carried out in Riyadh. It has measured the psychological burden such depression, anxiety and stress using DASS-21 to measure the prevalence of depression, anxiety and stress in PCOS and non- PCOS women. The findings revealed the possibility of evolving depression, anxiety, and stress was statistically significant and higher in PCOS in comparison with non-PCOS. However, the small sample size and regional focus may limit the generalizability of the findings to other populations.
- ❖ In another cross sectional study by Saslow and Aikens (2020) examined diet and lifestyle assessment program addressing depression, energy level, anxiety, weight diabetes prevention, menstrual period regulation and hirsutism, sleep stress and physical activity of 197 “Women with PCOS”, using 7- point Likert scale to rate diet and lifestyle, palatable eating motives scale (PEMS) through 7 potential program format option with 9 health outcomes. Results suggested majority of women were willing to participate in programs with numerous beneficial outcomes. But have lower rate of interest towards various diets. The study effectively identifies patient preferences but does not measure actual intervention outcomes, limiting its clinical relevance.
- ❖ Shakil, Wajid, and Ashraf (2019) conducted a cross-sectional study using a 2×3 (age × education) design involving 126 “Women with PCOS” and 63 women without PCOS, all aged between 18 and 45 years. The study aimed to assess differences in depression levels, sexual function, and life satisfaction through the use of the Siddiqui Shah Depression Scale (SSDS), the Life Satisfaction Scale (LSS), and the Female Sexual Function Index (FSFI). The results indicated that “Women with PCOS” experienced higher levels of depression, reduced sexual function, and lower life satisfaction compared to their non-PCOS counterparts. However, lower-educated “Women with PCOS” reported better life satisfaction

compared to their lower-educated non-PCOS peers. The cross-sectional nature of the study limits causal interpretations, and the unique finding regarding life satisfaction among less-educated women with PCOS warrants further exploration to determine underlying psychosocial or cultural factors.

- ❖ Tay, Teede, Loxton, Kulkarni, and Joham (2019) carried out a cross-sectional analysis using survey data from the Australian Longitudinal Study of Women's Health (ALSWH). They examined women born between 1989 and 1995, identifying 760 with PCOS and 7910 without. The study assessed various outcomes using measures such as BMI, the Adverse Childhood Experience Scale (ACES), the Medical Outcomes Study (MOS), a social support survey, and the Perceived Stress Questionnaire (PSQ). The results indicated that “Women with PCOS” had a notably higher rate of psychiatric disorders compared to those without PCOS, with significant associations found between PCOS and conditions such as depression, anxiety, post-traumatic stress disorder, and obsessive-compulsive disorder. While the large, population-based sample strengthens the findings, the cross-sectional design prevents establishing causality.
- ❖ In another study by Damone, Joham, Loxton, Earnest, Teede, and Moran (2019) examined the occurrence of psychological distress like anxiety, depression, perceived stress in women with and without Polycystic Ovary Syndrome (PCOS) with a large sample. Additionally, it sought to examine the part of stress as a contributing factor and mediator in the relationship between PCOS, depression, and anxiety. The research suggests that “Women with PCOS” are more prone to experiencing depression, anxiety, and perceived stress when compared to those without PCOS. Stress believed to have a significant part in understanding the relationship among PCOS and psychological distress. The investigation emphasizes the significance of considering stress assessment and management in the context of PCOS, as it could be pertinent for knowing the causes and medical/therapeutic care of these psychological issues. Despite its strengths in sample size and analytical approach, the study does not explore interventions or longitudinal trends in psychological health.

- ❖ Another study was undertaken by Chaudhari, Mazumdar, and Mehta (2018) focused on polycystic ovarian syndrome (PCOS). This research aimed to: (1) assess the occurrence of anxiety and depression in this demographic of women diagnosed with PCOS, (2) evaluate if PCOS women exhibit any psychiatric morbidity, and (3) evaluate the effect of psychiatric morbidity on the quality of life of these individuals. The findings revealed that 38.6% of the participants experienced anxiety, and 25.7% experienced depression. In the physical symptoms like fertility and alopecia had an alliance with anxiety, while depression is linked to acne. There was a negative relationship between psychiatric disorder and quality of life. This investigation underscores the significance of addressing mental health aspects among these women, as it can significantly impact the QOL of affected individuals. Although informative, the study lacks a control group, which weakens comparative conclusions about the impact of PCOS.
- ❖ Escobar-Morreale, H. F. (2018). Escobar-Morreale's review provides an in-depth analysis of PCOS, including its etiology, diagnosis, and treatment. The review places significant emphasis on the psychological impact of PCOS, detailing how hormonal imbalances, particularly elevated androgen levels, contribute to mood disorders. Escobar-Morreale discusses the interplay between metabolic factors, such as insulin resistance, and psychological symptoms, and stresses the importance of addressing mental health issues in the comprehensive management of PCOS. While comprehensive, the emphasis on hormonal causes might overlook important sociocultural or psychological contributors.
- ❖ In a cross-sectional study conducted by Lingling Li et. al. (2024) at a comprehensive hospital in Henan, China, data from 411 women diagnosed with PCOS were analyzed to explore the prevalence and predictors of depressive symptoms in relation to lifestyle factors. Depression was assessed using the Hamilton Depression Scale, alongside lifestyle and demographic data. Findings revealed that 49.4% of participants exhibited depressive symptoms, with 83.7% of those categorized as mild. Key risk factors identified through logistic regression included a disease duration of 1–3 years, the presence of acne, and

unhealthy lifestyle behaviors such as frequent high-fat diet consumption, staying up late, physical inactivity, and elevated mental stress. These findings underscore the importance of promoting healthy lifestyle choices not only for the physiological management of PCOS but also for mitigating associated psychological distress. However, as with many cross-sectional designs, causal relationships cannot be definitively established, and further longitudinal studies are needed to assess the directionality of the observed associations.

- ❖ Manchanda and Bhatt (2024) conducted a cross-sectional comparative study to examine the often-overlooked psychological impacts of PCOS, particularly focusing on anxiety, depression, stress, and eating behaviours. The study involved 200 participants—100 women diagnosed with PCOS and 100 without—using standardized instruments, including WHO tools and the Health Promoting Lifestyle Profile. Their findings revealed a significant correlation between PCOS and heightened levels of psychological distress, with affected individuals showing increased anxiety, depression, stress, and maladaptive eating patterns. Furthermore, the study highlighted a strong negative correlation between health-promoting lifestyles and psychological impacts, suggesting that lower engagement in healthy behaviors may exacerbate mental health challenges in this population. Interestingly, while the differences in health-promoting lifestyle between the two groups were not statistically significant, women with PCOS still reported relatively poorer lifestyle practices. The study underscores the importance of integrating psychological assessments and lifestyle interventions into PCOS management but is limited by its cross-sectional design, which restricts causal inference.
- ❖ Jannink et al. (2024) conducted a large-scale cross-sectional survey involving 1,025 women undergoing fertility treatment in the Netherlands, nearly half of whom had PCOS. The study aimed to assess whether women with PCOS experience higher levels of anxiety, depression, and lower body appreciation compared to women with other infertility diagnoses. Using validated tools—the Hospital Anxiety and Depression Scale (HADS) and the Body Appreciation Scale-2 (BAS-2)—the authors found no significant differences in clinically relevant symptoms of anxiety or depression between the two groups. However,

women with PCOS reported modestly lower levels of body appreciation (adjusted mean difference: -1.34). These findings challenge prevailing assumptions that PCOS is inherently linked to greater psychological distress in fertility treatment contexts and suggest that mental health vulnerabilities may be equally prevalent across infertility populations. While methodologically robust, the study's reliance on self-reported data and potential sampling bias are noteworthy limitations. Nonetheless, the results reinforce the importance of universal psychological screening and support for all women undergoing fertility treatment, regardless of diagnosis.

- ❖ Keeratibharat et al. (2024) conducted a cross-sectional study in Thailand to investigate the prevalence and associated factors of depression, anxiety, and mental well-being in women diagnosed with PCOS. Utilizing a sample of 260 participants aged 15 to 40 years, the study employed the Hospital Anxiety and Depression Scale (HADS) and the WHO-Five Well-Being Index (Thai version) to assess psychological health. The results indicated that 3.85% of participants experienced depression, 11.92% experienced anxiety, and 16.92% had poor mental well-being. Key factors associated with depression included abdominal obesity, poor mental well-being, and snoring, while anxiety was significantly linked to having children, alcohol consumption, hirsutism, and poor mental well-being. Notably, poor mental well-being emerged as a consistent predictor for both anxiety and depression, emphasizing its role as a central psychological concern. Although the reported prevalence rates were lower than those observed in some international studies, the identification of significant risk factors underscores the need for routine mental health screening in Thai women with PCOS. The study contributes valuable localized data and highlights the importance of culturally sensitive mental health interventions, though its generalizability may be limited to similar populations.
- ❖ Dutkiewicz et al. (2024) examined the psychological well-being, self-esteem, and stress coping mechanisms of women with PCOS, comparing them to healthy controls matched for age and BMI. The study also assessed how these psychological factors were related to clinical indicators like hyperandrogenism, central obesity, and insulin resistance (IR). The study included 42 women with

PCOS and 39 controls, assessing psychological traits alongside hormonal and metabolic profiles. Results revealed that women with PCOS exhibited significantly more symptoms of depression ($p=0.026$), greater tension induction ($p=0.032$), higher alcohol consumption ($p=0.015$), and reduced reliance on active coping and support-seeking strategies. Notably, psychological impairments correlated with markers of hyperandrogenism—such as serum testosterone and androstenedione—but not with central obesity or IR. For instance, testosterone was positively associated with seeking instrumental support and emotional focus, while hirsutism and androgenic alopecia demonstrated inverse and direct relationships with emotional states, respectively. These findings suggest that the mental health burden in PCOS is more closely tied to androgen excess than to metabolic factors, highlighting the importance of integrating endocrine and psychological care. However, the relatively small sample size limits the generalizability of the results and calls for further research with larger cohorts.

- ❖ Siddique et al. (2024) conducted a comparative cross-sectional study to assess the prevalence of psychological burden—specifically depression, anxiety, and stress—and its association with PCOS symptoms among medical students. Utilizing the DASS-21 scale, the study evaluated 291 randomly selected students and found a PCOS prevalence of 12.3%. While hirsutism was commonly reported, it showed no significant association with BMI. Notably, depression was significantly linked to menstrual irregularity ($p = 0.001$), and stress was associated with multiple PCOS symptoms including menstrual irregularity ($p = 0.009$), hirsutism ($p = 0.001$), and prolonged menstruation ($p = 0.024$). The findings emphasize that a considerable proportion of students exhibited PCOS symptoms without formal diagnosis, suggesting underrecognition of the condition. The authors advocate for integrated care approaches involving both gynecology and psychiatry to address the intertwined physical and psychological symptoms. Although limited to a specific population of medical students, the study highlights the urgent need for early screening and intervention strategies to support mental health in young women with PCOS-like presentations.
- ❖ Alnaeem et al. (2024) conducted a cross-sectional study to evaluate the prevalence of depression and anxiety among Saudi women with PCOS and to identify

associated psychosocial and demographic factors. Out of 967 participants, 367 (37.9%) were diagnosed with PCOS—an unusually high prevalence compared to global estimates. Using the DASS-21 scale, the study found that 30.5% of PCOS participants experienced extremely severe depression, while 39.2% reported extreme anxiety. Several factors were significantly associated with increased psychological burden, including being in the 15–25 or 26–35 age groups, being divorced, having a family history of PCOS, being overweight, and receiving advice on dietary and lifestyle changes. Interestingly, those who were advised on health-promoting behaviors showed higher levels of depression and anxiety, suggesting possible psychological strain from lifestyle management or lack of adequate support during intervention. These findings underscore the multifaceted mental health challenges experienced by women with PCOS and highlight the importance of culturally sensitive and psychologically supportive treatment plans. The reliance on self-reported online surveys and the exclusion of participants with psychiatric histories may, however, limit the generalizability and depth of the findings.

- ❖ Rehman et al. (2025) conducted a cross-sectional study to investigate how psychosocial well-being varies among women with PCOS across different reproductive stages—namely, nulligravida, primigravida, and multigravida. Involving 510 participants aged 18–45, the study assessed depression, anxiety, stress, and quality of life (QoL) using validated instruments. Results revealed distinct psychological profiles for each group: nulligravida women experienced the highest rates of severe depression (71.26%), primigravida women had the highest prevalence of severe anxiety (77.29%) yet reported the most favorable QoL, and multigravida women faced the most severe PCOS symptoms and highest stress levels (71.43%) alongside the poorest QoL ratings. Additionally, multigravida women exhibited the highest incidence of hirsutism and acne, suggesting cumulative symptom burden. These findings emphasize the nuanced psychosocial challenges tied to gravidity status in PCOS and advocate for personalized, stage-specific interventions. While the study enriches the understanding of reproductive-stage-related mental health disparities in PCOS, its

cross-sectional nature limits causal interpretations and calls for longitudinal research to further validate these patterns.

- ❖ Khan et al. (2025) conducted a narrative review to synthesize existing literature on the psychological and psychosocial challenges faced by women with PCOS—an area often overshadowed by the clinical and physiological focus of most research. Drawing on studies retrieved from PubMed and Google Scholar, the review highlights a heightened prevalence of anxiety, depression, and eating disorders among women with PCOS, compounded by emotional burdens such as chronic stress and social isolation. The authors emphasize that these psychological outcomes are not only the result of PCOS symptoms like hirsutism and acne but are also intensified by societal stigma and body image dissatisfaction. Additionally, impaired social functioning and feelings of inadequacy further contribute to diminished mental well-being. The review advocates for a more holistic approach to PCOS management—one that integrates regular mental health screenings and considers the complex interplay of emotional and psychosocial factors. While offering a broad overview of relevant studies, the narrative design of the review limits quantitative analysis and causality but nonetheless underscores critical gaps in current PCOS care and the need for mental health-informed interventions.

2.1.1 Summary of Literature Review on Depression, Anxiety, Stress and PCOS

The literature consistently highlights a significant psychological burden associated with Polycystic Ovary Syndrome (PCOS), manifesting predominantly as depression, anxiety, stress, and reduced quality of life. Across numerous cross-sectional and case-control studies, women with PCOS show markedly higher rates of mental health issues than those without the condition. Contributing factors include hormonal imbalances (e.g., elevated androgens), body image concerns (e.g., hirsutism, acne), lifestyle challenges, and sociocultural stigma. Studies using standardized tools such as DASS-21, HADS, and FSFI consistently demonstrate elevated psychological distress among women with PCOS. Time

perspective, illness perceptions, coping strategies, and attachment styles were also found to mediate or moderate psychological symptoms, emphasizing the complex interplay between psychological traits and PCOS-related distress. Meta-analyses and large-scale surveys strengthen the case for the high prevalence of depression and anxiety, with several studies reporting prevalence rates exceeding 40% for depression and 30% for anxiety. However, methodological limitations—such as cross-sectional designs, small or region-specific samples, and reliance on self-report measures—frequently restrict the ability to draw causal inferences. Emerging findings suggest the need for tailored mental health interventions, including psychoeducation, stress management, and lifestyle support. Specific subgroups, such as adolescents, women undergoing fertility treatment, or those in different reproductive stages, may experience unique psychological challenges requiring targeted support. Moreover, sociocultural context, including societal stigma, lifestyle expectations, and healthcare disparities, significantly shapes psychological outcomes and must be integrated into any comprehensive care strategy. Overall, while individual studies vary in scope and rigor, a clear consensus emerges: mental health is a critical yet under-addressed component of PCOS management. Future research should adopt longitudinal and intervention-based designs to better understand causality and to evaluate the effectiveness of integrated psychological and medical care models.

2.2. Self-criticism

- ❖ In his study, Stevenson (2022) examined how self-critical thinking acts as a mediator between perfectionism and felt stress in undergraduate students. This study examined the connections between multidimensional perfectionism, perceived stress, and self-critical thinking in a group of university students from the United Kingdom. The analysis considered both immediate and long-term associations. The objective was to determine if self-critical thinking during the initial assessment acted as a mediator between initial perfectionism and future stress levels during the follow-up. The results revealed that both socially dictated and self-oriented perfectionism were correlated with elevated levels of stress, self-loathing, and feelings of inadequacy at the initial stage. Longitudinal results

indicated that these manifestations of perfectionism were predictive of heightened stress and self-critical cognition over a span of three weeks. Significantly, several mediation analyses demonstrated that starting perfectionism had a long-term impact on reported stress at follow-up, with baseline self-hatred and feelings of inadequacy acting as mediators in this relationship. The findings indicate that perfectionistic tendencies and self-critical thinking might amplify the perception of stress in college students. This underscores the need of interventions that target self-critical thinking as a means to alleviate stress. However, the relatively short follow-up period (three weeks) limits the generalizability of long-term effects, and the reliance on self-reported measures could introduce bias.

- ❖ In her study, Katherine Wakelin (2022) investigated the effects of self-compassion interventions on self-criticism, which refers to the unfavourable judgement of oneself that is associated with mental disorders and negative outcomes in therapy. The review sought to assess the efficacy of these interventions in diminishing self-criticism and to identify factors that may impact their effectiveness. The meta-analysis found that self-compassion therapies had a substantial effect in reducing self-criticism when compared to control groups. The effects were more noticeable when the interventions were extended and when compared to passive controls rather than active controls. Nevertheless, factors such as different forms of self-criticism, the type of sample used, and the exact details of the intervention did not have a significant impact on the results. Although there is some evidence suggesting that self-compassion therapies are effective, the results are limited by the average quality and wide range of the research included. The inclusion of heterogeneous studies strengthens the meta-analytic breadth but also introduces variability that complicates firm conclusions about intervention efficacy.
- ❖ In her study, Laura M. Nagy (2021) investigated the impact of self-criticism and self-compassion on implicit associations related to non-suicidal self-injury (NSSI), which refers to self-inflicted hurt that is not intended to be fatal. The objective of the study was to investigate if deliberately inducing self-criticism would strengthen unconscious links with non-suicidal self-injury (NSSI), and whether practicing self-compassion would diminish these associations. Subjects

were randomly assigned to one of three conditions: a self-criticism induction, a self-compassion induction, or a neutral control condition. Implicit associations with self-harming behaviours were assessed both before and after the induction. The results partially confirmed the hypothesis, indicating that self-criticism led to an increase in implicit linkages with NSSI. However, self-compassion did not have a significant effect on these associations. These findings emphasize the significance of self-criticism in non-suicidal self-injury (NSSI) and indicate that future studies should investigate self-criticism as a possible antecedent to NSSI in longitudinal study. While the experimental design strengthens causal inference, the lack of significant effect for self-compassion highlights the need for refinement in intervention strategies or measurement sensitivity.

- ❖ Loew (2020) conducted a study examining the correlation between self-criticism and the effectiveness of psychotherapy. The study specifically investigated the connection between self-criticism levels before treatment and the outcomes of the therapy, as well as any changes in self-criticism that occurred during the course of the therapy. The meta-analysis found a correlation between elevated levels of self-criticism before treatment and unfavourable therapy results. While the overall effect sizes showed minimal variation, the association differed depending on the kind of mental health issue, indicating stronger connections with certain diseases. The study highlights the prognostic value of pre-treatment self-criticism, though the meta-analytic effect sizes suggest only modest predictive power overall.
- ❖ Richard Thompson (2004) created and verified the Levels of Self-Criticism (LOSC) Scale to assess two forms of negative self-assessment: Comparative Self-Criticism (CSC) and Internalised Self-Criticism (ISC). After conducting reliability and item analyses with 282 participants, a total of 34 questions were adjusted to create a final scale. This scale consists of 12 items for CSC (Customer Satisfaction) and 10 items for ISC (Internal Service Quality). The validation study, which involved 144 people, demonstrated that there was a moderate correlation between CSC and ISC. Additionally, both CSC and ISC were found to have unique associations with other measures of personality, attachment, and conflict resolution. These associations were independent of overall neuroticism.

Although the scale shows strong psychometric properties, the small sample size in the validation phase limits its generalizability and calls for replication in larger, diverse samples.

- ❖ Zaccari et al. (2024) conducted a meta-review to examine current trends and conceptual inconsistencies in the psychological construct of self-criticism (SC), a transdiagnostic factor relevant to a wide range of psychopathologies, including those affecting women with PCOS. Drawing from multiple databases—including PsycINFO, MEDLINE, and PubMed—the study identified significant heterogeneity in how SC is defined, theorized, and operationalized across systematic reviews. While self-criticism is increasingly recognized for its role in exacerbating mental health issues such as depression, anxiety, and body dissatisfaction, the review found that most literature fails to adequately address its multidimensional nature. Discrepancies between theoretical definitions and their empirical applications limit the interpretability of findings and constrain their clinical utility. Though not focused exclusively on PCOS, the study's emphasis on conceptual clarity in SC is particularly relevant to populations, like women with PCOS, who often struggle with internalized stigma, low self-esteem, and harsh self-evaluation. The authors call for greater theoretical dialogue and integration to refine SC as a clinical target—an imperative step toward developing more effective and individualized mental health interventions. The review's identification of conceptual fragmentation in self-criticism research is critical, as it underscores a foundational issue that hinders consistent measurement and clinical application. However, the lack of specific recommendations for operationalizing SC across populations like women with PCOS limits the study's translational impact.
- ❖ In a study conducted by Andrea Varaona et al. (2024), the relationship between Instagram usage and psychological variables such as self-compassion, self-criticism, and body dissatisfaction was examined among 1,051 adults aged 18–50 residing in Spain. Using standardized scales, the researchers found a significant positive correlation between time spent on Instagram and levels of self-criticism. Specifically, individuals who used Instagram for more than three hours daily reported higher self-criticism scores across all age groups.

Interestingly, no significant association was found between time spent on Instagram and self-compassion or body dissatisfaction. However, content exposure played a notable role: users who frequently viewed appearance-related content, such as beauty and fashion, demonstrated higher levels of self-criticism and body dissatisfaction—particularly among younger users (18–35 years). In contrast, viewing science-related content was linked to lower self-criticism and dissatisfaction. Despite its robust sample size and nuanced analysis of content categories, the study’s cross-sectional nature limits the ability to draw causal inferences. Nevertheless, the findings highlight the importance of content type over mere usage time in understanding Instagram’s psychological impact. While the study highlights important associations between Instagram content and psychological outcomes, its cross-sectional design weakens the strength of causal claims. Nonetheless, the nuanced examination of content type rather than just screen time is a methodological strength that informs future digital health research.

- ❖ Geller et al. (2024) explored the psychosocial mechanisms underlying the link between irritable bowel syndrome (IBS) and psychological distress, focusing particularly on the mediating roles of body image and self-criticism. Involving 507 adults—142 of whom were diagnosed with IBS—the study used self-report measures and path analysis to test a mediation model connecting IBS to depression and anxiety. Findings revealed that individuals with IBS reported significantly higher psychological distress, lower body appreciation, greater body dissatisfaction, and increased self-criticism compared to healthy controls. Importantly, body appreciation and self-criticism sequentially mediated the relationship between IBS and mental health symptoms, suggesting that reduced body appreciation in IBS patients fosters self-critical thinking, which in turn amplifies anxiety and depression. Although this study centers on IBS, its implications are highly relevant to PCOS populations, who similarly experience body image disturbances and elevated self-criticism due to chronic symptoms like hirsutism and weight gain. The research highlights the need for integrative care approaches that address not only physical symptoms but also the psychological and emotional dimensions of chronic conditions like IBS—and by extension,

PCOS. This study's mediation model adds valuable depth to our understanding of how chronic illness can influence mental health through psychological pathways. However, reliance on self-reported data may introduce bias, potentially affecting the generalizability of the findings to other chronic conditions like PCOS.

- ❖ Szitás et al. (2024) conducted a systematic review examining the psychological effects of forest bathing, specifically its impact on self-criticism, self-compassion, and self-protection. Analyzing 12 eligible studies, the review found that forest bathing is associated with reduced negative self-referential thinking—such as rumination—and increased self-compassion, along with improvements in mindfulness, introspection, and overall well-being. However, no studies directly investigated its impact on self-protection. Despite these promising outcomes, the authors noted that the overall methodological quality of the reviewed studies was low, primarily due to small sample sizes and a lack of randomized controlled trials. Although not directly related to PCOS, the review's emphasis on interventions that reduce self-criticism and enhance emotional well-being holds particular relevance for women with PCOS, who often experience heightened psychological distress and body dissatisfaction. The findings suggest that nature-based therapies like forest bathing may serve as complementary strategies in improving mental health in populations dealing with chronic, stigmatized health conditions. Nonetheless, more robust empirical evidence is needed to validate these potential benefits.
- ❖ Paranjothy and Wade (2024) conducted a comprehensive meta-analysis to explore the relationships between self-criticism, self-critical perfectionism, self-compassion, and disordered eating (DE), synthesizing data from 135 studies comprising over 42,000 participants. Their findings revealed a moderate positive correlation between self-criticism and disordered eating ($r = .37$), with sub-analyses showing effect sizes ranging from small to large depending on the self-criticism measure used ($r = .20-.52$). Additionally, self-compassion was found to be negatively associated with both disordered eating ($r = -.40$ to $-.43$) and self-criticism ($r = -.04$ to $-.88$), highlighting its protective role. These results support the notion that targeting self-criticism and enhancing self-compassion could significantly improve treatment outcomes for eating disorders. Although this

meta-analysis does not focus specifically on PCOS, its implications are highly relevant given the elevated rates of disordered eating and body dissatisfaction commonly reported among women with PCOS. The study reinforces the importance of integrating compassion-based strategies into clinical interventions for populations at risk of internalized stigma, body image issues, and emotional dysregulation. This meta-analysis provides robust empirical evidence linking self-criticism to disordered eating, strengthening the case for compassion-based therapies. However, the wide variation in effect sizes based on measurement tools highlights the need for more standardized assessments of self-criticism.

- ❖ Zaccari et al. (2024) conducted a systematic review to investigate how qualitative methodologies have been applied to the study of self-criticism (SC), a known transdiagnostic factor implicated in various psychopathologies. Analyzing 16 eligible studies out of 852 screened records, the authors found significant methodological inconsistencies across qualitative investigations of SC. While consensual qualitative research and thematic analysis were most commonly employed, there was no standardized approach to coding or conceptualizing SC. Some studies used top-down methods based on existing theoretical models, others adopted inductive (bottom-up) coding, and only a few integrated both approaches. Importantly, the categories of SC derived from qualitative data often diverged from established theoretical frameworks and were rarely revisited in follow-up studies. This review underscores the need for cohesive, theory-driven, and empirically grounded qualitative research on SC. For researchers studying PCOS and its psychological dimensions—such as internalized stigma, depression, or body dissatisfaction—this work highlights a crucial gap: the need for richer, person-centered qualitative data to understand how self-criticism manifests uniquely in women with PCOS. Incorporating standardized qualitative methods to explore SC in PCOS populations may help bridge current theoretical and clinical divides, improving intervention design by capturing nuanced, lived experiences. By identifying the methodological inconsistencies in qualitative SC research, the study spotlights a significant barrier to theoretical development in the field. Yet, the limited integration of

participant voices into theory-building points to an underutilized potential of qualitative methods in capturing lived experiences.

- ❖ In a longitudinal study grounded in the Transactional Model of Stress and Coping, Wong et al. (2025) investigated the dynamic interplay between self-criticism, self-compassion, psychological flexibility, and mental health outcomes. The three-wave study assessed 412 adults at baseline and followed them at six and twelve months, employing repeated measures panel analysis to validate hypothesized pathways. The findings demonstrated that both self-compassion and psychological flexibility—enhanced through Acceptance and Commitment Therapy (ACT)—acted as stable and consistent coping mechanisms negatively associated with internalized and comparative forms of self-criticism. The results provide empirical support for the use of compassion-focused and ACT-based interventions in mitigating the psychological burden of self-criticism and fostering mental well-being. This study contributes a longitudinal perspective to the growing evidence that cultivating self-compassion and acceptance-based coping enhances resilience against stress and psychopathology. The longitudinal design adds considerable strength to the causal interpretation of findings and supports ACT as a viable therapeutic avenue. Still, the sample may not reflect more diverse populations, limiting the generalizability of coping dynamics in specific clinical groups like women with PCOS.
- ❖ Gerhardt et al. (2024) investigated the influence of self-compassion and self-criticism on maternal mental health during the postpartum period, utilizing a cross-sectional design with 189 Brazilian women who had infants aged 0 to 12 months. Through network analysis, postpartum depression was identified as a central factor interlinking self-related constructs and maternal-infant bonding. Notably, uncompassionate self-responding (USR), rather than compassionate self-responding (CSR), exhibited the strongest association with postpartum depression, which itself correlated with poorer mother-infant bonding. These findings emphasize the detrimental role of self-criticism in postpartum psychopathology and suggest that reducing self-critical tendencies could not only enhance maternal mental health but also strengthen early relational bonds

crucial to infant development. The study underscores the potential value of early interventions targeting self-criticism as a preventative strategy for both maternal and child psychological outcomes. The study innovatively uses network analysis to visualize psychological constructs, offering fresh insights into postpartum mental health. However, its cross-sectional nature constrains any conclusions about the directionality of effects between self-criticism and maternal-infant bonding.

- ❖ Hidding et al. (2024) explored the therapeutic potential of Virtual Reality (VR) interventions in reducing self-criticism and enhancing self-compassion among individuals with elevated self-critical tendencies. In a randomized study involving 68 undergraduate students, participants engaged in VR roleplays where they responded compassionately to a virtual character expressing their own self-critical thoughts. One group received the intervention with a perspective change feature—allowing them to later experience their own compassionate words from the viewpoint of the virtual character—while the control group did not. Findings revealed that both groups showed significant reductions in self-criticism and increases in self-compassion following the intervention. However, there were no significant differences in emotional affect or between the perspective change and control conditions, suggesting that the act of delivering compassion alone may be sufficient to produce beneficial effects. This study highlights the potential of VR-based interventions as innovative tools for addressing self-criticism, though it also suggests that perspective change may not be necessary to achieve therapeutic outcomes. This study highlights the feasibility of VR in clinical contexts but falls short in clarifying the added value of perspective-taking in therapeutic outcomes. The small and homogenous sample (undergraduate students) also raises questions about real-world applicability in more diverse clinical populations.
- ❖ Seabra et al. (2024) investigated the psychological mechanisms underlying the link between discrimination and psychopathology among sexual minoritized (SM) adults. Drawing upon Minority Stress Theory and the Psychological Mediation Framework, the study examined the indirect effects of discrimination on psychopathological outcomes through internalized stigma, shame, and self-

criticism in a sample of 372 SM individuals. While all variables were significantly correlated, internalized stigma did not significantly mediate the relationship between discrimination and psychopathology. Instead, shame and self-criticism emerged as the only significant mediators. These findings emphasize the central role of self-conscious emotions in the mental health disparities experienced by SM populations and underscore the importance of targeting shame and self-criticism in psychological interventions aimed at mitigating the negative impacts of discrimination. By distinguishing shame and self-criticism as key mediators, the study advances our understanding of how minority stress impacts mental health. However, the non-significance of internalized stigma as a mediator may reflect measurement limitations or cultural variations in how stigma is internalized.

2.2.1 Summary of Literature Review on Self-Criticism

The studies collectively emphasize the central role of self-criticism as a transdiagnostic factor influencing a wide range of psychological outcomes, including stress, depression, anxiety, disordered eating, and self-injurious behavior. Research demonstrates that self-criticism mediates the effects of perfectionism and chronic illness on psychological distress, with multiple studies identifying it as both a risk factor and a mechanism through which mental health symptoms worsen. While self-compassion consistently emerges as a protective factor, its efficacy varies depending on intervention type, sample, and outcome measured. Interventions such as self-compassion therapies, Acceptance and Commitment Therapy, virtual reality-based exercises, and nature-based approaches show promise in reducing self-criticism and improving emotional well-being, though many suffer from methodological limitations. Conceptual and methodological inconsistencies in defining and measuring self-criticism, particularly in qualitative research, limit the generalizability and clinical utility of findings. Social and cultural variables, including stigma, discrimination, and media exposure, also shape the expression and impact of self-critical thinking. While these findings are drawn from diverse populations,

they hold particular relevance for vulnerable chronic illnesses, who frequently experience internalized stigma and body image concerns. Overall, the literature underscores the need for more consistent conceptualization of self-criticism and the development of scalable, theory-driven interventions to mitigate its psychological consequences. However, there are no studies that measured the variable self-criticism for PCOS women.

2.3 Self-Compassion

- ❖ In a cross-sectional study, Niekerk (2022) investigated the levels and potential factors associated with self-compassion and body compassion in women diagnosed with polycystic ovarian syndrome (PCOS). Participants completed an internet-based questionnaire that evaluated factors such as well-being, mental health, perception of one's physical appearance, and ability to show kindness towards oneself. The study found that there were low levels of self-compassion, and that depression and concerns about body image were identified as negative factors associated with this. The results highlight the important relationship between body image, psychological well-being, and self-compassion in “Women with PCOS”. However, the cross-sectional design limits the ability to infer causality between self-compassion and psychological outcomes.
- ❖ In a study conducted by Sadiq (2022), the researcher investigated the relationship between the quality of marriage, self-compassion, and psychological distress in women who experience primary infertility. The study postulated that both the quality of a marriage and an individual's self-compassion would be indicative of psychological discomfort, with self-compassion potentially acting as a mediator in the connection between marital quality and psychological distress. The sample comprised 115 women between the ages of 20 and 35. The analysis, conducted using the Relationship Assessment Scale and the Depression, Anxiety, and Stress Scale, revealed that a higher level of marital quality was linked to increased self-compassion and decreased psychological distress, specifically depression, anxiety, and stress. Psychological discomfort was inversely correlated with self-compassion. Mediation study revealed that self-compassion had a major role in mediating

the impact of marital quality on depression and stress, but not anxiety. This suggests that self-compassion may be crucial in addressing psychological disorders connected to infertility. Despite robust mediation analysis, the use of self-report measures and a limited sample size may affect the generalizability of the findings.

- ❖ In a study undertaken by Wakelin (2022), a systematic review and meta-analysis were performed to evaluate the overall influence of self-compassion interventions on self-criticism and to investigate potential factors that may moderate this impact. The review comprised of 20 randomized controlled trials (RCTs) and employed a modified Cochrane risk of bias checklist to assess the quality of the studies. The review determined that the studies were of moderate quality. The meta-analysis revealed that self-compassion therapies had a substantial effect on reducing self-criticism when compared to control groups. Nevertheless, the findings were constrained by the moderate caliber and significant variability of the research that were incorporated. The inclusion of RCTs strengthens the conclusions, but methodological heterogeneity limits the precision of effect estimates.
- ❖ In a pilot study conducted by Dreisoerner (2021), a compassionate writing intervention was utilised to promote self-kindness, common humanity, and mindfulness. The study investigated the potential correlation between enhancing a specific aspect of self-compassion and its effects on the other components, as well as the general well-being of individuals. The measurement of trait self-compassion was conducted using the six-factor model of the Self-Compassion Scale. The study presented initial evidence that the various elements of self-compassion support and strengthen each other, emphasizing the crucial function of mindfulness in the framework of self-compassion. As a pilot study, the small sample size and lack of a control group restrict the strength of the conclusions.
- ❖ Thomas (2020) carried out an evaluation of a self-compassion intervention program that has been meticulously created and has been novel in its approach. Based on the findings of the study, it was found that the program was viable and effective in providing assistance to young adults who were facing challenges

with their mental health. A number of participants expressed their satisfaction with the intervention, which demonstrated a number of tangible benefits. Despite promising results, the absence of detailed quantitative outcomes and control comparisons makes it difficult to assess efficacy rigorously.

- ❖ Kreemers (2020) did a study in which the researcher investigated the effects of a self-compassion intervention on individuals who were in the process of looking for work. The purpose of this study was to investigate how the intervention affected their feelings by significantly lowering their levels of self-criticism. Participants in the study were asked to engage in self-reflective activities through writing exercises. The purpose of these activities was to help participants address their negative experiences with job seeking with self-compassion. The results of the study showed that participating in this activity led to an increase in individuals' levels of self-compassion as well as an improvement in their emotional responses to the process of job hunting. In particular, it led to a reduction in the number of deactivating emotions that were negative and an increase in the number of deactivating emotions that were good. A further factor that contributed to the mediation of these effects was the reduction in the amount of self-criticism. Although the findings are encouraging, the lack of a randomized controlled design may limit internal validity.
- ❖ Within the scope of a research project carried out by López et al. (2015), the Self-Compassion Scale (SCS) was subjected to a comprehensive evaluation in a substantial community sample that included 1,643 persons. The purpose of their research was to investigate the degree to which the scale has construct validity, reliability, and factor structure. Confirmatory factor analysis was unable to duplicate this pattern, in contrast to the six-component model that was suggested. On the other hand, the exploratory component analysis provided evidence of a two-factor model that distinguished between positive and negative items, with both factors exhibiting a high degree of internal consistency. A significant association was found between the negative component and negative affect as well as mental issues. On the other hand, the positive factor revealed a greater correlation with positive affect. The findings of the study indicate that it

may not be appropriate to use the SCS total score as an all-encompassing indicator of self-compassion. This highlights the significance of making a distinction between self-compassion and self-criticism. This study offers important psychometric insights, though its implications call for caution in using aggregate SCS scores in future research.

- ❖ Heffernan (2010) conducted a study on self-compassion and emotional intelligence among nurses in a culturally diverse health system in New York. The study indicated a substantial positive link between self-compassion and emotional intelligence, with a correlation coefficient of 0.55. It has been suggested that future research should study the association between self-compassion and emotional intelligence in the nursing industry, as well as assess the potential benefits of enhancing these characteristics within the profession. The correlational nature of the study precludes causal inferences, and cultural factors may influence generalizability.
- ❖ Gilbert (2006) conducted a study to explore the effectiveness of the Compassionate Mind Training (CMT) program in treating feelings of guilt and self-criticism in people who had elevated levels of these emotions according to his findings. Within the context of psychological issues and the Cognitive-Motivational-Transformational (CMT) process, the study investigated the significance of shame and self-criticism from a psychological perspective. An investigation that was not randomised and consisted of six patients who got twelve sessions of cognitive behavioural therapy (CMT) demonstrated significant reductions in symptoms of depression, anxiety, self-criticism, shame, and submissive behaviour. Additionally, the participants demonstrated improved abilities to self-soothe and self-compassion. The small, non-randomized sample limits external validity, though the intervention appears promising for clinical application.
- ❖ The researchers Dundas, Binder, Hansen, and Stige (2017) conducted a study in which they investigated the impact that a self-compassion course that lasted for two weeks had on the self-regulation and mental well-being of college students. As a consequence of the intervention, the individual experienced decreased levels of anxiety and depression, as well as improved healthy self-

regulation and increased levels of self-compassion. These positive effects persisted for a period of six months after the intervention was carried out because of the intervention. A short self-compassion program was shown to be beneficial in enhancing mental well-being and self-control, as demonstrated by the study. The long-lasting effects enhance the study's practical value, though a longer intervention may yield even more pronounced benefits.

- ❖ The concept of "self-compassion" was first introduced by Neff (2003), who also developed the Self-Compassion Scale. The scale was designed to evaluate an individual's capacity to demonstrate self-compassion in the face of tough circumstances, to recognize the existence of shared human experiences, and to engage in mindfulness practices without becoming overly attached to negative feelings. The accuracy and consistency of the scale have been demonstrated through empirical research, which has also established a correlation between self-compassion and lower levels of anxiety and depression, as well as a greater degree of overall life satisfaction. Additionally, the scale is not comparable to other methods of assessing one's level of self-esteem. While foundational, the scale has since been scrutinized for its factor structure and its blending of self-compassion with self-criticism.
- ❖ The effectiveness of a self-compassion training program was researched and analyzed by Neff and Germer in their study that was conducted in 2013. According to the findings of the study, individuals who participated in self-compassion activities reported experiencing significant reductions in stress and improvements in their quality of life. Structured therapies that focus on self-compassion have been shown to have positive impacts, as seen here. A randomized controlled trial was used to carry out the research, and both pre- and post-intervention evaluations were carried out respectively. The use of a randomized controlled trial adds robustness to the findings, although the study's generalizability may be limited by the sample demographics, which were primarily self-selected and may not reflect more diverse populations.
- ❖ MacBeth and Gumley (2012) A higher degree of self-compassion was found to be connected with lower stress levels and better stress management, according to the findings of the study, which was conducted by utilising self-report

questionnaires to measure levels of stress and self-compassion. This finding suggests that self-compassion is beneficial for effective stress management and coping with stress. However, reliance on self-report measures introduces potential bias, and the correlational design precludes conclusions about the directionality of the relationship.

- ❖ Bluth and Blanton (2014). The participants filled out questions regarding their psychological well-being and their level of self-compassion. There was a correlation between higher self-compassion and improved psychological well-being, including a reduction in anxiety and depressive symptoms, according to the findings of the study, which highlights the importance that self-compassion has in enhancing mental health. The study adds to growing evidence linking self-compassion to mental health, but its design does not clarify whether self-compassion is a cause or a consequence of better psychological well-being.
- ❖ Smeets, Neff, and Alberts (2014). Pre- and post-intervention assessments were used in the research project to evaluate participants' levels of self-compassion and resilience. Researchers discovered that practicing self-compassion led to improvements in emotional resilience and coping skills, which ultimately resulted in a reduction in emotional distress. The use of pre- and post-assessment strengthens internal validity, though the absence of long-term follow-up limits understanding of whether these benefits are sustained over time.
- ❖ In their study from 2006, Gilbert and Procter investigated the effect that self-compassion plays in reducing the emotional Standardised questionnaires were utilised in order to carry out evaluations of self-compassion, depression, and anxiety. According to the findings of the study, self-compassion was found to considerably lessen symptoms of both anxiety and depression, indicating that it is an effective therapeutic mode of treatment. While the study presents strong initial evidence for therapeutic use of self-compassion, its non-randomized design and relatively small sample size limit the strength of its conclusions.
- ❖ In their 2017 study, Muris and Petrocchi investigated the connection between self-compassion and psychological discomfort Assessments of self-compassion and distress levels were carried out through the use of self-report questionnaires.

Within the context of the study, self-compassion was found to have an inverse relationship with psychological distress, which suggests that it has the potential to serve as a protective factor against distressing symptoms. However, reliance solely on self-report measures without longitudinal data limits the ability to infer causality between self-compassion and psychological distress.

- ❖ Germer and Neff (2013) researched the effects of a self-compassion training program on the levels of stress and emotional well-being. A comprehensive training program that included both pre- and post-intervention evaluations was utilised in the research investigation. The findings demonstrated that self-compassion training was beneficial, as seen by the considerable reductions in stress and improvements in emotional well-being reported by the participants. Despite positive outcomes, the study may be subject to self-selection bias as participants who enroll in compassion-based programs might already be motivated to improve their emotional well-being.
- ❖ In their 2015 study, Kelly and Carter studied the effect that self-compassion had on emotional eating and body image difficulties. The levels of self-compassion, emotional eating, and concerns about body image were examined using surveys. An increase in self-compassion was found to be connected with healthy eating behaviours as well as an improvement in body image, according to the findings of the study. Although the study supports self-compassion as a promising approach for body image and eating behavior interventions, its reliance on correlational data limits causal interpretation, and experimental studies would provide stronger evidence.
- ❖ Chu (2024) explored the complex interplay between compassion fatigue and emotional labor among female nursing staff, with a particular focus on the moderating role of self-compassion. Conducted across multiple hospital departments in Taiwan, the two-stage survey revealed that compassion fatigue significantly predicted increased surface acting and decreased deep acting and genuine emotional expression. Crucially, self-compassion moderated these effects: it reduced the reliance on surface acting and enhanced the expression of genuine emotions despite high levels of fatigue. These findings underscore the

protective role of self-compassion in mitigating the emotional costs of compassion fatigue, highlighting the need for institutional interventions that foster self-compassion among nurses as a means of promoting psychological resilience and more authentic emotional labor. The study effectively demonstrates the moderating role of self-compassion in emotional labor, providing practical implications for workplace mental health in high-stress environments like nursing. However, its reliance on self-reported measures and cultural specificity to Taiwan may limit generalizability to other healthcare systems.

- ❖ Berg et al. (2024) carried out a systematic review to explore how self-compassion and self-forgiveness individually and jointly influence outcomes related to alcohol consumption. Drawing from 37 studies—18 focusing on self-compassion, 18 on self-forgiveness, and one on both constructs—the review found consistent evidence that higher levels of self-compassion and self-forgiveness are associated with a lower risk of problematic drinking. Notably, self-forgiveness has been more extensively researched in treatment and recovery contexts and has shown promise in improving outcomes such as coping behaviors and psychological well-being. Meanwhile, self-compassion, though less studied in this domain, also emerged as a protective factor, potentially operating through mechanisms like reduced depression, enhanced coping, and increased perceived social support. These findings highlight the therapeutic potential of integrating self-compassion and self-forgiveness into interventions for alcohol use disorder, while also emphasizing the need for further empirical research to establish their causal roles and optimize clinical applications. This review offers a comprehensive synthesis of self-related constructs in alcohol use, highlighting promising therapeutic avenues. Yet, the disparate number of studies on self-compassion versus self-forgiveness reveals a research imbalance that weakens direct comparisons and underscores the need for more empirical work on self-compassion in addiction contexts.
- ❖ Adonis et al. (2025) explored the moderating role of self-compassion in the relationship between posttraumatic symptoms (PTS) and post-traumatic growth (PTG) in a sample of 413 trauma-exposed adults. Their findings revealed that

while PTS and PTG were positively correlated, self-compassion was negatively associated with PTS and served as a significant moderator in this relationship. Specifically, individuals with higher self-compassion demonstrated greater PTG even when experiencing elevated levels of PTS. Gender differences were also observed, with women reporting significantly higher PTS and lower self-compassion compared to men. These results position self-compassion as a critical protective factor in trauma recovery, suggesting that fostering self-compassion may not only buffer distress but also facilitate meaningful psychological growth following trauma. The study adds valuable insight into the resilience-building capacity of self-compassion in trauma recovery. However, gender differences were noted but not fully explored, leaving questions about how interventions might be tailored across sexes or gender identities.

- ❖ Katz and Moè (2024) examined how emotion regulation and self-compassion mediate the relationship between teachers' psychological need satisfaction or frustration and their use of motivating versus demotivating instructional styles. Using data from two cohorts of Italian teachers surveyed before (2019) and during (2020) the COVID-19 pandemic, the study found that need satisfaction consistently predicted motivating teaching styles, while need frustration predicted demotivating ones. Notably, the mediating mechanisms differed based on context: emotion reappraisal mediated the relationships in non-stressful times, whereas self-compassion emerged as the key mediator during the COVID-19 lockdown. These findings underscore the adaptive function of self-compassion under high-stress conditions and highlight its potential to support educators in maintaining effective teaching behaviors during crises. By comparing data pre- and mid-pandemic, the study elegantly illustrates how context influences psychological mechanisms like self-compassion. Nonetheless, the observational design precludes firm conclusions about causality, and pandemic-specific stressors may not generalize to other high-stress teaching environments.
- ❖ Edwards et al. (2024) explored the application of a self-compassion intervention tailored specifically for autistic adults, addressing the critical mental health disparities experienced by this population. Through a 5-week online program

incorporating psychoeducation, meditation, and self-reflective exercises, 39 participants engaged in developing self-compassion skills. Thematic analysis of qualitative feedback revealed four major themes: the beneficial effects of self-compassion, personal challenges during engagement, understanding self-compassion as a developmental process, and appreciation for autism-specific adaptations. This study offers important insights into how self-compassion can be both beneficial and complex for autistic individuals, emphasizing the need for inclusive, neurodivergent-sensitive mental health support strategies. The research reinforces the importance of customizing interventions to fit the cognitive and emotional landscapes of autistic adults for greater therapeutic effectiveness. The study stands out for its neurodivergent-sensitive approach to mental health intervention, addressing a critical gap in care for autistic adults. However, its small sample size and lack of a control group limit the strength of its conclusions and warrant replication in larger, more diverse cohorts.

- ❖ Muris et al. (2024) critically examined the construct of self-compassion in adolescent emotional functioning, particularly challenging the validity of the Self-Compassion Scale (SCS) as a unified protective measure. The study distinguished between compassionate self-responding (CSR) and uncompassionate self-responding (USR), suggesting that the negative components of the scale—self-criticism, isolation, and overidentification—may contribute more significantly to emotional vulnerability than previously recognized. Through a meta-analysis of 16 studies and network analyses across three datasets, the researchers found that while CSR offered a modest protective effect against anxiety and depression, USR demonstrated a substantially stronger association with these symptoms. These findings emphasize the need to treat CSR and USR as distinct constructs, rather than combining them into a single bipolar continuum, thus allowing for a more nuanced understanding of self-compassion's dual role in adolescent psychopathology—both as a buffer and as a risk factor. The critical examination of the Self-Compassion Scale enhances conceptual clarity and measurement precision in adolescent research. However, by emphasizing USR's predictive power, the study risks

pathologizing normal self-evaluative processes if not interpreted within developmental and contextual boundaries.

- ❖ Cai (2024) explored an under-researched phenomenon in self-compassion practice known as “backdraft,” referring to the emergence of adverse emotional reactions when individuals begin to show themselves kindness and care. While self-compassion is widely recognized for its psychological and physiological benefits, Cai emphasized that healing processes—particularly among individuals with past trauma—may be accompanied by heightened vulnerability or emotional distress. Drawing from Buddhist philosophy and related therapeutic constructs such as the “fear of self-compassion” and adverse effects in mindfulness-based interventions, the author argued that these overlapping frameworks offer valuable insights into the origins and manifestations of backdraft. The commentary called for a clearer, empirically grounded definition of backdraft to facilitate more rigorous scientific inquiry. Recognizing and addressing backdraft could enhance the safety, acceptance, and effectiveness of self-compassion interventions, particularly in clinical settings where emotional resistance may hinder therapeutic outcomes. This commentary sheds light on an important but overlooked complication in self-compassion practice, particularly in trauma-informed care. Yet, the lack of empirical data makes the concept of “backdraft” more speculative than evidence-based, highlighting the need for systematic investigation to move beyond anecdotal and theoretical discourse.

2.3.1 Summary of Literature Review on Self Compassion

The reviewed studies collectively underscore the multifaceted role of self-compassion across various psychological domains and populations. Research consistently reveals that higher self-compassion is associated with improved mental health outcomes, reduced stress, and enhanced emotional resilience, although limitations such as self-report biases and cross-sectional designs restrict causal interpretation. Interventions like self-compassion training and writing exercises have shown effectiveness in mitigating psychological distress, including depression, anxiety, and self-criticism, among individuals facing

infertility, unemployment, or emotional labor in high-stress professions such as nursing and teaching. Systematic reviews and meta-analyses highlight self-compassion's therapeutic potential, though they point out methodological heterogeneity and a need for more robust, longitudinal studies. Studies among autistic adults and adolescents suggest that tailoring self-compassion approaches to specific cognitive and emotional needs is crucial, while emerging research on constructs like “backdraft” and distinctions between compassionate and uncompassionate self-responding (CSR vs. USR) calls for refined conceptual clarity and measurement precision. Overall, self-compassion emerges as a promising yet complex psychological resource that supports emotional well-being and adaptive functioning, but its mechanisms, applications, and potential risks warrant further empirical exploration. However, there are very few studies that measured self-compassion for PCOS women.

2.4. Pranayama

- ❖ Sarwal, Dhamija, Jain, and Basavaraddi (2023) on Covid-19 healthcare professionals about the effectiveness of pranayama through a randomised, clinical, quasi-trial, by exposing them regularly to Covid-19. The intervention group practiced Pranayama modules twice daily for 28 days, the control group did not receive pranayama and continued to be with same routine. Results showed that significantly fewer participants in the intervention group developed COVID-19 when compared with the control group. The study suggests that regular Pranayama practice may contribute to preventing COVID-19 infection in HCPs. However, the lack of blinding and potential lifestyle confounders may limit the internal validity of the results.
- ❖ Trivedi et al. (2023) conducted a preliminary investigation to evaluate how humming (simple Bhramari), physical exercise, emotional stress, and sleep affect heart rate variability (HRV) metrics, including the stress index (SI). In their study, 23 participants were monitored using a single-channel Holter device to capture HRV data, which was then analysed using Kubios HRV Premium software. The findings revealed that humming resulted in the lowest stress index when

compared to physical activity, emotional stress, and sleep, suggesting that it might be a promising method for reducing stress. The research implies that regular humming could improve parasympathetic nervous system activity and diminish sympathetic response. The small sample size and preliminary nature of the study call for larger trials to confirm generalizability and long-term effects.

- ❖ Ushamohan, Belur, Rajasekaran, Ilavarasu, and Srinivasan (2023) explored Bhramari pranayama, a yogic technique involving self-vocalized humming, as a research tool for understanding meditation. Bhramari pranayama's overt and measurable components, including breath control and humming, make it unique for scientific investigation. The study reviews scientific literature and classical yoga texts to outline a framework for how these components induce a meditative state. It breaks down Bhramari into pranayama, the sound-producing phase, and Shanmukhi practice, identifying measurable attributes like fundamental frequency and articulation. Concepts like efference copy, corollary discharge, and sense of agency are also observable in electrophysiological studies. This framework sheds light on how Bhramari pranayama's observable features lead to meditation and may have therapeutic applications due to its ability to produce resonant vibrations, sensory entrainment, and gamma waves with clinical significance. While the theoretical framework is well-developed, the study lacks empirical validation through controlled experiments.
- ❖ Kaur, Bordoloi, and Baruah (2023) conducted a study to assess the impact of pranayama on reducing fatigue during External Radiation Therapy (ERT) in cancer patients at a selected hospital in Guwahati, Assam. Using a quantitative evaluative approach and a randomized pre-test post-test control group design, they divided 84 cancer patients equally into a control group and an experimental group. Pranayama was administered as an intervention to the experimental group. After the intervention, the experimental group showed a significant reduction in fatigue levels, with 97.6% experiencing mild fatigue, compared to 64.3% in the control group who still had severe fatigue. The study concluded that pranayama is an effective intervention for reducing fatigue in cancer patients undergoing

ERT. Although the findings are promising, there is no mention of blinding or controlling for placebo effects, which may affect the study's rigor.

- ❖ The study by Malhotra, Javed, Wakode, Bharshankar, Soni, and Porter (2022) investigated the effects of kapalbhati pranayam, a fast-paced respiratory exercise, on heart rate variability (HRV) and brain waves. The researchers found that during and after kapalbhati, there were significant changes in HRV, indicating parasympathetic withdrawal and sympathetic activation. However, there were insignificant changes in brain waves compared to baseline values. Post-pranayama, there was an increase in gamma wave activation, suggesting control over the default mode network. Overall, kapalbhati was found to have initial energizing and cleansing effects on the body. The study provides useful physiological insights, though limited statistical power and lack of a control group weaken causal inferences.
- ❖ In a study by Aili (2021), examined the link of PCOS to genetic predisposition, obesity, and stress, results in symptoms like irregular periods, hirsutism, acne, and infertility. The study emphasizes lifestyle modification as the primary treatment, with a focus on weight loss. Yoga, specifically Yogasanas, is highlighted as a holistic solution, promoting hormonal balance, relaxation, and improved ovarian function in PCOS patients. While the theoretical grounding is sound, the study lacks original experimental data, relying heavily on existing literature and anecdotal evidence.
- ❖ In a study by Thakur, Singh and Tripathi (2021), polycystic ovarian syndrome (PCOS), affecting 5-10% of Indian women, was examined. PCOS is a syndrome with unclear causes, possibly linked to hormonal imbalances, stress, and a sedentary lifestyle. It leads to symptoms like acne, weight gain, hirsutism, fertility issues, and more. If untreated, it can escalate to serious health conditions. The study highlights the effectiveness of yoga, in combination with medical treatment, in managing PCOS symptoms. Analyzing 74 research papers from 2012 to 2019, the review identifies 16 relevant studies demonstrating successful yogic approaches for PCOS management. Though the review is thorough, the selection

criteria and methodological quality of the included studies are not explicitly discussed.

- ❖ In Mohseni Eghbali, Bahrami, Dastaran, and Amini's 2021 study, 61 cases of PCOS undergoing infertility related medical care were divided into two groups: one got trained for yoga exercises for a time period of 6 weeks (intervention group) and the other receiving routine care (control group). After the intervention, the yoga group showed significant reductions in hirsutism, abdominal circumference, and hip circumference compared to the control group. The results suggest yoga could improve treatment strategy in "Women with PCOS", particularly in addressing hirsutism and reducing abdominal and hip measurements. While results are statistically significant, a longer follow-up period would help assess the sustainability of improvements.
- ❖ A study by Vibhute, Ujwale, and Joshi (2021) highlights the prevalence of polycystic ovarian syndrome occurring in females, characterized by elevated androgen levels and menstrual irregularities. PCOS is associated with symptoms like obesity, acne, amenorrhea, excessive hair growth, and infertility, prompting women to seek healthcare assistance. Yoga, as described in ancient science such as Ayurveda, can play a vital role in alleviating these symptoms. Yoga is effective in improving infertility related functions by decreasing stress related factors along with balancing the hormone profiles. The integration of Ayurvedic concepts is interesting, but the study lacks empirical data and clearly defined outcome measures.
- ❖ Lalitha, Maheshkumar, Shobana, and Deepika (2021) studied the immediate effects of Kapalbhathi Pranayam on cardiac autonomic function in 50 healthy volunteers. After 5 minutes of practice, there was a significant reduction in parasympathetic activity, followed by increased parasympathetic dominance after a 20-minute recovery period. Further research is needed to confirm these findings. The use of healthy volunteers limits the generalizability to clinical populations such as those with PCOS.

- ❖ Bansiwala and Mahey (2020) mentioned behavioural strategies through yoga, meditation and healthy lifestyle to relieve stress and emotional wellbeing in management of PCOS, as recent advances in obstetrics and gynecology, enlightening the path for next generation of gynaecologists. The mention is conceptual rather than empirical, offering limited evidence-based insight.
- ❖ Selvaraj, vanitha, dhanaraj, sekar and Babu (2020) conducted an experimental research on 204 adolescent girls with PCOS, keeping 102 each in control and experimental. This investigation aimed to evaluate the effect of Yoga and exercise. The results revealed yoga and exercise are very helpful in minimizing PCOS risks. The study demonstrates positive outcomes, though more detail on intervention duration and adherence would strengthen its reliability.
- ❖ Cox, Ullrich French, Tylka and McMahon (2019) carried cross sectional and prospective intervention study within a yoga context to inspect the body surveillance and another factor body appreciation. In context the mediating factor self compassion, motivation for increased physical activities with two sets of samples, first sample size is 269 female participants and second is 323 female students. Self compassion, body surveillance, body appreciation and intrinsic motivation for physical activity were measured with appropriate tools in association with yoga program. The results suggested persons with more self-compassion have better involvement towards their body and habitually monitoring it. The study's strength lies in its dual methodology, though cross-sectional components limit causal interpretation.
- ❖ In Prabhakari and Gopinath 2019 study, it was found that both asanas and pranayama had a positive effect on hormonal variables, specifically fasting insulin and estrogen, among "Women with PCOS". A 12-week training program, consisting of six days per week, resulted in improvements in these hormonal variables in both the Asanas and Pranayama experimental groups when compared to the Control group that received no treatment. Although the hormonal changes were statistically significant, the study would benefit from exploring long-term adherence and outcomes.

- ❖ In a study conducted by Nalgirkar, Vinchurkaar, Saoji, and Mohanty (2018), it was observed that a 3-month yoga intervention positively impacted women with primary Dysfunctional Uterine Bleeding (DUB). The yoga set exhibited noteworthy reductions in the score of anxiety, perceived stress than healthy women.. Additionally, yoga set experienced better sleep quality, as indicated by reduced sleep disturbances, decreased need for sleep medications, and higher global sleep quality scores. However, These results call attention to the positive impact of yoga therapy on DUB patients' mental well-being and sleep quality. Inclusion of healthy women as a comparison group may not fully isolate the intervention's effect on DUB patients.
- ❖ Vanitha, Pandiaraja, Maheshkumar and Venkateswaran (2018) conducted Yoga intervention study with 40 PCOS women with age between 18 and 35 years to examine resting cardio vascular parameter for 12 weeks of yoga nidra practices. The study showed favourable changes in blood pressure, heart rate and anthropocentric parameters after yoga nidra intervention. The small sample size and lack of blinding limit the robustness of the findings.
- ❖ Nidhi, padmalatha, nagarathna and Amritanshu (2013) carried experimental study 72 adolescent (37 yoga group , 35 control group to examine the effect of yoga in PCOS in respect to their quality of life. The measurement here collected with appropriate tools and analysed. The results revealed yoga program for 12 weeks significantly improve the quality of life with PCOS than control group who underwent physical exercise. The study effectively demonstrates yoga's benefits, though the relatively short duration limits conclusions about sustained effects.
- ❖ Goyal et al. (2014) performed a comprehensive systematic review and meta-analysis to assess the effectiveness of various yoga and meditation techniques, including Pranayama, in managing psychological stress and enhancing overall well-being. The review covered randomized controlled trials (RCTs) and found that Pranayama significantly reduced anxiety and depressive symptoms and improved overall mental health compared to control groups. The authors concluded that Pranayama, as part of a broader mindfulness and yoga practice, could be a valuable intervention for stress management. The inclusion of RCTs

strengthens the findings, though heterogeneity in intervention types and durations may affect comparability.

- ❖ Metangale and Mishra (2024) highlighted the multifactorial nature of Polycystic Ovarian Syndrome (PCOS), describing it as a complex lifestyle disorder with no clearly defined etiology. The condition is marked by a range of reproductive, hormonal, and psychological symptoms—including infertility, hirsutism, irregular menstruation, and elevated androgen levels—compounded by factors such as sedentary habits, poor diet, and chronic stress. The authors emphasized the key role of stress in exacerbating PCOS symptoms and advocated for non-pharmacological interventions such as therapeutic yoga. Integrating gentle postures, pranayama (breath work), and meditation, yoga was presented as an effective strategy for managing PCOS through hormonal regulation and stress reduction. The study proposed that by promoting endocrine balance and mental well-being, yoga offers a holistic approach to mitigating the long-term health complications associated with PCOS. The study effectively emphasizes stress as a key modifiable factor in PCOS management and positions yoga as a holistic intervention. However, its framing of PCOS as a "lifestyle disorder" may inadvertently downplay its complex endocrine and genetic underpinnings, warranting a more nuanced biomedical perspective alongside lifestyle interventions.
- ❖ Mondal (2024) conducted a comprehensive review to uncover the physiological mechanisms underpinning *pranayama*, or yogic breathing techniques, which have gained global recognition for their therapeutic potential. Analyzing 73 studies—including systematic reviews, clinical trials, and observational research—the author proposed a six-step model detailing how pranayama influences physiological systems. This model articulates how pranayama promotes both immediate and long-term physiological adaptations, offering a neurobiological rationale for its use in both clinical rehabilitation and general wellness. The review emphasized the need for further empirical studies to validate these proposed mechanisms, paving the way for the scientific integration of pranayama into mainstream therapeutic practices. Mondal's six-step physiological model enhances the theoretical understanding of pranayama's overall impact on the

body, creating a link between ancient practices and contemporary neuroscience. Yet, without direct empirical validation of the proposed steps, the model remains largely hypothetical and underscores the need for translational studies with neuroimaging and physiological markers.

- ❖ Arumugam et al. (2024) conducted a systematic review analyzing 21 studies to evaluate the physiological and therapeutic effects of *pranayama*, a central yogic breathing technique. The review revealed that pranayama exerts a wide range of positive impacts on physical and mental health, including enhanced lung capacity, improved blood circulation, optimized heart rate, and strengthened muscular and neural systems. Techniques such as Sheetali, Bhramari, Kapalbhathi, and Bhastrika were especially noted for their efficacy in regulating blood pressure, increasing oxygenation, and promoting emotional stability by alleviating stress, anxiety, and depression. These findings underscore pranayama's potential as a non-pharmacological intervention in clinical settings, particularly for conditions like hypertension and asthma. The authors emphasized that while current results are promising, further empirical research is necessary to clarify the underlying physiological mechanisms and expand its application in modern healthcare systems. The review offers strong support for the therapeutic versatility of pranayama, bolstering its application in both physical and mental health domains. However, the generalization of findings across different pranayama techniques may mask technique-specific effects, which calls for greater methodological granularity in future trials.
- ❖ Shukla (2025) investigated the impact of *pranayama* on oxidative stress and antioxidant defenses in the context of periodontal health. In this cross-sectional study involving 224 participants aged 35–44, individuals who regularly practiced pranayama demonstrated significantly higher salivary total antioxidant capacity (TAC) and lower levels of the oxidative stress marker malondialdehyde (MDA) compared to non-practitioners. The findings suggest that pranayama enhances antioxidant activity while reducing oxidative damage, thereby contributing to improved periodontal health. The study also highlights the broader physiological benefits of pranayama, including stress reduction through decreased cortisol levels and enhanced cellular processes such as phagocytosis and fibroblast

regulation. These results support the potential role of pranayama as a complementary therapeutic strategy for managing periodontitis and promoting overall oral and systemic well-being. Shukla's study innovatively connects pranayama to oral health via biochemical markers, expanding its relevance beyond traditional domains. However, its cross-sectional design limits causal inferences, and lifestyle confounders like diet or oral hygiene practices were not fully accounted for, potentially influencing oxidative stress outcomes.

- ❖ Peerbhoy and Sheffield (2024) conducted a feasibility study examining the effects of two behavioral motivational strategies—Implementation Intention and Benefits Analysis—on engagement with *pranayama* practice among healthcare professionals. The study utilized both qualitative and quantitative methods, with 84 participants completing the intervention delivered via an online platform. Findings indicated that both motivational approaches increased participants' intention to practice and actual engagement with pranayama, as well as perceived capability and opportunity for practice. However, there was limited impact on emotional regulation and no significant change in general well-being within the one-week timeframe. Qualitative insights revealed that emotional and somatic benefits were commonly reported, while environmental stressors in healthcare settings often hindered the application of motivational strategies. This study underscores the short-term feasibility of behavioral nudges to promote pranayama practice and suggests the need for deeper investigation into long-term implementation and contextual barriers. This study provides a novel behavioral lens on pranayama adherence, showing promise for digital health interventions. Nevertheless, the short duration (one week) may not capture the longer-term psychological or behavioral changes necessary to substantiate pranayama's sustained benefits in clinical or workplace settings.
- ❖ Chaudhary and Kumar (2024) investigated the impact of *pranayama* on college students' perceived quality of life through a short-term intervention. A group of thirty students from Uttar Pradesh's Amroha district took part in a one-week pranayama intervention, which included daily sessions lasting 45 minutes. Using the validated Quality of Life Scale by Dubey et al., participants reported their quality of life before and after the intervention. Paired *t*-test results demonstrated

a statistically significant improvement in scores post-intervention ($p < 0.01$), suggesting that pranayama practice contributed to enhanced well-being among students. The study emphasizes the potential benefits of integrating pranayama into educational settings to support students' psychological health and overall life satisfaction. The significant short-term improvement in students' quality of life supports pranayama's psychological benefits, especially in academic settings. Still, the small sample and lack of a control group reduce internal validity, and the brief intervention period may not reflect lasting effects without follow-up assessments.

- ❖ Dharakrswari (2025) explored the impact of a combined *pranayama* and meditation intervention on self-confidence among adolescent handball players. Thirty participants aged 14–17 from Tamil Nadu were divided equally into an experimental group, which engaged in a six-week breathing and meditation program, and a control group with no intervention. Self-confidence levels were assessed using Vealey's Trait Sports Confidence Inventory (TSCI) both before and after the intervention. Statistical analysis using *t*-ratios indicated a significant improvement in the self-confidence of the experimental group compared to the control group. These findings suggest that integrated yogic practices like pranayama and meditation can play a valuable role in enhancing psychological preparedness and confidence in young athletes. The study highlights pranayama's role in enhancing self-confidence among youth athletes, with a well-structured control design. However, it does not isolate the specific contributions of pranayama versus meditation, limiting clarity on which component was most effective in improving psychological outcomes.
- ❖ Giridharan et al. (2024) conducted a systematic review of randomized controlled trials (RCTs) to assess the efficacy of *pranayama* as a complementary therapy for cancer patients. The review focused on studies published between 2013 and 2023 that compared *pranayama* interventions to non-yoga control conditions. Key outcome measures included psychological well-being, physiological health markers, treatment-related side effects, and overall quality of life. Findings revealed that *pranayama* practices were associated with enhanced antioxidant activity, reduced stress and anxiety, improved sleep quality, and better overall

quality of life among cancer patients. However, the authors noted that the current body of evidence is limited in scope due to small sample sizes and varied methodologies across studies. They emphasized the need for more rigorous and large-scale trials to validate these promising preliminary findings and to better understand the mechanisms through which *pranayama* exerts its effects. The systematic review strengthens the evidence base for pranayama in cancer care, showing improvements in both psychological and physiological parameters. However, heterogeneity in study design and limited sample sizes across trials weaken the reliability of pooled conclusions, highlighting the need for more standardized protocols.

- ❖ Chetry et al. (2024) conducted a comprehensive review of experimental studies exploring the health benefits of *Bhramari Pranayama*, a yogic breathing technique rooted in ancient Indian practices. The review analyzed 46 studies published between 2006 and 2023, including 18 single-arm clinical trials, 22 clinically controlled trials (CCTs), and six randomized controlled trials (RCTs). Findings consistently indicated that *Bhramari Pranayama* yields positive outcomes across various domains, notably psychological, cardiovascular, and pulmonary health. Regular practice was associated with increased parasympathetic activity, improved pulmonary function, better sleep quality, and enhanced attention. Simultaneously, reductions were observed in stress, anxiety, depression, sympathetic activity, and blood pressure. The practice also showed promise in alleviating symptoms in individuals with hypertension and tinnitus. Despite these encouraging results, the authors emphasized the need for more robust and large-scale trials to address existing research gaps and validate the therapeutic potential of *Bhramari Pranayama* in specific clinical populations. The review consolidates extensive research on *Bhramari Pranayama*, showcasing its diverse therapeutic potential across multiple systems. Despite promising trends, the prevalence of single-arm and non-randomized trials introduces bias, underscoring the need for more rigorous randomized controlled studies to validate efficacy.
- ❖ Rawat et al. (2024) conducted a focused literature review on the therapeutic efficacy of *Nadishodhana Pranayama* (alternate nostril breathing), highlighting

its potential role in managing various chronic illnesses. The authors systematically analyzed 14 relevant studies from an initial pool of 84 articles sourced from PubMed, Google Scholar, and the Ayush Portal. The review found that *Nadishodhana Pranayama* exerts a significant regulatory effect on the autonomic nervous system by reducing sympathetic overactivity and enhancing parasympathetic responses. These effects contribute to improved oxygenation, reduced metabolic rates, and overall physiological relaxation. Additionally, the practice supports hypothalamic balance and has shown benefits in conditions requiring autonomic regulation. The authors concluded that with correct technique and consistent practice, *Nadishodhana Pranayama* can serve as a safe, non-pharmacological adjunctive therapy for chronic disease management and general well-being. Rawat's focused review effectively demonstrates *Nadishodhana Pranayama*'s impact on autonomic balance, supporting its role in chronic disease management. Nonetheless, the limited number of high-quality trials and absence of standardized intervention protocols restrict the generalizability and reproducibility of findings.

2.4.1 Summary of Literature Review on Pranayama

The reviewed studies collectively highlight the multifaceted therapeutic potential of pranayama and related yogic practices across a diverse range of health conditions, including COVID-19 prevention, cardiovascular regulation, cancer-related fatigue, stress management, PCOS, and general psychological well-being. Several clinical and observational studies, as well as systematic reviews, support pranayama's beneficial effects on physiological parameters such as heart rate variability, hormonal balance, autonomic nervous system regulation, oxidative stress reduction, and antioxidant activity. Practices like Bhramari, Kapalabhati, *Nadishodhana*, and Yoga Nidra have shown particular promise in enhancing parasympathetic activity, reducing sympathetic overactivity, improving sleep, lowering blood pressure, and promoting emotional stability. The integration of pranayama in populations ranging from adolescent girls with PCOS to healthcare professionals and student-athletes indicates its wide applicability. While many

interventions report significant improvements in targeted outcomes—ranging from self-confidence and quality of life to infertility symptoms and cardiovascular parameters—several studies are limited by methodological constraints such as small sample sizes, lack of control groups, short intervention periods, and absence of blinding. Reviews, including meta-analyses and theoretical frameworks, provide compelling rationales for pranayama’s clinical utility but consistently call for larger, high-quality trials with standardized protocols to validate long-term efficacy and clarify underlying mechanisms. Overall, the body of literature suggests pranayama is a promising complementary practice, with broad potential in both physical and mental health domains, though its integration into mainstream healthcare will require stronger empirical validation.

2.5. Mirror Work

- ❖ Potthoff and Schienle (2021) conducted an eye-tracking study with 68 adults to examine the relationship between personality traits (self-esteem, narcissism propensity, self-disgust) and gaze behavior during mirror viewing. The results revealed a connection between more self evaluation and less time duration, the shorter duration. However, the small sample size and correlational design limit the ability to generalize findings or infer causal relationships between personality traits and gaze behavior.
- ❖ In Caputo's (2021) study, which involved 12 participants, it was found that split-mirror gazing—where a person's face is divided into two halves in the reflection—led to increased dissociation compared to gazing into a single mirror. This dissociation included experiences of altered self-identity, such as a sense of double-identity, during split-mirror gazing. The findings highlight a distinction between detachment and compartmentalization and may have relevance for understanding dissociative identity disorder (DID). The portraits of the participants revealed that the left side of their identity was associated with more negative traits, while the right side was linked to more positive characteristics. While the study offers novel insights, its small sample size and qualitative nature

limit the scope of conclusions, necessitating further empirical research for validation.

- ❖ Røgild-Müller (2021) explores the concept of the dialogical self by combining both occidental and oriental perspectives. Inspired by the work of David Y. F. Ho, the study involves self-reflection in front of a mirror to examine inner dialogue. The analysis incorporates Dialogical Self Theory and Dialectic perspectives, shedding light on the dialogical aspects of spirituality. This approach seeks to understand the complexity of the self through a multifaceted lens. Although the theoretical synthesis is rich and integrative, the lack of empirical data limits its applicability beyond philosophical or conceptual exploration.
- ❖ In a 2021 study by Yu, Bae, Choi, and Kim, the researchers introduced the smart mirror LUX, created to improve mental well-being amid the COVID-19 pandemic and increasing focus on mental health. LUX utilizes deep learning models for sentiment analysis of Korean text, categorizing emotions into anger, sadness, neutrality, and happiness, and responds with appropriate content such as motivational quotes, music, and empathetic messages. Beyond these features, the smart mirror also includes standard functions like weather forecasts, calendar updates, news, and time display. While innovative, the study lacks longitudinal data to assess the sustained psychological impact of using LUX on users' mental well-being.
- ❖ Monéger, Chatard, and Selimbegović (2020) aimed to replicate the mirror effect, which posits that self-awareness triggered by viewing one's reflection can increase the accessibility of suicide-related terms. Their pre-registered study, which involved 150 participants, assessed recognition latencies for suicide-related, negative, and neutral words through a lexical decision task. However, their findings did not support the mirror effect observed in the original study. A multiverse analysis indicated a significant effect only when extreme data points were excluded, and an equivalence test neither confirmed nor denied the existence of the mirror effect. These findings call into question the validity of the original effect and highlight the need for pre-registered replications to ensure reliable scientific conclusions. This study exemplifies the importance of replication and

rigorous statistical methods in psychological research, but ambiguity in results calls for further experimental refinement.

- ❖ Barnier and Collison (2019) explored how self-focused attention through mirror gazing affects body image and related psychological factors. Their study involved 51 non-clinical participants, who were randomly assigned to either a low self-focused attention condition (viewing their reflection from a distance) or a high self-focused attention condition (examining a disliked body part up close). After 5 minutes of mirror gazing, those in the high self-focused attention condition reported reduced satisfaction with their appearance, perceived attractiveness, and self-esteem. Additionally, they experienced increased distress about their appearance, heightened concern over disliked body parts, stronger urges to alter their appearance, and greater body-focused shame. These results lend support to theories suggesting that self-focused attention and mirror-related behaviors may play a role in the onset and persistence of body dysmorphic disorder and its psychological impacts. The experimental design is robust, though the short duration of exposure limits insight into long-term psychological outcomes.
- ❖ An investigation by Ol, Van Heng, Danielsson, and Husum 2018 in rural Cambodia explored mirror and tactile therapy's impact on phantom and stump pain in traumatic amputees. Three treatment groups showed over 50% pain reduction. Combined mirror-tactile therapy slightly outperformed individual therapies but had minimal clinical significance. Pain reduction was sustained for three months' post-treatment. While the findings support the feasibility of low-cost interventions, the minimal clinical advantage of combined therapy suggests the need to optimize treatment protocols.

- ❖ In a 2018 study by Tesler, Mohammed, Hamilton, Mancuso, and McNeese, the researchers examined how guided storytelling as a team intervention influences team mental model similarity and overall team performance. Their findings revealed that delivering essential information through storytelling and providing time for team members to reflect improved the similarity of team mental models. Additionally, the indirect impact of storytelling on team performance via enhanced mental model similarity was further strengthened by including guided team reflexivity. These results underscore the advantages of integrating storytelling and reflective practices into team interactions. The study offers strong support for narrative-based interventions, though its generalizability may be constrained by the specific team environments studied.
- ❖ Petrocchi, Ottaviani, and Convoyumdjian (2016) conducted a study with 86 participants (40 men and 46 women) to explore the effects of self-compassion practices through mirror work, which involves repeating positive affirmations while looking in a mirror. Their results indicated that mirror work enhances the effectiveness of self-compassion interventions by activating the soothing effect system and increasing parasympathetic activity. This study provides valuable physiological evidence for the efficacy of self-compassion interventions, although it would benefit from longer-term follow-up.
- ❖ In a 2016 study by Lim, Lee, Yoo, Yun, and Hwang, the effects of mirror therapy on subacute stroke patients were examined. The group that received mirror therapy in addition to conventional treatment demonstrated more significant improvements in upper extremity function (measured by FMA) and daily living activities (assessed by MBI) compared to the control group, which only received

sham therapy. These findings suggest that mirror therapy is effective in promoting recovery in stroke patients. Despite its positive findings, the study does not clarify whether the benefits of mirror therapy persist beyond the treatment period.

- ❖ A review by Anderson and Gallup Jr. 2015 focuses on self-recognition in nonhuman primates and methodological challenges. While self-recognition has been demonstrated in great apes, including mirror-guided self-exploration and mark tests, efforts to show it in other primates have been less convincing. The review concludes that there is no compelling evidence for mirror self-recognition in prosimians, monkeys, or lesser apes, despite extensive efforts. The review effectively synthesizes methodological limitations but also underscores the anthropocentric bias in interpreting animal cognition.
- ❖ Mckellar (2015) performed an investigation to take a look at the feelings and experiences of women especially personal perception through the methods of painting, interviews and life writing among “Women with PCOS”. The results showed they struggle with their femininity and feel shame and embarrassment about their bodies and significant of them reported depression is associated with PCOS. Though rich in qualitative insight, the subjective nature of narrative methods limits the study’s capacity to infer broader psychological trends in the PCOS population.
- ❖ Syahadah and Yuliana (2024) conducted a qualitative descriptive study exploring the role of positive affirmations in the lives of Generation Z individuals. Anchored in Maslow's theory of motivation and framed within a constructivist paradigm, the study aimed to understand how positive affirmations contribute to self-love, interpersonal relationships, and self-respect. Data were gathered through one-on-one interviews with three Gen Z informants who regularly engaged in affirmation

practices such as silent recitations and writing affirmations on sticky notes. The findings revealed that positive affirmations serve as a personal tool for enhancing emotional well-being, promoting smoother interpersonal communication, and reducing internal negative thought patterns. Participants reported increased self-love and greater ease in forming connections with others, aligning closely with Maslow's hierarchy of needs related to belongingness and self-actualization. While the study offers valuable insights into how affirmations may fulfill psychological needs as outlined by Maslow, the small sample size of only three participants limits the generalizability of the findings. Additionally, the reliance on self-reported experiences without triangulation through other qualitative or quantitative methods weakens the robustness of the conclusions. Further research involving larger and more diverse samples is essential to substantiate the observed benefits and to explore potential limitations or differing outcomes across cultural or social contexts.

- ❖ In the early stages of the COVID-19 pandemic, Kibbey et al. (2024) conducted a preliminary study to assess the impact of a one-time digital intervention—values affirmation for behavioral activation (VABA)—on participants' outcomes. The study involved 296 undergraduate students under state-wide lockdown, randomly assigned to either the VABA condition—consisting of a 10-minute values clarification and affirmation task—or a time- and attention-matched control condition. The researchers hypothesized that VABA would outperform the control in enhancing mood, reducing COVID-19-related fear and depressive symptoms, and increasing positively reinforcing behaviors. Results showed that both groups experienced within-group increases in positive affect, but the VABA group had a significantly larger increase ($d = 0.22, p = .022$). Notably, 24-hour follow-up data indicated significantly higher behavioral activation in the VABA group ($d = 0.65, p < .001$), which in turn predicted fewer depressive symptoms ($\beta = -.134, p = .003$). While the intervention demonstrated promising acute effects on mood and behavior, the brief duration and short-term follow-up limit the ability to assess long-term efficacy. Future studies should explore whether these benefits persist over time and extend to broader populations.

- ❖ Yan et al. (2023) conducted a large-scale empirical study to evaluate the effectiveness of a self-affirmation intervention in supporting the mental health of Chinese adolescents during the COVID-19 pandemic—a context in which psychological distress was widespread and culturally specific coping mechanisms were under strain. The study involved 2,234 students from 112 secondary schools in China, who were randomly divided into either a values-affirmation group or a control group. Participants in the intervention group engaged in a writing task focused on their core personal values. The study found that self-affirmation significantly improved students' life satisfaction, self-esteem, and general mental well-being, and helped buffer a decline in their sense of purpose in life. However, the intervention showed no significant effects on clinical symptoms of depression, anxiety, or loneliness. These findings suggest that while values-affirmation may not directly address clinical-level psychological symptoms, it can serve as a culturally adaptable, low-cost intervention to enhance overall psychological resilience and well-being during crises. Nonetheless, the limited impact on clinical outcomes highlights the need for integrating such interventions with more comprehensive mental health strategies, especially in collectivist cultural settings.
- ❖ Khoo et al. (2024) conducted an experimental intervention study to explore whether self-affirmative use of social networking sites (SNS) could positively influence self-esteem, challenging the commonly held view that SNS use generally leads to poorer self-perception. The study hypothesized that viewing one's own Instagram profile—a curated representation of positive aspects of the self—would enhance self-concept clarity and, in turn, increase state self-esteem. Participants were randomly assigned to either view their own Instagram profile or a neutral abstract art profile. Using multilevel latent variable path analyses, the study found that participants who engaged with their personal profiles reported higher state self-esteem, with improved self-concept clarity acting as a significant mediator. These findings suggest that, when guided intentionally, SNS use can serve as a self-affirmative tool rather than a psychological liability. However, the intervention's reliance on a digital self-curation platform raises concerns about reinforcing superficial self-worth or excluding individuals with less positive

online identities. Future research should investigate long-term effects and explore how self-affirmative SNS use interacts with broader patterns of digital well-being.

- ❖ Stephan and Sedikides (2023) presented a theoretical integration of research on mental time travel, proposing that both prospection (imagining the future self) and retrospection (reflecting on the past self) serve as mechanisms of self-affirmation by emphasizing central and positive aspects of identity. Drawing on evidence from studies of self-prospection and nostalgia, the authors argue that mentally revisiting the past or envisioning the future can strengthen self-esteem, enhance a sense of coherence, and increase perceived control—three critical components of psychological well-being. These self-affirming effects, they suggest, arise because such temporal reflections broaden the perceived foundation of self-integrity, helping individuals view themselves as capable, consistent, and worthy. Notably, the authors suggest that mental time travel can be effectively applied as an intervention tool in various areas, including promoting healthier behaviors, enhancing motivation in education, improving workplace performance, and strengthening interpersonal relationships. While compelling, this framework remains largely conceptual, and future empirical studies are needed to validate the causal role of mental time travel in producing sustained self-affirmation effects, especially in diverse cultural and situational contexts.
- ❖ In a pre-registered study, Malatyalı and van Koningsbruggen (2024) explored the relationship between spontaneous self-affirmation—the innate habit of contemplating one’s personal strengths or values—and the quality of romantic relationships. The study involved 335 individuals of diverse gender identities who had been cohabiting with their partners for at least one year. Participants completed validated scales assessing spontaneous self-affirmation, relationship satisfaction, commitment, intimacy, conflict frequency, conflict resolution styles, and attachment dimensions. The findings showed that spontaneous self-affirmation was significantly associated with greater relationship satisfaction, intimacy, commitment, and the use of constructive conflict resolution strategies, such as positive problem-solving. However, it was not significantly related to conflict frequency or the use of destructive conflict styles. When controlling for attachment anxiety and avoidance, only the link between spontaneous self-

affirmation and relationship satisfaction remained significant, suggesting that much of the observed association may be influenced by underlying attachment styles. These results highlight spontaneous self-affirmation as a potentially valuable, yet attachment-dependent, psychological resource in romantic relationships, warranting further investigation into how it interacts with foundational emotional patterns to influence relationship dynamics.

- ❖ Hung et al. (2024) investigated whether integrating generative AI chatbots into brief, self-administered positive psychology interventions could improve their effectiveness, addressing the common limitation of small effect sizes in such interventions. The study comprised two within-subject experiments: Study 1 tested a gratitude intervention delivered through Snapchat's My AI, and Study 2 examined a self-affirmation task facilitated by a customized version of ChatGPT. While neither AI-assisted intervention outperformed traditional methods in their primary outcomes—gratitude (Study 1) and self-view (Study 2)—exploratory analyses revealed that the AI-integrated self-affirmation task significantly improved life satisfaction and medium-arousal positive affect. These findings suggest that although AI may not universally enhance all well-being metrics, it holds promise for selectively boosting specific emotional outcomes. The nuanced results point to the importance of matching AI support with appropriate intervention types and highlight the need for further research to identify optimal design and delivery conditions for AI-augmented psychological tools.
- ❖ Brockner and van Dijke (2024) explored how employees' anticipation of returning to the physical workplace (RTW) after prolonged periods of working from home (WFH) during the COVID-19 pandemic affects their job attitudes, specifically work engagement and burnout. Grounded in the Job Demands-Resources (JD-R) model and self-affirmation theory, the study posited that employees may feel conflicted about RTW—valuing certain aspects of both remote and on-site work. Findings showed that the perceived imminence of RTW was positively correlated with work engagement and negatively with burnout, indicating that employees generally viewed the return positively. However, when participants underwent a self-affirmation intervention, these associations were neutralized, suggesting that self-affirmation reduced the psychological salience of the RTW transition.

Notably, these effects persisted over a six-week follow-up period. The results suggest that while the anticipation of workplace re-entry can boost morale, self-affirmation interventions may buffer individuals from over-investing emotionally in external transitions, potentially offering psychological balance. However, the mechanism by which self-affirmation diffuses both positive and negative anticipation requires further investigation, especially in the context of long-term job re-entry adaptation.

- ❖ **Winfield (2025)** conducted a mixed-methods study to investigate the under-explored use of mirrors as tools for enhancing self-compassion in non-clinical populations. Using a pragmatic framework, the research involved two groups ($n = 12$) of experienced mindfulness practitioners who engaged in a week-long self-compassion intervention, either in front of a mirror or with eyes closed. Participants recorded daily reflections via journals, which were analyzed using both qualitative Narrative Inquiry (NI) and quantitative tools such as the Self-Compassion Scale (SCS) and the Linguistic Inquiry and Word Count (LIWC-22). While SCS results showed no significant difference between groups ($p > 0.05$), LIWC analysis revealed that the control group (eyes closed) used more compassion-, mindfulness-, and autonomy-related language, suggesting deeper engagement. Narrative data indicated that the mirror often acted as a distraction, although some participants found it had subtle benefits for self-awareness and emotional processing. Overall, the findings suggest that verbal self-compassion practices may be more impactful than mirror-based interventions, unless additional training is provided. However, the small sample size and homogeneity of experienced mindfulness practitioners limit the generalizability of the findings. Moreover, while the integration of linguistic and narrative analysis adds depth, the lack of long-term follow-up data leaves the sustainability of the intervention's effects uncertain. Future research should explore these dynamics in larger and more diverse populations, and consider longitudinal designs to evaluate lasting outcomes.

2.5.1 Summary of Literature Review on Mirror Work

The reviewed studies collectively highlight the multifaceted psychological impacts of mirror use, self-affirmation, and reflective practices across diverse populations and contexts. Research on mirror gazing demonstrates its potential to influence self-perception, body image, emotional states, and even therapeutic outcomes, though limitations such as small sample sizes, short intervention durations, and correlational designs are common. Studies on self-affirmation—whether through verbal affirmations, digital tools, or reflection on values—reveal its benefits for emotional well-being, relationship satisfaction, and resilience, especially during periods of stress such as the COVID-19 pandemic. Technological innovations like smart mirrors and AI chatbots show emerging potential but require further validation. Across interventions, while effects on mood, self-esteem, and identity coherence are often positive, findings vary in robustness, generalizability, and long-term impact. The literature supports the value of reflective and affirmational strategies but underscores the need for more rigorous, longitudinal, and culturally sensitive research to fully establish their efficacy and boundaries. However, there are very few studies that have employed Mirror Work as an intervention for improving psychological well-being.

2.6. Gratitude Journal Writing

- ❖ Regan, Walsh, and Lyubomirsky (2023) found that long-form gratitude writing exercises, like essays and letters, led to greater well-being and positive outcomes compared to shorter gratitude lists. Unconstrained gratitude lists, where participants wrote about any topics, also boosted gratitude and positive feelings. Additionally, writing gratitude letters to specific individuals increased gratitude and positive emotions but made participants feel more indebted. This study highlights the effectiveness of gratitude interventions and how their format and type impact outcomes. However, the study does not address the long-term sustainability of these effects beyond the intervention period.
- ❖ Bernard, Poncin, Bovet, Tamches, Cantin, Pralong, and Borasio (2023) conducted a pilot study in the palliative care context to assess the practicability and

appropriateness of an intervention of gratitude. This intervention involved patients and their chosen caregivers writing and sharing gratitude letters with each other. The findings indicated that the intervention was well-received by participants and considered feasible, with flexible modalities of participation to cater to individual preferences. While the intervention did not lead to statistically significant changes in patients' quality of life, relationships, psychological distress, or subjective burden, it had a significant positive impact on caregivers, reducing their psychological distress, particularly in terms of depression. Interviews revealed that a substantial proportion of participants experienced positive outcomes, both emotional and cognitive, while a small number reported negative emotional effects. The study suggests the need for larger-scale evaluations with control groups to further assess the intervention's effectiveness in palliative care settings. A key limitation is the absence of a control group, which reduces the strength of causal claims about the intervention's impact.

- ❖ Fekete and Deichert (2022) conducted a study on pandemic-related stress and found that online gratitude writing had more lasting benefits compared to expressive writing or a control group. Notably the group writing gratitude continued the levels of gratitude and have shown decreased stress and increased positive feelings, after a month of post reporting. On the other hand, the members in other group of expressive writing did not show the maintained level of gratitude as earlier and did not show any reduction in stress and feelings of negativity. Group of controls neither kept the level of gratitude and the negativity did not change with the absence of any reduction in stress level. The post intervention results were recorded after a month. This suggests that gratitude-focused writing may be especially effective for managing stress and negative emotions during highly stressful and uncertain situations like the COVID-19 pandemic. Despite promising findings, the study's reliance on self-report measures may introduce response biases affecting the internal validity.
- ❖ Kwok, Gu, and Tam 2022 study in Hong Kong involved adolescents with moderate anxiety. They underwent a positive psychology program combining gratitude and emotional intelligence techniques in groups. Results showed

reduced anxiety and increased happiness after the program, mediated by gratitude and emotional intelligence. This suggests positive psychology programs can benefit adolescents' mental well-being. However, the absence of a control group limits the ability to attribute observed changes specifically to the gratitude component of the program.

- ❖ Wolfe 2022 study explored gratitude's impact on body dissatisfaction in females exposed to ideal body images. A comparison was done with a Global Gratitude induction and using media exposure using Gratitude self. Participants who practiced gratitude experienced a reduced level of feelings of body image changing when compared to the group that got left to the media images. Participants who practiced gratitude experienced. Both gratitude strategies had a similar buffering effect on body dissatisfaction. The study is limited by its narrow demographic focus, reducing generalizability to broader populations or different gender groups.
- ❖ In Ko, Kim, and Kim's (2021) study, nursing students engaged in an eight-week gratitude journaling program, which aimed to explore their experiences and assess their perspectives on this intervention. After the program, students shared their reflections through essays, and content analysis revealed five key categories. These categories underscored the importance of promoting consistent participation in gratitude journaling, as it positively impacted nursing students' perspectives, emotions, behaviors, stress management, and self-reflection. Yet, the qualitative nature of the study and lack of a comparison group restricts objective measurement of outcomes.
- ❖ Locklear, Taylor, and Ambrose's (2021) study mentions a gratitude intervention for 10 days in order to reduce work area mistreatment. Drawing on multiple theories, it found gratitude was an instrument in reducing mistreatment by increasing resources of self control and was more effective in workplaces with higher gratitude norms. This highlights gratitude interventions become instrumental and easy task to reduce the interpersonal issues at workplace. The study's strength lies in its theoretical integration, but it lacks longitudinal data to confirm sustained effects.

- ❖ Nawa and Yamagishi's 2021 study explored 2 weeks' gratitude journal writing on online and assessed its effect over the university students and their motivation for academics. Participants who regularly engaged in gratitude journaling showed increased interest for academic enthusiasm. Notably the encouragement continued even after a time period of 12 weeks, highlighting positive influence of gratitude interventions on academic motivation among students. Nevertheless, the study did not measure long-term academic outcomes such as grades or retention.
- ❖ Arnout and Almoied's (2021) examined the relationship among gratitude, resilience, well-being and counselors' creativity. The study included 610 psychological counselors and utilized structural equation modeling for evaluating proposed structural model. The findings indicated that gratitude and resilience had both direct and indirect effects on creativity, with well-being serving as a mediating factor. The model demonstrated a good fit with the collected data, emphasizing the significance of gratitude, resilience, and well-being in enhancing counselors' creativity and providing effective psychological services. Although the model showed good fit, the cross-sectional design precludes causal inference.
- ❖ In a study by Komase, Watanabe, and Kawakami (2021), the researchers explored the effects of gratitude intervention programs on work engagement among Japanese employees, emphasizing the importance of personal and job resources. The study employed a two-arm, parallel-group cluster randomized control trial, recruiting Japanese organizations and their employees through snowball sampling. Participants in the intervention group participated in a 1-month gratitude program that encouraged mutual gratitude exchanges within their workplaces. Results showed that these participants had significant improvements in work engagement, as measured by the Japanese version of the Utrecht Work Engagement Scale. This effect was evaluated at the start of the study and again after 1, 3, and 6 months, demonstrating the potential of gratitude interventions to enhance work engagement, even in organizations with common time constraints. However, the recruitment via snowball sampling may introduce selection bias and affect representativeness.

- ❖ In a study by Cousin, Redwine, Bricker, Kip, and Buck (2021), gratitude was found to have a positive impact on cardiovascular health. This review of 13 studies highlighted that gratitude improves biomarkers related to cardiovascular disease and enhances adherence to health behaviors. Such findings suggest that gratitude interventions could be a cost-effective approach to improving cardiovascular outcomes for patients with heart disease. Still, heterogeneity in study designs across the reviewed literature may reduce the clarity of mechanisms involved.
- ❖ Bohlmeijer, Kraiss, Watkins, Schotanus-Dijkstra (2021) conducted a gratitude intervention for 6 weeks among participants with moderate to less well being. The participants in this study also had moderate levels of depression and anxiety. Compared to self-kindness and a control group, gratitude intervention shown more useful for increasing mental health. Gratitude measures, although it did not significantly impact distress. The results suggest it's a valuable, low-intensity intervention, especially for higher-educated women, with lasting effects on gratitude. Yet, the lack of significant impact on psychological distress may suggest the need for complementary interventions.
- ❖ Koay, Ng, Tham, and Tan (2020) conducted a study on undergraduate students were given the task of posting pictures related to gratitude to be posted in social media. Where as another group were encouraged to post color related pictures. The results showed increased gratitude levels in the gratitude group, indicating the potential of social media for gratitude interventions among young adults. Nonetheless, the study does not account for individual differences in social media engagement that may influence outcomes.
- ❖ Chamizo - Nieto, Rey and Pellitteri (2020) carried out a study among 1157 students to look into the mediating roles into emotional intelligence and aggressive cyber actions. The finding revealed gratitude intervention was very helpful in reducing the aggressive activities using cyber equipments by adolescents. However, reliance on self-reported aggression may limit the objectivity of the findings.

- ❖ Gabana, Wong, D'Addanio, and Chow (2020) conducted a pilot study to assess the impact of multiple gratitude intervention sessions on 18 female soccer players from a public high school in the United States. The study utilized suitable measurement tools to gather the necessary data, and the gratitude interventions were structured specifically for the athlete gratitude group. Results revealed soccer team participated in TAGG intervention exhibited enhanced gratitude, team cohesion and mental health. Being a small pilot study with no control group, the findings should be interpreted cautiously.
- ❖ Swain, Thompson , Gallagher, Paddison and Mercer (2019) conducted a pilot study to test gratitude intervention and online mindfulness for self management of arthritis pain among 81 people the pilot study concluded with positive support to gratitude intervention and mindfulness in minimizing pain and anxiety due to arthritis. Still, the lack of a larger randomized sample restricts generalizability to broader arthritis populations.
- ❖ Deng, Xiang, Zhu, Li, Yu, and Liu (2019) found that gratitude-based interventions, including gratitude-sharing and blessing-counting, improved subjective well-being and reduced aggression among male violent prisoners in China over five weeks. Gratitude have shown a positive mediating factor for improved well-being. Despite promising results, the exclusive focus on male violent offenders limits applicability to other incarcerated populations.
- ❖ In a study by Ducasse, Dassa, Courtet, Brand-Arpon, Walter, Guillaume, Jaussent, and Olié (2019), a 7-day gratitude diary intervention was compared to a food diary control among adults hospitalized for suicidal ideation or attempts. The gratitude diary group has shown a greater reductiondepression, anxiety, and optimism when compared with the group which did not write the the diaryof gratitude. While there were notable differences onsuicidal ideation and hopelessness between groups, participants found the gratitude intervention useful, suggesting its potential as an adjunctive strategy for suicidal patients. However, the short duration of the intervention raises questions about long-term efficacy.

- ❖ Isik and Erguner - Tekinalp (2017) conducted a study to assess the effects of gratitude writing (journaling) on life satisfaction and positive affect through experimental study 11 students were assigned to write gratitude journal and 10 students were kept as control without the gratitude writing. 3 weeks of journal writing assessed with proper tools. The results revealed the students involved in gratitude writings had significantly higher post test scores in all dimensions. The small sample size limits the statistical power and external validity of the study.
- ❖ Wong, Owen, Gabana , Brown, Mcninnis , Toth , and Gilmann (2016) carried randomized controlled trial with 293 adults were arranged randomly as three groups namely Gratitude intervention, expressive writing, and group with out any special instruction. The findings discussed use of gratitude intervention as added interventions for psychotherapy clients. This well-designed RCT strengthens causal claims, but generalization to clinical populations requires further replication.
- ❖ In Emmons and Stern's 2013 article, gratitude practice is highlighted as a potentially powerful and underutilized force in clinical practice, capable of promoting relational healing. They provide an overview of gratitude's defining properties and its positive impact on mental health outcomes. The article also discusses a case study on using gratitude as a psychotherapeutic intervention and offers self-strategies and techniques for cultivating gratitude. It concludes by exploring the potential therapeutic benefits of incorporating gratitude into clinical settings. Although conceptually strong, the article relies heavily on anecdotal evidence and lacks empirical outcome data.
- ❖ Emmons and McCullough (2003) conducted an experiment involving three groups: one group wrote weekly about things they were grateful for, another wrote about daily hassles, and a control group wrote about neutral topics. The study found that participants in the gratitude journaling group reported higher levels of positive mood and life satisfaction and experienced fewer physical symptoms compared to the other groups. This research established that regular practice of gratitude journaling could enhance overall well-being and reduce the impact of

daily stressors. A key strength is its experimental design, though the study did not assess effects beyond a 10-week period.

- ❖ Seligman et al. (2005) investigated the effects of various positive psychology interventions, including gratitude journaling. Participants who engaged in writing about things they were grateful for showed significant improvements in life satisfaction and reductions in depressive symptoms over a six-month period. The study highlighted the long-term benefits of gratitude practices, showing that the positive effects of gratitude journaling could be sustained and contribute to lasting improvements in mental health. However, self-selection into interventions may have influenced the outcomes due to expectancy effects.
- ❖ Wood, Froh, and Geraghty (2010) reviewed the literature on gratitude interventions, including gratitude journaling, and integrated findings to provide a comprehensive overview of their impact on well-being. The review concluded that gratitude practices significantly contribute to improved mood, better interpersonal relationships, and enhanced life satisfaction. The study emphasized that gratitude journaling fosters a more positive outlook on life and promotes overall psychological health. Yet, the review acknowledges that many studies in the field suffer from small sample sizes and short follow-ups.
- ❖ Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008) investigated the effects of gratitude journaling among adolescents. Participants were asked to maintain a daily gratitude journal for several weeks. The study found that adolescents who practiced gratitude journaling showed significant improvements in overall life satisfaction, reduced depressive symptoms, and increased positive emotions. This research underscored the benefits of gratitude journaling not only for adults but also for younger populations, enhancing their emotional well-being and coping skills. Still, the study did not explore the potential moderating effects of age or baseline emotional state.
- ❖ Javaid et al. (2024) conducted a qualitative exploratory study to investigate the understanding and expression of gratitude among Pakistani university students, examining how cultural, social, and religious influences shape their perspectives. Using convenience sampling, data were collected through semi-structured interviews with 15 students and open-ended questionnaires completed by 25

others, all aged between 18 and 25. Thematic analysis revealed six core themes: Understanding Gratitude, Expressing Gratitude, Social Media's Effect on Gratitude, Gratitude and Academic Performance, Benefits of Gratitude, and Gratitude in Family Relationships. The study found that gratitude played a positive role in academic performance and stress management, with expressions of gratitude often tied to religious values and family bonds. However, broader societal challenges, such as corruption and social disparity, were identified as obstacles to practicing gratitude. The authors suggest that cultivating gratitude within university settings could enhance the educational environment, but interventions must be sensitive to the wider sociocultural context. While offering valuable cultural insights, the study's reliance on a small, convenience-based sample limits its generalizability, indicating the need for longitudinal and comparative studies across diverse educational and societal settings.

- ❖ Desai et al. (2024) conducted a randomized controlled study to compare the effects of Heartfulness meditation and gratitude practice on the mental well-being of healthcare professionals across the United States. Over a six-week intervention period, participants were assigned to either a trainer-guided virtual Heartfulness meditation group or a self-guided, podcast-based gratitude practice group. The study utilized the Professional Quality of Life Scale-5 (ProQOL-5) to assess Compassion Satisfaction (CS), Burnout (BO), and Secondary Traumatic Stress (STS), and the Utrecht Work Engagement Scale (UWES) to measure vigor, dedication, and absorption at work. While both groups showed benefits, the Heartfulness group demonstrated statistically significant improvements in reducing burnout ($p = 0.002$), lowering secondary traumatic stress ($p = 0.0004$), and increasing work-related vigor ($p = 0.0392$). Though the increase in compassion satisfaction was not statistically significant, a positive trend was observed. Participant feedback supported these results, with individuals in the Heartfulness group experiencing improved sleep and lower stress sensitivity, while those practicing gratitude reported enhanced mood and a sense of accomplishment. The study highlights Heartfulness meditation as a particularly effective tool for combating burnout, though both interventions showed unique strengths. However, the relatively small sample size ($N = 83$) limits broader

generalization, and larger randomized trials are recommended to further validate and expand upon these promising findings.

- ❖ Lee and Kim (2024) conducted a meta-analysis to assess the effectiveness of gratitude promotion programs among South Korean college students, analyzing 11 studies involving 683 participants using the PRISMA methodology. The results revealed an overall effect size of 0.6671, indicating an above-medium impact of these interventions. Among the subdomains, cognitive outcomes showed the largest effect size ($d = 1.37$), followed by behavioral ($d = 0.77$) and emotional ($d = 0.60$) outcomes, suggesting that gratitude interventions are particularly influential in enhancing students' thought patterns and self-perception. Programs combining gratitude practice and recording were more effective ($d = 0.85$) than those using recording alone ($d = 0.77$), and interventions lasting at least 16 weeks yielded the highest impact ($d = 1.61$). These findings emphasize the importance of both program structure and duration in maximizing the benefits of gratitude interventions. While the study provides strong evidence for the efficacy of such programs in the South Korean higher education context, further research is needed to explore long-term effects and cross-cultural applicability of gratitude interventions in diverse student populations.
- ❖ Deichman (2023) investigated the effectiveness of a more flexible and comprehensive gratitude intervention, the *My Best Self 101* (MBS101) gratitude module, compared to the traditional gratitude journaling practice. The study employed a randomized controlled design involving 225 adult participants over a 21-day period. The MBS101 module offered psychoeducation about gratitude alongside a variety of empirically supported gratitude practices, allowing participants to choose practices that resonated with them. Using seemingly unrelated regression models, the study found that the MBS101 group experienced significantly greater improvements in both gratitude and subjective well-being than the journaling group. Moreover, interaction effects revealed that the benefits of MBS101 increased with the amount of time participants engaged in the practices. These findings suggest that providing individuals with customizable and engaging gratitude interventions may enhance their psychological outcomes more effectively than rigid, one-size-fits-all approaches. However, while

promising, further studies are needed to replicate these results and determine the long-term sustainability of such flexible gratitude programs across diverse populations.

- ❖ Jacobs and McConnell (2024) explored the emotional and cognitive mechanisms through which expressing gratitude to nature may promote pro-environmental behavior. Across two experimental studies, participants wrote gratitude letters either to nature, to built environments, or engaged in a control activity. The researchers found that gratitude toward nature significantly increased the perceived magnitude of nature ("nature size") and strengthened participants' inclusion of nature in their self-concept. Although no direct effect on pro-environmental behavioral intentions was observed in Study 1, these nature-oriented psychological shifts indirectly led to increased intentions through mediated pathways. The findings were confirmed in Study 2, which also revealed additional influencing factors, namely biospheric value orientation and individual norms related to positive reciprocity. Notably, the boost in pro-environmental intentions was strongest among participants who highly endorsed biospheric values, suggesting that individual differences in environmental concern influence the effectiveness of such interventions. These findings highlight the unique role of nature-directed gratitude in fostering ecological concern by reshaping how individuals perceive and relate to the natural world. However, the absence of direct behavioral effects and the reliance on intention-based measures point to the need for future research involving real-world behavioral outcomes and broader population samples.
- ❖ Zuniga (2023) investigated the unique role of Gratitude to God (GTG) in predicting prosocial and relational virtues—specifically forgiveness, relational humility, and altruism—beyond the effects of domain-general gratitude and religious commitment. Using a sample of 582 undergraduate students, participants self-reported their levels of GTG, religious commitment, general gratitude, forgiveness, relational humility, and altruism. The study found that GTG significantly predicted greater forgiveness, even after accounting for domain-general gratitude. Additionally, GTG significantly predicted relational humility, but this association was evident only in individuals with strong religious

commitment, indicating that religiosity may serve as a moderating factor. In contrast, neither GTG nor general gratitude predicted altruism, whereas religious commitment emerged as the only significant predictor of altruistic behavior. These findings underscore GTG as a distinct construct within gratitude research, particularly in religious populations, offering nuanced insights into how spiritual gratitude may influence interpersonal dynamics. However, the study's reliance on self-report measures and a homogeneous sample of undergraduates limits the generalizability of the results, calling for future research in more diverse populations and using behavioral measures of prosociality.

2.6.1 Summary of Literature Review on Gratitude Journal Writing

Across the reviewed studies, gratitude interventions consistently demonstrated positive effects on mental well-being, emotional resilience, interpersonal relationships, and even physical health across diverse populations and settings. Techniques included journaling, letter writing, social media engagement, and structured programs, with results showing improvements in areas like stress reduction, life satisfaction, academic motivation, workplace engagement, and even cardiovascular biomarkers. Gratitude was also found to mediate outcomes such as reduced aggression, enhanced creativity, and strengthened family or caregiver relationships. Tailored interventions, such as those incorporating emotional intelligence or cultural context, tended to yield better results, while flexible or multi-pronged approaches often outperformed rigid formats. However, many studies faced limitations such as small sample sizes, lack of control groups, short intervention durations, and reliance on self-reported data, which restrict generalizability and causal interpretation. Nevertheless, the collective evidence suggests that gratitude practices are a low-cost, adaptable, and psychologically beneficial intervention with wide-ranging applications. However, there has been no studies done for gratitude journal writing intervention in the context of PCOS women.

2.7 Gap Analysis

- Upon reviewing the existing literature, several noteworthy observations come to light.
- Most studies have predominantly centered on the examination of depression, anxiety, and stress.
- Very few studies were conducted on self compassion in “Women with PCOS”, leaving exploration on self-compassion among women with Polycystic Ovary syndrome relatively underrepresented.
- Notably, many of these investigations have been led by medical professionals, with only limited involvement from psychologists.
- There is only insufficient knowledge about self criticism in the frame work of PCOS women.
- Variable self-criticism and its role to affect quality of life in PCOS women needs to be studied in detail.
- Our research pioneers the study that explores level of self-criticism in “Women with PCOS”
- With the substantial growth of health psychology in the Western world, a significant opportunity exists for further exploration on menal health indicatorson PCOSwomen.
- Additionally, emotional, psychological vulnerabilities, including self-criticism, body image concerns, self-esteem, and social acceptance, have not received in-depth scrutiny in prior research efforts.
- Furthermore, the underlying psychological factors contributing to depression, anxiety, and stress, effective management plans remain relatively understudied.
- The emotional dimensions of individuals and strategies to enhance their overall mental health have not received adequate attention either.
- Quality of life among “Women with PCOS”, closely linked to their emotional well-being, hinges on an assessment of psychological factors significantly affecting their emotional state.

- No prior research has explored the relationship between self-criticism and self-compassion and their impact on occurrence anxiety, depression, and stress in PCOS women suggesting an avenue for further investigation.
- Even though there mentioned the previous literatures about positive psychological interventions could be effective in the management of psychological intervention, more exploration needed.

Pranayama

- The efficacy of pranayama on clinical population like PCOS women and their mental health distress needs more exploration.
- The effect of pranayama on level of self compassion and self criticism needs to be explored in detail.
- Moreover, the pranayama and its potential benefits on PCOS needs more detailed investigation.

Gratitude Journal Writing

- Even though the field of gratitude research advancing in psychological studies, needs further examination to establish it as a recognized attribute and assess its potential utility for patients exhibiting clinical features of psychological distress.
- Further the impact of gratitude journal writing and its impact on self compassion and self-criticism needs further exploration, especially in the context of PCOS women.
- Though there are studies on gratitude journal writings, how effective it can be on clinical diagnosed PCOS women remain underexplored offering an opportunity for deeper investigation.

Mirror work

- Recommendations such as mirror work (a positive self-affirmation in front of mirror) while proposed as a positive psychological intervention have not

undergone empirical testing within the context of PCOS-related psychological distress.

- This simple and cost effective method needs further investigation to know whether it can be an attribute to increase self compassion and psychological well-being in PCOS women

CHAPTER 3

RESEARCH METHODOLOGY

The selection of an appropriate research method was crucial to guide the research systematically and maintain scientific rigour.

The chapter begins by outlining the research's aim, research questions, objectives, and hypotheses, which laid the foundation for formulating statements about the selected population and anticipating the intervention's effects. To accomplish the predetermined objectives, a suitable research methodology was chosen, the methodology of phase 1, phase 2 are detailed below. A simple sample study is also mentioned in this chapter.

This chapter delves into various aspects of the methodology, including the research objectives, research design, study setting, variables under investigation, the target population, sample selection, determination of sample size, sampling techniques, sampling criteria, data collection methods, and the statistical analysis procedures for both Phase 1 and Phase 2. Additionally, it discusses the specific intervention details, such as 12 weeks of Pranayama, 6 weeks of Gratitude Journal Writing, and 21 days of Mirror work.

3.1. PURPOSE

The present study aimed to investigate the efficacy of Pranayama, Mirror Work, and Gratitude Journal Writing in reducing self-criticism, Depression, anxiety, stress and improving self compassion in PCOS women.

3.2. RESEARCH QUESTIONS

1. Would women with Polycystic Ovary Syndrome have high “self-criticism”?
2. Would women with Polycystic Ovary Syndrome have high “depression, anxiety and stress”?
3. Do women with Polycystic Ovary Syndrome have low levels of “self compassion”?
4. Would Pranayama reduce “psychological distress” in PCOS women?

5. Would Pranayama reduce “self-criticism and improve self compassion” in PCOS women?
6. Would Mirror Work reduce “psychological distress” in PCOS women?
7. Would Mirror Work reduce “self-criticism and improve self compassion” in PCOS women?
8. Would Gratitude Journal Writing reduce “psychological distress” in PCOS women?
9. Would Gratitude Journal Writing reduce “self-criticism and improve self compassion” in PCOS women?

3.3. OBJECTIVES

Based on the questions formulated the following objectives are derived.

- 1) To compare the level of “Depression, Anxiety and Stress” in “Women with PCOS” and without PCOS.
- 2) To compare the level of “Self-Criticism and Self-Compassion” in “Women with PCOS” and without PCOS.
- 3) To find the effect of intervention of Pranayama, mirror work and “gratitude journal writing on self-criticism and self-compassion” in “Women with PCOS”.
- 4) To examine the effect of intervention of Pranayama, mirror work and gratitude journal writing on “depression, anxiety and stress” in “Women with PCOS”.

3.4. Hypotheses of the Study:

Based on the stated objectives, the following hypotheses are presented:

H₁ : “Women with PCOS” would have significantly high “depression, anxiety and stress” as compared to women without PCOS.

H₂ : “Women with PCOS” would have significantly high self-criticism and low self-compassion” as compared to women without PCOS.

H₃ : There would be significant decrease in “self- criticism and increase in self-compassion” in “Women with PCOS” after the intervention of Pranayama, mirror work and journal writing as compared to control group.

H₄ : There would be significant decrease in “stress, anxiety and depression” in “Women with PCOS” after the intervention of Pranayama, mirror work and journal writing as compared to control group.

3.5. METHOD OF INVESTIGATION

The present study aimed to explore various variables, including depression, anxiety, stress, self-criticism, self-compassion, and the independent variables of pranayama, mirror work, and gratitude journal writing in PCOS women. To achieve the study's objectives, it was divided into two phases:

Phase 1 involved assessing the levels of the dependent variables among PCOS women using quantitative survey measures.

Phase 2 focused on the development and implementation of intervention programs involving Pranayama, Mirror Work and Gratitude Journal Writing based on the baseline data collected in Phase 1. Further details regarding the methodology for these two phases are discussed below.

3.5.1 Ethical Considerations:

Ethical approval for this study was granted by Srushti Hospital through the SRI RAJARAJESWARI INDEPENDENT ETHICS COMMITTEE, under the reference number ECR/338/Indt/TN/2021, in accordance with the New Drugs and Clinical Trials Rules, 2019. Participants were thoroughly briefed about the study's objectives and the voluntary, anonymous nature of their involvement. They received an informed consent document, approved by the ethics committee, which detailed the researcher's information, the study's focus, the associated university, and their rights to participate, withdraw, or decline at any time. Participants were well-informed about the study's goals and methods before they agreed to take part. Consent was obtained from all participants before the study began, and confidentiality of their personal information and data was strictly upheld throughout. The researcher is a certified Yoga Wellness Instructor recognized by the Ayush Ministry (Certification Number P020022442)

3.6. Phase 1

3.6.1. Sample study

A sample study was conducted through an online survey during Jan 2021, 5 PCOS women and 6 non PCOS women at reproductive age were requested to fill the questionnaire through google forms. Participants were explained through call/messages about the purpose of this survey. Their names are kept confidential. It aimed at familiarising the researcher with the administration procedure of the tool, testing the reliability, validity and feasibility of the tools and to determine the time required for the assessment. The sample study also focused on addressing the critical barriers during the conduction of the study. The tools concluded to be feasible, reliable, valid and practical for the pursuit of this study.

3.6.2. Research Design

The current research has been conducted as a randomised controlled cross sectional pre & post design. It is also known as classical experiment.

The research design also examined the levels of the dependent variables in women with and without PCOS. The research design also examined the level of self-criticism in “Women with PCOS” and compared it with women without. The current research has been conducted with, pre and post, control random trials which is the classical experiment. This study used a cross-sectional method; a cross-sectional method is a type of observational study that analyses data from a population at a specific point of time. The rationale for choosing a quantitative method was to identify the severity level of the psychological distress (depression, anxiety and stress, self-criticism and self-compassion among “Women with PCOS” and also to comprehend the relationship between the dependent variable (Depression, anxiety, stress, self-criticism, self-compassion) and independent variable (pranayama, gratitude journal writing, mirror work). The main focus of the research design was to study the factors depression, anxiety, stress, self-criticism and self-compassion in “Women with PCOS” and without PCOS. Pre and post intervention namely, pranayama, gratitude journal writing and mirror work in “Women with PCOS”, both in control and experimental groups. Thus

the research design examines the efficacy of pranayama, gratitude journal writing and mirror work by examining pre and post, control group design. The research design investigates the relationship between the proposed predictors and the criterion variable, and aims to identify the predictive role of the independent variables in predicting the dependent variable.

3.6.3. Setting of the research Study

The setting of a research study is the location where the research takes place. Setting refers to the area where the conducted study occurs. The setting of a research study can have a significant impact on the results of the study. Therefore, it is important to select an appropriate setting and to prepare the setting carefully. (Polit & Hungler, 1999). The researcher must determine the location for data collection.

The setting should be safe and comfortable for participants to ensure that they are able to focus on the study and provide accurate data. The setting should also be free from distractions to minimise the likelihood of participants being interrupted or influenced by outside factors. The setting should be accessible to participants, meaning that it is located in a convenient location and is easy for participants to get to. Finally, the setting should be affordable, meaning that the cost of renting or using the setting is within the budget of the research study.

The setting must also be compatible with the research's purpose and goals. Once the setting has been chosen, the researcher must prepare the setting for data collection. This may include setting up equipment, cleaning the area, and ensuring that the setting is comfortable and safe for participants.

The criteria for selecting the setting were:

1. Availability of the study participants.
2. The familiarity of the setting to the investigator.
3. The proximity of the setting.
4. Expected cooperation from the management for the study.

This study was carried out exclusively in “Srushti Fertility Centre and Women’s Hospital - Chennai,” India during February 2022 to September 2022. Srushti hospital

is one of the leading fertility centres and women's well-being centres. It has a strong academic reputation and is affiliated with several Indian colleges as well as a few international hospitals for ongoing medical education. It has been a place for many audits and studies in genetics and reproductive medicine. Women from all walks of life come here for treatment and wellness purpose. The researcher chose "Srushti hospital" based on the feasibility of studying PCOS women.

3.6.4. Population

The population of this study consisted of PCOS women. According to Polit and Hungler (1999), the population is the total group of people who share some traits and are of interest to the researcher. The requirement to identify the group to which the study's findings are applied leads to the need to define the population for the research endeavour.

3.6.5. Sample

The participants in this study, who were diagnosed with Poly Cystic Ovary Syndrome, were out patients of Srushti Fertility Centre and Women's Hospital - Chennai, India. Women who did not have PCOS were recruited from visitors, relatives, and hostels near to the Hospital. The sample can be considered as a part of the whole, Treece and Treece (1986). The sample constitutes a representative portion of the overall population.

3.6.6. Sample Design and Sampling Technique

To gather the data for this investigation, the researcher used a purposive sample strategy. According to Abdellah, Levine, and Levine (1986), the kind of variables being examined and the nature of the issue being analysed determine which sampling approach is best. The emphasis of the purposive sampling is on a particular characteristic of a populace that is of interest which would enable an answer for the research question posed. This type of sampling is often used when the researcher wants to learn about a specific group or population. Purposive sampling is an acceptable kind of sampling for specific situations. It utilises the judgement of a specialist in choosing cases or it chooses cases with special intention in mind.

3.6.7. Sampling Procedure

Purposive sampling was used to choose the research participants. Women who were diagnosed with PCOS and were between the ages of 18 and 49 were the inclusion

criteria. Using the Rotterdam Criteria (Rotterdam 2004), which requires at least two of three specific clinical features—polycystic ovaries, signs of hyperandrogenism, and oligo/anovulation as detected on ultrasonography—PCOS was diagnosed in these individuals. Pregnant women, women in menopause, those with a history of psychiatric disorders, individuals identified with pituitary or adrenal disorders, those with adrenal neoplasms, and those undergoing psychological interventions, were not included. Senior doctors from Srushti hospitals' outpatient obstetrics and gynaecology department validated the PCOS diagnosis.

3.6.8. Criteria Used for Sample Selection

The sample selection criteria outlined below were tailored to suit the requirements of this research:

3.6.8.1. Inclusion criteria:

- Women diagnosed with PCOS
- Women at reproductive age

3.6.8.2. Exclusion criteria:

- Women at menopause
- Pregnant women.
- History of existence of psychiatric disorder.
- This study will exclude any underlying disease of neoplasm's, adrenal and pituitary glands disorder.
- Those undergoing psychological / Yoga interventions.

3.6.9. Monitoring

The subjects kept closely monitored with rapport such that they were not indulging in any other psychological / yogic interventions from external sources.

3.6.10. Variables

The independent variables were “Pranayama, Mirror Work, and Gratitude Journal Writing”.

The dependent variables were “Depression, Anxiety, Stress, Self-Criticism, and Self-Compassion”.

3.6.11. Measures used for the study

The following were the measures used for the study:

1. Demographic details sheet.
2. Informed consent form.
3. Depression Anxiety Stress Scale (DASS 21).
4. Forms of Self criticizing/Attacking & Self-Reassuring Scale (FSCRS)
5. Self-compassion Scale. (SCS)

3.6.11.1. Demographic details sheet

A demographic questionnaire, drafted by the researcher, in consultation with the medical director of Srushti Hospital was given to each participant and asked to fill in the details they are comfortable to reveal. The following questions were included in the questionnaire.

1. E mail id
2. Age
3. Height in CM
4. Weight in Kg
5. Which state you belong?
6. Do you belong to Urban or Rural?
7. Your highest education
8. Marital status - Married / Unmarried

9. Employment status - Employed / Unemployed / Homemaker / Student
10. Are you aware of a condition called PCOS - Yes/ No?
11. Are You a known PCOS/PCOD - Yes / No?
12. Is there a history of PCOS in your family?
13. DO you have excess hair growth on your face / Body - Yes / No?
14. Do you have Acne?
15. Do you have irregular periods with long gap?
16. How many hrs of sleep do you get every day?

3.6.11.2. Informed consent form

The Informed Consent Form encompassed the following information:

1. Research project title
2. Name, contact details of the researcher.
3. Researcher's address (University) and also of the Hospital.
4. The participant's right to accept or refuse participation and withdraw from the research after commencement.
5. Agreement of concealing the identity of participant
6. Acceptance of participation by putting signature

Copy of the informed consent format is attached in the annexure

3.6.11.3. Tools

1. Depression Anxiety Stress Scale 21 (DASS21, Lovibond, S.H., & Lovibond, P.F., 1995)

Overview

The DASS-21 questionnaire consists of three self-assessment scales intended to gauge negative emotional states related to depression, anxiety, and stress. There are 7 items in Depression, 7 in Anxiety and 7 in stress. Participants must utilize a 4-point scale

ranging 0 to 3, to indicate the severity or frequency of each item marked. The DASS-21 is a condensed version of the DASS-42, with final scores in each category being doubled. For the depression category, scores within the range of 0-9 are considered normal, and scores from 10 to 28 are deemed higher. In the anxiety category, normal scores fall between 0-7, while scores from 8 to 20 are indicative of pathological levels. As for the stress category, normal scores range from 0-14, while pathological scores are within the range of 15 to 34. Below is the item list for the Depression, Anxiety, and Stress scales of the DASS21.

Score Interpretation

In most instances, DASS scale scores can be understood by comparing them to the means and standard deviations of the full normative sample. Following the DASS Manual, each score's total can be assessed using the five DASS severity ratings: normal, mild, moderate, severe, and extremely severe.

When you aggregate the scores for each factor and then double them, you obtain a total score ranging from 0 to 42 for each scale individually

Higher DASS21 scores are indicative of more elevated levels of psychological distress (Lovibond & Lovibond, 1995). Cut-off scores have been established for each subscale, encompassing five severity categories. Elevated scores imply a greater presence of symptoms.

Furthermore, when applicable, the cohort was divided into two groups based on the severity labels provided by the DASS Manual. The 'distressed' group comprised participants reporting distress symptoms categorising them as moderate, severe, or extremely severe. In contrast, the 'non-distressed' group consisted of individuals reporting lower symptom levels, in line with either no distress or only mild distress.

Validity of DASS-21

The DASS's validity has been supported in by recent research, which demonstrated correlations between the scales and existing self-report measures of anxiety and depression (Flynn, Noone & Sarma, 2018).

Reliability of DASS-21

Studies have found that the original scale scores of the DASS-21 demonstrate good internal consistency (reliability).

2. Forms of Self criticizing/Attacking &Self-Reassuring Scale (FSCRS) (Gilbert et al. 2004)

Dr. Paul Gilbert and colleagues created the Forms of Self-Criticizing/Attacking & Self-Reassuring Scale (FSCRS) in 2004 as a psychological tool to assess self-critical and self-reassuring thinking patterns. Based on clinical observations of depressed patients who often displayed unique and recurrent patterns of self-criticism and self-reassurance, this measure was developed. Understanding the relationship between these cognitive processes and mental health—especially in relation to self-esteem and emotional regulation—is made possible thanks in large part to the FSCRS.

Structure and Scoring

The FSCRS comprises 22 items, each of which is assessed using a 5-point severity index that ranges from 0 (not at all) to 4 (extremely). This enables respondents to express the degree to which they concur with each assertion, thereby elucidating their self-critical and self-reassuring tendencies.

The scale is divided into three subscales:

1. **Inadequate-Self (IS):** This subscale includes 9 items that assess feelings of inadequacy and self-criticism. It reflects the extent to which individuals perceive themselves as insufficient or failing in various aspects of their life.

High scores on the IS subscale indicate a strong tendency towards self-criticism and feelings of personal inadequacy.

2. **Hated-Self (HS):** Comprising 5 items, this subscale measures the degree of self-directed hostility and disdain. It captures the intensity of negative feelings towards oneself, which often manifest as self-loathing or severe self-criticism. Elevated scores on the HS subscale suggest a higher level of self-directed aggression and internalized negativity.
3. **Reassured-Self (RS):** The RS subscale includes 8 items that gauge the extent of self-reassuring thoughts and behaviors. This subscale evaluates how much individuals engage in self-supportive and comforting thoughts. Lower scores on the RS subscale indicate less frequent self-reassurance and, by extension, a greater reliance on self-critical thinking.

Interpreting the Scores

The FSCRS is structured so that all scores are positive, meaning higher scores reflect greater intensity of the measured constructs. However, the interpretation of scores differs between subscales:

- **Inadequate-Self (IS) and Hated-Self (HS):** These subscales are associated with self-criticism. Higher scores on these scales are indicative of stronger self-critical tendencies, where individuals are more likely to experience and report feelings of inadequacy and self-loathing. Consequently, lower scores on these subscales are preferable, as they suggest less self-criticism and greater self-acceptance.
- **Reassured-Self (RS):** This subscale measures self-reassuring behaviors and attitudes. Higher scores here indicate more frequent engagement in self-reassurance, which is generally considered positive. Thus, higher RS scores are desirable, reflecting healthier self-support and emotional resilience.

Validity of the FSCRS

Strong correlations were found between the FSCRS and LOSC, supporting construct validity. Additionally, the FSCRS was correlated with the Self-Compassion Scale

(SCS) in another study, further demonstrating construct validity. Correlations aligned with theoretical expectations, indicating good convergent and divergent validity for all FSCRS subscales.

Reliability of the FSCRS

The FSCRS subscales demonstrate strong internal consistency reliability. In the original study by Gilbert et al. (2004), the Cronbach's alpha values were reported as 0.90 for the IS subscale, 0.86 for the HS subscale, and 0.86 for the RS subscale. A test-retest reliability study in a Portuguese sample demonstrated correlations of 0.72 - IS, 0.78 - HS, and 0.65 - RS, over a four-week interval (Castilho et al. 2015).

Self-compassion Scale (SCS, Neff K.D. 2003)

Overview

This instrument consists of 26 items presented in questionnaire format. The responses were collected using 5 point Likert scale. The 13 negative items were reversed in scoring and then summed with the 13 positive items. The SCS provides a comprehensive evaluation of an individual's self-compassion.

Score Interpretation

The 13 items with negative scores are reverse scored and added to the 13 items with positive scores to get the total self-compassion score. The average score of the six subscale means generates an overall self-compassion score ranging from 1 to 5 or (26 to 130 as total score).

Validity and Reliability of the Self-Compassion Scale

The factor loadings for the subscales of the self-compassion scale were as follows: self-kindness had factor loadings ranging from 0.71 to 0.77, self-judgment ranged from 0.65 to 0.80, common humanity had factor loadings between 0.57 and 0.79, isolation ranged from 0.63 to 0.78, mindfulness showed factor loadings from 0.62 to 0.80, and over-identification had factor loadings ranging from 0.65 to 0.78. The overall scale had a Cronbach's alpha coefficient of 0.92, while the individual subscales had coefficients of

0.78, 0.77, 0.80, 0.79, 0.75, and 0.81. The test-retest reliability for the entire scale was 0.93, with subscale coefficients of 0.88, 0.88, 0.80, 0.85, 0.85, and 0.88, respectively (Neff, 2003b).

Table 1

The summary of the Psychometric Properties of the Tools used by the researcher

Name of Tool	Variable	Variable Classification	Reliability of the Tool used	Validity
DASS-21	Depression, Anxiety, Stress	Dependent variable	Cronbach's alpha of 0.96 = High Reliability	Strong concurrent validity
Forms of Self criticizing/ Attacking & Self-Reassuring Scale (FSCRS)	Self-Criticism	Dependent variable	Cronbach's alpha of 0.90(IS), 0.86(HS), 0.86(RS) = high reliability Internal Consistency = high reliability Test-retest reliability= High reliability	Good convergent and divergent validity
Self-Compassion Scale (SCS)	Self-Compassion	Dependent variable	Cronbach's alpha of 0.90 = High reliability Internal consistency= High reliability Test-retest Reliability = High Reliability	Strong discriminant and convergent validity

3.6.12. Sample Description

A total of 180 women at reproductive age were selected for the study, 90 PCOS and 90 without PCOS women.

The sample size 90 PCOS and 90 Non PCOS were considered based on the previous studies. Asdaq and Yasmin (2020) conducted a study with 82 PCOS and 85 control at Riyadh, Saudi Arabia. Dutkiewicz et, al (2024) investigated the psychological traits along with hormonal and metabolic profile. The study included 42 women with PCOS and 39 control. Shakil et, al. (2020) studied PCOS women's mental health with 63 PCOS and 63 in control, in Lahore, Pakistan. In another study conducted by Saxena et, al (2020) on mental health among PCOS medical students, recruited 70 PCOS at Udaipur, Rajasthan, India. Hence, the researcher considered 90 PCOS women. This number was based on clinical accessibility, ethical considerations by the ethical committee, and the need to ensure reliable data while maintaining manageable research logistics.

A total of 90 women diagnosed with Polycystic Ovary Syndrome (PCOS) were selected for this study. The sample was drawn specifically from Srushti fertility hospitals and women's well being centres that specialize in gynecology and obstetrics, where PCOS is commonly diagnosed and managed. This ensured that all participants had a confirmed clinical diagnosis, increasing the accuracy and consistency of the data.

From the 90 PCOS women, 30 women were selected for Pranayama, 30 women for Mirror Work and 30 women for Gratitude Journal Writing. In each of the interventions, the 30 women were further randomly divided into two groups of 15 women each. These two groups represented the "Experimental and control groups". 90 "Women with PCOS" cases were identified from obstetrics and Gynaecology (OBGYN) outpatient departments and clinics of Srushti fertility hospitals and women's well being centres. The purpose of the research was explained to each participant. A written consent was obtained and the participants were informed that they can participate, refuse or withdraw at any point of time from the study.

A code number was assigned to each participant to conceal their identity. A written pre-assessment was done to evaluate their scores on the dependent variables through paper and pen. Samples were recruited to check the levels of dependent variables.

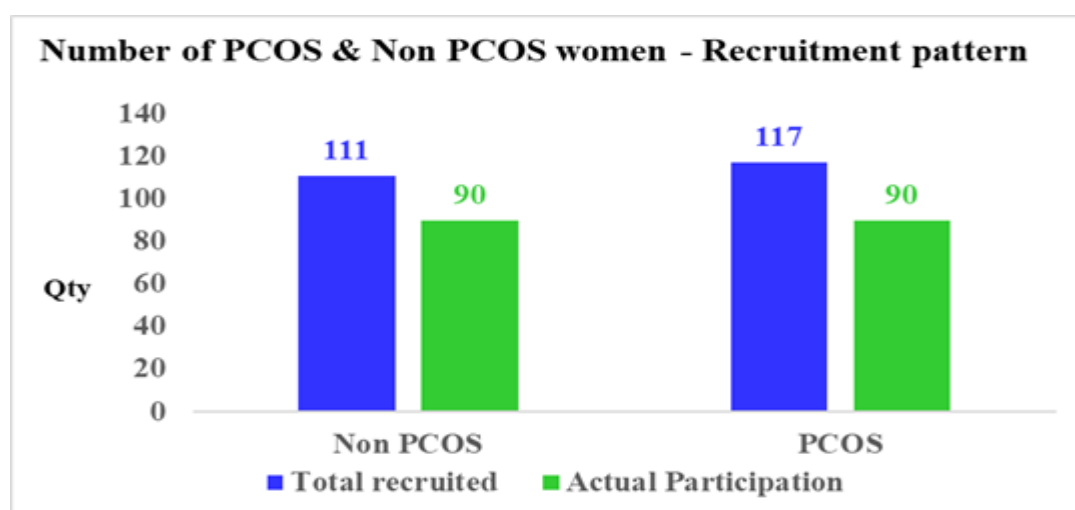
90 Non PCOS women also were recruited through random technique to compare the levels of depression, anxiety, stress, self-criticism and self-compassion, the samples were recruited through a simple random technique from Non PCOS healthy women at reproductive age who were patient's relative, other visitors of the hospitals, few hospital staffs and women residing nearby hostels were approved by the medical director of Srushti hospitals.

3.6.13. Recruitment of 180 women

A total of 228 women given consent to take part in this study, 21 Non PCOS women and 27 PCOS women dropped out of the study due to various reasons. The final sample of 180 women completed the questionnaires.

Figure 2

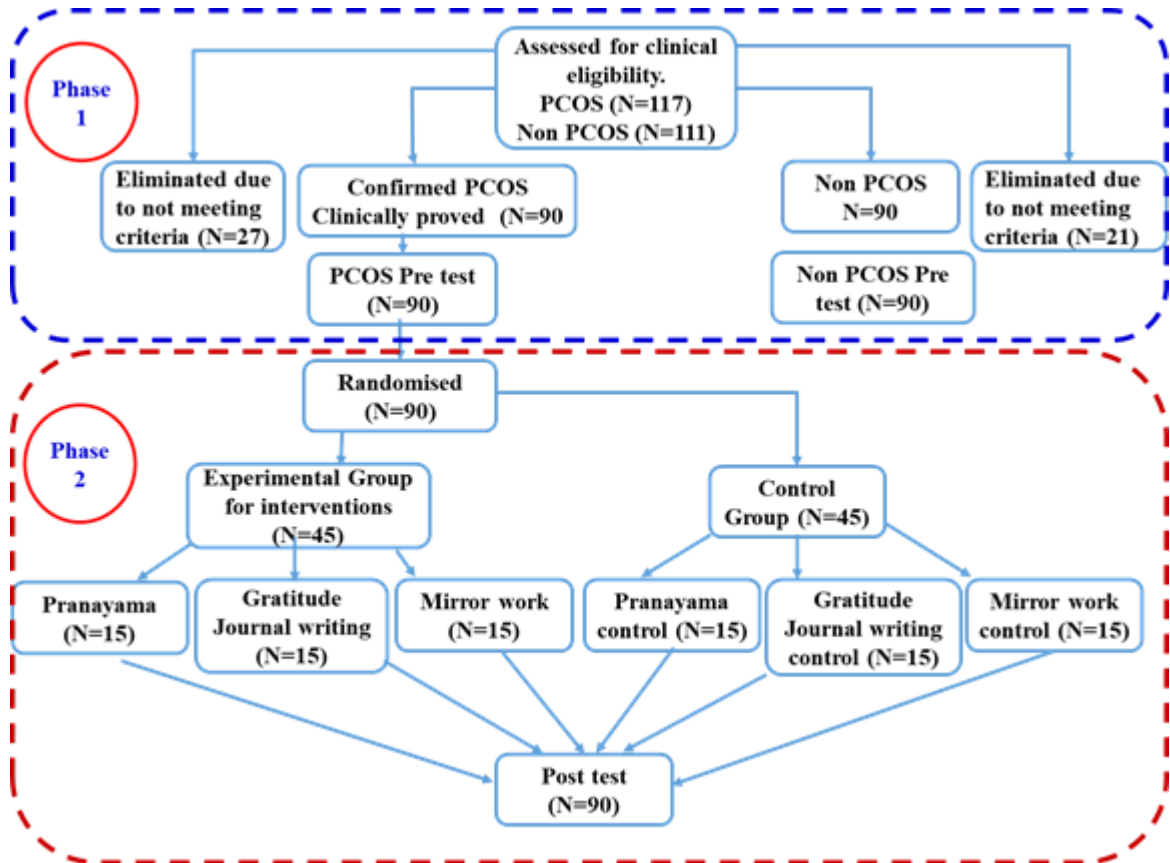
Illustrates the recruitment pattern of PCOS women and Non PCOS women participants



Eliminated 21 Non PCOS and 27 PCOS women during recruitment

Figure 3

Process flow chart for phase 1 and phase 2



3.6.14 Statistical Analysis

After organizing the research data statistical analysis included both descriptive and inferential statistics.

1. Independent t-test was used to find differences of the dependent variables among PCOS and Non PCOS women.
2. Mean and standard deviation shown the severity in the dependent variables among PCOS women and Non PCOS women.

The empirical data collected were examined using Statistical Package for Social Science (SPSS- Version 23). Acceptance level for all statistical test for p value was set as 0.05.

3.7. PHASE 2

Interventions involving Pranayama, Mirror Work, and Gratitude Journal Writing were administered to “Women with PCOS” to assess the impact of Independent variable on the dependent variables as determined by the pre-test results.

3.7.1. Research Design

3.7.1.1 Scope and Rationale of the interventions

The present study explores the psychological well-being of women diagnosed with Polycystic Ovary Syndrome (PCOS), utilizing three distinct psychosocial interventions. The participants involved were clinically diagnosed individuals who required intensive psychological support and training, regardless of the seemingly straightforward nature of the intervention procedures. It is important to note that these participants were concurrently undergoing various physiological treatments for PCOS, which posed a practical challenge in implementing all three psychosocial interventions simultaneously.

Methodological Considerations

Each intervention was applied independently through controlled experimental and empirical procedures to determine its standalone impact on mental health outcomes. This methodological choice was deliberate and essential to ensure that the effects observed could be attributed solely to the specific intervention, rather than the synergistic effect of combined therapies.

Justification for Independent Application of Interventions

The decision to avoid simultaneous implementation of all three interventions was guided by both ethical and practical concerns. Integrating all three approaches at once could pose several risks, particularly for individuals with pre-existing psychological vulnerabilities. The potential downsides include:

- **Emotional Overload:** Participants dealing with trauma, low self-esteem, or depressive symptoms may experience heightened emotional distress when required to engage deeply with multiple therapeutic tools concurrently. For example, mirror work—one of the interventions—can elicit intense emotional responses, particularly in those with body image concerns.
- **Increased Risk of Inconsistency and Dropout:** The cumulative demand of engaging in multiple interventions simultaneously may result in psychological fatigue, leading participants to disengage or withdraw from the study entirely.
- **Difficulty in Isolating Outcomes:** Simultaneous application of multiple interventions would compromise the ability to determine which specific technique contributed to observed improvements or challenges, thereby affecting both research validity and the practical utility of the findings in clinical settings.

The post tests were conducted after 3 months of Pranayama, 21 days of Mirror Work, and 6 weeks of Gratitude Journal Writing for the respective groups.

3.7.1.2 Duration of the interventions

Mirror Work and the 21-Day Practice: A Psychological Perspective

Why 21 Days? Origins in Habit Formation

The notion that 21 days can initiate lasting behavioral change originated with Dr. Maxwell Maltz, a plastic surgeon who observed that his patients generally took about three weeks to adjust to changes in their physical appearance following surgery (Maltz, 1960). Based on these clinical observations, he proposed that it takes a minimum of 21 days for a new self-image or behavior to begin forming in the mind.

Maltz emphasized the phrase “at least 21 days,” highlighting that behavioral adaptation is variable and context-dependent. His work laid a foundation for later studies exploring the science of habit formation.

Modern Evidence on Habit Formation

Contemporary research has nuanced our understanding of how long it takes to form a new habit. A study by Lally et al. (2009) at University College London followed participants over a 12-week period and found that habit formation, on average, required 66 days, although early behavior changes began to consolidate between 18 and 30 days, especially for simpler tasks. This research suggests that while 21 days may not be sufficient for full habit automation, it is a psychologically meaningful threshold for initiating change.

Neuroplasticity and Repetition

The concept of neuroplasticity—the brain's ability to reorganize itself by forming new neural pathways—is central to the effectiveness of mirror work. Repeating affirmations and engaging in consistent self-directed behavior can gradually alter neural circuits associated with self-perception and emotion regulation (Doidge, 2007). Over time, these new patterns can replace long-standing negative beliefs or emotional responses.

Why Mirror Work Benefits from a 21-Day Practice

For many individuals, looking directly into a mirror and affirming positive qualities can initially provoke discomfort, particularly if they struggle with self-criticism or low self-esteem. A structured 21-day mirror work practice helps to:

- Desensitize emotional discomfort through gradual exposure to one's own reflection and internal dialogue.
- Initiate new thought patterns, promoting self-acceptance, forgiveness, and emotional resilience (Neff & Germer, 2013).
- Internalize affirmations via repetition, turning conscious efforts into automatic, self-supportive habits.
- Activate mirror neurons, which are involved in empathy and social cognition, potentially enhancing self-compassion through observed emotional expression (Iacoboni, 2009).

Therefore, the 21-day mirror work routine is not an arbitrary duration—it is grounded in psychological theory and supported by empirical research. This period allows for the disruption of old cognitive habits and the establishment of new, healthier ones. When practiced consistently and authentically, mirror work leverages the principles of neuroplasticity and habit formation to become a sustainable tool for emotional healing and self-empowerment.

Justification for a Six-Week Gratitude Journaling Intervention

The selection of a six-week duration for a gratitude journaling intervention is grounded in empirical evidence from positive psychology, behavioral science, and clinical research. This timeframe has consistently been associated with measurable improvements in psychological well-being, including enhanced mood, increased life satisfaction, and greater resilience.

Empirical Foundations in Positive Psychology

Foundational research in positive psychology supports the efficacy of gratitude journaling over a six-week period. In a seminal study, Emmons and McCullough (2003) found that participants who engaged in weekly gratitude writing reported increased optimism, improved sleep quality, reduced physical complaints, and enhanced overall well-being. Since then, the six-week model has been widely replicated, establishing it as a reliable and clinically viable format for gratitude interventions.

Psychological Adaptation and Behavioral Change

Behavioral science models indicate that a six-week duration aligns with the psychological adaptation curve, facilitating the transition from novelty-driven compliance to sustained cognitive and emotional engagement. In the initial stages (weeks 1–2), individuals typically experience heightened motivation and awareness. During the middle stages (weeks 3–4), emotional resonance with the practice tends to deepen. By weeks 5–6, gratitude-related thinking often becomes internalized and habitual (Lally et al., 2010). This progression aligns with behavior change theories,

which emphasize sustained repetition and consistency as essential components of habit formation.

Neuroplasticity and Emotional Regulation

Neuroscientific research provides further support for a six-week timeframe by demonstrating how regular gratitude practice can facilitate emotional and cognitive restructuring. For example, consistent engagement in gratitude exercises activates brain regions associated with emotional regulation and positive affect, particularly the medial prefrontal cortex (Tang et al., 2015). Studies suggest that practicing gratitude consistently over six to eight weeks enhances neural connectivity in these areas, reinforcing gratitude as a stable emotional habit.

Intervention Design Considerations

From a clinical design perspective, a six-week intervention balances efficacy with feasibility. It is long enough to produce statistically significant improvements in psychological outcomes while short enough to maintain participant engagement and adherence. Notably, other evidence-based programs—such as Mindfulness-Based Stress Reduction (MBSR) and cognitive-behavioral gratitude interventions—often employ a six- to eight-week structure for similar reasons (Seligman et al., 2005; Wood et al., 2010).

Supporting Literature

Multiple studies validate the effectiveness of a six-week intervention model:

- Emmons and McCullough (2003) observed significant increases in well-being following six weeks of gratitude journaling.
- Seligman et al. (2005) reported that positive psychology interventions practiced over six weeks produced benefits that persisted for up to six months.
- Wood et al. (2010) found that four to six weeks of nightly gratitude reflection improved sleep quality and subjective well-being.

- Lally et al. (2010) emphasized that habit formation typically requires sustained behavioral repetition across several weeks.
- Bohlmeijer et. al (2021) conducted a six week gratitude, self-kindness and a controlled trial on the general adults to improve the mental health.

In summary, a six-week gratitude journaling intervention is both scientifically supported and behaviorally optimal. It aligns with empirical research, facilitates emotional and cognitive transformation through neuroplasticity, and ensures practical feasibility for program implementation. This duration maximizes the potential for lasting psychological change while maintaining participant adherence and clinical effectiveness.

Justification for 12 weeks (90days) Pranayama

A 12-week duration was selected for the pranayama intervention in this study to align with existing research demonstrating that this time frame is both feasible and effective for eliciting psychological improvements. For instance, Lata et al. (2022) observed significant reductions in anxiety, depression, and anger, along with enhanced well-being among medical students after a 12-week intervention that included pranayama. Similarly, Anand et al. (2018) implemented a 12-week pranayama regimen and found notable improvements in physical fitness and mental health parameters, although not all were statistically significant—highlighting the need for continued investigation. Furthermore, Sharma and Dogra (2024) identified 12 weeks as a commonly adopted duration in studies reporting positive mental health outcomes, supporting its scientific validity. Choosing this duration ensures adequate time for participants to internalize breathing techniques and experience measurable changes in psychological well-being.

3.7.2. Sample design

A random sampling method was utilised to distribute the participants. The PCOS women were distributed into control groups and experimental through a lottery-based method. Out of a pool of 90 “Women with PCOS”, 30 women in each group were randomly assigned to the “Experimental and control groups” of 3 different intervention

groups. The 30 women were further randomly distributed to experimental and control group with 15 in each group.

3.7.3. Allocation of 90 PCOS women

The 90 “Women with PCOS” allocated to the following groups as: 15 “Women with PCOS” to Pranayama experimental group, 15 PCOS to Pranayama Control group, 15 PCOS women to Mirror work experimental group, 15 PCOS to Mirror work control group, 15 “Women with PCOS” to Gratitude journal writing experimental group and 15 “Women with PCOS” to Gratitude journal writing control group.

3.7.4. Sample Selection Criteria

The criteria for selecting participants, both for inclusion and exclusion that pertain specifically to Phase 2 of this study can be found in the Phase 1 study.

3.7.5. Variables

- Pranayama, Mirror Work and Gratitude Journal Writing were the independent variables.
- Self-Criticism, Self-Compassion, Stress, Depression and Anxiety were the dependent variables.

3.7.6. Intervention program

Pranayama

The primary goal of this study was to assess the effectiveness of a 12-week pranayama intervention on the dependent variables. As anticipated, the results revealed significant improvements from before to after the 12-week pranayama program. Participants reported reduced self-criticism, enhanced self-compassion, and lower levels of depression, anxiety, and stress. This suggests that pranayama has the potential to enhance the psychological wellbeing of “Women with PCOS”, promote self-compassion, and reduce stress. All participants completed questionnaires post-intervention, with a 100% response rate.

Mirror Work

The mirror work intervention followed the Louise Hay pattern, which emphasizes the power of words and positive affirmations. Louise Hay's approach encourages us to choose positivity and gratitude in our self-talk, promoting self-acceptance. This method involves repeating positive self-affirmations in front of a mirror, a self-help technique endorsed by various websites and psychology literature. Baseline data was collected from 30 randomly assigned participants in experimental or control group. The experimental group engaged in a 21-day mirror work intervention, repeating positive self-affirmations in front of a mirror, with guidance provided through various means. Participants were diligent in their practice and encouraged to continue independently after the intervention. Google Meets were conducted to monitor progress and motivate participants. All participants completed questionnaires post-intervention, with a 100% response rate.

Gratitude Journal Writing

Gratitude writing is a purposeful practice where one expresses appreciation for received blessings or desires fulfilled. It is a valuable virtue that allows individuals to recognize goodness in their lives. Following the law of thinking, gratitude is seen to attract abundance. Dr. Dispenza (2014) describes gratitude as an emotional signature, representing a state of receptivity and acknowledgment. 15 PCOS women participated in a 6-week gratitude journal intervention, with another 15 in the control group. Participants were instructed to daily write down five things they were grateful for, using their imagination to feel the gratitude. They were provided with a journal and trained in person, encouraged to continue the practice daily for six weeks. Regular interactions and motivation were provided via Google Meets, calls, and messages. After six weeks, participants completed a post-test questionnaire. Many reported improved positivity, attitude, self-worth, and overall happiness. The small sample size allowed for close monitoring and motivation, and participants expressed interest in continuing the practice. All participants completed questionnaires post-intervention, with a 100% response rate.

3.7.7. Measurement

The instruments employed in Phase 1 to gather initial data were reapplied for post-test and assessments following the Self-Compassion Intervention program in Phase 2.

3.8. Pranayama

3.8.1 Description

Pranayama is a yogic act performed for channelling the flow of life energy that handles all the physical processes in the human system. Nidhi, padmalatha, nagarathna and Amritanshu (2013) carried out an experimental study of 72 adolescents (37 yoga group, 35 control group) to examine the effect of yoga in PCOS in respect to their quality of life and the results revealed yoga program for 12 weeks significantly improve the quality of life with PCOS than control group who underwent physical exercise. Thakur et. al. 2021 found that Pranayama is capable to reduce mental tension, stress and anxiety among PCOS. According to (Aili, 2021), Yoga serves as an excellent means of reducing stress. When combined with relaxation methods, Yoga contributes to enhancing overall well-being and boosting vitality. (Ansari 2016)

Firstly, the study fills a knowledge gap on the effect of pranayama on psychological well-being in “Women with PCOS” by building on previous research. The goal of the present study was to determine how well pranayama intervention affected dependent variables in PCOS-affected women. In addition, “Women with PCOS” anticipated that the pranayama would enhance their mental well-being, foster a greater sense of self-compassion, and aid in daily stress reduction. Thus, the purpose of our research was to find out how well the pranayama intervention affected the PCOS women's levels of self-compassion and self-criticism. We also conducted a twelve-week pranayama intervention for the PCOS women in the experimental group in order to investigate the impact of pranayama on stress, anxiety, and depression in PCOS women.

Thirty PCOS participants were chosen to take part in the 12-week pranayama intervention as part of this intervention trial. The thirty women all finished the FSCRS (Gilbert et al. 2004), the Self-Compassion scales (Neff 2003), and the Pretest for Dass-21 (Lovibond & Lovibond 1995). In the pre-test dataset, every participant was given a

unique number. Following the pretest, the PCOS women were split into “Experimental and control groups” using basic randomisation. To guarantee objectivity and true randomness in the assignment procedure, a second individual drew slips of paper with code numbers from a box. Thus, the experimental group consisted of 15 women, whereas the control group consisted of 15 women. Between the “Experimental and control groups” pretest p-values, there was no discernible difference.

First Pranayama class conducted at Srushti Hospital auditorium. A WhatsApp group formed with the consent of each member. The subjects of the experimental group (n=15) were asked to Practice Pranayama for 10 minutes every day at a constant time for 3 months. Initially, each of the subjects were trained one to one by the researcher at the Srushti hospital premises. Subsequently, using google meet, weekly twice online training and practices and monitoring were done with the subjects. Participants were given a few warm up stretches, few deep breathing exercises, relax ... sit comfortably preferably padmasana, ardha padmasana or any other comfortable position with neck and spine straight. A yoga prayer song was played to bring concentration.

1. Anulom Viloma pranayama with chin mudra, nasagra mudra, its benefits in detail and the contra indications were explained and taught.

2. Bhramari Pranayama with Shamugha mudra were taught in detail and practiced. Do's and Don'ts of Pranayama were taught clearly. Participants were encouraged to practice pranayama daily and acknowledged in the WhatsApp group. Researcher conducted classes regularly and systematically in online mode, as well as directly for the participants who were visiting the hospital. Participants actively participated in this programme and kept acknowledging directly, through call/ WhatsApp messages. 15 members of the control group were requested to proceed with the regular lifestyle and the researcher kept a good rapport with them.

Since the sample size was 15, researcher could closely monitor them either in person or by messages/calls. Participants kept acknowledging about their daily practice in the WhatsApp group. At the end of 3 months into the practice of the interventions, a post test on the 5 variables have completed by the experimental group. Researcher thanked the Pranayama group members and encouraged them to continue the practice for their

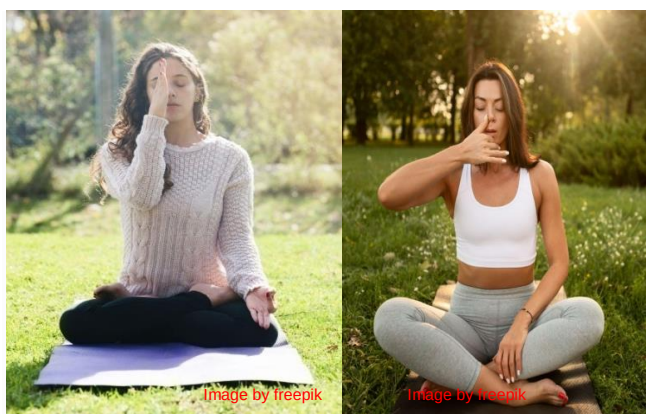
betterment. Participants were very happy and expressed their gratitude for teaching pranayama and put positive comments in the group.

The control group continued their usual routine without special guidance. After 12 weeks, post-tests using DASS, FSCRS, and SCS were conducted to assess changes in dependent variables. The effects of the Pranayama intervention were then analysed by comparing pre-test and post-test scores for “Women with PCOS”.

Researcher has also offered pranayama training to the control group, considering the ethical views and the result achieved in the experimental group.

Figure 4

Pranayama Practice sample photos



3.8.2. Procedure of Pranayama

The detailed Pranayama practices taken from Asana Pranayama Mudra Bandha (Saraswati, 1996) are described below:

3.8.2.1. Nasagra Mudra (nose tip position):

- Hold your right hand's fingers in front of your face. Gently place the index and middle fingers on the center of your eyebrows in a relaxed manner.
- Place your thumb over the right nostril and your ring finger over the left.
- Press alternately on one nostril to block the air followed by the other.
- Fold your little finger.

3.8.2.2. Anulom Viloma/Nadi shodhana/Alternate Nostril breathing

- Sit in a comfortable meditation posture, preferably siddha/siddha yoni asana or padmasana. If you can't sit this way, you may sit against a wall with your legs stretched out or use a chair with a straight back.
- Keep your head and spine upright.
- Begin with equal inhalation and exhalation, 5 times using the ratio 1:1.
- Breathe in deeply as possible from the abdomen and breathe out.
- Relax..,
- Gently close your eyes
- Place your right hand in the nasagra mudra and rest your left hand on your knee in chin or gyana mudra.
- Close your right nostril with your thumb and inhale through the left nostril.
- At the count of 1,2,3 in mind,
- Now close the left nostril with the ring finger and release the thumb from the right nostril and exhale from the right nostril counting 1,2,3 mentally.
- Now inhale through the right nostril, maintaining the same count 1,2,3
- Now close the right nostril, counting the same and open the left nostril and breathe out counting the same as before.
- This is one round. Practice 5 to 10 rounds.
- As you are comfortable, you can extend your counting mentally.

3.8.2.3. Bhramari Pranayama (humming bee breath):

- Ideally, use padmasana or siddha/siddha yoni asana for this practice. Close your eyes and relax your entire body briefly.
- Keep your lips gently closed with a slight gap between your teeth throughout the practice to allow the humming sound to be felt in your brain.
- Lift your hands to the sides and bend your elbows, bringing your arms to your ears. Shanmukhi mudra can be used.
- Breathe in through your nose.
- Exhale slowly and steadily while producing a deep, continuous humming sound.
- It should be soft and melodious, causing the front of your skull to resonate.
- This constitutes one round.

- After exhalation, inhale deeply and repeat. Perform five rounds.
- Focus your awareness on the humming sound within your head and maintaining steady and even breath.
- Start with 5 to 10 sets initially and gradually increase to for intense mental tension, anxiety, or therapeutic purposes.
- Best practised late at night or early in the morning for heightened sensitivity, but can be done at any peaceful time.

3.8.2.4. Shanmukhi Mudra

- Begin by sitting in siddha/siddha yoni asana if you're able, or choose a meditation posture that feels comfortable, using a cushion beneath your perineum for support. Maintain an erect posture, keeping your head and spine aligned. Close your eyes and place your hands on your knees, allowing your body to relax completely.
- Raise your arms, positioning them in front of your face with elbows pointing outward. Use your thumbs to gently cover your ears, your index fingers to close your eyes, your middle fingers to rest on your nostrils, and your ring and little fingers to seal your lips.
- To start the breathing exercise, release the pressure of your middle fingers to open your nostrils and take a deep, full yogic breath. Once you've inhaled fully, use your middle fingers to close your nostrils again. Hold your breath for as long as it feels comfortable, focusing your attention on any sounds you may perceive in the areas of the bindu, ajna, or anahata chakras.
- When you're ready to exhale, lift your middle fingers and release the breath slowly. This marks the completion of one cycle. Immediately begin another round by inhaling, and continue this pattern throughout your practice session.
- To end your practice, lower your hands to your knees while keeping your eyes closed. Gradually shift your awareness to external sounds and sensations in your body.

- This technique becomes more potent as you develop the ability to extend your breath retention. Regular practice of nadi shodhana pranayama can help improve this capacity.
- For beginners, start with 5-10 minute sessions and slowly increase the duration to 30 minutes over the course of several months.
- Avoid this for people who are experiencing depression.

3.8.2.5. Chin Mudra

- Similar to gyana mudra, but with both palms facing upwards, resting on the knees with relaxed hands and arms.
- Choose between gyana or chin mudra for meditation unless otherwise instructed.
- Chin mudra enhances the effectiveness of meditation as it helps channel the energy emitted by the palms and fingers.

The above pranayama and mudras were trained and practiced by the members in the experimental group for 12 weeks. Contra indications and benefits of these pranayama were taught in details to the participants.

3.9. Gratitude journal writing

Gratitude can be described as the perception of abundance, as elucidated by Watkins and colleagues in 2009. The exploration of how cultivating gratitude can potentially enhance individuals' daily psychological well-being was initially undertaken by Emmons and colleagues in 2004 through three distinct studies, each varying in intervention intensity, measurement techniques, and participant demographics. Remarkably, even amidst challenging life experiences, some individuals manage to identify silver linings, and those who do exhibit greater resilience, as suggested by the research of Tennen and Affleck in 2002. One of the most prevalent methods for fostering gratitude is the use of gratitude journals, where individuals are encouraged to regularly compile written lists of things they are thankful for, as outlined by O'Connell and colleagues in 2018. Fekete and colleagues in 2022 proposed that the practice of gratitude journaling helps maintain gratitude levels while reducing stress and negative

emotions. Based on Komase et al. in 2021, interventions centered around gratitude hold promise for improving mental health, although their overall impact on well-being is still an area of ongoing investigation.

3.9.1 Intervention:

6 weeks Gratitude journal writing intervention was given to 15 PCOS women in the experimental group keeping 15 in the control group. Participants were trained in how to write a gratitude Journal on a daily basis for 6 weeks continuously. Initially the training was given in person. A WhatsApp group was formed with the consent of each member, though few opted to be on personnel communication id. The participants were motivated to write 5 things they are grateful for every day. With a feeling of imagination of gratitude for the things/person they already possess. The researcher provided them with a book and pen to encourage. Few samples of gratitude journal writing were shared with the members. Participants were encouraged to write the gratitude preferably in the morning or night before sleep every day for continuous six weeks. Examples of gratitude journal writing: I am grateful and happy that I am healthy.

I am thankful and happy I have fresh air to breathe.

I Am grateful and happy that I have good food to eat.

I Am grateful for having a home to stay in.

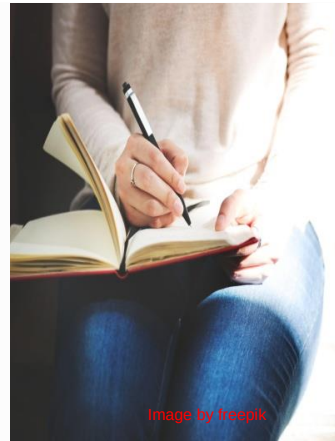
Thank you, I have good friends.

As they learned to thank the things they already belong to, the participants were encouraged to say advance thanks giving by imagining and visualizing the things/ happenings/ people/ relationship they looked for, as if it were already there. Members were made to understand the positivity and wellness thoughts they have to choose for. This has motivated them a lot and the participants reported that advance thanks giving helped them a lot. Many of the participants had submitted a model writing of their

gratitude book to the researcher and also a weekly WhatsApp copy of their sample writing was compiled to the personal id of the investigator. Participants were allowed to write in their fluent language if they wished so, as they progressed they could write as much as gratefulness. The researcher also arranged a few google meets to motivate, encourage, and interact and to monitor the progress. Besides, most of the participants kept interaction with investigator either directly, through calls/ WhatsApp chat. Some of the participants' positive comments, and the researcher's continuous motivation at individual level would have contributed to get in track to experience the complete benefits. Participants expressed gratitude for the positive changes and improved attitudes in their daily lives, feeling more self-worth. The researcher thanked them for their involvement and noted that many reported feeling better in various ways. With a sample size of 15, the investigator could closely monitor participants through personal interaction and communication, which further motivated them. Both "Experimental and control groups" underwent a post-test after 6 weeks of the gratitude journal writing intervention, using the same measures as the pre-test (DASS, FSCRS, and SCS-26 items) to assess changes. The response rate was 100% for both groups. In appreciation and ethical consideration, the researcher offered gratitude journal training to the control group as well.

Figure 5

Gratitude journal writing sample



3.10 Mirror Work

The 21 days of mirror work intervention Louise Hay pattern (Guidelines) was adopted. The researcher had obtained the license from HAY foundation to follow the 21days mirror work pattern.

Positive affirmations in front of a mirror repeating can increase self-acceptance, it is a self-help method recommended in many websites and psychology books. The mirror serves as a tool for enhancing self-compassion by facilitating compassionate self-talk, fostering kindness and connectedness when facing difficult situations, and promoting the cultivation of positive emotions (Muris & Petrocchi, 2017). Louis Hay's Mirror Work, a self-help technique, involves reciting positive affirmations in front of a mirror (Hay, 2016). Silvia (2002) proposes that the objective self-awareness theory suggests mirrors can amplify self-focused attention and self-awareness, and their ability to induce this state has made them subjects of exploration in self-awareness and self-focusing research.

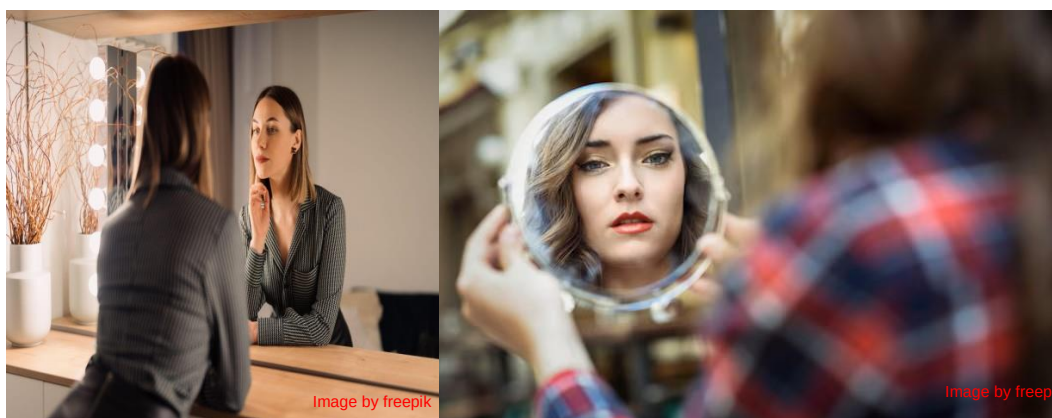
Petrocchi et al. (2016) hypothesized that repeating self-caring phrases in front of a mirror, following a brief induction of self-criticism, would result in a more significant increase in positive effects—especially the comforting benefits tied to enhanced self-compassion and feelings of safety—when compared to either repeating the expressions without a mirror or merely looking at the mirror without repetition.

There is a limitation of existing research on self -compassion in PCOS women and little is known about the impact of self-criticism in “Women with PCOS”. Hence this study was designed to evaluate the effect of mirror work in “Women with PCOS”. The study will do this by evaluating the level of psychological distress before and after the intervention. This is important because “Women with PCOS” reported to have more Depression, anxiety, stress and self-criticism. PCOS women also have reported to have less self-compassion. As we have predicted that there will be substantial differences in the test scores of pre and post 21 days mirror work intervention. Moreover, PCOS women were expected to improve their mental health after a 21 day mirror work -a positive self-affirmation in front of a mirror which can be done at one’s own pace, once trained and it is economical.

We adopted the guidelines of Louis Hay’s 21 days’ mirror work method because this method is cost effective and one can practise at one’s own pace at any time. This method is simple yet powerful as mentioned by (Hay, 2016). Louis Hay says that although one may not totally transform their life in 21 days, establish the foundation. (Hay 2016). There has not yet been any study conducted to investigate if mirror work methods can influence the dependent variables in PCOS women. Therefore, the present study aims to do the same.

Figure 6

Sample Mirror work



For this intervention study, 30 women diagnosed with PCOS were chosen, and we enrolled those who expressed their willingness to engage in the 21-day continuous program. A distinctive identification number was assigned to each participant within the initial dataset. To ensure an impartial and genuinely random assignment process, randomization was achieved by drawing slips of paper from a container by an independent individual. Following the baseline assessments, the participants were distributed randomly to either an experimental group or a control group, with 15 members in each group. Importantly, there was no significant difference in the pretest p-values between the “Experimental and control groups”.

3.10.1 Intervention:

After baseline data was collected from 30 participants, they were randomly allocated into two groups namely experimental and control. p values in the two groups were not notably different. The experimental group received a mirror work intervention for 21 days, which involved repeating positive self-affirmations in front of a mirror. The control group participants were kept in contact with the researcher and continued with their usual activities. The experimental group participants were instructed and got trial training in the mirror work procedure through in-person. Followed by through calls/messages/google meets A WhatsApp group was formed with the consent of each member. Participants were allowed to clear any doubts during the entire time period and they actively participated throughout. Many participants were curious and reported this was a new term and experience for them.

First day: A google meet was arranged by the researcher once again to train, interact, and to explain how to go about the mirror work. Participants were instructed and trained to stand/sit in front of a mirror, feel relaxed, take a few deep breaths, look at the mirror and tell AM cool and relaxed. I Am Healthy. I AM Beautiful. Participants could repeat as many times as they wish to do morning and evening or whenever possible.

The researcher provided audio recordings of phrases, messages and google meets to cover up 21 days’ practice of positive self-affirmation in front of a mirror, audio voices

were recorded in her own voice. This was in accordance with the guidelines of Louis Hay's Mirror Work method for 21 days. Although the pattern of 21 days of Louise Hay is chosen, the researcher made alterations wherever needed according to the needs of this community of women and later once trained, the participants could say their own affirmation along with the instructions/ guidelines given by the investigator. This Has encouraged the PCOS women in the experimental group to actively participate and could bring a positive change in their attitude and thinking towards themselves.

Two consecutive days google meets were conducted in view to train the participants once again with mirror work, a positive self-affirmation in front of a mirror. Participants were trained and made understand the benefits of mirror work in their physical and mental health with examples of previous literature, audiobook, researcher tried to encourage participants to practice mirror work every day for 21 days, for optimum benefits and the participants did so.

First Day Affirmations: The researcher had asked the participants to stand/sit in front of a mirror (they could also use a small mirror), relax..., take few deep breaths in, breathe out, now look at yourselves, (into your eyes) in the mirror, try to give a smile and say (This instruction are for all 21 days), I Am cool and relaxed, I Am good, I have good concentration, I am healthy (repeat few times), Feel a positive energy in yourself, feel happy. Participants raised some queries and the researcher cleared it. They were asked to say the affirmations a minimum of 10 minutes and whenever they wish to say.

Figure 7

mirror work selfie sample



Second Day: Another google meet was arranged, the participants were enthusiastic about the second day and have expressed the feeling of wellness they already started to feel and their commitment to do all 21 days were expressed. The researcher asked them to repeat the affirmations they had told the first day, follow the same instructions, I am healthy, I Am beautiful, I am Happy, I am cool and relaxed.

Third day: Looking at the mirror, with a feeling of relaxation, without judgment, accepting simply what we are; we are going to affirm better things about us. Relax...., look at your eyes in mirror and say, I Am open and receptive. Repeat a few times, be open to receive everything the creator/universe offers us in order to enhance oneself with positive energy. I am happy, I am confident, I understand my self-worth, I feel good about myself, I accept myself as worthy. You can start practicing your own affirmations along with this.

Fourth Day: Concept of monitoring individual's self-talk. Tell the following affirmations in front of the mirror. "I let go of all the negative messages, limitations from the past, I Am healthy, I am beautiful and I am self-confident". I Am Happy.

Fifth day: Love oneself is to have self-acceptance. Stand in front of a mirror and relax and do gradual breathing in and breathe out. To affirm I love and approve myself, I Am healthy, I Am beautiful, I Am cool and relaxed, I Am strong, I Am a magnificent woman, I chose to be good to myself. To repeat all positive affirmations from day 1. To tell affirmations in the language regularly used by the individual will bring better results, any translations, clarifications please call/message me.

Sixth day: To release the judgemental and inner critique model of an individual. Take a deep breath in, breathe out. To affirm I love and accept myself exactly as I am, I am worthy, I speak up for myself, life supports me in every possible way, I Am Healthy, I Am beautiful, I Am strong, I Am cool and relaxed and I am self-confident. Repeat all the affirmations you had been telling from day 1, remind you mirror work doesn't work on theory, but through practice.

Seventh day: To repeat all affirmations from day 1. Researcher conducted a google meet session with the participants.

Eight day: Practice all the affirmations you had been telling from day 1.

Ninth Day: Practice all the affirmations morning and evening and whenever possible. Feel relaxed, add your own affirmations to affirm all is well, everything is getting better and better along with other affirmations. Any clarification please call/message.

Tenth day: A total transformation of ourselves can take place, we are trying to connect ourselves to the higher selves, trying to connect to the universal energy, repeat the affirmations in front of a mirror, with a grateful heart, say thank you, thankyou. thank you so much.

Eleventh Day: To release the incidents of negativity from past life. I release person X from my life. He/she is good. I am good. This helps in curbing the hatred and resentment against individuals. The positive energy will flow into you from the universe, continue to say your affirmations from day 1.

Twelfth Day: To stand in front of a mirror and take a deep breath in and breathe out, a few times more. To affirm I am grateful for that “I Am healthy”, “I love life”, I enjoy foods that are best for my body, I make healthy choices, to continue positive affirmations from day 1. Second mirror selfie,

Thirteenth Day: Today you shall practice with confidence the affirmations you were saying from day 1

Fourteenth Day: Repetition helps to rewrite the subconscious mind. Continue to practice with simple present tense Positive Self-Affirmations. “I Am self-confident”, “I Am beautiful”.

Fifteenth Day: To affirm, I trust the life, Universe/God gives me everything I need, there is nothing to fear, all is well and I am safe”. Repeat affirmations from day 1. Let’s give a smile to ourself. Continue the regular affirmations.

Sixteenth day: Let's spend a few minutes in silence, thanking the universe, Almighty God. Take a few deep breaths in and breathe out. To affirm Today is a blessed day. I am ever grateful, I am good, I am healthy, I am happy, I am cool and relaxed. Further add all affirmations said from Day 1. Second mirror selfie

Seventeenth Day: Continue the Positive Self Affirmations standing/sitting in front of a mirror looking into your own eyes. Repeat all the affirmations you had been telling from day 1.

Eighteenth Day: Nourish yourself and release stress, hatred, anxiety, resentment, jealousy, guilt and many more negative feelings. I Am Happy, I Am safe, I attract all the good things into my life. "I attract only healthy relationships", I Am happy, I Am safe, All is well. Further, to continue all affirmations from day 1.

Nineteenth Day google: Google meet conducted to interact, clear any doubts. Repeat the positive self affirmations you had been telling from day 1. Say thank you, thank you, thank you.

Twentieth Day: Continue to practice all the affirmations, you had been practising from day 1, feel relaxed and happy.

Twenty First day: Take a few deep breaths for a few times. To affirm: "I have all the time I need". I believe in possibilities, I am at peace, "I let go of all fear and doubt and life becomes simple and easy for me", I create a stress free world for myself, I realize that stress is only fear. I am grateful to feel perfectly healthy, Thank You, Thank You (being grateful).

NB: The researcher trained the PCOS women in the mirror work experimental group in more detail than mentioned above.

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Even though the researcher has trained with some positive statements/affirmations, the participants could say their own statements or positive affirmations. Participants were

requested to report their daily practice in the WhatsApp group or in person, and weekly mirror selfies of their practice were collected for the record, and the participants complied. The participants were instructed to repeat the positive self-affirmations daily morning and evening and at any other time they were able to do so. The researcher obtained a license from Hay House and followed Louis Hay's 21-day pattern (Guidelines) for this mirror work experiment. The researcher could encourage the participants to develop self-love and the participants were committed to practice. They were encouraged to continue the mirror work independently after the 21-day intervention period. This is because mirror work could further valuable for participants to develop self-compassion, self-acceptance, and self-love. It can also help participants to heal from past trauma and to connect with their true selves. The mirror work is a practice that can be done for a lifetime, and it is something that participants can continue to do even after the intervention period is over. The performance of other members encouraged others. The participants were requested to complete the questionnaires post intervention for DASS-21, FSCRS and SCS after 21 days of the practice. All the participants completed the 21-day mirror work safely and successfully. Post-Intervention Assessment:

After a 21-day mirror work intervention, participants were able to practice independently and completed the post-test 30 to 35 days later, achieving a 100% response rate in both “Experimental and control groups”. Pre-test measures (DASS, FSCRS, and SCS-26) assessed changes in depression, anxiety, stress, self-criticism, and self-compassion. The researcher personally thanked participants and, observing positive changes, offered mirror work training to the control group, considering ethical considerations. This gesture aimed to ensure that all participants could benefit from the intervention.

Results of pre and post-tests of all 5 variables measured, all 3 interventions are recorded in the next chapter-results and discussion.

3.11 Statistical analysis

1. Independent sample t-test conducted for pre-test established the prevalence of mental distress (Depression, Anxiety, Stress), reduced self-compassion and increased self-criticism for “Women with PCOS” in comparison to Non PCOS women. Homogeneity of data were confirmed using Levene’s test. Homogeneity is a statistical term that mentions similarity of the data distribution. In this case, results showed that both “Experimental and control groups” were similar with regard to their mental distress, self-compassion, self-criticism and other relevant demographic parameters. This is important because it means that the results of the study are not likely to be due to differences between the groups, but rather to the effects of the intervention.

2. Paired sample t test conducted on the post intervention test data for “Experimental and control groups” for “Depression, Anxiety, Stress, Self-compassion and Self-criticism” levels.

3. Descriptive statistical analysis such as mean and standard deviation shown the severity of Depression, Anxiety, Stress, self-compassion and self-criticism among PCOS women in experimental group and control group.

3.11.1 Effect size

Cohen's d is used for calculating the **effect size** of experimental group for each of the variables “Depression, Anxiety, Stress, Self-compassion and Self-criticism”. An effect size of **0.2** designates a small effect, **0.5** denotes a medium effect, and **0.8** or higher indicates a **larger effect**.

Statistical Package for Social Science (SPSS- Version 23) is used to analyse the empirical data collected. Acceptance level for all statistical tests for *p* value was set as 0.05.

3.12 Scientific controls

Following criteria adopted for scientific controls of the subjects for the research.

1. Selection criteria well defined and instituted for screening and recruitment.
2. Subjects were recruited from the same clinical setting of the Hospital and screening done by the senior Gynaecology doctors.
3. Ethical committee approval obtained and followed ethical guidelines
4. Informed consent obtained from all participants
5. Code nos allocated for each participants for maintaining secrecy of their identity
6. Standardised and well established questionnaires used for pre test and post test.
7. Randomised selection done for experimental and control groups
8. Separate Control groups installed for all the three interventions
9. Homogeneity of data were confirmed using Levene's equality of variance test.
10. Subjects were closely monitored with separate WhatsApp groups for each intervention and control groups for their practices / activities.
11. Pre test and Post test measures. Collecting baseline data before intervention and measuring again after, to control for natural changes over time.

CHAPTER 4

RESULTS AND DISCUSSIONS

This chapter focuses on the outcomes and deliberations of the present research. The data obtained from both Phase 1 and Phase 2 underwent scrutiny to assess their conformity with normal distribution and equality of variances through relevant statistical methods. Subsequently, the results were organized into tables, graphs and their implications were elucidated. Following this, a comprehensive summary of the significant discoveries from both Phase 1 and Phase 2 is presented, including the determination of whether the study's hypotheses were upheld or refuted, followed by an in-depth discussion.

Collected data from the hard copy questionnaires were entered to excel. 13 Reverse scored answers in Self Compassion Scale were suitably interleaved to the respective answers using formulae created in excel.

As per the guide lines given in the DASS 21 scale there are 7 answers under Depression, 7 in Anxiety and 7 in Stress are grouped. To calculate the depression score, sum up the score and double it, similarly to arrive at the Anxiety score, sum up the score and double it. Stress score also to be calculated the same way.

There are 6 sub scales given in the self-compassion scale. In each category, answers were added up and its average was calculated. Upon getting the individual average value in each sub division, average of the sub groups was calculated. Average of the sub group value is the self-compassion score.

For calculating the self-criticism value, inadequate self (IS) and hated self (HS) subdivision of FSCRS scale was considered.

After calculating the data in its subscale requirement, the data had been transposed in excel from row format to column as required for analysis in SPSS.

Pre-test data of 90 PCOS and 90 Non PCOS were grouped together for phase 1 analysis using SPSS.

4.1 Statistical Analysis

The empirical data collected for both Pre-test (Base line) and Post intervention test score were analysed using SPSS (Statistical Package for Social Science- Version 23). Acceptance level for all statistical tests for p value was set as 0.05. As mentioned in the methodology chapter, both descriptive as well as inferential statistics were used for analysing data. Results of the data analysis are described and presented below under the following sections and headings.

4.1.1 Phase 1: Base Line (Pre-test)

1. Demographic details - comparison of “Women with PCOS” and without PCOS.
2. Comparison of “Depression, anxiety & stress” levels in “Women with PCOS” and without PCOS.
3. Comparison of “Self Compassion and Self-criticism” levels of “Women with PCOS” and without PCOS.

4.1.2 Phase 2: Post-test (after the intervention)

1. Effect of Pranayama intervention on “Depression, anxiety & stress levels” in “Women with PCOS” in experimental group in comparison of PCOS women in Control group.
2. Effect of Pranayama intervention on “Self Compassion and Self-criticism” levels in “Women with PCOS” in experimental group in comparison of PCOS women in Control group.
3. Effect of Mirror work intervention on “Depression, anxiety & stress” levels in “Women with PCOS” in experimental group in comparison of PCOS women in Control group.
4. Effect of Mirror work intervention on “Self Compassion and Self-criticism” levels in “Women with PCOS” in experimental group in comparison of PCOS women in Control group.
5. Effect of Gratitude Journal writing intervention on “Depression, anxiety & stress” levels in “Women with PCOS” in experimental group in comparison of PCOS women in Control group (Jose,S. 2023)

6. Effect of Gratitude Journal writing on “Self Compassion and Self-criticism” levels in “Women with PCOS” in experimental group in comparison of PCOS women in Control group. (Jose, S. 2023)

4.2 Results of Phase 1 - Base line (Pre-test)

4.2.1 Demographic details

Demographic details compared between PCOS and without PCOS to see the homogeneity of samples as well as for comparing the specific features of PCOS women, namely excess hair growth on face and body, acne on the face, irregular periods with healthy Non PCOS women. Descriptive statistical analysis such as mean, percentage (%) and frequency are used to describe the characteristic of demographic details. At the time of pre-test, using a questionnaire with the following details collected and analysed.

1. Age of the participants
2. Body Mass Index (BMI)
3. Excessive hair on the face or body
4. Acne on the face
5. Irregular periods
6. Marital status
7. Educational background
8. Sleep time
9. Employment status
10. Urban – Rural category

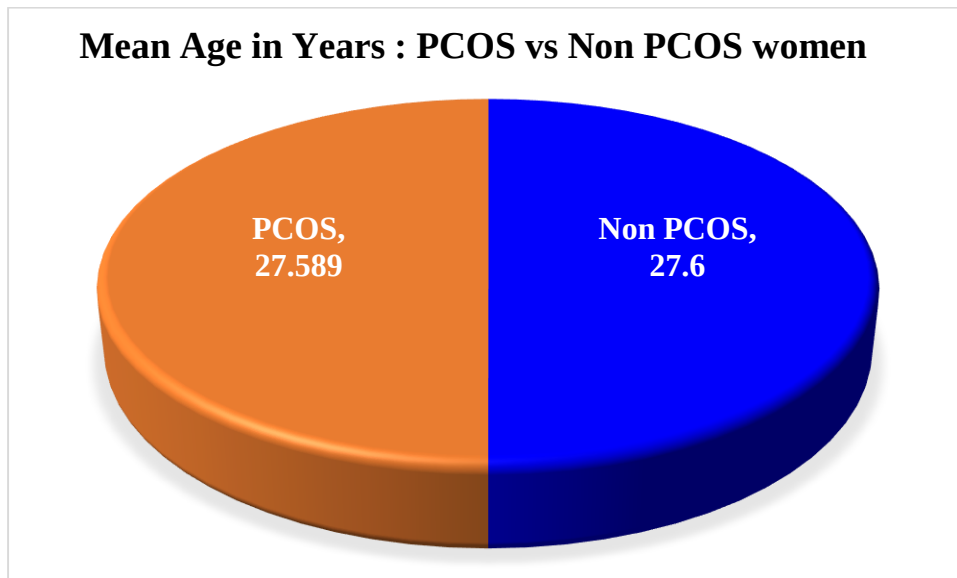
Table 2

Age comparison of PCOS women and without PCOS women N=90 each

Demographic details	PCOS Group		Non PCOS group		t-test for Equality of		
	Pre test (N=90)		Pre test (N=90)		t	df	p
	Mean	SD	Mean	SD			
Age	27.59	5.47	27.60	6.90	0.01	178.00	0.99

Figure 8

Illustrates the Mean age of “Women with PCOS” and healthy women participants.



Mean age of PCOS group of women is 27.589 years and mean age of Non PCOS group is 27.600. Mean age is almost same for both the groups. However, the standard deviation of the PCOS women age is 5.473 and that of Non PCOS women are 6.90. P value is 0.99, which shows there is no significant difference in the age group of the study samples of PCOS and Non PCOS women. Fig 8 pi chart shows the Mean age of PCOS and Non PCOS groups. Fig 9 shows the age distribution of PCOS women group in a histogram and normal graph, Fig 10 shows that of the Non PCOS group of participants.

Figure 9

Illustrates the Mean age, Standard deviation and frequency distribution of age of “Women with PCOS” participants.

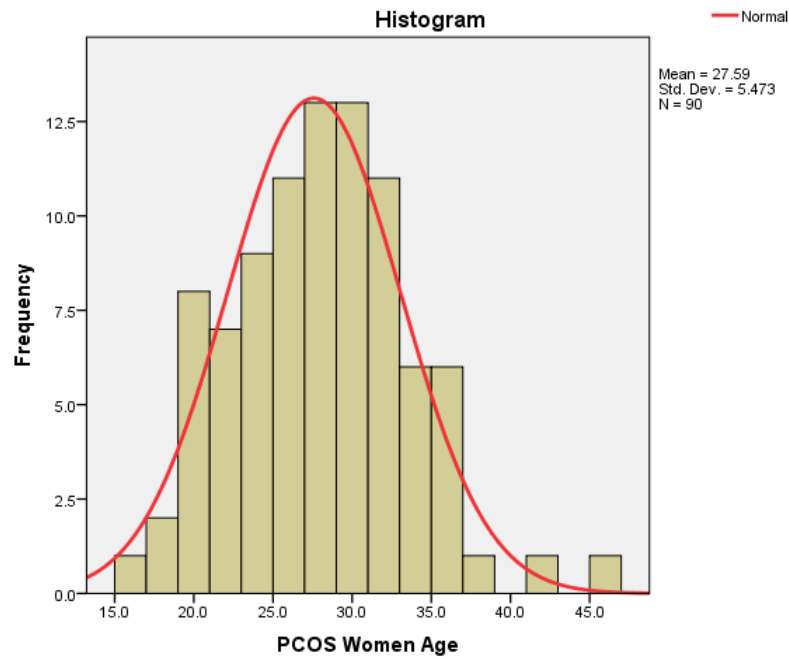


Figure 10

Illustrates the Mean age, Standard deviation and frequency distribution of age of Non PCOS women participants.

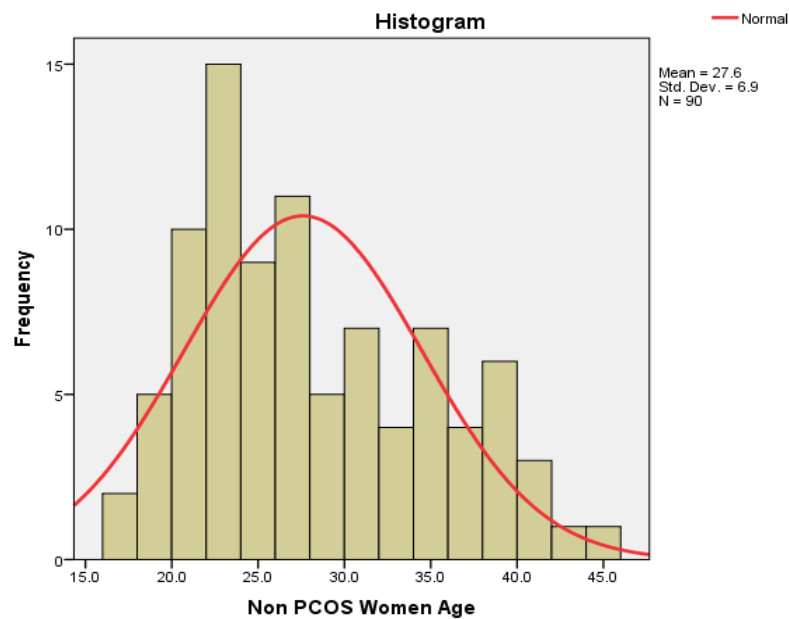


Table 3

Comparison of Mean Body Mass Index (BMI), Excess hair on face / body, Acne on face, Irregular periods in PCOS and Non PCOS women.

Group	Mean Body Mass Index (BMI)	Excess Hair on face / body %		Acne on face %		Irregular periods %	
		Yes	NO	Yes	NO	Yes	NO
PCOS (N90)	26.92	49	51	43	57	69	31
Non PCOS (N90)	23.61	6	94	27	73	8	92

Table 3, depicts few of the *typical features of PCOS* women namely *excess hair on face / body, Acne on face & irregular periods*. All the parameters show significantly high difference compared to Non PCOS. The table 3 also shows, mean *Body Mass Index (BMI)* of *PCOS group of women significantly higher (26.92)* than that of *Non PCOS group of women (23.61)*. BMI above 25 is considered as overweight (25 to 29.9), hence PCOS women are falling in the overweight category. Non PCOS women are falling in the normal range (18.5 to 24.9). Excess hair growth on PCOS women were 49% in comparison of 6% in Non PCOS women. 43% of PCOS women have Acne against 27% of Non PCOS women. Irregular periods were 69 % in PCOS as against 8% in Non PCOS.

Figure 11

Illustrates the Mean Body Mass Index (BMI) of “Women with PCOS” and healthy women participants.

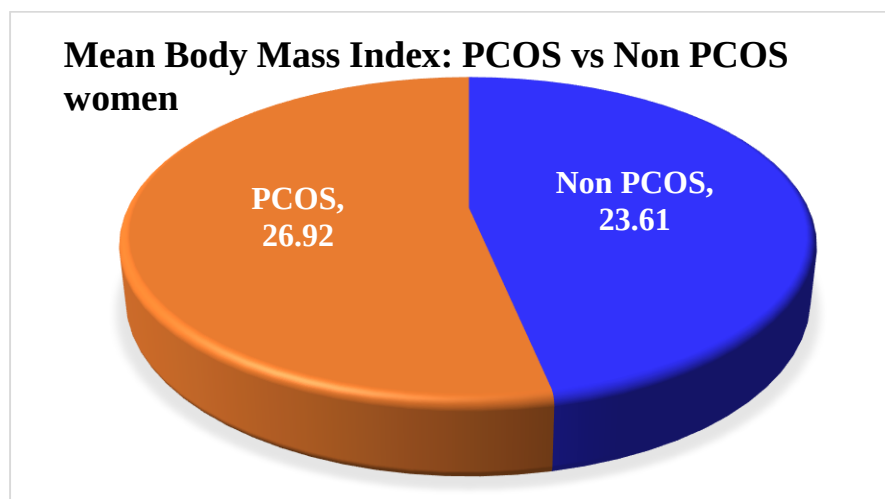


Figure 12

Illustrates the level of excess hair growth on face / body of PCOS women in %

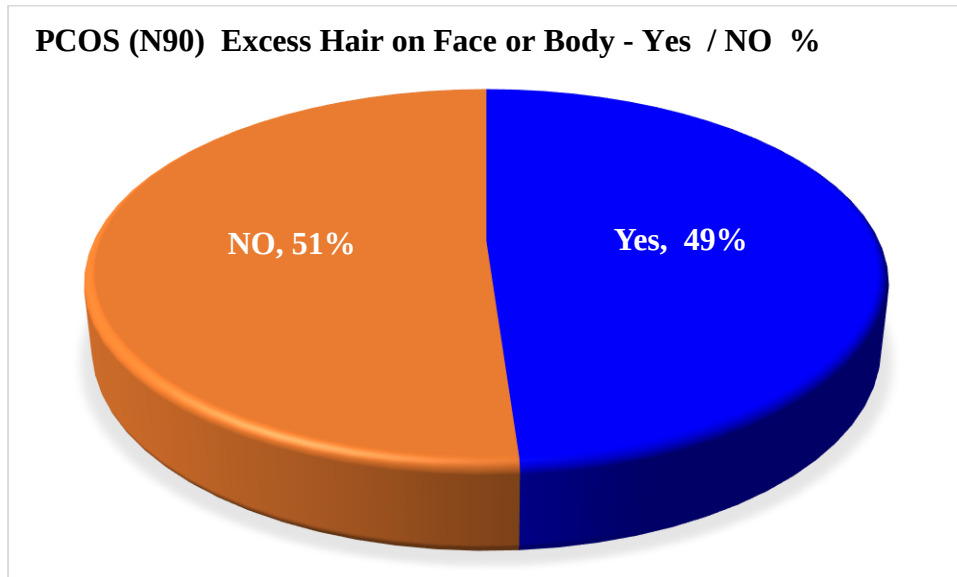


Figure 13

Illustrates the level of excess hair growth on face / body of Non PCOS women in %

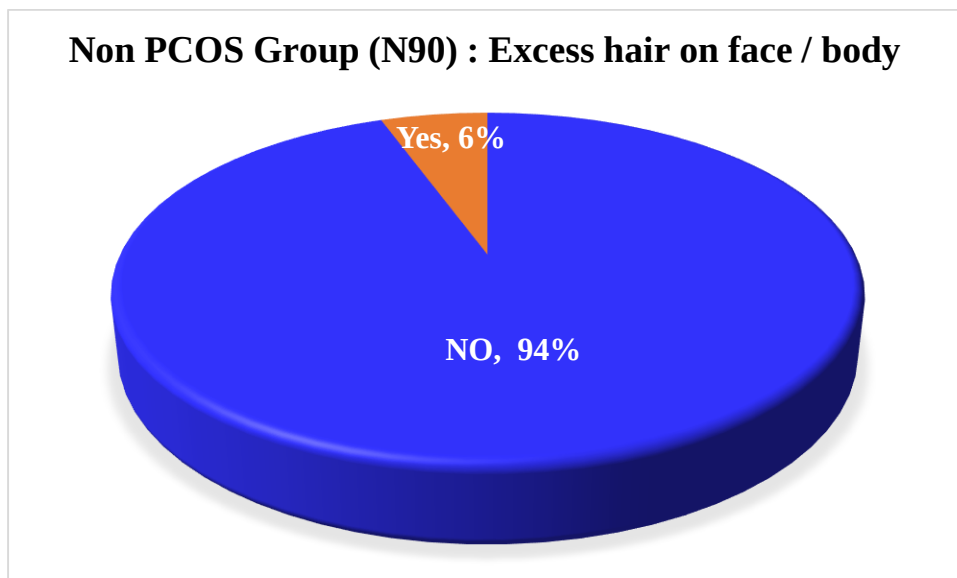


Figure 14

Illustrates the level of Acne on face of PCOS women in %

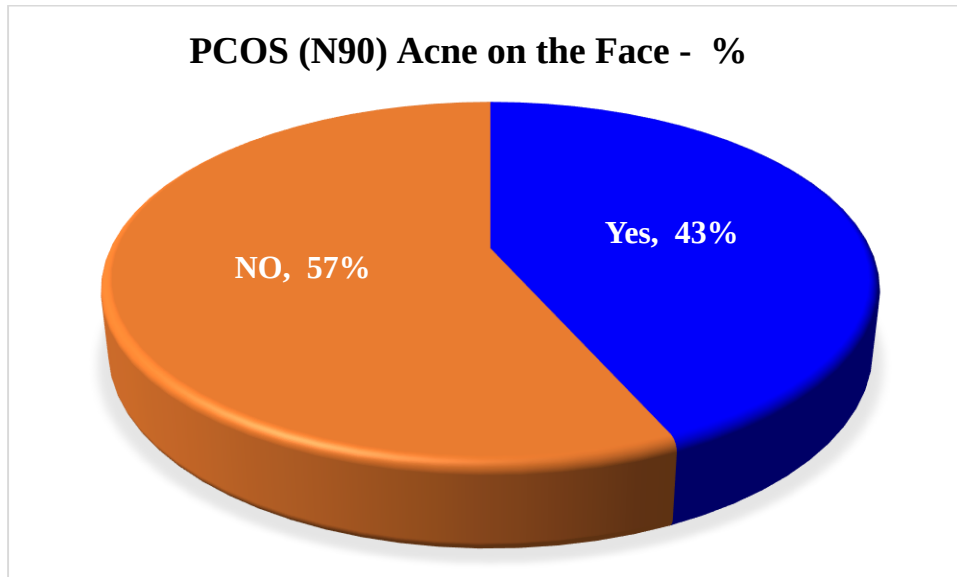


Figure 15

Illustrates the level of Acne on face of Non PCOS women in %

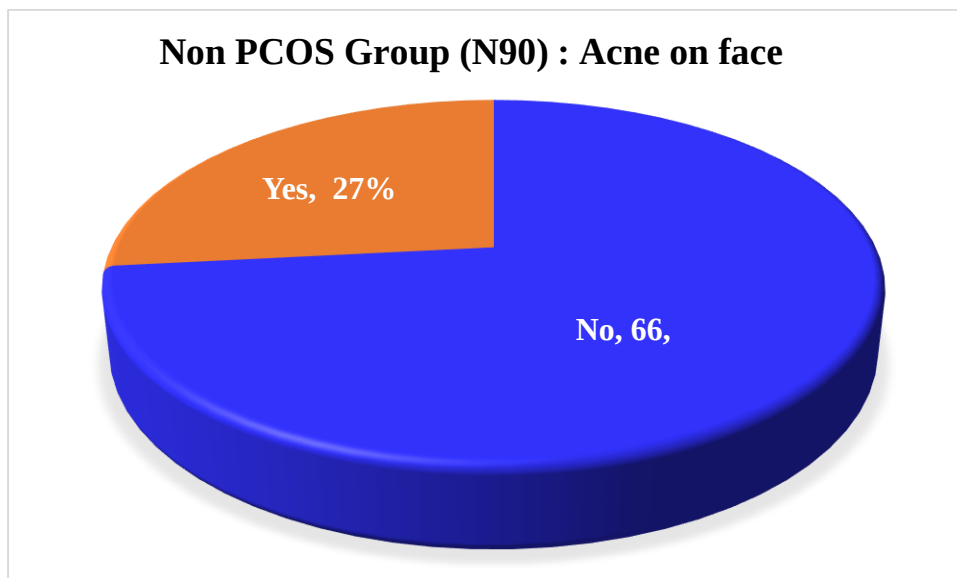


Figure 16

Illustrates the level of irregular periods in PCOS women in %

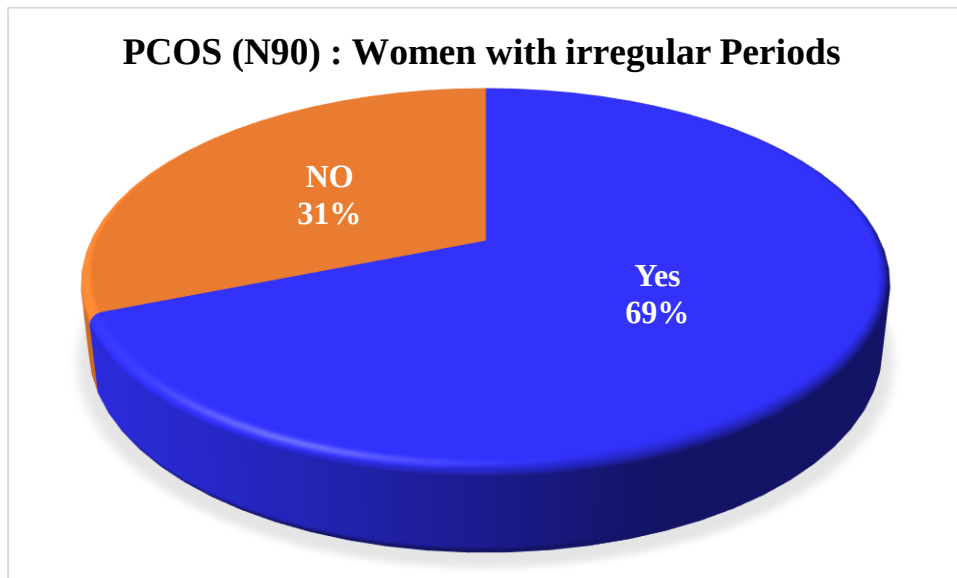


Figure 17

Illustrates the level of irregular periods in Non PCOS women in %

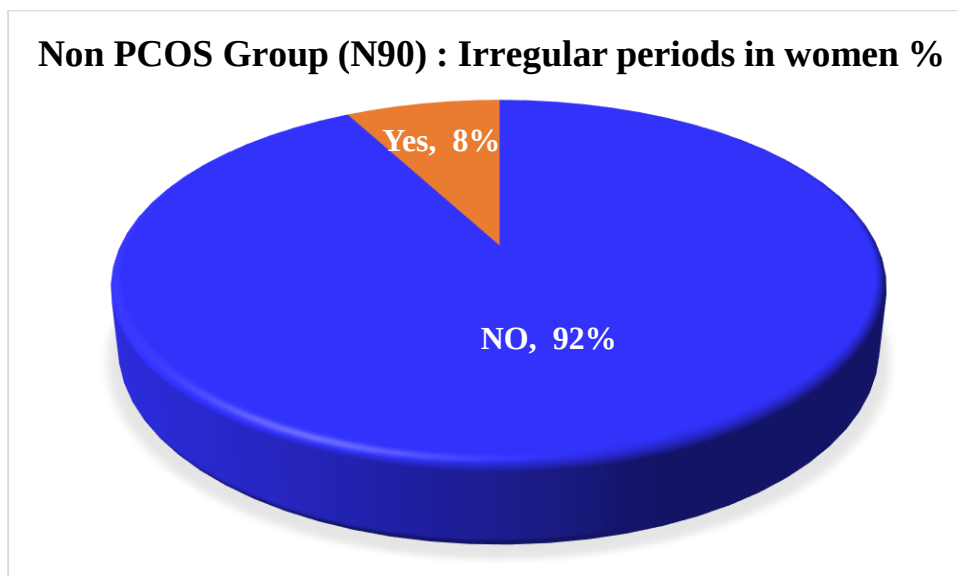


Table 4

Marital status, Educational Background and sleep time of PCOS and Non PCOS women. (N=90 each)

Group	Marital Status		Educational background %		Sleep time Hrs
	Married %	Unmarried %	Graduate and above %	Plus 2 and below %	
PCOS (N90)	72	28	73	27	7.2
Non PCOS (N90)	43	57	78	22	7.5

Table 4 shows, 72% of “Women with PCOS” were married whereas only 43 % of Non PCOS were married. Educational background from table 4 shows 73% of PCOS women were graduates and above at the same time 78 % of the Non PCOS women were graduates and above. Table 4 displays that sleep time for PCOS women were 7.2 hrs and for Non PCOS women it was 7.5 hrs.

Figure 18

Illustrates the Marital status of “Women with PCOS”

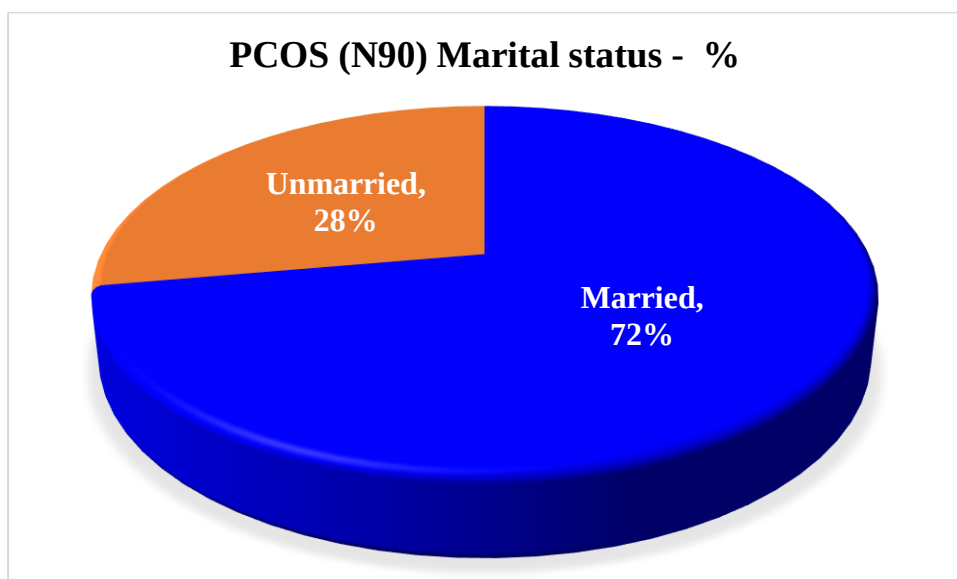


Figure 19

Illustrates the Marital status of Non PCOS women

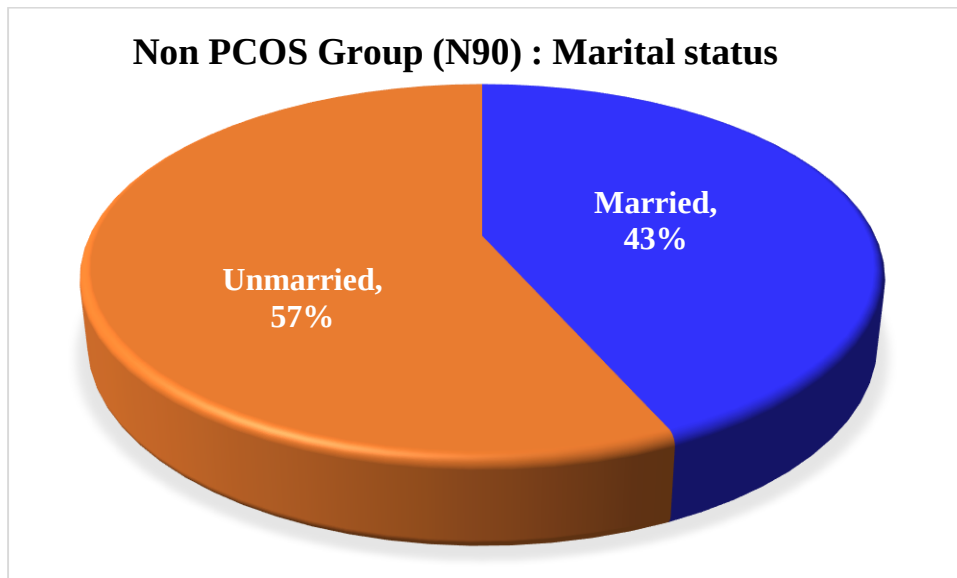


Figure 20

Illustrates the educational back ground in % of Non PCOS women

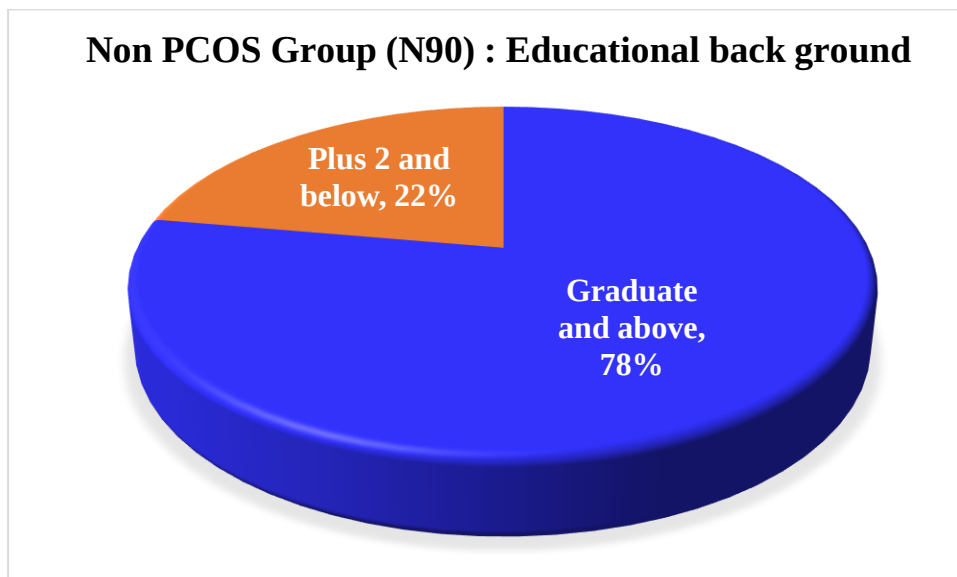


Figure: 21. Illustrates the educational background in % of PCOS women

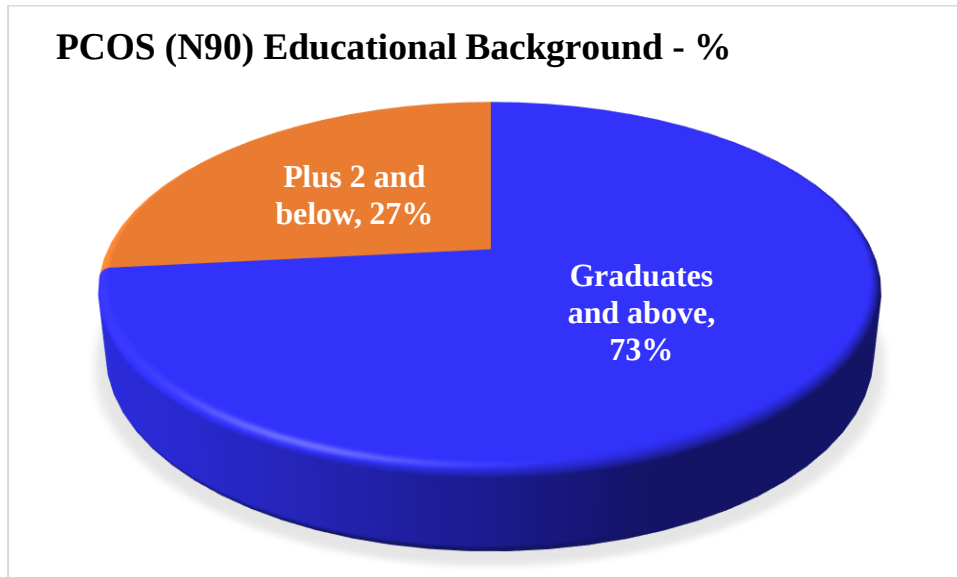


Figure 22

Illustrates the sleep pattern of PCOS and Non PCOS women in hrs

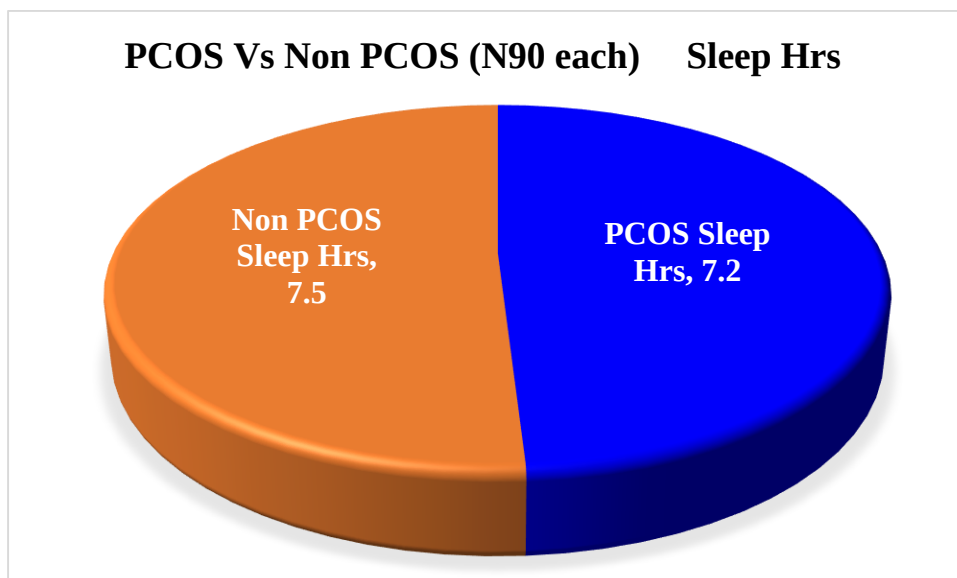


Table 5:

PCOS and Non PCOS Professional back ground and Urban – Rural division (in %)

Group	Professional Background (%)				Urban - Rural category	
	Employed (%)	Homemaker (%)	Student (%)	Unemployed (%)	Urban %	Rural %
PCOS (N90)	43	41	15	1	72	28
Non PCOS (N90)	57	11	20	12	68	32

Table 5, details the professional back ground of participating PCOS and Non PCOS women. 43% of PCOS women were employed, 57 % of Non PCOS women were employed. 41% of “Women with PCOS” were home makers, whereas 11 % Non PCOS were homemakers, 15 % PCOS were students & 20 % Non PCOS were students. 1% of PCOS was unemployed, where as 12 % Non PCOS were unemployed. 72 % of PCOS women were from Urban area and 68% of Non PCOS were from Urban area, remaining are from rural area,

From table 4 & table 5, it can be seen that marital status and % of home makers significantly higher in PCOS compared to Non PCOS women, owing to the fact that the data sample collected from a women fertility center. Apart from the above two data, rest of demographic details of PCOS and Non PCOS were homogeneous.

Figure 23

Illustrates the professional details in % of PCOS women

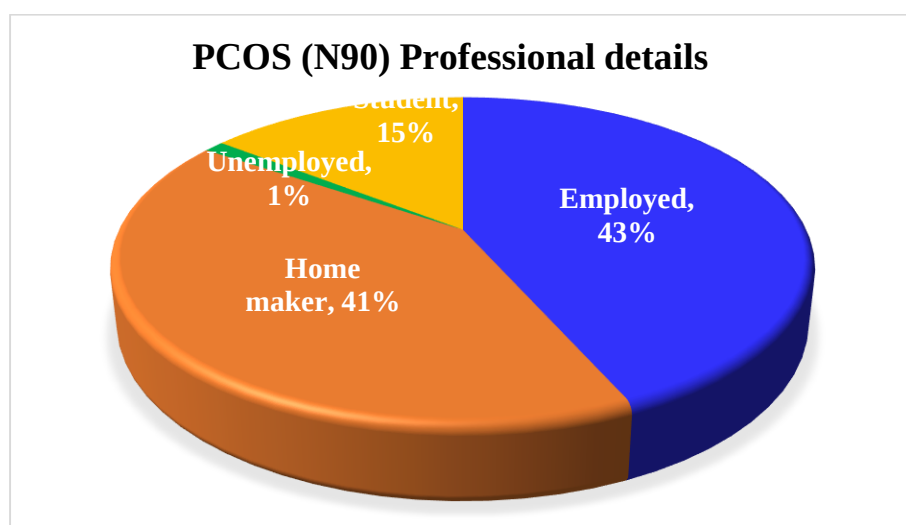


Figure24

Illustrates the professional details in % of Non PCOS women

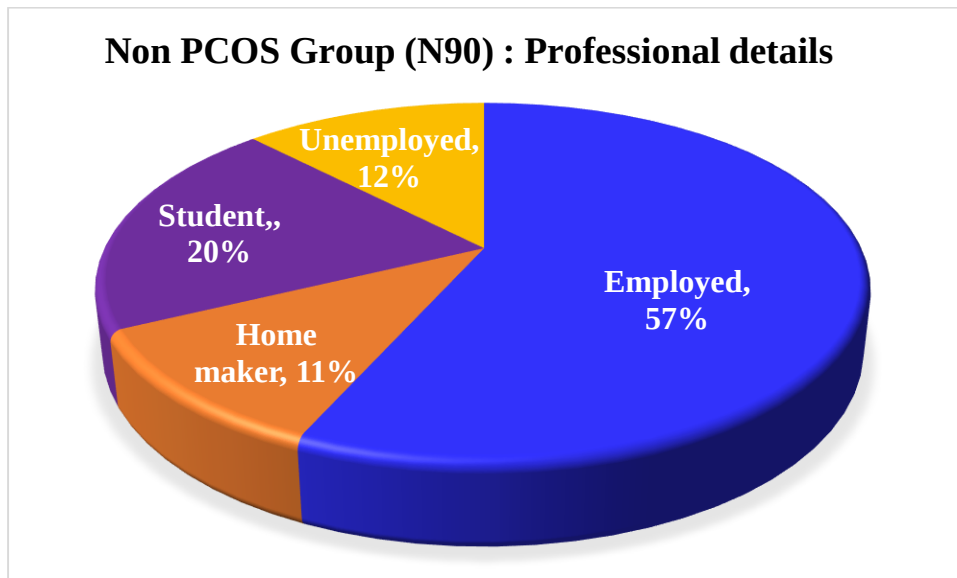


Figure 25

Illustrates the % of PCOS women belongs to Urban or Rural area.

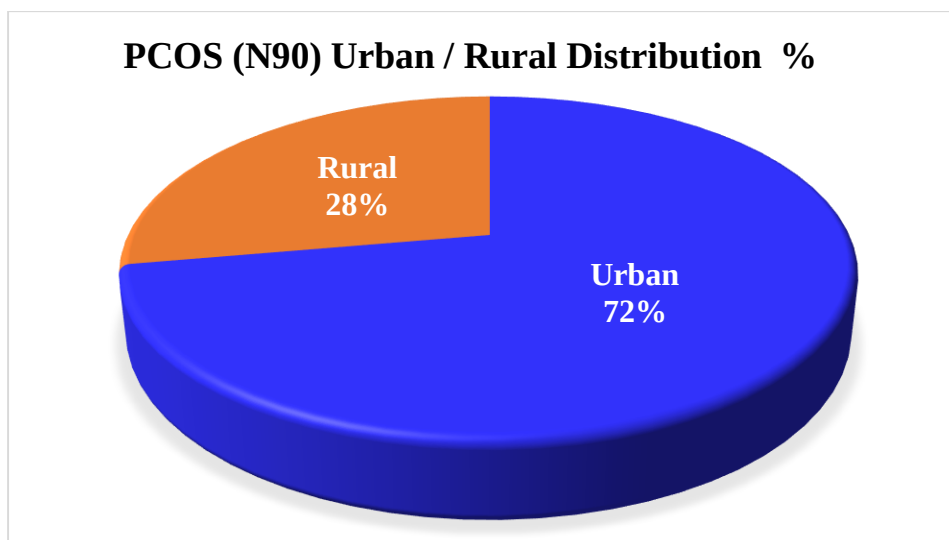
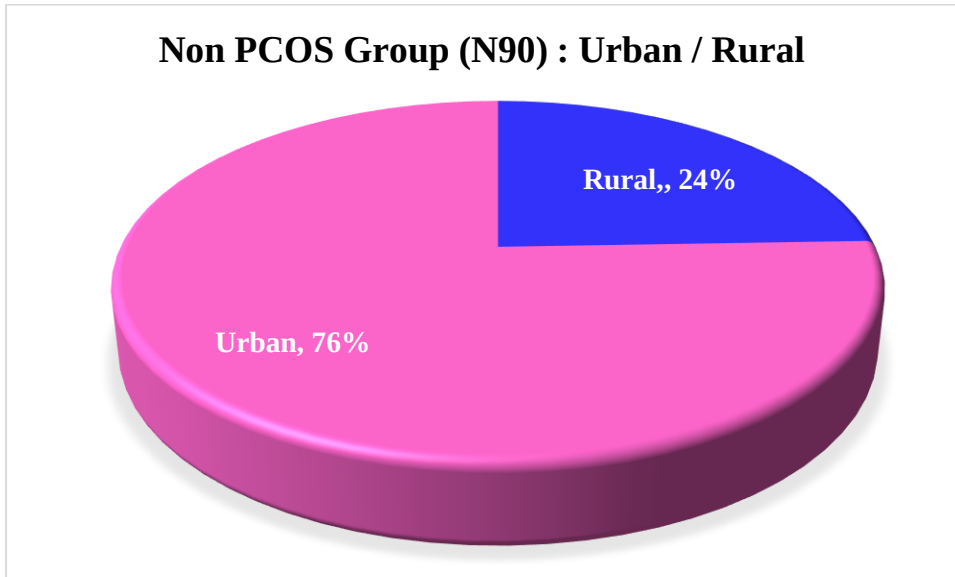


Figure 26

Illustrates the % of Non PCOS women belongs to Urban or Rural area.



4.2.2 Result of phase 1 for the variables

Base line (Pre-test) on variables-“Depression, Anxiety, Stress, Self-compassion and Self-criticism” of PCOS cases and Non PCOS

Pre-test was performed to evaluate the severity of mental distress levels like Depression, Anxiety, Stress and Self-compassion and self-Criticism levels of “Women with PCOS” (N=90), and also to compare the same variables with healthy Non PCOS women (N=90).

Independent sample t-test was performed for the variables of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”. Levene’s test for equality of variance performed to confirm normality, homogeneity of the data for parametric distribution. Levene's test is a statistical test use to assess whether the variances of different groups or samples are significantly different from each other. When Levene's test is significant with $p \leq .05$, it indicates that the assumption of homogeneity of variance has likely been violated.

After confirming the homogeneity in Levene's test, considering equal variance assumed, Depression, stress and self-compassion scores of Non PCOS and PCOS were measured using independent t-test. However, anxiety and is+hs (self-criticism) in Non PCOS and PCOS were measured considering equal variance not assumed $p < 0.05$. Hence non parametric Mann Whitney U test performed. An Independent t-test was performed for 90 Non PCOS and 90 PCOS to measure all the five variables.

An independent sample t-test was performed among Non-PCOS and PCOS to check Hypotheses 1 and 2. (H₁) & (H₂).

NON PCOS women and PCOS women

Table 6

Comparison of mean for PCOS cases and Non PCOS for variables "Depression, Anxiety, Stress, Self-compassion and Self-criticism".

	Group	N	Mean	Std. Deviation	Std. Error Mean
Depression	Non PCOS	90	10.067	5.863	0.618
	PCOS	90	22.333	6.132	0.646
Anxiety	Non PCOS	90	7.222	4.700	0.495
	PCOS	90	17.400	6.067	0.640
Stress	Non PCOS	90	13.400	5.901	0.622
	PCOS	90	23.911	5.105	0.538
SCS (Self-compassion)	Non PCOS	90	3.451	0.356	0.037
	PCOS	90	2.746	0.338	0.035
is+hs (Self-Criticism)	Non PCOS	90	12.933	6.283	0.662
	PCOS	90	27.022	8.147	0.858

Table 7

Independent Samples Test for PCOS cases and Non PCOS for “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Variables	Levene's Test for		t-test for Equality of Means								Cohen's d
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	Standard Deviation Pooled	
Depression	0.169	0.682	13.717	178	0.000	-12.267	0.894	-14.031	-10.50	6.00	2.05
Anxiety	5.549	0.02	12.582	178	0.000	-10.177	0.808	-11.774	-8.58	5.43	1.87
Stress	3.053	0.082	12.779	178	0.000	-10.511	0.822	-12.134	-8.89	5.52	1.90
SCS Self-compassion scale	0.018	0.895	13.604	178	0.000	0.705	0.051	0.602	0.81	0.35	2.03
is+hs (Self-Criticism)	4.995	0.027	12.991	178	0.000	-14.088	1.084	-16.229	-11.95	7.27	1.94

Table 8

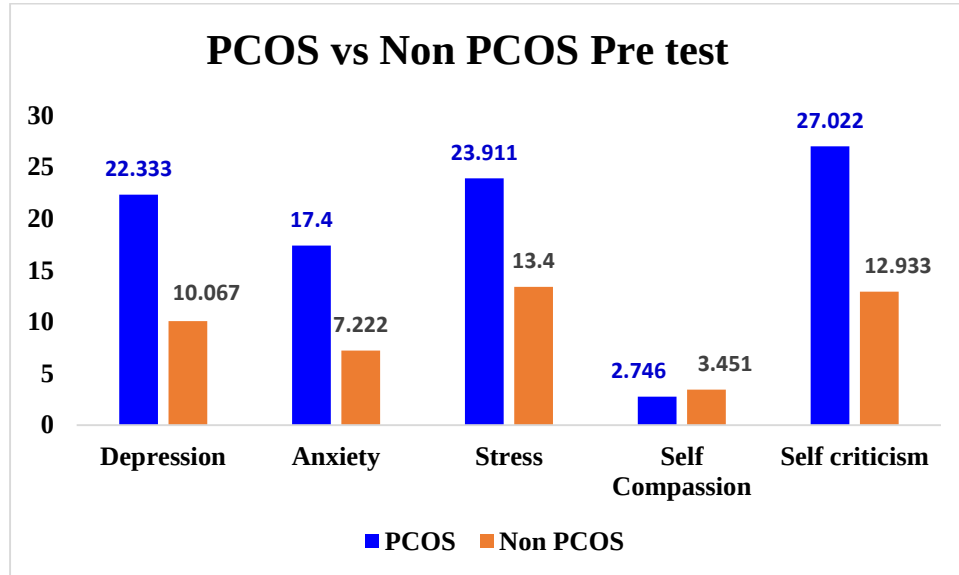
Independent samples Mann Whitney U test for “Anxiety and self-criticism” (is+hs) in PCOS and Non PCOS for pre test

Hypothesis Test Summary - Mann Whitney U Test			
Null Hypothesis	Test	Sig	Decision
The distribution of Anxiety is the same across categories of Group	Independent Samples Mann Whitney U Test	0.000	Reject the null hypothesis
The distribution of is+hs is the same across categories of Group	Independent Samples Mann Whitney U Test	0.000	Reject the null hypothesis

Asymptomatic significances are displayed. The significant level is 0.05

Figure 27

Pre and Post-test comparison of mean for PCOS and Non PCOS



Independent sample t test was performed to compare Depression in Non PCOS women and PCOS. Ref Table 6 & 7: There was a *significant difference in Depression between Non PCOS* ($M=10.067$, $SD=5.863$) and *PCOS women* ($M=22.333$, $SD=6.1315$); $t(178) = 13.717$, $p = .000$. Cohens d is 2.05 which is large effect size.

Independent sample t test was performed to compare Anxiety in Non PCOS women and PCOS. Ref Table 6 & 7: There was a *significant difference in Anxiety between Non PCOS* ($M=7.222$, $SD=4.699$) and *PCOS women* ($M=17.400$, $SD=6.066$); $t(167.53) = 12.582$, $p = .000$. Cohens d is 1.89 which is large effect size.

Independent sample t test was performed to compare Stress in Non PCOS women and PCOS. Ref Table 6 & 7: There was a *significant difference in Stress between Non PCOS* ($M=13.400$, $SD=5.901$) and *PCOS women* ($M=23.911$, $SD=5.1048$); $t(178) = 12.779$, $p = .000$. Cohens d is 1.91 which is large effect size.

Independent sample t test was performed to compare Self-Compassion in Non PCOS women and PCOS women. Ref Table 6 & 7: There was a *significant difference in Self Compassion between Non PCOS* ($M=3.451$, $SD=.356$) and *PCOS women* ($M=2.746$, $SD=.338$); $t(178) = 13.604$, $p = .000$. Mean value of self-compassion in PCOS is significantly low. Cohens d is 2.03 which is large effect size.

Independent sample t test was performed to compare Self-Criticism in Non PCOS women and PCOS women. Ref Table 6 & 7: There was a *significant difference in Self Criticism (is+hs) between Non PCOS (M=12.933, SD=6.283) and PCOS women (M=27.022, SD=8.147); t (167.201) = 12.991, p = .000. Mean value of self-criticism in PCOS is significantly high.* Cohens d is 1.95 which is large effect size.

Highlights and summary of table 6 & 7

Non PCOS and PCOS independent sample t test (pre-test), result elucidates the following: Noticeable statistically significant difference in PCOS with significantly higher depression $t(14)=13.72$, anxiety $t(14)=12.58$, stress $t(14)=12.78$ and self criticism $t(14)=13.6$ and significantly lower self compassion $t(14) = 12.99$. The **p** value is **0.000** in all the five variables. Cohen's d is greater than 1.8 in all variables signifies large effect size.

Conclusion of the results in phase 1

The above results answer the research questions 1,2 & 3 namely

- “1. Would women with Polycystic Ovary Syndrome have high “self-criticism”?”
 - 2. Would women with Polycystic Ovary Syndrome have high “depression, anxiety and stress”?”
 - 3. Do women with Polycystic Ovary Syndrome have low levels of “self compassion”?”
- Yes, Women with PCOS have high ‘self-criticism’, high ‘depression, anxiety, stress’ and low ‘self-compassion’.

Therefore, the above results show that **Hypothesis 1, “Women with PCOS” would have significantly high depression, anxiety and stress as compared to women without PCOS”(H₁) is accepted.**

H₁ – Hypothesis 1. Accepted

The above results show that **Hypothesis 2, “Women with PCOS” would have significantly high self-criticism and low self-compassion as compared to women without PCOS” (H₂) is accepted.**

H₂ – Hypothesis 2. Accepted.

4.3 Results of Phase 2 for the variables

The aim of the phase 2 part of the study was to test the effect of 3 interventions namely, pranayama, mirror work and gratitude journal writing on the mental distress i.e., depression, anxiety and stress as well as self-compassion and self-criticism of “Women with PCOS”. As per the research design outlined by the researcher, the above variables are used to test the Hypothesis 3 and 4.

Hypothesis 3(H₃) – “There would be significant decrease in self- criticism and increase in self-compassion in “Women with PCOS” after the intervention of Pranayama, mirror work and gratitude journal writing as compared to control group”.

Hypothesis 4(H₄) – “There would be significant decrease in stress, anxiety and depression in “Women with PCOS” after the intervention of Pranayama, mirror work and gratitude journal writing as compared to control group”.

In line with the requirement, as a first step, group homogeneity was required to ensure. The following explains the step by step activities and results obtained in each levels of the study.

4.3.1 Comparison of pretest scores of Experimental group vs control group

90 PCOS were randomly allocated to 15 each for 3 Experimental groups namely Pranayama, Gratitude Journal writing and Mirror work, and 15 each in 3 respective control groups. **Independent sample t test** carried out between “Experimental and control groups” of pranayama, gratitude journal writing and mirror work. Test results are tabulated in the following tables.

Table 9

Independent sample t testfor Pranayama experimental and control group of pre-test for “Depression, Anxiety, Self-Compassion and Self-criticism” of “Women with PCOS”.

Scales used	Experimental Group		Control group		t-test for Equality of Means		
	Pre test (N=15)		Pre test (N=15)		t	Df	P
DASS 21	Mean	SD	Mean	SD			
Depression	22.53	6.567	21.73	5.338	0.366	28	0.717
Anxiety	18.67	7.078	17.47	5.208	0.529	28	0.601
Stress	22.8	5.797	23.2	4.769	0.206	28	0.838
Self-Compassion (SCS)	2.808	0.28	2.809	0.391	0.004	28	0.996
FSCRS-Self Criticism (is+hs)	25.53	7.652	28.33	8.6	0.942	28	0.354

Figure 28

Pre test comparison of mean for Pranayama - “Experimental and control groups”

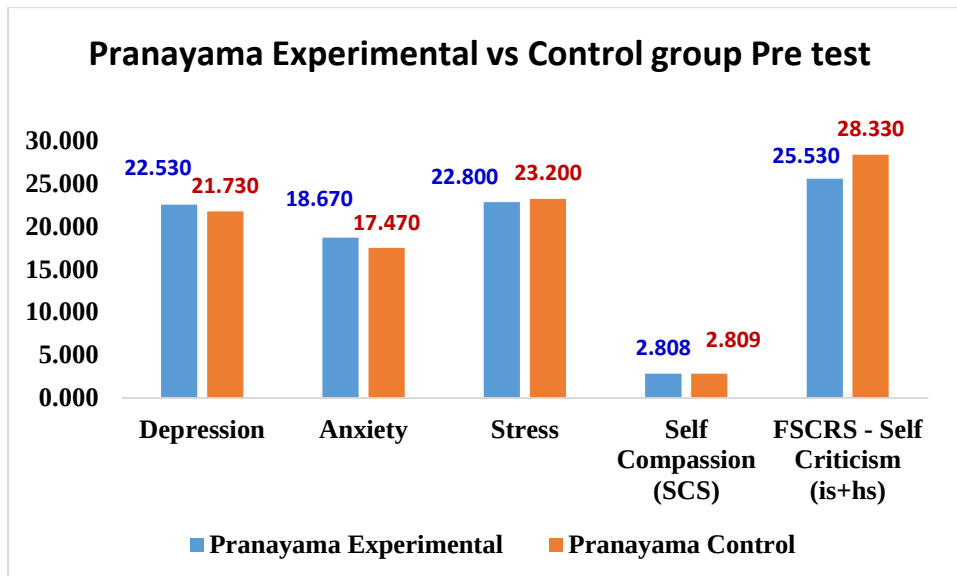


Table 10

Independent sample t test between Gratitude journal writing experimental and control group of pre-test for “Depression, Anxiety, Self-Compassion and Self-criticism” of “Women with PCOS”.

Scales used	Experimental Group		Control group		t-test for Equality of Means		
	Pre test (N=15) Mean	SD	Pre test (N=15) Mean	SD	t	df	P
DASS 21							
Depression	22.4	7.453	21.333	5.538	0.445	28	0.66
Anxiety	16.933	7.324	17.2	6.132	0.108	28	0.915
Stress	23.467	5.731	24	5.555	0.259	28	0.798
Self-Compassion (SCS)	2.781	0.39	2.8	0.324	0.144	28	0.886
FSCRS-Self Criticism (is+hs)	25.467	8.202	28.467	11.519	0.822	28	0.418

Figure 29

Pre test comparison of mean for Gratitude Journal writing - “Experimental and control groups”

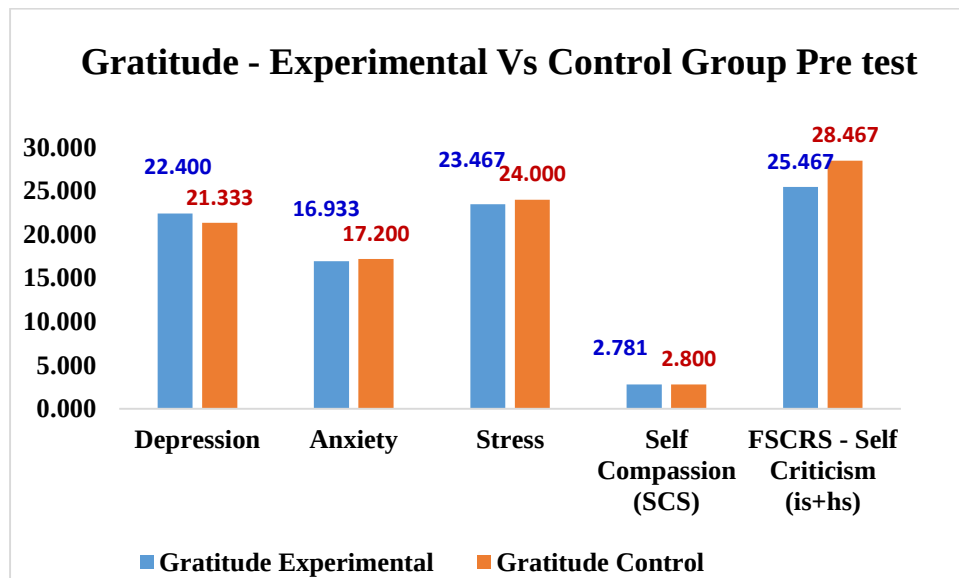


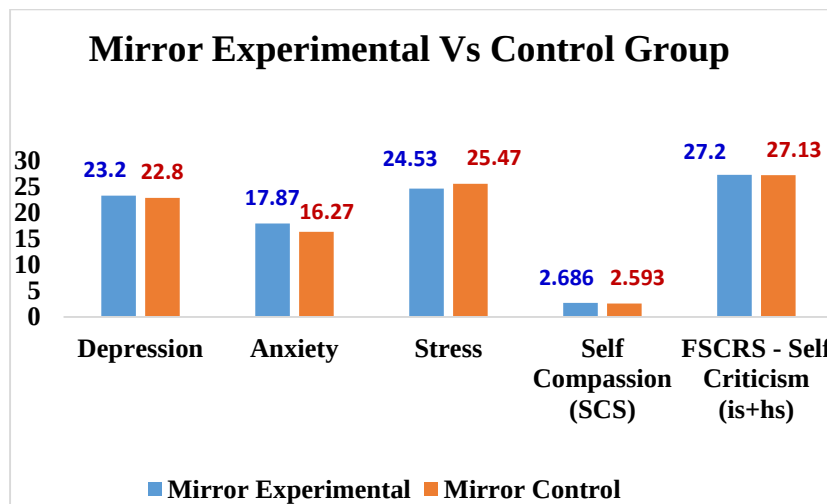
Table 11

Independent sample t test between mirror work experimental and control group of pre-test for “Depression, Anxiety, Self-Compassion and Self-criticism” of “Women with PCOS”.

Scales used	Experimental Group		Control group		t-test for Equality of Means		
	Pre test (N=15)		Pre test (N=15)		t	df	P
DASS 21	Mean	SD	Mean	SD			
Depression	23.2	5.943	22.8	6.581	0.175	28	0.863
Anxiety	17.87	5.423	16.27	5.7	0.788	28	0.438
Stress	24.53	4.926	25.47	4.033	0.568	28	0.575
Self-Compassion (SCS)	2.686	0.325	2.593	0.306	0.8	28	0.43
FSCRS - Self Criticism (is+hs)	27.2	6.581	27.13	6.093	0.029	28	0.977

Figure 30

Pre test comparison of mean for Mirror work - “Experimental and control groups”



The independent sample t test results in the above three tables shows that $P > 0.05$, which means no significant difference was found in the “Experimental and control groups” of the three intervention groups.

4.3.2 Comparison of pre-test and post-intervention scores between the “Experimental and control groups”

After the completion of respective interventions on each of the experimental groups namely pranayama, gratitude journal writing and mirror work, post test had been performed and data were collected from each of the participants in “Experimental and control groups”.

Collected data were tabulated in excel and tabulated as per the scale requirement as explained in the phase 1 for pretest data.

Pre and post test scores of all the five variables namely “Depression, Anxiety, Stress, Self-compassion and Self-criticism” tabulated and paired sample t-test was performed separately for each of the experimental groups namely Pranayama, Gratitude journal writing and Mirror work and the respective control groups. The sample size was 15 in each group. Normality test was conducted on the difference on the pre and post-test values to find out if the data were normally distributed. Kolmogorov-Smirnov & Shapiro-Wilk, Skewness and Kurtosis were recorded for the parametric test. A paired sample t test was carried out for all the 5 variables namely “Depression, Anxiety, Stress, Self-compassion and Self-criticism” after verifying the normality test score for pranayama, mirror work and gratitude journal writing “Experimental and control groups”.

4.3.2.1 Pranayama Experimental (PE)

Table 12

Skewness and Kurtosis for Pranayama Experimental (PE) group for pre and post test differences of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”.

Pranayama Experimental		Statistic	Std. Error
Depression PE Pre Post Test Difference	Skewness	-0.221	0.58
	Kurtosis	-1.163	1.121
Anxiety PE Pre Post Test Difference	Skewness	0.497	0.58
	Kurtosis	-1.066	1.121
Stress PE Pre Post Test Difference	Skewness	-0.506	0.58
	Kurtosis	-0.142	1.121
SCS (Self-Compassion) PE Pre Post Test Difference	Skewness	-1.001	0.58
	Kurtosis	0.368	1.121
IS+HS (Self-Criticism) PE Pre Post Test Difference	Skewness	0.465	0.58
	Kurtosis	0.953	1.121

Tests of Normality

Table 13

Test of Normality for Pranayama Experimental (PE) group for pre and post test differences of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”.

Pranayama Experimental	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Depression PE Pre Post Test Difference	0.192	15	0.141	0.929	15	0.268
Anxiety PE Pre post test Difference	0.176	15	.200 [*]	0.89	15	0.066
Stress PE Pre post test Difference	0.141	15	.200 [*]	0.937	15	0.347
SCS (Self-Compassion) PE Pre post test Difference	0.186	15	0.175	0.911	15	0.139
IS+HS (Self-Criticism) PE Pre post test Difference	0.127	15	.200 [*]	0.964	15	0.759

From Table 13: It can be seen that *Depression in Pranayama Experimental test difference* for Shapiro-Wilk $p=.268$, Skewness $-.221$, Kurtosis -1.163 . Hence it is considered as normally distributed.

Anxiety in Pranayama Experimental test difference for Shapiro-Wilk $p=.066$, Skewness .497, Kurtosis -1.066. Hence it is considered as normally distributed.

Stress in Pranayama Experimental test difference for Shapiro-Wilk $p=.347$, Skewness -.506, Kurtosis -.142. Hence it is considered as normally distributed.

Self-Compassion in Pranayama Experimental test difference for Shapiro-Wilk $p=.139$, Skewness -1.001, Kurtosis .368. Hence it is considered as normally distributed.

Self-Criticism in Pranayama Experimental test difference for Shapiro-Wilk $p=.759$, Skewness .465, Kurtosis .953. Hence it is considered as normally distributed.

Table 14

Paired sample Statistics for Pranayama Experimental (PE) group for pre and post test differences of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”.

	Mean	N	Std. Deviation	Std. Error Mean
Depression PE Pre test	22.533	15	6.567	1.696
Depression PE Post test	11.467	15	3.42	0.883
Anxiety PE Pre test	18.667	15	7.078	1.828
Anxiety PE Post Test	7.733	15	4.527	1.169
Stress PE Pre test	22.8	15	5.797	1.497
Stress PE Post Test	12.533	15	3.248	0.839
SCS PE Pre test	2.808	15	0.28	0.072
SCS PE Post Test	3.51	15	0.35	0.09
IS+HS PE Pre test	25.533	15	7.652	1.976
IS+HS PE Post test	13.133	15	6.664	1.721

Figure 31

Pre and Post score comparison of mean for Pranayama-Experimental Group

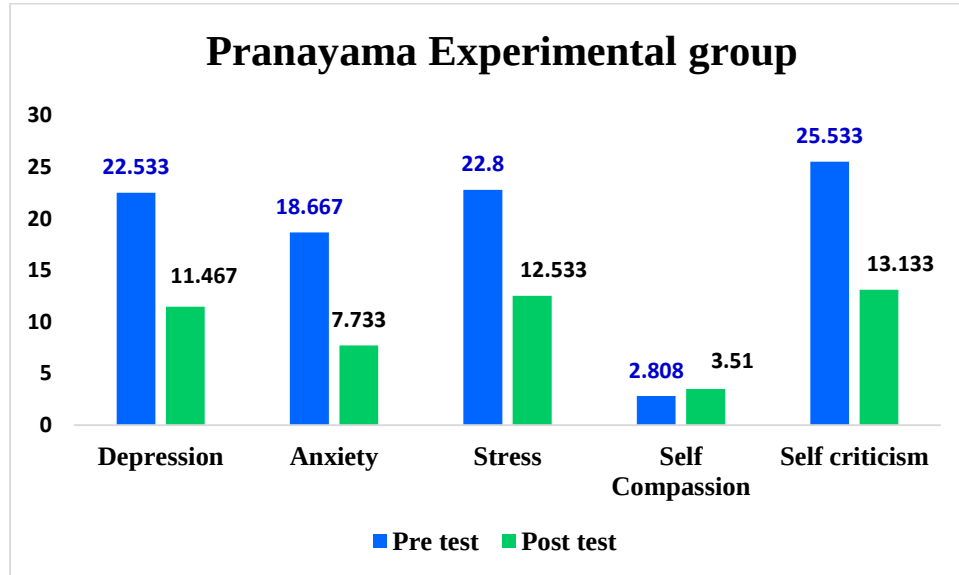


Table 15

Paired sample test for Pranayama Experimental (PE) group for pre and post score differences of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”.

Mean difference of the variables	Paired Difference					t	df	Sig. (2-tailed)	Effect Size Cohen's d
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Depression PE Pre test - Depression PE Post test	11.066	5.119	1.32	8.23	13.9	8.372	14	0.000	2.16
Anxiety PE Pre test - Anxiety PE Post Test	10.933	6.497	1.68	7.34	14.53	6.518	14	0.000	1.68
Stress PE Pre test – Stress PE Post Test	10.266	5.548	1.43	7.19	13.34	7.167	14	0.000	1.85
SCS PE Pre test - SCS PE Post Test	-0.702	0.435	0.11	-0.94	-0.461	6.255	14	0.000	1.61
IS+HS PE Pre test - IS+HS PE Post test	12.4	8.862	2.29	7.49	17.31	5.419	14	0.000	1.40

Paired sample t-test results tabulated in Table 15 for the mean difference of variables for *Pranayama* intervention.

Refer tables 14 & 15. There was a significant difference in the test score of Depression in Pranayama before ($M=22.533$, $SD=6.566$) and after pranayama ($M=11.467$, $SD=3.419$); $t(14) = 8.372$, $p = .000$. Cohen's d is 2.16 which is large effect size.

There was a significant difference in the test score of Anxiety before Pranayama ($M=18.667$, $SD=7.077$) and after ($M=7.733$, $SD=4.5272$); $t(14) = 6.518$, $p = .000$. Cohen's d is 1.68 which is large effect size.

There was a significant difference in the test score of Stress before Pranayama ($M=22.800$, $SD=5.796$) and after Pranayama ($M=12.533$, $SD=3.248$); $t(14) = 7.167$, $p = .000$. Cohen's d is 1.85 which is large effect size.

There was a significant difference in the test score of Self Compassion before Pranayama ($M=2.808$, $SD=.280$) and after pranayama ($M=3.510$, $SD=.3496$); $t(14) = 6.255$, $p = .000$. Cohen's d is 1.615 which is large effect size.

There was a significant difference in the test score of Self Criticism before Pranayama ($M=25.533$, $SD=7.652$) and after pranayama ($M=13.133$, $SD=6.664$); $t(14) = 5.419$, $p = .000$. Cohen's d is 1.399 which is large effect size.

Highlight and summary of Table 14&15

After the Pranayama intervention, experimental group paired t test result elucidates the following. Noticeable statistically significant reduction in pre and post test depression $t(14)=8.372$, anxiety $t(14) = 6.518$, stress $t(14)= 7.167$, self-criticism $t(14) = 5.419$ and significant improvement in self-compassion $t(14) = 6.255$. The p value is **0.000** in all the five variables. Cohen's d is greater than 1 in all the five variables, indicates large effect size.

Therefore, the above results show that Hypotheses 3 (H_3) and Hypothesis 4 (H_4) are accepted.

4.3.2.2 Pranayama Control (PC)

Table 16

Skewness and Kurtosis for Pranayama Control (PC) group for pre and post score differences of “Depression, Anxiety, Stress, Self-compassion and Self-criticism”.

Pranayama Control		Statistic	Std. Error
Depression PC Pre Post Test Difference	Skewness	-0.45	0.58
	Kurtosis	-0.353	1.121
Anxiety PC Pre Post Test Difference	Skewness	0.057	0.58
	Kurtosis	0.944	1.121
Stress PC Pre Post Test Difference	Skewness	-0.451	0.58
	Kurtosis	-0.424	1.121
SCS (Self Compassion) PC Pre Post Test Difference	Skewness	0.146	0.58
	Kurtosis	0.261	1.121
IS+HS (Self Criticism) PC Pre Post Test Difference	Skewness	0.793	0.58
	Kurtosis	1.816	1.121

Tests of Normality

Table 17

Test of Normality for Pranayama Control (PC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Depression PC Pre Post Test Difference	0.158	15	.200 [*]	0.932	15	0.295
Anxiety PC Pre post test Difference	0.171	15	.200 [*]	0.939	15	0.366
Stress PC Pre post test Difference	0.148	15	.200 [*]	0.918	15	0.177
SCS (Self Compassion) PC Pre post test Difference	0.189	15	0.154	0.957	15	0.641
IS+HS (Self Criticism) PC Pre post test Difference	0.216	15	0.058	0.919	15	0.184

From Table 17: It can be seen that *Depression in Pranayama Control test difference* for Shapiro-Wilk $p = .295$, Skewness $-.450$, Kurtosis $-.353$. Hence it is considered as normally distributed.

Anxiety Pranayama Control test difference for Shapiro-Wilk $p = .366$, Skewness $.057$, Kurtosis $.944$. Hence it is considered as normally distributed.

Stress Pranayama Control test difference for Shapiro-Wilk $p = .177$, Skewness $-.451$, Kurtosis $-.424$. Hence it is considered as normally distributed.

Self Compassion Pranayama Control test difference for Shapiro-Wilk $p = .641$, Skewness $.146$, Kurtosis $.261$. Hence it is considered as normally distributed.

Self Criticism Pranayama Control test difference for Shapiro-Wilk $p = .184$, Skewness $.793$, Kurtosis 1.816 . Hence it is considered as normally distributed.

Paired sample Statistics

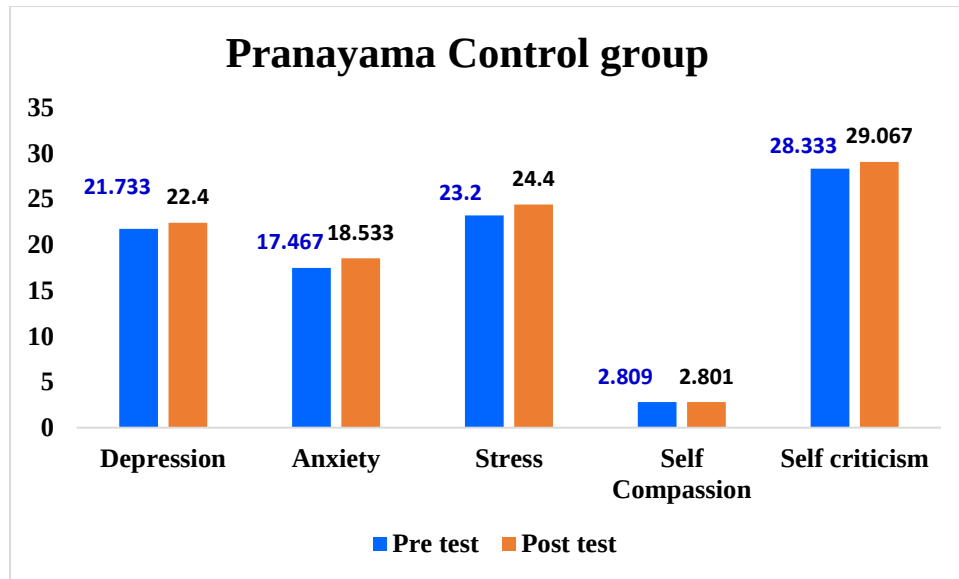
Table 18

Paired sample Statistics for Pranayama Control (PC) group for pre and post score differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Mean	N	Std. Deviation	Std. Error Mean
Depression PC Pre test	21.733	15	5.338	1.378
Depression PC Post test	22.4	15	6.197	1.6
Anxiety PC Pre test	17.467	15	5.208	1.345
Anxiety PC Post Test	18.533	15	8.634	2.229
Stress PC Pre test	23.2	15	4.769	1.231
Stress PC Post Test	24.4	15	5.962	1.539
SCS PC Pre test	2.809	15	0.391	0.101
SCS P PC Post Test	2.802	15	0.385	0.1
IS+HS PC Pre test	28.333	15	8.6	2.22
IS+HS PC Post test	29.067	15	9.43	2.435

Figure 32

Pre and Post-test comparison of mean for Pranayama - Control Group



Paired Sample Test

Table 19

Paired sample test for Pranayama Control (PC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Mean difference of the variables	Paired Difference						t	df	Sig. (2-tailed)	Effect Size Cohen's d
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper					
Depression PC Pre test-Depression PC Post test	-0.667	5.327	1.376	-3.617	2.284	0.485	14	0.635	0.13	
Anxiety PC Pre test - Anxiety PC Post Test	-1.067	5.946	1.535	-4.359	2.226	0.695	14	0.499	0.18	
Stress PC Pre test – Stress PC Post Test	-1.200	4.395	1.135	-3.634	1.234	1.058	14	0.308	0.27	
SCS PC re test - SCS PC Post Test	0.007	0.166	0.043	-0.085	0.099	0.168	14	0.869	0.04	
IS+HS PC Pre test - IS+HS PC Post test	-0.733	4.480	1.157	-3.214	1.747	0.634	14	0.536	0.16	

Paired sample t test performed to test score of all the variables *Depression in Pranayama group - Pre test and post test*. Result is tabulated in Table 19. There was

no significant difference in the test score of Depression in Pranayama control group for pretest (M=21.733, SD=5.338) and Post test (M=22.400, SD=6.196); t (14) = .485, p =.635

There was no significant difference in the test score of Anxiety in Pranayama control group for pretest (M=17.467, SD=5.208) and Post test (M=18.533, SD=8.634); t (14) = .695, p =.499

There was no significant difference in the test score of Stress in Pranayama control group for pretest (M=23.200, SD=4.768) and Post test (M=24.400, SD=5.961); t (14) = 1.058, p =.308

There was no significant difference in the test score of Self Compassion in Pranayama control group for pretest (M=2.808, SD=.391) and Post test (M=2.801, SD=.385); t (14) = .168, p =.869

There was no significant difference in the test score of Self Criticism in Pranayama control group for pretest (M=28.333, SD=8.599) and Post test (M=29.067, SD=9.429); t (14) = .634, p =.536

The results indicate that there is no significant difference between the pre-test and post-test scores in the control group for Pranayama.

Highlight and summary of Table 18& 19

Pranayama control group reveals the following. There is no significant change in pre and post test of depression $t(14) = 0.485$, anxiety $t(14) = 0.695$, stress $t(14) = 1.058$, self-criticism $t(14) = 0.634$ and self compassion $t(14) = 0.168$. The **p** value is **>0.3** in all the five variables indicates there is no significant change observed in control group.

4.3.2.3 Mirror work Experimental (ME)

Table 20

Skewness and Kurtosis for Mirror work Experimental (ME) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Descriptives

Mirror Experimental		Statistic	Std. Error
Depression ME Pre Post Test Difference	Skewness	-0.735	0.58
	Kurtosis	0.263	1.121
AnxietyMEPre Post Test Difference	Skewness	-0.427	0.58
	Kurtosis	0.223	1.121
StressMEPre Post Test Difference	Skewness	1.576	0.58
	Kurtosis	1.771	1.121
SCS (Self Compassion)MEPre Post Test Difference	Skewness	-0.149	0.58
	Kurtosis	-0.262	1.121
IS+HS (Self Criticism) MEPre Post Test Difference	Skewness	-0.054	0.58
	Kurtosis	-0.343	1.121

Tests of Normality

Table 21

Test of Normality for Mirror work Experimental (ME) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Depression MEPre Post Test Difference	0.179	15	.200 [*]	0.918	15	0.181
Anxiety MEPre post test Difference	0.212	15	0.068	0.942	15	0.405
Stress MEPre post test Difference	0.279	15	0.003	0.776	15	0.002
SCS (Self Compassion) MEPre post test Difference	0.138	15	.200 [*]	0.976	15	0.933
IS+HS (Self Criticism) MEPre post test Difference	0.133	15	.200 [*]	0.951	15	0.539

From Table 21: It can be seen that *Depression Mirror work Experimental test difference* for Shapiro-Wilk $p=.181$, Skewness $-.735$, Kurtosis $.263$. Hence it is considered as normally distributed.

Anxiety Mirror work Experimental test difference for Shapiro-Wilk $p=.405$, Skewness $-.427$, Kurtosis $.223$. Hence it is considered as normally distributed.

Stress Mirror work Experimental test difference for Shapiro-Wilk $p=.002$, Skewness 1.576 , Kurtosis 1.771 . Hence it is considered as normally distributed.

Self Compassion Mirror work Experimental test difference for Shapiro-Wilk $p=.933$ Skewness $-.149$, Kurtosis $-.262$. Hence it is considered as normally distributed.

Self Criticism Mirror work Experimental test difference for Shapiro-Wilk $p=.539$ Skewness $-.054$, Kurtosis $-.343$. Hence it is considered as normally distributed.

Paired sample Statistics

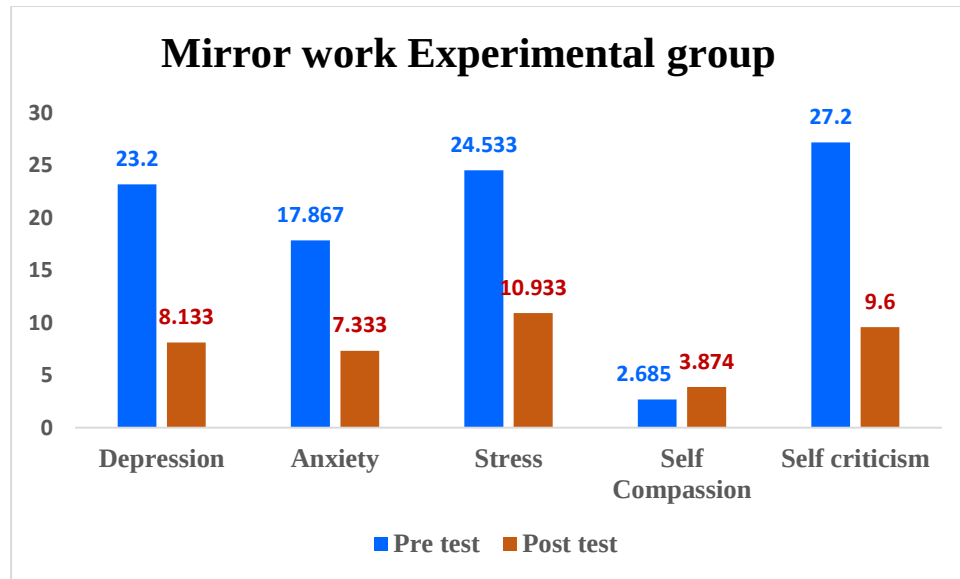
Table 22

Paired sample Statistics for Mirror work Experimental (ME) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Depression ME Pre and Post test	Mean	N	Std. Deviation	Std. Error Mean
Depression ME Pre test	23.2	15	5.942	1.534
Depression ME Post test	8.133	15	3.739	0.965
Anxiety ME Pre test	17.867	15	5.423	1.4
Anxiety ME Post Test	7.333	15	3.518	0.908
Stress MEPre test	24.533	15	4.926	1.271
Stress MEPost Test	10.933	15	3.283	0.847
SCS MEPre test	2.685	15	0.325	0.083
SCS MEPost Test	3.874	15	0.381	0.098
IS+HS MEPre test	27.2	15	6.581	1.699
IS+HS MEis+ hs Post test	9.6	15	6.511	1.681

Figure 33

Pre and Post-test comparison of mean for Mirror work - Experimental Group



Paired Sample Test

Table 23

Paired Sample test for Mirror work Experimental (ME) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Mean difference of the variables	Paired Difference								
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)	Effect Size Cohen's d
Depression ME Pre test- Depression ME Post test	15.07	5.23	1.35	12.17	17.96	11.157	14	0.000	2.88
Anxiety ME Pre test - Anxiety ME Post Test	10.53	5.15	1.33	7.68	13.39	7.917	14	0.000	2.04
Stress ME Pre test – Stress ME Post Test	13.60	5.62	1.45	10.49	16.71	9.379	14	0.000	2.42
SCS ME Pre test - SCS ME Post Test	-1.19	0.49	0.13	-1.46	-0.916	9.346	14	0.000	2.41
IS+HS ME Pre test - IS+HS ME Post test	17.60	7.15	1.85	13.64	21.56	9.534	14	0.000	2.46

Paired sample t-test results tabulated in Table 23 for the mean difference of variables for Mirror work intervention before and after.

There is a significant difference in the test scores of Depression before Mirror work ($M=23.200$, $SD=5.942$) and after mirror work ($M=8.133$, $SD=3.739$); $t(14) = 11.157$, $p = .000$. Cohen's d is 2.88 which is large effect size.

Significant difference was observed in the test scores of Anxiety before Mirror work ($M=17.867$, $SD=5.4231$) and after mirror work ($M=7.333$, $SD=3.518$); $t(14) = 7.917$, $p = .000$. Cohen's d is 2.04 which is large effect size.

There was a significant difference in the test score of Stress in before Mirror work ($M=24.533$, $SD=4.9261$) and after mirror work ($M=10.933$, $SD=3.2834$); $t(14) = 9.379$, $p = .000$. Cohen's d is 2.42 which is large effect size.

There was a significant difference in the test score of Self Compassion before Mirror work ($M=2.685$, $SD=.325$) and after mirror work ($M=3.87444$, $SD=.381393$); $t(14) = 9.346$, $p = .000$. Cohen's d is 2.41 which is large effect size.

There was a significant difference in the test score of Self Criticism before Mirror work ($M=27.200$, $SD=6.581$) and after mirror work ($M=9.600$, $SD=.6.511$); $t(14) = 9.534$, $p = .000$. Cohen's d is 2.46 which is large effect size.

Highlight and summary of Table 22&23

After the Mirror work intervention, experimental group paired t test result elucidates the following. Noticeable statistically significant reduction in pre and post test depression $t(14) = 11.157$, anxiety $t(14) = 7.917$, stress $t(14) = 9.379$, self-criticism $t(14) = 9.534$ and significant improvement in self-compassion $t(14) = 9.346$. The p value is **0.000** in all the five variables. Cohen's d is greater than 2 in all the five variables, indicates large effect size.

Therefore, the above results show that Hypotheses 3 (H₃) and 4 (H₄) are accepted.

4.3.2.4 Mirror Work Control (MC)

Table 24

Skewness and Kurtosis for Mirror work Control (MC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Descriptives

Mirror Control		Statistic	Std. Error
Depression MC Pre Post Test Difference	Skewness	0.797	0.58
	Kurtosis	0.515	1.121
Anxiety MC Pre Post Test Difference	Skewness	0.454	0.58
	Kurtosis	-0.458	1.121
Stress MC Pre Post Test Difference	Skewness	-0.21	0.58
	Kurtosis	0.52	1.121
SCS (Self Compassion) MC Pre Post Test Difference	Skewness	-0.987	0.58
	Kurtosis	1.088	1.121
IS+HS (Self Criticism) MC Pre Post Test Difference	Skewness	1.335	0.58
	Kurtosis	1.813	1.121

Tests of Normality

Table 25

Tests of Normality for Mirror work Control (MC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Mirror Control	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Depression MC Pre Post Test Difference	0.215	15	0.061	0.928	15	0.258
Anxiety MC Pre post test Difference	0.149	15	.200*	0.911	15	0.139
Stress MC Pre post test Difference	0.21	15	0.073	0.934	15	0.313
SCS (Self Compassion) MC Pre post test Difference	0.205	15	0.09	0.913	15	0.148
IS+HS (Self Criticism) MC Pre post test Difference	0.275	15	0.003	0.866	15	0.029

From Table 25: It can be seen that *Depression Mirror work Control test difference* for Shapiro-Wilk $p=.258$, Skewness .797, Kurtosis .515. Hence it is considered as normally distributed.

Anxiety Mirror work Control test difference for Shapiro-Wilk $p=.139$, Skewness .454, Kurtosis -.458. Hence it is considered as normally distributed.

Stress Mirror work Control test difference for Shapiro-Wilk $p=.313$, Skewness -.210, Kurtosis .520. Hence it is considered as normally distributed.

Self Compassion Mirror work Control test difference for Shapiro-Wilk $p=.148$, Skewness -.987, Kurtosis 1.088. Hence it is considered as normally distributed.

Self Criticism Mirror work Control test difference for Shapiro-Wilk $p=.029$, Skewness 1.335, Kurtosis 1.813. Hence it is considered as normally distributed.

Paired sample Statistics

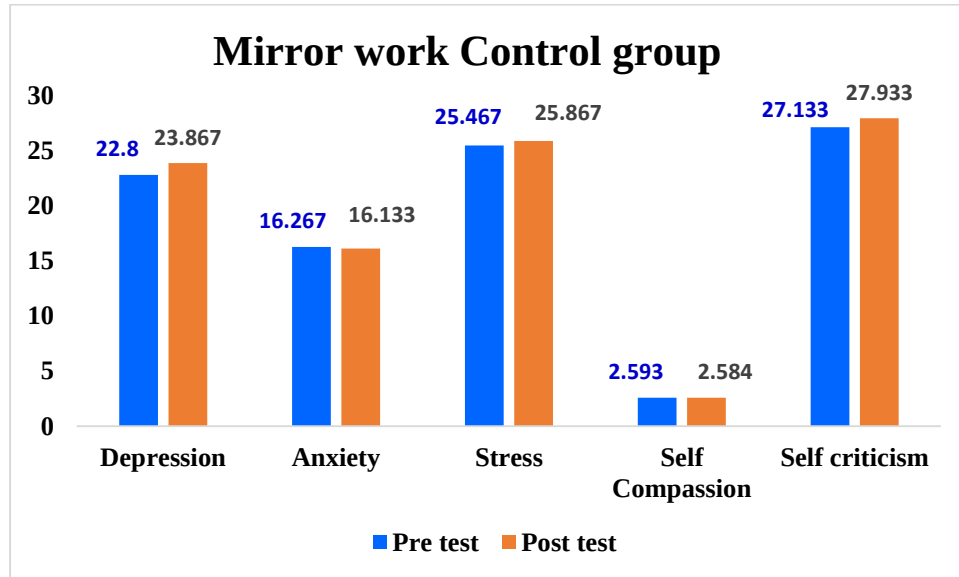
Table 26

Paired sample Statistics for Mirror work Control (MC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Mean	N	Std. Deviation	Std. Error Mean
Depression MC Pre test	22.8	15	6.581	1.699
Depression MCPPost test	23.867	15	7.07	1.825
Anxiety MC Pre test	16.267	15	5.701	1.472
Anxiety MC Post Test	16.133	15	6.069	1.567
Stress MCPPre test	25.467	15	4.033	1.041
Stress MCPPost Test	25.867	15	4.307	1.112
SCS MCPPre test	2.593	15	0.306	0.079
SCS MCPPost Test	2.584	15	0.303	0.078
IS+HS MC Pre test	27.133	15	6.093	1.573
IS+HS MC Post test	27.933	15	5.763	1.488

Figure 34

Pre and Post-test comparison of mean for Mirror work - Control Group



Paired Sample Test

Table 27

Paired Sample Test for Mirror work Control (MC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Mean difference of the variables	Paired Difference					t	df	Sig. (2-tailed)	Effect Size Cohen's d
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Depression MCPre test- Depression MC Post test	-1.066	3.195	0.825	-2.836	0.703	1.293	14	0.217	0.33
Anxiety MCPre test - Anxiety MCPPost Test	0.133	3.248	0.839	-1.666	1.932	0.159	14	0.876	0.04
Stress MCPre test – Stress MCPPost Test	-0.400	3.481	0.899	-2.328	1.528	0.445	14	0.663	0.11
SCS MCPre test - SCS MCPPost Test	0.009	0.124	0.032	-0.060	0.078	0.277	14	0.786	0.07
IS+HS MC Pre test - IS+HS MC Post test	-0.800	1.897	0.490	-1.851	0.251	1.633	14	0.125	0.42

A paired sample t test performed to test the score of variables for Mirror work control group Pre test and post test and the same is tabulated in Table 27.

There was no significant difference in the test score of Depression in Mirror work control group for pretest ($M=22.800$, $SD=6.581$) and Post test ($M=23.867$, $SD=7.0697$); $t(14) = 1.293$, $p = .217$

There was no significant difference in the test score of Anxiety in Mirror work control group for pretest ($M=16.267$, $SD=5.700$) and Post test ($M=16.133$, $SD=6.069$); $t(14) = .159$, $p = .876$

There was no significant difference in the test score of Stress in Mirror work control group for pretest ($M=25.467$, $SD=4.033$) and Post test ($M=25.867$, $SD=4.307$); $t(14) = -.445$, $p = .663$

There was no significant difference in the test score of Self Compassion in Mirror work control group for pretest ($M=2.593$, $SD=.305$) and Post test ($M=2.584$, $SD=.303$); $t(14) = .277$, $p = .786$

There was no significant difference in the test score of Self Criticism in Mirror work control group for pretest ($M=27.133$, $SD=6.092$) and Post test ($M=27.933$, $SD=5.762$); $t(14) = -1.633$, $p = .125$

Highlight and summary of Table 26&27

Mirror work control group reveals the following. There is no significant change in pre and post test of depression $t(14) = 1.293$, anxiety $t(14) = 0.159$, stress $t(14) = 0.445$, self-criticism $t(14) = 1.63$ and self compassion $t(14) = 0.277$. The p value is >0.12 in all the five variables indicates there is no significant change observed in control group

The results show there is no significant difference in the pre and post test scores in control group.

4.3.2.5 Gratitude Journal writing Experimental (GE)

Table 28

Skewness and Kurtosis for Gratitude Journal writing Experimental (GE) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Descriptives

Gratitude Experimental		Statistic	Std. Error
Depression GE Pre Post Test Difference	Skewness	0.763	0.58
	Kurtosis	-0.478	1.121
Anxiety GE Pre Post Test Difference	Skewness	0.117	0.58
	Kurtosis	-0.996	1.121
Stress GE Pre Post Test Difference	Skewness	0.14	0.58
	Kurtosis	-0.38	1.121
SCS (Self Compassion) GE Pre Post Test Difference	Skewness	-0.6	0.58
	Kurtosis	-1.004	1.121
IS+HS (Self Criticism) GE Pre Post Test Difference	Skewness	-1.42	0.58
	Kurtosis	1.869	1.121

Tests of Normality

Table 29

Test of Normality for Gratitude Journal writing Experimental (GE) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Depression GE Pre Post Test Difference	0.234	15	0.026	0.907	15	0.123
Anxiety GE Pre post test Difference	0.132	15	.200*	0.959	15	0.675
Stress GE Pre post test Difference	0.157	15	.200*	0.978	15	0.952
SCS (Self Compassion) GE Pre post test Difference	0.204	15	0.094	0.892	15	0.072
IS+HS (Self Criticism) GE Pre post test Difference	0.236	15	0.024	0.866	15	0.029

From Table 29: It can be seen that *Depression Gratitude Journal writing Experimental test difference* for Shapiro-Wilk $p=.123$, Skewness .763, Kurtosis -.478. Hence it is considered as normally distributed.

Anxiety Gratitude Journal writing Experimental test difference for Shapiro-Wilk $p=.675$, Skewness .117, Kurtosis -.996. Hence it is considered as normally distributed.

Stress Gratitude Journal writing Experimental test difference for Shapiro-Wilk $p=.952$, Skewness .140, Kurtosis -.380. Hence it is considered as normally distributed.

Self Compassion Gratitude Journal writing Experimental test difference for Shapiro-Wilk $p=.072$, Skewness -.600, Kurtosis -1.004. Hence it is considered as normally distributed.

Self Criticism Gratitude Journal writing Experimental test difference for Shapiro-Wilk $p=.029$, Skewness -1.420, Kurtosis 1.869. Hence it is considered as normally distributed.

Paired sample Statistics

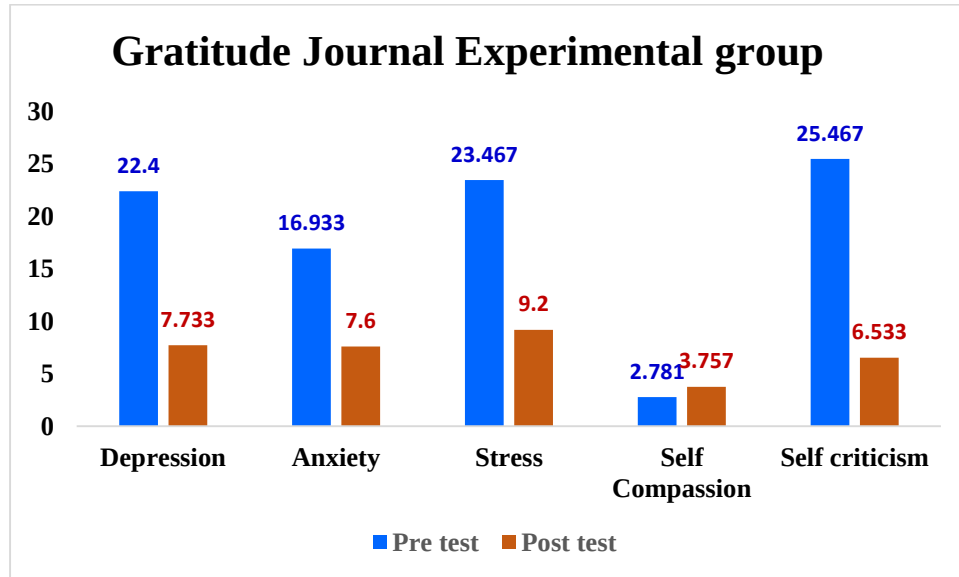
Table 30

Paired Sample Statistics for Gratitude Journal writing Experimental (GE) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Mean	N	Std. Deviation	Std. Error Mean
Depression GEPre test	22.4	15	7.452	1.924
Depression GEPost test	7.73	15	3.918	1.011
Anxiety GE Pre test	16.93	15	7.323	1.891
Anxiety GE Post Test	7.6	15	4.014	1.036
Stress GE Pre test	23.47	15	5.73	1.479
StresscGE Post Test	9.2	15	4.647	1.2
SCS GE Pre test	2.78	15	0.389	0.101
SCS GE Post Test	3.76	15	0.451	0.117
IS+HS GE Pre test	25.47	15	8.202	2.118
IS+HS GE Post Test	6.53	15	4.438	1.146

Figure 35

Pre and Post-test comparison of mean for Gratitude Journal writing - Experimental Group



Paired Sample Test

Table 31

Paired Sample Test for Gratitude Journal writing Experimental (GE) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Mean difference of the variables	Paired Difference					t	df	Sig. (2-tailed)	Effect Size Cohen's d
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Depression GE Pre test- Depression GE Post test	14.667	7.770	2.006	10.363	18.969	7.310	14	0.000	1.89
Anxiety GE Pre test - Anxiety GE Post Test	9.333	6.032	1.557	5.993	12.674	5.993	14	0.000	1.55
Stress GE Pre test – Stress GE Post Test	14.266	7.206	1.861	10.276	18.257	7.668	14	0.000	1.98
SCS GE Pre test - SCS GE Post Test	-0.977	0.531	0.137	-1.271	-0.682	7.118	14	0.000	1.84
IS+HS GE Pre test - IS+HS GE Post Test	18.933	9.903	2.556	13.449	24.417	7.405	14	0.000	1.91

A paired sample t test performed to test the score of Depression before Gratitude Journal writing and after Gratitude Journal writing. Table 31 shows there was a significant difference in the test score of Depression in Gratitude Journal writing before

($M=22.40$, $SD=7.452$) and after ($M=7.733$, $SD=3.918$); $t(14) = 7.310$, $p = .000$. Cohen's d is 1.888 which is large effect size.

A paired sample t test performed to test the score of Anxiety before Gratitude Journal writing and after Gratitude Journal writing. Refer Table 30, There was a significant difference in the test score of Anxiety in Gratitude Journal writing before ($M=16.933$, $SD=7.323$) and after ($M=7.600$, $SD=4.014$); $t(14) = 5.993$, $p = .000$. Cohen's d is 1.547 which is large effect size.

A paired sample t test performed to test the score of Stress before Gratitude Journal writing and after Gratitude Journal writing. Refer Table 30. There was a significant difference in the test score of Stress in Gratitude Journal writing before ($M=23.467$, $SD=5.730$) and after ($M=9.200$, $SD=4.647$); $t(14) = 7.668$, $p = .000$. Cohen's d is 1.98 which is large effect size.

A paired sample t test performed to test the score of Self Compassion before Gratitude Journal writing and after Gratitude Journal writing. Refer Table 30. There was a significant difference in the test score of Self Compassion in Gratitude Journal writing before ($M=2.781$, $SD=.389$) and after ($M=3.757$, $SD=.451$); $t(14) = 7.118$, $p = .000$. Cohen's d is 1.838 which is large effect size.

A paired sample t test performed to test the score of Self Criticism before Gratitude Journal writing and after Gratitude Journal writing. Refer Table 30, There was a significant difference in the test score of Self Criticism in Gratitude Journal writing before ($M=25.467$, $SD=8.201$) and after ($M=6.533$, $SD=4.4379$); $t(14) = 7.405$, $p = .000$. Cohen's d is 1.912 which is large effect size.

Highlight and summary of Table 30&31

After the Gratitude journal writing intervention, experimental group paired t test result reveals the following. Noticeable statistically significant reduction in pre and post test depression $t(14)=7.31$, anxiety $t(14) = 5.993$, stress $t(14)= 7.668$, self-criticism $t(14) = 7.405$ and significant improvement in self-compassion $t(14) = 7.118$. The p value is **0.000** in all the five variables. Cohen's d is greater than 1.5 in all the five variables, indicates large effect size.

Therefore, the results show that Hypotheses 3 (H_3) and 4 (H_4) are accepted.

4.3.2.6 Gratitude Journal writing Control (GC)

Table 32

Skewness and Kurtosis for Gratitude Journal writing Control (GC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

Descriptives

Gratitude Control		Statistic	Std. Error
Depression GC Pre Post Test Difference	Skewness	-0.322	0.58
	Kurtosis	-0.34	1.121
Anxiety GC Pre Post Test Difference	Skewness	0.898	0.58
	Kurtosis	0.122	1.121
Stress GC Pre Post Test Difference	Skewness	1.244	0.58
	Kurtosis	1.261	1.121
SCS (Self Compassion) GC Pre Post Test Difference	Skewness	-0.384	0.58
	Kurtosis	-0.07	1.121
IS+HS (Self Criticism) GC Pre Post Test Difference	Skewness	0.081	0.58
	Kurtosis	-1.343	1.121

Test for Normality

Table 33

Test for Normality for Gratitude Journal writing Control (GC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Depression GC Pre Post Test Difference	0.168	15	.200*	0.924	15	0.218
Anxiety GC Pre post test Difference	0.285	15	0.002	0.853	15	0.019
Stress GC Pre post test Difference	0.208	15	0.08	0.871	15	0.035
SCS (Self Compassion) GC Pre post test Difference	0.109	15	.200*	0.962	15	0.725
IS+HS (Self Criticism) GC Pre post test Difference	0.174	15	.200*	0.922	15	0.204

From Table 33: It can be seen that Depression Gratitude Journal writing Control test difference for Shapiro-Wilk $p=.218$, Skewness $-.322$, Kurtosis $-.344$. Hence it is considered as normally distributed.

Anxiety Gratitude Journal writing Control test difference for Shapiro-Wilk $p=.019$, Skewness $.898$, Kurtosis $.122$. Hence it is considered as normally distributed.

Stress Gratitude Journal writing Control test difference for Shapiro-Wilk $p=.035$, Skewness 1.244 , Kurtosis 1.261 . Hence it is considered as normally distributed.

Self Compassion Gratitude Journal writing Control test difference for Shapiro-Wilk $p=.035$, Skewness $.200$, Kurtosis $.725$. Hence it is considered as normally distributed.

Self Criticism Gratitude Journal writing Control test difference for Shapiro-Wilk $p=.204$, Skewness $.081$, Kurtosis -1.343 . Hence it is considered as normally distributed.

Paired sample Statistics

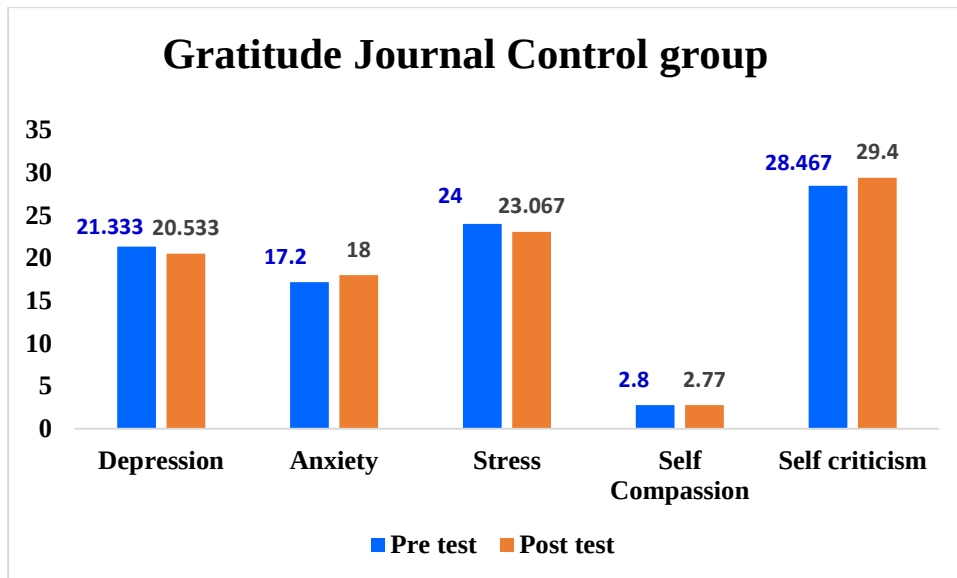
Table 34

Paired sample Statistics for Gratitude Journal writing Control (GC) group for pre and post test differences of "Depression, Anxiety, Stress, Self compassion and Self criticism".

Gratitude Control	Mean	N	Std. Deviation	Std. Error Mean
Depression GC Pre test	21.333	15	5.537	1.43
Depression GC Post test	20.533	15	6.069	1.567
Anxiety GC Pre test	17.2	15	6.131	1.583
Anxiety GC Post Test	18	15	6.187	1.597
Stress GC Pre test	24	15	5.554	1.434
Stress GC Post Test	23.067	15	5.063	1.307
SCS GC Pre test	2.8	15	0.323	0.083
SCS GC Post Test	2.77	15	0.352	0.091
IS+HS GC Pre test	28.467	15	11.519	2.974
IS+HS GC Post Test	29.4	15	9.912	2.559

Figure 36

Pre and Post-test comparison of mean for Gratitude Journal writing - Control Group



Paired sample Test

Table 35

Paired sample Test for Gratitude Journal writing Control (GC) group for pre and post test differences of “Depression, Anxiety, Stress, Self compassion and Self criticism”.

	Paired Difference					t	df	Sig. (2-tailed)	Effect Size Cohen's d
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Depression GCPre test- Depression GCPost test	0.8	2.366	0.611	-0.51	2.11	1.309	14	0.212	0.34
Anxiety GCPre test - Anxiety GC Post Test	-0.8	2.4842	0.6414	-2.1757	0.575	1.247	14	0.233	0.32
Stress GC Pre test – Stress GC Post Test	0.933	4.527	1.168	-1.573	3.44	0.798	14	0.438	0.21
SCS GCPre test - SCS GC Post Test	0.03	0.147	0.038	-0.051	0.111	0.787	14	0.445	0.20
IS+HS (self-Criticism) GC Pre test - IS+HS (self-Criticism) GC Post Test	-0.933	2.939	0.758	-2.56	0.694	1.23	14	0.239	0.32

A paired sample t test performed to test the score of Depression in Gratitude Journal writing control groupPre test and post test. Table 35 Shows there was no significant difference in the test score of Depression in Gratitude Journal writing control group for pretest (M=21.333, SD=5.537) and Post test (M=20.533, SD=6.069); $t(14) = 1.309$, $p = .212$

A paired sample t test performed to test the score of Anxiety in Gratitude Journal writing control group Pre test and post test. Refer Table 34, There was no significant

difference in the test score of Anxiety in Gratitude Journal writing control group for pretest (M=17.200, SD=6.131) and Post test (M=18.000, SD=6.187); $t(14) = 1.247$, $p = .233$

A paired sample t test performed to test the score of Stress in Gratitude Journal writing control group Pre test and post test. Refer Table 34. There was no significant difference in the test score of Stress in Gratitude Journal writing control group for pretest (M=24.000, SD=5.554) and Post test (M=23.067, SD=3.063); $t(14) = .798$, $p = .438$

A paired sample t test performed to test the score of Self Compassion in Gratitude Journal writing control group Pre test and post test. Refer Table 34. There was no significant difference in the test score of Self Compassion in Gratitude Journal writing control group for pretest (M=2.800, SD=.323) and Post test (M=2.770, SD=.351); $t(14) = .787$, $p = .445$

A paired sample t test performed to test the score of Self Criticism in Gratitude Journal writing control group Pre test and post test. Refer Table 34, There was no significant difference in the test score of Self Criticism in Gratitude Journal writing control group for pretest (M=28.467, SD=11.519) and Post test (M=29.400, SD=9.912); $t(14) = 1.230$, $p = .239$

Highlight and summary of Table 34&35

Gratitude journal writing control group reveals the following. There is no significant change in pre and post test of depression $t(14) = 1.309$, anxiety $t(14) = 1.247$, stress $t(14) = 0.798$, self-criticism $t(14) = 1.23$ and self compassion $t(14) = .787$. The p value is >0.2 in all the five variables indicates there is no significant change observed in control group.

The results show there is no significant difference in the pre and post test scores in control group.

Conclusion of the results in phase 2

Therefore, the above results show that **Hypothesis 3 (H₃)**, ‘There would be significant decrease in self- criticism and increase in self-compassion in “Women with PCOS” after the intervention of Pranayama, mirror work and Gratitude journal writing as compared to control group’. **(H₃) is accepted.**

H₃ – Hypothesis 3. Accepted

The above results show that **Hypothesis 4 (H₄)**, ‘There would be a significant decrease in stress, anxiety and depression in “Women with PCOS” after the intervention of Pranayama, mirror work and Gratitude journal writing as compared to control group’. **(H₄) is accepted.**

H₄ – Hypothesis 4. Accepted.

4.4 DISCUSSION

4.4.1 Comparison between women with and without PCOS

The main objective of the study in phase 1 was to compare “Women with PCOS” to those without the illness psychologically, concentrating on differences in stress, anxiety, and depression using the DASS-21. Self-criticism was also examined in this research in women with and without PCOS. This groundbreaking research used the FSCRS scale to quantify self-criticism in PCOS women and compared it to healthy, non-PCOS women. Although there have been some studies about PCOS and self-compassion, this research has used the Self-Compassion Scale to conduct a thorough investigation of self-compassion. This study aimed to clarify the significant differences in depression, anxiety, and stress levels between “Women with PCOS” and those without it. The results of this study also unequivocally show that there was a substantial difference between the two groups' degrees of self-compassion and self-criticism. In the given sample group of **PCOS women have exhibited high depression, anxiety and stress as compared to women without the condition** (Addressed Research question 2)

Significant differences in mental health markers between the two groups are shown by our results. In comparison to women without PCOS, those with the disorder reported

greater levels of stress ($p=0.000$), anxiety ($p=0.000$), and depression ($p=0.000$). This discovery is consistent with the body of research that has previously addressed the possibility of psychological problems in “Women with PCOS” as a result of the physical and hormonal impacts of the disorder (Cinar et al., 2011).

In this sample group of **“Women with PCOS” have exhibited more self criticism and less self compassion than Non PCOS women** (Addressed Research question 1 & 3)

In addition, compared to women without PCOS, “Women with PCOS” showed significantly higher levels of self-criticism ($p=0.000$) and lower levels of self-compassion ($p=0.000$). Self-criticism may be harmful to mental health and exacerbate depressive and anxious emotions. It is characterised by negative self-evaluation and self-blame. On the other hand, enhanced psychological resilience and general well-being are associated with self-compassion, which is characterised by self-kindness and self-understanding in light of personal adversities. This research is the first to evaluate PCOS women's self-criticism.

The findings of the research highlight the significance of attending to the psychological well-being of “Women with PCOS” and provide insightful information on the mental health difficulties they face.

These results highlight the unique psychological challenges faced by “Women with PCOS” and highlight the need for specialised therapies to meet their mental health requirements. The elevated levels of stress, anxiety, and depression highlight how crucial it is to include psychological well-being assistance in the all-encompassing care and treatment of PCOS. When providing mental health services to “Women with PCOS” diagnosis, mental health practitioners should be aware of these increased risks and take into account suitable therapies to reduce psychological discomfort.

According to Papalou & Kandarakis (2016), stress is thought to have a significant role in PCOS. In addition, tension and anxiety were evaluated in this research and compared to non-PCOS participants. This finding is consistent with other research highlighting the increased vulnerability to mental health issues in PCOS patients as a result of the physical and hormonal consequences of the illness (Cinar et al., 2011). Ehrmann (2005)

states that oligomenorrhea, infertility, hirsutism (excessive development of coarse face and body hair), male pattern baldness, acne, and obesity are among the signs of PCOS disease. In addition to experiencing physical disturbances and illnesses, “Women with PCOS” are also more likely to develop mental illnesses such as depression, bipolar disorder, stress, body dissatisfaction, sexual dissatisfaction, and poor health-related quality of life (Melissa et al. 2006).

Self-criticism, which entails self-blame and negative self-evaluation, may be harmful to mental health and exacerbate anxiety and depression symptoms. On the other hand, psychological resilience and general well-being are associated with self-compassion, which is characterised by self-kindness and understanding in light of personal adversities.

Women with polycystic ovarian syndrome were shown to have low levels of body and self compassion. (Van Niekerk and others, 2022).

Moreover, women grappling with PCOS exhibited heightened self-criticism coupled with reduced self-compassion when just exposed with women who did not have PCOS. These results accentuate the distinctive psychological hurdles confronted by women dealing with PCOS, emphasizing the necessity for tailored interventions aimed at addressing their mental well-being requirements. These study findings are in concordance with a prior investigation by Light (2020), which similarly underlined the potential psychological distress resulting from the perception of illness in the context of PCOS. The formulation of self-management interventions catering to the needs of “Women with PCOS” becomes imperative.

The heightened levels of depression, anxiety, and stress uncovered within this demographic highlight the essential nature of incorporating mental health support within the comprehensive framework of PCOS care and management. Mental health professionals who work with women diagnosed with PCOS should be cognizant of these elevated risks and contemplate appropriate measures to alleviate psychological distress.

The outcomes of our present study align with earlier research that has established a connection between PCOS and psychological symptoms. Our findings correspond with the discoveries of Asdaq et al. (2020), who identified a statistically significant and heightened presence of emerging depression, anxiety, and stress in PCOS individuals

when compared to those without the condition. The evaluation of the severity of depression, anxiety, and stress was accomplished using the DASS-21 assessment tool. This research concentrates specifically on the presence of self-critical tendencies and lack of self-compassion in “Women with PCOS”, factors that can significantly impact their mental well-being. Interestingly, despite conducting an extensive literature review, no prior research on self-criticism in PCOS-affected women was identified. Thus, this study is groundbreaking in its exploration of self-criticism using the FSCRS scale among “Women with PCOS”, revealing a higher prevalence rate when compared to healthy controls. Similarly, this study is also one of the few to gauge self-compassion among PCOS women, with significant differences found when compared to matched controls utilizing the 26-item Self-Compassion Scale (SCS). The study evaluated the impacts of interventions such as pranayama, mirror work, and gratitude journal writing, with results indicating that participation in these interventions led to reductions in depression, anxiety, stress, and self-criticism, alongside fostering increased self-compassion.

Furthermore, the findings from this research bring out the necessity of formulating targeted interventions to tackle the psychological obstacles encountered by “Women with PCOS”. A previously discussed article on the effectiveness of gratitude journal writing in “Women with PCOS” (referred to as Austin et al., 2021) offers invaluable insights into such an intervention. Gratitude journal writing has demonstrated promising outcomes in diminishing depression, anxiety, stress, and self-criticism, while concurrently elevating self-compassion within this demographic. Integrating interventions like gratitude journal writing into the treatment regimens for PCOS women could potentially enhance their mental health outcomes and overall quality of life.

The present research aligns with previous studies that have identified a connection between PCOS and psychological symptoms. Previous studies have indicated that PCOS is associated with the likelihood of developing mood disorders, anxiety disorders, and a reduced quality of life (Veltman-Verhulst et al., 2012). The current findings contribute to the evidence by specifically addressing the self-critical tendencies, factors that significantly affect their mental well-being.

As with any study, this research does have limitations that merit consideration. The employed cross-sectional design provides insights into the association between PCOS and mental health indicators, but it doesn't establish a causal relationship. Future longitudinal studies would be instrumental in elucidating the temporal dynamics between PCOS and psychological well-being. Additionally, the study's focus on a specific demographic necessitates further research encompassing larger and more diversified populations.

The implications extend to clinical practice, underscoring the significance of integrating mental health assessment and support into the management of PCOS. Furthermore, our research underscores the necessity for the development of targeted interventions aimed at tackling the psychological challenges faced by “Women with PCOS”.

In conclusion, this study unveils the mental health obstacles confronted by “Women with PCOS”, highlighting their elevated levels of depression, anxiety, stress, self-criticism, and lower levels of self-compassion in comparison to women without the condition. These revelations accentuate the requirement for personalized interventions aimed at addressing the psychological welfare of PCOS-affected women. The inclusion of positive psychological interventions like gratitude journal writing, mirror work and pranayama as exemplified in the previously mentioned study, could provide crucial assistance in ameliorating mental health outcomes for this group. By embracing a holistic approach that encompasses both the psychological and physiological facets of PCOS, healthcare practitioners can effectively bolster the overall well-being and life quality of women grappling with this condition.

4.4.2 Pranayama Pre-Post Intervention

The research aimed to examine the impact of a closely supervised three-month pranayama intervention in reducing depression, anxiety, and stress levels while increasing self-compassion and decreasing self-criticism among PCOS women,

There was significant reduction of depression, Anxiety and stress in the experimental group after the intervention of Pranayama in “Women with PCOS”

The pranayama intervention had a significant effect on the participants' mental well-being. Those in the experimental group, who regularly practiced pranayama, had a notable reduction in depression ($p=0.000$), anxiety ($p=0.000$), and stress ($p=0.000$) scores compared to their baseline measurements. These results suggest that pranayama practice may serve as an effective intervention for mitigating symptoms of depression, anxiety, and stress in women PCOS women. Cohen's d is greater than 1 in all the three variables indicates a large effect size.

There was significant decrease in self criticism and increased self compassion in experimental group of “Women with PCOS” after the intervention of Pranayama

Notably the pranayama intervention demonstrated a notable decrease of self-criticism ($p=0.000$) among the participants. The capacity of pranayama to alleviate self-critical tendencies can be instrumental in enhancing the overall well-being of these women and promoting a more positive self-perception.

Furthermore, our study revealed a significant enhancement in self-compassion ($p=0.000$) among the experimental group following the pranayama intervention. This observed elevation in self-compassion suggests that pranayama practice can cultivate a kinder and more self-accepting attitude, which is especially beneficial for “Women with PCOS” who may grapple with various physical and emotional challenges.

Cohen's d is greater than 1 in both variables indicates a large effect size.

There were no significant changes in Depression, Anxiety, Stress in “Women with PCOS” in Pranayama control group

Significantly, the control group, who didn't undergo the pranayama intervention and continued with their regular routines, did not exhibit substantial changes in their mental health indicators depression ($p=.635$), anxiety ($p=.499$), stress ($p=.308$). This further bolsters the assertion that the positive outcomes observed in the experimental group can indeed be attributed to pranayama practice.

There were no significant changes observed in self criticism and self compassion in PCOS women in Pranayama control group

The control group, who were requested to remain with the regular activities had not shown significant changes in their self criticism ($p=.536$), upon FSCRS and self

compassion ($p = .869$) (SCS 26 item) level. This further strengthens the proposition that the positive outcomes observed in the experimental group can indeed be attributed to the practice of pranayama.

Hence, this study's findings offer valuable insights into the potential advantages of pranayama practice on the mental health parameters within this specific population. The significant results may be attributed to the consistent motivation provided by the researcher for daily pranayama practice and the dedication of participants who sought to instigate change, particularly given that they were from a fertility center. The smaller group size of 15 members allowed the investigator to offer more personalized attention and support to each participant.

Our study aligns with research published in the *Journal of Traditional and Complementary Medicine* (Jagadeesan et al., 2022), which found that Bhramari Pranayama intervention was effective for COVID-19 patients in reducing depression, anxiety, and stress in isolation, as well as enhancing their sleep quality and overall well-being. It also correlates with a systematic review conducted by Thakur (2021), which emphasized the potential of pranayama to reduce mental tension, stress, and anxiety in individuals. Moreover, another study published in the *International Research Journal of Ayurveda & Yoga* (Dayal, 2023) concluded that yoga and pranayama can help alleviate anxiety by regulating the HPA axis, reducing physiological arousal, and increasing heart rate variability, resulting in overall improvements in mental and physical health. Our study is consistent with these findings, as the controlled breathing techniques in pranayama lead to relaxation and reduced stress responses (Saraswati, 2013).

Additionally, the capacity of pranayama to enhance mental health aligns with our examination of other mind-body practices such as yoga and meditation, which have demonstrated effectiveness in reducing symptoms of depression and anxiety in various populations (Pascoe et al., 2017). Note the underlying physiological mechanisms that may contribute to the observed benefits of pranayama.

Acknowledging the fundamental physiological mechanisms that might contribute to the observed advantages of pranayama is vital. The deliberate breathing techniques inherent in pranayama are thought to stimulate the parasympathetic nervous system,

leading to relaxation and diminished stress responses. Additionally, pranayama might augment emotional regulation, enhance concentration and attentiveness, all of which potentially contribute to the observed enhancements in mental health markers (Jerath et al., 2015).

While this study presents encouraging results, several limitations necessitate consideration. The relatively modest sample size and the singular demographic (“Women with PCOS”) confine the applicability of the findings. Expanding research to encompass more extensive and varied populations would bolster the strength and relevance of the conclusions. Additionally, the study's three-month duration could have influenced the observed outcomes, and extended follow-up investigations could shed light on the sustainability of the intervention's effects.

In summary, this research furnishes substantiation for the effectiveness of pranayama in reducing depression, anxiety, stress, and self-criticism, along with elevating self-compassion in women dealing in PCOS women. The significant strides noted in the experimental group indicated that pranayama could serve as a valuable supplementary approach within the comprehensive care framework for “Women with PCOS”, targeting not only the physical facets of the condition but also the mental well-being. Medical professionals and healthcare providers might contemplate integrating pranayama techniques into treatment strategies for “Women with PCOS” to fortify their mental health and overall quality of life.

The outcomes of this study pave the way for further exploration, encompassing randomized controlled trials involving more substantial and more diversified participant pools. Additionally, investigations into the prolonged impacts of pranayama on mental health among “Women with PCOS” could yield insights into the sustainability of the intervention's effects. Such scholarly pursuits would contribute to an enhanced comprehension of the potential advantages offered by pranayama practice and its role in fostering mental health among individuals with PCOS and related conditions.

However, there are several intrinsic limitations to this research. First off, the small sample size may have raised questions about the results' wider application. Second, the research was carried out in a particular clinical setting—the Women's Hospital and Fertility Centre at Srushti Fertility Centre in Chennai, India. Furthermore, the research's cultural context—India, with its distinct social and family pressures—may have had an impact on the results, highlighting the need for such studies in other cultural contexts. Thirdly, it's important to note that we relied on a self-report methodology to gauge levels of depression, anxiety, stress, as well as self-criticism and self-compassion. While this approach is widely used, it does come with inherent subjectivity, susceptibility to biases, and reliance on an individual's sincerity and self-perception. Fourthly, potential recall bias might have been introduced, and the study's focus on a single hospital raises considerations regarding the representativeness of the findings across a broader healthcare landscape.

The integration of pranayama into PCOS management presents notable limitations and culturally specific implications that affect its acceptance and accessibility across diverse populations. In Western or scientifically oriented societies, pranayama may be dismissed as lacking empirical support, despite emerging research suggesting its role in reducing stress and improving insulin sensitivity—both important factors in managing PCOS symptoms. In more conservative or traditional societies, such as those in South Asia, the Middle East, or parts of Africa, menstrual and reproductive health are often stigmatized topics. This cultural silence can prevent women from seeking support or participating in practices like pranayama, especially in public or group settings where privacy is limited.

While the practice itself is free, structured instruction or access to yoga therapy may be limited in low-income or rural areas. Additionally, time constraints and domestic responsibilities can hinder women, particularly in urban settings, from incorporating pranayama into their daily routines without institutional support.

Despite these barriers, the implications of promoting pranayama are significant. In countries where yoga is culturally integrated, such as India, it offers a low-cost, non-invasive complement to conventional treatment. Globally, the rise of wellness trends creates an opportunity to normalize pranayama as part of holistic health care. Its

psychological benefits—such as alleviating anxiety and depression, which are prevalent among women with PCOS—enhance its value.

To conclude, this study underscores the effectiveness of Pranayama, a yogic breathing technique, as a potent intervention for mitigating psychological distress encompassing Depression, Anxiety, and Stress. Additionally, it has demonstrated its efficacy in diminishing self-criticism while fostering an augmentation of self-compassion among women diagnosed with PCOS. The outcomes suggest a viable integration of Pranayama within the spectrum of PCOS management, to bolster mental health outcomes in tandem with conventional care practices.

The absence of noteworthy changes within the control group further substantiates the case for Pranayama's efficacy as a means to enhance psychological well-being in women dealing with PCOS.

4.4.3 Mirror Work Pre-Post Intervention

This marks the inaugural intervention study employing mirror work in PCOS women. Our primary goal in the research is to find the efficacy of mirror work as a practice to enhance self-compassion while reducing depression, anxiety, stress, and self-criticism in women diagnosed with Polycystic Ovary Syndrome (PCOS). In the discussion section, we will delve into the theoretical and practical implications of the study, draw comparisons with prior research, delineate the limitations, and suggest avenues for future research.

PCOS, a complex hormonal disorder, often leads to psychological distress, including depression, anxiety, stress, and self-criticism. In response, we focused on mirror work, a simple and cost-effective method that can be practiced independently. It involves positive self-affirmations in front of a mirror. This study aimed to offer a unique intervention to enhance self-compassion and mitigate destructive psychological symptoms like self-criticism, depression, anxiety, and stress in this population. Comparisons with previous research underscore both consistencies with existing findings and novel contributions.

There exists a significant difference in Depression, Anxiety and stress in the experimental group of “Women with PCOS” women after the intervention of Mirror Work.

In our study, the experimental group engaged in Mirror Work sessions, whereas the group in control did not receive any specific intervention. Results stipulated remarkable decrease in experimental group after Mirror Work intervention, with no significant changes observed in control group. Concerning the psychological variables measured, the experimental group demonstrated a noteworthy decrease in depression ($p = .000$), anxiety ($p = .000$), stress ($p = .000$). Cohen's d is greater than 1 in all the three variables indicates a large effect size.

There exhibited a significant difference in Self criticism and self compassion in the experimental group of Mirror Work in “Women with PCOS”

There was a notable decrease in self-criticism ($p = .000$), along with a noteworthy increase in self-compassion ($p = .000$). These outcomes suggest that Mirror Work can be a valuable intervention for “Women with PCOS”, as it positively influences various aspects of their psychological well-being. Cohen's d is greater than 1 in both variables indicates a large effect size.

No significant changes observed in Depression, Anxiety, and stress among control group of mirror work “Women with PCOS”

In contrast, the control group did not display significant changes in depression ($p = .217$), anxiety ($p = .876$), stress ($p = .663$),

No significant changes observed in self criticism and self compassion in mirror work control group of “Women with PCOS”

Self-criticism ($p = .125$) and self compassion ($p = .786$). This supports the idea that the improvements observed in the experimental group can be attributed specifically to the Mirror Work intervention, ruling out the influence of other confounding factors. The absence of significant changes in the control group strengthens the evidence for the effectiveness of Mirror Work in enhancing psychological well-being among “Women with PCOS”.

Our results align with the results of Petrocchi et al. (2016), where mirror work was found to increase the effectiveness of self-compassion interventions by stimulating the soothing effect system through parasympathetic activity. Furthermore, our study is in line with previous research indicating that mirrors can be a tool for boosting self-compassion by facilitating compassionate self-talk, fostering kindness and connectedness when facing challenging situations, and promoting the cultivation of positive emotions (Muris & Petrocchi, 2017). Our study's findings diverge from Selimbegović et al.'s (2013) study, which indicated that merely facing a mirror was sufficient to decrease latencies for suicide-related words compared to neutral content. Similarly, our results contrast with Monéger et al.'s (2020) findings, where the mirror effect could not be supported or refuted. Our research findings significantly support the improvement of depression, anxiety, stress, self-compassion, and self-criticism with the Mirror Work intervention. This effect may be attributed to the participants' dedicated commitment to improvement, reinforced by the researcher through a continuous 21-day training program. Additionally, the participants were a clinical population diagnosed with PCOS from a fertility center, allowing the investigator to provide individualized attention to each participant in the smaller group of 15 members. This personalized approach likely contributed to the impactful results, as it fostered a habit change in thinking patterns. Notably, participants expressed interest in continuing the Mirror Work practice even after the 21-day intervention.

Women diagnosed with Polycystic Ovary Syndrome (PCOS) often have difficulties about their unhappiness with their physical appearance, imbalances in their hormones, and concerns about their ability to conceive. These obstacles can lead to increased levels of despair, anxiety, stress, self-criticism, and reduced self-compassion. Mirror Work provides a pragmatic, easily approachable, and economical remedy that specifically targets these issues and promotes a more favourable self-image. The correlation between heightened self-compassion and enhanced psychological well-being and resilience implies the importance of self-compassion in aiding “Women with PCOS” in managing the difficulties they face. Furthermore, the significant reduction in self-criticism scores suggests that Mirror Work therapies could potentially mitigate self-critical inclinations in “Women with PCOS”. Through the use of self-reflection exercises facilitated by a mirror, individuals can confront negative self-perceptions and

cultivate a mind-set that is more accepting and supportive of oneself. This is an important step, given the connections between self-criticism and psychiatric suffering.

The experimental group, engaging in Mirror Work practice for 21 days, demonstrated significant improvements in self-compassion and significant decreases in self-criticism, depression, anxiety, and stress compared to the control group. These results underline the potential effectiveness of Mirror Work in promoting self-compassion while mitigating self-criticism and alleviating depression, anxiety, and stress.

These findings are supported by feedback from the Mirror Work WhatsApp group, where participants reported finding the practice self-motivating, easy to follow, and transformative. They noted positive changes in self-perception and highlighted the cost-effectiveness and flexibility of the method.

While studies on the effects of Mirror Work in “Women with PCOS” are limited, similar interventions in other populations have demonstrated positive outcomes in self-compassion (Petrocchi et al., 2016; Muris & Petrocchi, 2017). These findings further emphasize that Mirror Work can be a valuable tool for enhancing self-compassion and reducing self-criticism, depression, anxiety, and stress across diverse populations.

From a practical standpoint, Mirror Work is a simple, economical intervention that can be effortlessly integrated into the self-care routines of “Women with PCOS”. By incorporating Mirror Work into their daily lives, these women may experience reduced levels of depression, anxiety, stress, and self-criticism, along with increased self-compassion, ultimately improving their psychological well-being.

The findings align with the theoretical framework proposed by Kristin Neff, who developed the Self-Compassion Scale (SCS) (Neff, 2003a). All six subscales of the SCS were found to be positively influenced by Mirror Work practice. These results substantiate experiential evidence for the efficacy of Mirror Work in cultivating self-compassion and align with Neff's theoretical model.

The participant group size was not large, hence limiting the universality of the findings. The study heavily relied on participants' self-reported accounts, which may be subject to personal biases and might not capture the full range of their experiences. Incorporating objective measurements and long-term assessments could provide a more robust evaluation of the intervention's effects. Expanding the participant pool to include larger and more diverse groups in future research would enhance the applicability of the findings.

Moreover, this study was conducted exclusively within the specific clinical environment of the Srushti Fertility Centre and Women's Hospital in Chennai, India. Given the potential influence of cultural context and the specific population seeking treatment, careful considerations should be taken when extending the findings.

Furthermore, this study focused solely on the short-term effects of Mirror Work over a 21-day intervention period. Exploring the long-term impacts of Mirror Work and its potential role in preventing the recurrence of psychological symptoms could provide valuable insights for developing evidence-based interventions.

Future research could delve into the optimal duration and frequency of Mirror Work practice for “Women with PCOS”. While this study implemented a 21-day intervention period based on the established pattern of Mirror Work by Louise Hay (with permission from the Hay House Foundation), the most effective duration and potential cumulative effects over an extended period remain unexplored. Investigating the long-term effects of Mirror Work and its role in preventing the relapse of psychological symptoms would offer valuable insights for the development of evidence-based interventions.

Additionally, conducting randomized controlled trials with larger sample sizes and more diverse populations would enhance the robustness of the findings. Exploring the differential effects of Mirror Work in subgroups of “Women with PCOS”, such as those with varying levels of depression or anxiety, could help identify individuals who may benefit most from this intervention. Moreover, investigating the mechanisms underlying the observed changes in self-compassion and psychological well-being,

such as changes in cognitive processes or self-perception, could provide a deeper understanding of the therapeutic effects of the intervention.

In conclusion, the findings of this study suggest that Mirror Work positively impact the psychological well-being of “Women with PCOS”. The substantial improvements in depression, anxiety, stress, self-compassion, and self-criticism scores emphasize the importance of addressing self-acceptance, and self-reflection in interventions for “Women with PCOS”. Mirror Work offers a unique approach, using mirrors as a tool to facilitate self-reflection and self-acceptance, ultimately leading to improved psychological outcomes.

The practice of mirror work - engaging in self-affirmation and self-compassion while looking at oneself in a mirror—carries nuanced limitations and implications when applied in the context of PCOS, particularly across different cultural and social contexts. For many women with PCOS, body image disturbances, low self-esteem, and internalized shame are common due to visible symptoms such as acne, weight gain, or hirsutism. Mirror work has the potential to support emotional healing by fostering self-acceptance and body neutrality. However, its effectiveness and cultural resonance are not universal. In societies where body image is heavily influenced by rigid beauty standards—whether Westernized ideals of thinness or culturally specific expectations of femininity—mirror work may initially provoke distress rather than relief, as it confronts deeply internalized judgments and insecurities. This emotional discomfort can be especially acute for women with PCOS, whose symptoms often place them outside of socially sanctioned norms of attractiveness and desirability.

Cultural attitudes toward self-expression and introspection further shape the reception of mirror work. In collectivist cultures where humility is emphasized and self-praise is discouraged, looking into a mirror and speaking affirmations may be seen as narcissistic or culturally inappropriate. Similarly, in religiously conservative environments, discussing or engaging with the body in such an intimate and personal way may be considered taboo or shameful. Privacy is another practical constraint—women living in crowded or intergenerational households may lack the safe, uninterrupted space

necessary to perform mirror work without fear of judgment or interruption. Moreover, in communities where mental health practices are still stigmatized or underprioritized, mirror work may be dismissed as strange, frivolous, or irrelevant.

Nevertheless, when culturally and contextually adapted, mirror work can offer powerful psychological benefits for women with PCOS. It can aid in disrupting negative self-talk, increasing emotional resilience, and cultivating a more compassionate relationship with the body—especially in the face of chronic symptoms that can feel alienating. In therapeutic or group settings, mirror work can be guided sensitively to reduce initial discomfort and be combined with journaling or counseling to deepen its effects. For populations where direct mirror-based affirmation may not be culturally acceptable, adaptations such as visualization exercises or spoken affirmations without a mirror can preserve core benefits while respecting cultural boundaries. Ultimately, while mirror work is not universally accessible or comfortable, its thoughtful integration into PCOS care—especially as part of body image and self-worth interventions—can contribute meaningfully to the emotional well-being of affected women when implemented with cultural empathy and psychological sensitivity.

To sum up, this study adds valuable insights to the existing literature by investigating how Mirror Work practice influences the self-compassion and psychological well-being of “Women with PCOS”. Mirror Work is beneficial for enhancing self-compassion, reducing self-criticism, stress, anxiety, and depression in this specific population. The practical implications of incorporating Mirror Work as a self-care tool are noteworthy, as it provides a simple, cost-effective, and accessible means to improve psychological well-being. Nonetheless, it's crucial to underscore the need for further research to validate and expand upon these findings, address study limitations, and explore additional variables that may influence the efficacy of Mirror Work as an intervention for “Women with PCOS”. Future research can build upon this study, exploring various aspects of the psychological variable of self-criticism in “Women with PCOS” and its diverse management strategies.

4.4.4 Gratitude Pre-Post Intervention

This study affirms that a well-monitored six-week Gratitude Journal writing intervention significantly reduces self-criticism, stress, anxiety and depression scores among women diagnosed with Polycystic Ovary Syndrome (PCOS). Similar positive outcomes were observed for self-compassion among participants who practiced Gratitude journal writing. Additionally, those engaging in Gratitude journal writing reported a noteworthy decrease in self-criticism levels. Conversely, the control group, which continued with their regular routines, did not exhibit any significant changes in their mental well-being. This research study sheds light on the effects of gratitude journal writing on mental health indicators in women living with PCOS, offering valuable insights into the potential benefits of this intervention. The previously mentioned study on the effectiveness of gratitude journal writing in “Women with PCOS” (Austin et al., 2021) provides valuable insights into such interventions. Gratitude journal writing has shown promising results in reducing self-criticism, stress, anxiety and depression while also boosting self-compassion in this population.

There was significant reduction in Depression, Anxiety and stress in the experimental group of “Women with PCOS” after the intervention of Gratitude Journal Writing

The findings from this research have shown a significant reduction in stress, anxiety and depression using DASS -21. Our findings reveal substantial improvements in the experimental group following the intervention. The statistical significance with p-values for depression ($p = .000$), anxiety ($p = .000$), stress ($p = .000$).Cohen’s d is greater than 1 in all the three variables indicates a large effect size.

There was a significant difference in Self criticism and self compassion after the intervention of Gratitude Journal writing in the experimental group of PCOS women

Self-criticism ($p = .000$) underscores the potential effectiveness of gratitude journaling as an intervention tool. Furthermore, the increase in self-compassion ($p = .000$) levels

post-intervention indicates the positive impact of gratitude journal writing. Cohen's d is greater than 1 in both variables indicates a large effect size.

There were no significant changes in Depression, Anxiety and stress among control group of “Women with PCOS”

In contrast, the control group exhibited no significant changes in depression ($p = .212$), anxiety ($p = .233$), stress ($p = .438$)

There were no significant alterations in Self criticism and self compassion in control group of gratitude journal writing “Women with PCOS”

Self-Criticism ($p = .239$), and self-compassion ($p = .445$). These results further validate the influence of gratitude journal writing on mental well-being.

Our study provides useful insights into a less studied topic, highlighting the effectiveness of thankfulness diary writing in a specific demographic. PCOS has a complex impact on a woman's body, including irregular menstrual cycles, obesity, infertility, and hirsutism. This condition can significantly affect psychological well-being (Cinar et al., 2011). Therefore, utilising uncomplicated yet efficient methods such as keeping a thankfulness book can be advantageous in alleviating the psychological anguish linked to PCOS.

The study found that engaging in gratitude journal writing had a significant impact on reducing melancholy, anxiety, tension, and self-criticism. Additionally, it significantly influenced the levels of self-compassion in the experimental group. The results are consistent with the findings of Fekete et al. (2022), who proposed that engaging in gratitude writing might effectively sustain gratitude levels, alleviate stress, and mitigate negative emotions. Our study aligns with the findings of Austin et al. (2021) published in the Journal of Frontiers in Psychology and Lathren et al. (2018) published in the Journal of Adolescent Research. These studies suggest that interventions based on compassion practices target both negative self-talk and self-directed kindness. These methods have been proven to provide favourable results, such as reducing feelings of isolation, promoting a stronger sense of interpersonal connection, and improving one's capacity to adapt to physical limitations after completing the treatment program. However, our study diverges from Komase et al. (2021) as they claimed that the impact of thankfulness interventions on well-being remains uncertain. The results of our study

provide evidence that the practice of creating a gratitude notebook can effectively decrease self-criticism and improve self-compassion.

Our findings contrast with the findings of research such as Layous et al. (2013), which proposed that gratitude letters may be successful in certain cultures but not in others, with nations like India perhaps not seeing full benefits (Fekete et al., 2022). Notably, the practice of writing thanks was effective with our Indian participants. A study conducted by Bohlmeijer and colleagues in 2021, published in the *Journal of Happiness Studies*, investigated the impact of a six-week program focused on gratitude practices, primarily consisting of written tasks. Although this intervention did not decrease the distress levels of the participants, it did result in improved well-being compared to groups that focused on self-compassion or received no specific therapy. Nevertheless, our investigation produced favourable outcomes, such as a decrease in stress levels and an enhancement in overall well-being. The divergence in results from previous studies can be ascribed to the fact that our volunteers were sourced from a reproductive centre and were provided with regular encouragement by the researcher, in addition to their dedicated endeavours to achieve favourable outcomes.

An article published in the journal *Frontiers in Psychology* (Sztachañska et al., 2019) revealed that female breast cancer patients who participated in a daily thankfulness writing exercise for a duration of two weeks had enhancements in their overall psychological well-being on a daily basis. Additionally, these women indicated a heightened sense of support and had an enhanced utilisation of advantageous coping strategies. Our findings are consistent with the findings of this investigation. The participants in our study reported good outcomes, including increased happiness, enhanced confidence, notable changes in thinking patterns, reduced stress, and an overall improvement in mental state. Significantly, our intervention exhibited effectiveness within a relatively brief timeframe (six weeks), establishing thankfulness journaling as a pragmatic and economical intervention that may readily be incorporated into the daily regimens of “Women with PCOS”.

These findings provide additional evidence that the practice of writing in a thankfulness diary can be a beneficial method for improving self-compassion and decreasing sadness, anxiety, stress, and self-criticism in various groups of people.

This study adds to the existing body of knowledge on the use of gratitude diary writing as a tool to improve mental well-being, from a theoretical standpoint. In addition, performing experiments with bigger sample sizes would increase the strength and reliability of the results. However, further investigation is necessary to replicate and expand upon these findings.

Regarding the psychological variables assessed, the experimental group exhibited a noteworthy reduction in despair, anxiety, tension, and self-criticism, accompanied by a substantial enhancement in self-compassion. The results indicate that keeping a thankfulness notebook can be a helpful treatment for “Women with PCOS”, improving many elements of their mental well-being. Moreover, the notable reduction in self-criticism ratings indicates that gratitude journaling interventions could potentially mitigate self-critical inclinations in women diagnosed with PCOS. Minimising self-criticism is crucial, since it has been associated with heightened psychological suffering and diminished overall well-being. Furthermore, the notable rise in self-compassion ratings suggests that the practice of writing in a gratitude diary can potentially elevate levels of self-compassion in “Women with PCOS”. Enhanced self-compassion is associated with enhanced psychological well-being and resilience, indicating its potential significance in assisting “Women with PCOS” in managing the difficulties they encounter.

The absence of disparity in the control group further reinforces the data supporting the efficacy of gratitude diary writing as an intervention for augmenting psychological well-being.

In order to improve the outcomes, future investigations should incorporate more extensive samples. It is important to consider that the cultural context and the characteristics of the population seeking therapy may influence the results. Therefore, it is necessary to be cautious when applying these findings to other contexts. Additional research is necessary to reproduce and build upon these findings and to overcome the study's constraints, particularly if there are changes in the demographics of the participants. In addition, a more in-depth investigation might examine the enduring behaviours and effects of keeping a thankfulness notebook on the mental health and self-compassion of “Women with PCOS”. Furthermore, conducting randomised

controlled trials with larger and more diverse participant samples would enhance the strength and reliability of the results.

The practice of gratitude journaling in the context of PCOS management carries important limitations and implications that vary across cultural and social settings. While gratitude journaling has been linked to improved psychological well-being, reduced stress, and enhanced emotional regulation—all of which are relevant for managing the psychosocial burden of PCOS—its adoption and perceived legitimacy can be influenced by a range of contextual factors. In many cultures, especially those with a strong biomedical focus, mental and emotional health practices like journaling may be viewed as ancillary or even trivial in comparison to pharmacological treatment, thereby limiting their uptake. Moreover, in societies where emotional expression is discouraged or where women's emotional experiences are undervalued, journaling may not be socially reinforced or encouraged as a valid coping strategy.

Cultural norms surrounding literacy and privacy also play a role. In low-literacy communities, the written aspect of journaling may present a barrier, especially if individuals are unfamiliar with reflective writing or have limited formal education. In collectivist cultures, where verbal storytelling or shared experiences are more culturally appropriate than solitary written reflection, journaling may feel unnatural or isolating. Additionally, privacy concerns—especially in tightly knit households where personal belongings are not easily safeguarded—can deter individuals from maintaining a journal that includes sensitive emotional content.

Despite these limitations, the implications of gratitude journaling for women with PCOS are potentially significant. Given that PCOS is often accompanied by anxiety, depression, and body image distress, regular journaling focused on gratitude can serve as a simple, cost-free tool for fostering resilience and emotional balance. When implemented thoughtfully, it can promote self-awareness and a sense of control, especially in a condition that often feels overwhelming and unpredictable. In supportive cultural contexts, group-based adaptations—such as facilitated discussions or gratitude circles—can preserve the core psychological benefits while aligning with local values and norms. Health educators and clinicians can also introduce gratitude journaling as part of broader psychoeducational interventions, tailoring it to different levels of

literacy and cultural acceptability. Ultimately, while gratitude journaling may not be universally intuitive or accessible, it holds promise as a flexible and empowering mental health strategy when adapted to the diverse social realities of women living with PCOS.

Ultimately, this study enhances our understanding of the possible benefits associated with the act of writing a gratitude notebook in improving self-compassion and addressing psychological symptoms in “Women with PCOS”. These findings are important for therapeutic applications, highlighting the importance of including self-compassion therapies within the comprehensive care approach for persons with PCOS.

CHAPTER 5

SUMMARY AND CONCLUSION

5.1. Summary

This study sheds light on the difficulties that women who have polycystic ovary syndrome (PCOS) encounter in terms of their mental health. It does so by revealing that women with PCOS experience higher levels of sadness, anxiety, stress, and self-criticism, as well as lower levels of self-compassion. Given these findings, it is clear that women who are coping with polycystic ovary syndrome (PCOS) require individualized approaches to improve their mental health. The implementation of positive psychological methods, such as keeping a gratitude notebook, as proven in the earlier study, has the potential to improve mental health outcomes for the demographic that is being discussed here. It is possible for healthcare providers to adopt a complete approach to support women who have polycystic ovary syndrome (PCOS) if they take into account both the psychological and physical components of the condition.

The findings of this study give compelling evidence that pranayama, a breathing technique traditionally associated with yoga, can be an effective intervention for lowering psychological distress, such as anxiety, stress, and depression, among women who have polycystic ovary syndrome (PCOS). Additionally, it has been shown to be useful in lowering levels of self-criticism and raising levels of self-compassion among this population. According to these findings, pranayama could be introduced into the management of polycystic ovary syndrome (PCOS) in order to improve mental health outcomes in addition to normal care. This study highlights the relevance of addressing psychological factors in addition to physical symptoms, highlighting the potential advantages of taking a holistic approach to treatment. The fact that the dependent variables in the experimental group showed signs of improvement suggests that pranayama has the potential to be an effective supplemental intervention in the holistic treatment of "Women with PCOS." This treatment would not only address the medical elements of the ailment, but it would also address the emotional well-being of the

patients. Pranayama practices should be considered for incorporation into treatment plans for "Women with PCOS" on the part of clinicians and other healthcare practitioners in order to enhance the mental health of these women and improve their overall quality of life.

When it comes to having a beneficial impact on the psychological well-being of "Women with PCOS," the outcomes of this study indicate that interventions involving Mirror Work contain potentially favorable implications. Within the context of therapies that are specifically designed for "Women with PCOS," the significant improvements that were found in the dependent variables bring to light the importance of self-acceptance and self-reflection. Mirror Work is a unique strategy that makes use of mirrors as a tool to enable self-reflection and self-acceptance, which eventually leads to enhanced psychological outcomes of the individual. According to the findings, mirror work has the potential to effectively improve self-compassion while also having a positive impact on reducing sadness, anxiety, tension, and self-criticism among this particular group. It is important to underline the practical consequences of using mirror work as a self-care tool because of its ease of use, cost-effectiveness, and accessibility in terms of improving psychological well-being. Nevertheless, it is of the utmost importance to underline the necessity of conducting additional research in order to replicate these findings, address the limitations of the study, and investigate other factors that may influence the efficacy of mirror work as an intervention for "Women with PCOS." When seen in a broader framework, the potential benefits of mirror work practices in terms of building self-compassion and decreasing psychological symptoms in "Women with PCOS" are understood. These findings have implications for clinical application, highlighting the significance of including self-compassion therapies into the comprehensive care of individuals who are afflicted with polycystic ovary syndrome (PCOS), which would ultimately improve the individuals' quality of life and general well-being

In "Women with PCOS," the study makes a significant advance to our understanding of the psychological issues that are prevalent in patients. Not only do the findings have major therapeutic implications, but they also emphasize the potential for gratitude journal writing to improve mental health in the community that was studied. Specifically, it highlights how essential it is to incorporate psychological therapies into

the comprehensive treatment of polycystic ovary syndrome (PCOS), recognizing the vital role that both the mind and the body play in determining the results of health conditions. In order to validate these findings and expand our understanding of the mental health implications of polycystic ovary syndrome (PCOS), it is recommended that future research concentrate on larger sample sizes and longitudinal studies that include participants from a variety of ethnic backgrounds. As a whole, it is common knowledge that keeping a thankfulness journal might assist "women with PCOS" in cultivating self-compassion and managing their psychological issues. In light of these findings, it is imperative that self-compassion therapies be incorporated into the comprehensive care of patients who have polycystic ovary syndrome (PCOS), with the ultimate goal of enhancing the quality of life. In addition to this, they have practical implications for clinical implementation.

In summary, the findings of this study demonstrate the potential benefits of incorporating psychological therapies into the treatment of "Women with PCOS" and provide valuable information regarding the mental health challenges that these women face. The significance of mental health in the holistic treatment of polycystic ovary syndrome (PCOS) is highlighted by the fact that pranayama, mirror work, and maintaining a gratitude diary all have positive effects on reduced psychological distress and increased levels of self-compassion. It is vital that additional study be conducted on these therapies and that they be verified in order to guarantee that they will effectively improve the well-being of "women with PCOS." More research must be done on these therapies. Treatment that is more successful and supportive can be provided by medical professionals through the utilization of a holistic strategy that integrates both psychological and physical procedures. This approach has the potential to improve the quality of life for individuals who are afflicted with this illness.

5.2. Implications

The implications on Pranayama are far-reaching and profound, potentially revolutionizing our approach to PCOS management. It is important to highlight psychological dimensions alongside physical symptoms, advocating for a truly holistic perspective in treating this complex endocrine disorder. The implications extend beyond individual patient care to the broader healthcare system. Integrating

complementary therapies like Pranayama into standard PCOS treatment protocols could lead to more satisfactory patient outcomes, potentially reducing the need for more invasive or costly interventions. This could have significant implications for healthcare costs and resource allocation in the long term.

Endocrinologists, gynaecologists, and primary care physicians treating PCOS patients may need to collaborate more closely with mental health professionals, yoga instructors, and other complementary therapy practitioners. This inter professional approach could lead to more comprehensive and effective treatment plans.

The study also highlights the potential for patient empowerment in PCOS management. Pranayama techniques, once learned, can be practiced independently by patients, giving them a sense of control over their condition. This self-management aspect could improve treatment adherence and overall patient satisfaction.

It's also crucial to consider the cultural aspects of integrating Pranayama into PCOS management. As a practice with roots in Eastern philosophy, its acceptance and effectiveness may vary across different cultural contexts. Research into how Pranayama can be effectively introduced and practiced in diverse cultural settings is essential for its broader application.

The economic implications of incorporating Pranayama into PCOS treatment also merit investigation. Cost-effectiveness studies comparing Pranayama to other interventions could provide valuable data for healthcare policy decisions and insurance coverage considerations.

The implications of our findings on Mirror Work interventions are profound, particularly in a clinical context. This novel approach to addressing the psychological aspects of PCOS offers a promising avenue for enhancing mental health for affected women.

The versatility of Mirror Work is one of its key strengths. Mental health professionals, including psychologists and counsellors, can incorporate these techniques into structured therapy sessions. This might involve guided mirror exercises where patients

practice positive self-talk, challenge negative thought patterns, or engage in mindfulness practices while looking at their reflection. Alternatively, healthcare providers can suggest self-guided mirror exercises as complementary practices for patients to continue at home between sessions. For endocrinologists, gynaecologists, and other medical professionals treating PCOS, understanding and recommending Mirror Work could significantly enhance their ability to provide holistic care. By addressing the psychological impact of PCOS symptoms, these interventions may improve patients' overall treatment adherence and outcomes. For instance, a woman who develops a more positive body image through Mirror Work might be more motivated to maintain lifestyle changes crucial for PCOS management.

The potential benefits of Mirror Work extend beyond immediate psychological relief. By promoting self-compassion and a more positive self-image, these interventions could help “Women with PCOS” navigate social situations with greater confidence, potentially improving their relationships and social support networks. This, in turn, could lead to better overall mental health and stress management, factors known to influence the severity of PCOS symptoms. Moreover, Mirror Work could be particularly beneficial in addressing the often-overlooked aspect of sexuality and intimacy issues in “Women with PCOS”. Many women with this condition report decreased sexual satisfaction and body confidence, which can strain relationships. Mirror Work that focuses on self-acceptance and appreciation of one's body could help ameliorate these concerns.

However, it's crucial to approach the implementation of Mirror Work interventions with caution and nuance. While the potential benefits are significant, it's essential to recognize that these techniques may not be suitable or effective for everyone. Some “Women with PCOS” may find mirror exercises uncomfortable or even triggering, particularly if they have experienced significant body image-related distress in the past or have a history of trauma related to their appearance. For these individuals, jumping directly into intense Mirror Work could be counterproductive or potentially harmful. Therefore, a careful, client-centered, and tailored approach is paramount when implementing these interventions. Healthcare providers should conduct thorough assessments before suggesting Mirror Work, considering factors such as the patient's

mental health history, current psychological state, and comfort level with self-reflection exercises. A gradual introduction to Mirror Work might be necessary for some patients, perhaps starting with less direct exercises like journaling about self-image before progressing to actual mirror use.

The importance of creating a safe and supportive environment for Mirror Work cannot be overstated. Whether in a clinical setting or as a self-guided practice, individuals should feel encouraged, supported, and safe throughout the process. This might involve providing patients with coping strategies to use if they experience distress during mirror exercises, ensuring follow-up support is available, and emphasizing that progress may be gradual and non-linear.

Training for healthcare providers in implementing Mirror Work interventions is another crucial consideration. Mental health professionals may need specialized training to effectively guide patients through these exercises, while medical doctors treating PCOS might benefit from workshops or continuing education on the psychological aspects of the condition and how to integrate interventions like Mirror Work into their treatment plans.

Additionally, cultural sensitivity is vital when recommending Mirror Work. In some cultures, extensive focus on one's appearance or self might be viewed negatively or as a form of vanity. Healthcare providers should be prepared to adapt the language and framing of Mirror Work to align with diverse cultural values and beliefs.

This intervention stands out for its simplicity, cost-effectiveness, and accessibility, making it an attractive option for widespread adoption among women struggling with PCOS.

The ease of implementation is a key advantage of gratitude journaling. Unlike interventions that require specialized equipment or professional supervision, gratitude journaling can be done at home with minimal resources - just a notebook and pen, or even a digital device. This makes it an ideal complementary therapy that can be seamlessly integrated into existing PCOS management strategies without adding significant time or financial burdens.

Furthermore, the potential for customization is considerable. Women can tailor their gratitude practice to fit their personal preferences and schedules. Some might prefer a structured approach with daily entries, while others might opt for weekly reflections. The content can also be personalized, focusing on aspects of life that resonate most with each individual, whether it's relationships, personal achievements, or progress in managing PCOS symptoms.

From a healthcare provider's perspective, gratitude journaling offers a valuable tool for holistic patient care. It can be easily recommended as part of a comprehensive treatment plan, potentially enhancing the effectiveness of medical interventions by improving patients' psychological resilience and overall outlook. This could lead to better treatment adherence and, consequently, improved health outcomes.

PCOS support organizations could incorporate gratitude journaling workshops or challenges into their programs, fostering a sense of community among participants while promoting individual well-being. Online platforms and mobile applications dedicated to PCOS management could integrate gratitude journaling features, making the practice even more accessible and potentially increasing adherence through reminders and progress tracking.

5.3. Limitations

This research, like any other study, presents several noteworthy limitations. The cross-sectional design employed here provides valuable information about the connection between PCOS and mental health indicators; however, it does not establish causality. A primary limitation of this study lies in the relatively small sample size, which may limit the generalizability of the findings. The sample was drawn exclusively from a single hospital, which may not adequately reflect the broader population of women with polycystic ovary syndrome (PCOS). Participants may have shared similar sociodemographic or cultural backgrounds, access to healthcare, or exposure to psychosocial stressors, which can influence both baseline mental health and responsiveness to psychological interventions. The limited size of the sample also reduces statistical power, making it difficult to detect subtle differences or interactions

between variables such as age, BMI, symptom severity, or treatment history. The recruitment of participants from a single clinical setting introduces the possibility of institutional bias. The hospital's environment, healthcare protocols, patient management approaches, and the rapport between clinicians and patients could have contributed to the observed improvements in mental health, independent of the specific intervention. This context-specific effect raises concerns about external validity; that is, whether similar outcomes could be replicated in community clinics, private practices, or rural healthcare centers with differing infrastructures or resources. Although improvements in mental health indicators were observed post-intervention, the absence of long-term follow-up limits our ability to determine the sustainability of these effects. Mental health outcomes—particularly in chronic and relapsing conditions such as anxiety and depression—often fluctuate over time and may be influenced by hormonal, environmental, or psychosocial changes. Without longitudinal data, it is not possible to assess whether the benefits of the intervention persist, diminish, or evolve after the completion of the study. Given that participation in the intervention was voluntary, there may be an inherent selection bias. Individuals who opted into the study may have been more motivated, psychologically minded, or receptive to behavioral change. This self-selection could skew the results toward a more favorable outcome and may not be representative of the wider PCOS population, particularly those who are less engaged with mental health services or who experience higher levels of stigma or treatment hesitancy. Mental health outcomes in this study were primarily assessed through self-reported questionnaires. While these instruments are commonly used and validated, they are inherently subject to response biases, including social desirability bias, recall bias, and self-perception distortions. Participants may have reported improved well-being due to perceived expectations, a desire to please researchers or clinicians, or because of heightened self-awareness through intervention exposure rather than actual psychological change. The intervention period was relatively brief, which may not be sufficient to generate lasting behavioral or cognitive restructuring in individuals dealing with chronic psychological symptoms related to PCOS. Mental health disorders often require long-term strategies, particularly when comorbid with hormonal imbalances or metabolic complications. Thus, the intervention may have produced short-term symptomatic relief rather than durable therapeutic change.

Although the intervention was implemented in a specific sociocultural context, it was not explicitly tailored for the cultural, linguistic, or gender-specific nuances relevant to women in the studied population. Culturally unadapted interventions may fail to fully engage participants, address culturally rooted mental health stigma, or resonate with local beliefs about illness, body image, and femininity—factors especially salient in PCOS-related distress. The intervention followed a standardized protocol, which may not have adequately addressed individual differences in symptom presentation, psychological needs, or coping mechanisms. PCOS is a heterogeneous condition, and mental health impacts can vary widely across individuals. A one-size-fits-all approach may have reduced treatment efficacy for participants whose needs fell outside the scope of the intervention content.

5.4. Future Research

Routine Psychological Screening, becomes a standard protocol for PCOS women in clinical settings could be implemented. Interdisciplinary Clinics: A holistic treatment approach which includes endocrinologists, gynecologists, psychiatrists, and psychologists will co-manage in clinical settings becomes an important consideration for the management of PCOS patients. The psychological impact of fertility challenges, social stigma and delayed diagnosis on these women could be addressed in clinical settings by adopting a suitable framework. Through tailored psychological intervention, the programs could be administered according to the cultural contexts, especially to address the stigma and fertility associated with PCOS. In order to normalize the isolation and experiences faced by PCOS women, the clinical settings can arrange Group therapy models, which could enhance their psychological and emotional well being. This will assure the PCOS patients to go for the suitable psychological supportive intervention. Thus empowering them emotionally and supporting them throughout with psychological assistance. The integration of mirror work, pranayama and gratitude journal into clinical practice reflects a forward –thinking approach to enhancing the psychological well-being of women with PCOS. In future clinical settings, both private and government healthcare facilities can benefit from adopting such interventions as part of comprehensive PCOS management strategies. Medical and paramedical

professionals can be trained to understand the psychological dimensions of PCOS. Through different training programs like structured workshops, Continuous medical education and certification modules on integrative psychological interventions can equip them to implement these practices. Primary Health Centers (PHCs), Community Health Centers and Urban Health Missions can run pilot programs where women diagnosed with PCOS are offered these psychological interventions alongside standard treatment. Evaluation of outcomes will strengthen for any policy support. By institutionalizing these practices in both government and private healthcare systems, India and other nations can move toward an integrative, empathetic and sustainable healthcare model. Future psychological research is well-positioned to explore how Mirror Work, Gratitude Journal Writing, and Pranayama can be leveraged as structured, evidence-based tools to support emotional regulation, self-identity, and resilience in women navigating the chronic emotional burden of PCOS. Mirror Work, which directly engages the self-perception and self-compassion domains, offers particular relevance for those struggling with body image disturbances and internalized stigma. Future studies may explore how this practice can be formalized within therapeutic frameworks such as Compassion-Focused Therapy (CFT) or Schema Therapy, particularly targeting maladaptive core beliefs around body shame, unworthiness, or perceived social rejection—beliefs commonly seen in women with PCOS due to visible physical symptoms and infertility concerns. Longitudinal psychological studies could investigate the durability of self-esteem gains achieved through Mirror Work and assess whether it reduces vulnerability to depressive episodes or mitigates the impact of external appearance-based feedback (e.g., social media exposure, interpersonal criticism). Additionally, group therapy settings might incorporate guided mirror-based affirmations to examine their effects on shared vulnerability, peer empathy, and body image normalization, adding a communal healing dimension to what has traditionally been a solitary practice.

Gratitude Journal Writing, meanwhile, presents a powerful tool for reframing negative cognitive patterns—particularly the tendency toward rumination, helplessness, and cognitive distortion that often accompanies the experience of PCOS. Future psychological research could focus on how gratitude journaling can serve as a cognitive

restructuring technique within positive psychology-based interventions. For example, gratitude entries may help counteract selective abstraction and catastrophizing, redirecting attention to moments of control, beauty, or personal strength, even amidst ongoing symptoms. Studies might examine the impact of gratitude journaling on cognitive flexibility and emotional resilience—two psychological constructs shown to buffer against anxiety and depressive symptoms. In therapy settings, clinicians could guide clients in integrating gratitude work into behavioral activation plans or as part of post-session reflection, allowing for therapeutic reinforcement of positive themes. Moreover, qualitative research could explore the emotional narratives women express through gratitude journaling over time, offering insights into how this practice influences their evolving illness identity, sense of coherence, and emotional tone. There's also potential to investigate how journaling interacts with social support; for example, whether writing about gratitude for relationships fosters stronger interpersonal connections or reduces perceived isolation—an especially relevant line of inquiry, given the social withdrawal often reported by women with PCOS.

Pranayama, though primarily rooted in physiological mechanisms, also carries profound psychological implications for emotional regulation and stress-related reactivity. Future research may explore its role through the lens of affective neuroscience and behavioral psychology, particularly in how breath awareness shapes present-moment focus, emotional tolerance, and impulse control. As women with PCOS frequently report heightened emotional reactivity, irritability, and feelings of overwhelm—especially during hormonal fluctuations—Pranayama may serve as a nonverbal emotion regulation strategy that bypasses cognitive overload. Studies could evaluate its effectiveness in reducing emotional dysregulation symptoms (e.g., anger outbursts, mood swings, emotional numbness) and improving distress tolerance. Integrating Pranayama into Dialectical Behavior Therapy (DBT) or Acceptance and Commitment Therapy (ACT) modules may offer additional therapeutic benefits, particularly for clients who struggle to access or articulate emotion verbally. Furthermore, future research could explore how different breathing styles affect emotional granularity—the ability to identify and differentiate between emotional states—a trait associated with better psychological adjustment and mental health

outcomes. Group-based Pranayama interventions could also be studied for their potential to increase feelings of emotional safety, connectedness, and co-regulation in group therapy or support communities, offering a somatic entry point to collective emotional healing.

Together, these three interventions—when examined through a psychological research lens—represent a meaningful shift in how we conceptualize and treat the mental health dimensions of PCOS. Rather than solely focusing on symptom reduction, future directions can investigate how these tools support identity reconstruction, emotional agency, and narrative coherence in women who often feel disconnected from their bodies and alienated by the chronic nature of their condition. Moreover, these practices can be framed as self-empowerment strategies—restoring a sense of control and agency over one's emotional world, which is often eroded by the unpredictability and stigma surrounding PCOS. Mixed-methods studies, combining quantitative scales (e.g., body image satisfaction, emotion regulation, self-compassion) with narrative interviews, may offer a richer understanding of how women internalize and integrate these practices into their self-concept. As mental health treatment for PCOS evolves, the psychological sophistication of these interventions must evolve with it—not merely as calming techniques or journaling exercises, but as intentional, research-informed strategies for fostering emotional healing, resilience, and long-term well-being in a population that has long been underserved in both reproductive and psychological care.

5.5 CONCLUSION

The findings of our study highlight an important component of polycystic ovary syndrome (PCOS), which is the severe psychological impact it has on women. This impact manifests itself in higher levels of stress, anxiety, and depression when compared to women who do not have the illness. "Women with PCOS" have been shown to have elevated levels of self-criticism as well as decreased levels of self-compassion, according to the findings of this study, which has provided vital insights into the mental health difficulties that they confront. These findings bring to light an

essential feature of PCOS care that is sometimes disregarded: the requirement for comprehensive approaches that take into account both the physiological and psychosocial aspects of the condition.

Pranayama, Mirror Work, and Gratitude Journal Writing are three specific interventions that have been investigated by our research to see whether or not they are effective in treating the severe psychological concerns that have been identified at this time. Each of these therapies has shown significant benefits in terms of improving mental health outcomes for "Women with PCOS," particularly in terms of lowering levels of depression, anxiety, and stress, as well as fostering better levels of self-compassion and lowering levels of self-criticism.

In summary, this research draws attention to the fact that these women suffer significant obstacles. With the help of these techniques, one can improve their mental health, increase their capacity for self-compassion, and decrease their tendency to criticize themselves. Nevertheless, in order to fully realize their potential, it is necessary to do continuing research in order to investigate their effects over the long term, their applicability across a wide range of populations, and their integration with conventional PCOS treatments. It is possible that future study will help to the development of more effective and holistic care solutions that will improve the quality of life for "women with PCOS" if these problem areas are addressed.

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APPENDICES

Request Letter seeking Permission to do survey on PCOS women

From,

Seena Jose

07-02-2022

D 8 & 9, Bhatia Gardens,

55 Manapakkam Main road

Chennai – 125

Pin 600125

To,

The Chairperson Srushti Hospital

Porur, Chennai.

Sub: Permission to do survey on PCOS patients on their mental health and Quality of life.

Dear Madam,

I am Seena Jose, PhD Scholar in Psychology (Reg No: 41800406), Lovely Professional University, Punjab, residing at the above address at Manapakkam. For my PhD research, I would like to conduct survey on women with PCOS and non PCOS women on their mental health and quality of life (100 plus PCOS and 100 plus non PCOS women). 50% of the PCOS will be kept in control group and remaining 50% in experimental group will be given positive psychological intervention and Pranayama.

Code of ethics will be followed. My programme will indeed bring benefit for the Psychological well-being of the women under study.

The patient's identity will be kept confidential by allocating code numbers during the survey and interventions.

I request you to kindly permit me to conduct the survey and interventions.

Yours faithfully,

Seena Jose

Research Scholar, LPU.

(Reg No 41800406.)

Mob no: 8056123476

E mail: seena.james.k@gmail.com

Permission Letter from Srushti Hospital

	SRUSHTI HOSPITAL PVT. LTD. MATERNAL AND CHILD HEALTH, FERTILITY & MULTISPECIALITY 1, Padmavathy Street, Thirumalai Nagar, Ramapuram, Chennai - 600 089. Phone : 2486 1144, 2486 3544, 98404 53454 Fax : 044 - 24867527 www.motherababy.com	 
To	07-02-2022	
Ms Seena Jose Ph.D Scholar in Psychology, [Part Time - Reg No - 41800406] Lovely Professional University Phagwara, Jalandhar, Punjab. PIN 144001 Subject: Permission to conduct research work in Srushti hospital Dear Seena Jose, Thank you for submitting the detailed proposal along with other necessary documents to Srushti Hospital. We are pleased to inform you that your request to conduct the research in our hospital on the topic entitled "The Efficacy of Pranayama, Mirror Work and Gratitude Journal Writing on Self Compassion in Women with Polycystic Ovary Syndrome" under the guidance of Dr.JehangeerMajeed, PhD., Lovely Professional University has been accepted. Dr.SamundiSankari and Dr.Divya Selvamani will guide you at the hospital. Ethical Licence for the research can be obtained through hospital from SRIRAJA RAJESWARIINDEPENDENTETHICS COMMITTEE- Registration No.ECR/338/Indt/TN/2021 Sincerely, For Srushti Hospital Dr.Divya Selvamani Medical Director Mobile number:9840641341 Dr. DIVYA SIVARAMAN Regd. No: 71274 Dr.SamundiSankari 7/2/22 Founder and Chief Consultant Mobile Number:9840039939 Dr. S. SAMUNDI SANKARI Regd. No: 22619 Regd Off : 129, Habibullah Road, T. Nagar, Chennai - 600 017. Phone : 2834 2798, 2834 0945, 2834 2727 'We respect every woman's dream to mother a baby'		

Informed Consent – (English)

INFORMED CONSENT

Title of the Research project

The Efficacy of Pranayama, Mirror Work and Gratitude Journal Writing on Self Compassion in Women with Polycystic Ovarian Syndrome

Name, position and contact details of Researcher:

Seena Jose, Research Scholar, Lovely Professional University, Phagwara, Jalandhar, Punjab. Pin 144001

Srushti Fertility centre & Women's Hospital, No 1, Padmavathy Street, Thirumalai Nagar, Ramapuram, Chennai -89, Pin 600089.

Put tick mark in the box

1. I confirm that I have been explained about the research study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. ☐
3. I agree to take part in the above study. ☐
4. I understand that my name and identity will be concealed. ☐
5. I agree to use my data for research purpose without revealing my identity. ☐

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

Informed Consent – (Tamil)

அறிவிக்கப்பட்ட முடிவு

ஆராய்ச்சி திட்டத்தின் தலைப்பு

பாலிசிஸ்டிக் ஓவறியன் சின்ட்ரோம் உள்ள பெண்களில் சுய அனுகம்பயை பற்றிய பிராணாயாமம், மிரர் வொர்க், கிராட்டிட்யூட் ஜெர்னல் ரைட்டிங் ஆகியவற்றின் பலன்

ஆராய்ச்சியாளரின் பெயர், நிலை மற்றும் தொடர்பு விவரங்கள்:

சீனா ஜோஸ், ஆராய்ச்சி அறிஞர், லவ்லி புரொபஷனல் யுனிவர்டிடி, பக்வாரா, ஜலந்தர், பஞ்சாப். பின் 144001

ஸ்ருஷ்டி கருத்தரிப்பு மையம் & பெண்கள் மருத்துவமனை, எண் 1, பத்மாவதி தெரு, திருமலை நகர், ராமாபுரம், சென்னை -89, பின் 600089.

பெட்டியில் டிக் மார்க் போடவும்

- ஆராய்ச்சிப் படிப்பைப் பற்றி எனக்கு விளக்கப்பட்டது மற்றும் கேள்விகளைக் கேட்க வாய்ப்பு கிடைத்தது என்பதை உறுதிப்படுத்துகிறேன். ☐
- எனது பங்கேற்பு தன்னார்வமானது என்பதையும், எந்த நேரத்திலும் காரணம் கூறாமல் திரும்பப் பெற எனக்கு சுதந்திரம் உள்ளது என்பதையும் புரிந்துகொள்கிறேன். ☐
- மேற்கூறிய ஆய்வில் பங்கேற்க ஒப்புக்கொள்கிறேன். ☐
- எனது பெயரும் அடையாளமும் மறைக்கப்படும் என்பதை நான் புரிந்துகொள்கிறேன். ☐
- எனது அடையாளத்தை வெளிப்படுத்தாமல் ஆராய்ச்சி நோக்கத்திற்காக எனது தகவல்களை பயன்படுத்த ஒப்புக்கொள்கிறேன். ☐

Name of Participant

Date

Signature

Name of Researcher

Date

Signature

YOGA Wellness Instructor certificate from Ayush Ministry



DASS 21 Permission

Down load DASS forms

Down load DASS forms

The DASS questionnaire forms may be downloaded and copied without restriction. However, the scales may not be modified or sold for profit.

[DASS response form](#)

[DASS21 response form](#) (short version of the scales)

[DASS scoring template](#) (best printed onto a plastic overhead—see FAQ#30)

[Return to DASS homepage](#)

<https://www2.psy.unsw.edu.au/groups/dass/down.htm>

DASS21

Name:

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

DASS-21 Scoring Instructions

The DASS-21 should not be used to replace a face to face clinical interview. If you are experiencing significant emotional difficulties, you should contact your GP for a referral to a qualified professional.

Depression, Anxiety and Stress Scale - 21 Items (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The assumption on which the DASS-21 development was based (and which was confirmed by the research data) is that the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. The DASS-21 therefore has no direct implications for the allocation of patients to discrete diagnostic categories postulated in classificatory systems such as the DSM and ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are as follows: NB Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

DASS 21 Severity Rating	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Self Compassion Scale Permission

To all interested, please feel free to use the Self-Compassion Scale (SCS) for research or any other use. Masters and dissertation students also have my permission to use and publish the Self- Compassion Scale in their theses. The SCS is appropriate for ages 14 and up (as long as individuals have at least an 8th grade reading level). If you aren't that interested in using the subscales, you might also want to consider using the Short SCS (12 items), which has a near perfect correlation with the long scale.

Kristin Neff, PhD

Associate Professor

Educational Psychology Dept. University of Texas at Austin 1 University Station,
D5800 Austin, TX 78712

e-mail: kristin.neff@mail.utexas.edu

Reference:

Neff, K.D. (2003). Development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223-250.

Coding Key:

Self-Kindness Items: 5, 12, 19, 23, 26

Self-Judgment Items: 1, 8, 11, 16, 21

Common Humanity Items: 3, 7, 10, 15

Isolation Items: 4, 13, 18, 25

Mindfulness Items: 9, 14, 17, 22

Over-identified Items: 2, 6, 20, 24

Sub scale scores are computed by calculating the mean of subscale item responses.

To compute a total self-compassion score, reverse score the negative subscale items - self-judgment, isolation, and over-identification (i.e., 1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1) - then compute a total mean.

(This method of calculating the total score is slightly different than that used in the

article referenced above, in which each subscale was added together. However, I find it is easier to interpret the scores if the total mean is used.)

Self Compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost **Almost**

Never **always**

1

2

3

4

5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself.

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

_____ 12. When I'm going through a very hard time, I give myself the caring and

tenderness I need.

- _____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
- _ 14. When something painful happens I try to take a balanced view of the situation.
- _____ 15. I try to see my failings as part of the human condition.
- _____ 16. When I see aspects of myself that I don't like, I get down on myself.
- _ 17. When I fail at something important to me I try to keep things in perspective.
- _____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- _____ 19. I'm kind to myself when I'm experiencing suffering.
- _____ 20. When something upsets me I get carried away with my feelings.
- _ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- _ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- _____ 23. I'm tolerant of my own flaws and inadequacies.
- _ 24. When something painful happens I tend to blow the incident out of proportion.
- _ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- _____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Permission for FSCRS Scale

Paul Gilbert <p.gilbert@derby.ac.uk>

To: 'Seena James'

Cc: 'Lesley Lewis', Jaskaran Basran

Mon, 24 Oct at 10:07 pm

all our scales are free to use and you can find them on our website

<https://www.compassionatemind.co.uk/resource/scales>

I think we might have a translation. Lesley will be in touch with you.

Prof Paul Gilbert. PhD, FBPsS, OBE

Centre for Compassion Research and
Training

College of Health, Psychology and Social
Care

University of Derby,

Kedleston Road,

Derby

DE22 1GB

Email contact: p.gilbert@derby.ac.uk

Email
contact: paul.gilbert@compassionatemind.co.uk

Contact Nicola Barnett (Research Support
Officer)
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Tel: 01332 591229

<http://www.derby.ac.uk/research/ourresearch/>

Prof Paul Gilbert. PhD, FBPsS, OBE

The Compassionate Mind Foundation

Office 29, Riverside Chambers,

Full Street,

Derby

DE1 3AF

Contact Sharon Preston (PA and contact
for all

Foundation related enquires)

sharon.preston@compassionatemind.co.uk

Tel: 01332 742722

www.compassionatemind.co.uk

www.profpaulgilbert.co.uk

Click on the books below for links to Amazon for some of my recent books

See below for some key papers and links to further publications on Google Scholar

Compassion: From Its Evolution to a Psychotherapy

Creating a Compassionate World: Addressing the Conflicts Between Sharing and Caring Versus Controlling and Holding Evolved Strategies

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THE FORMS OF SELF-CRITICISING/ ATTACKING & SELF-REASSURING SCALE (FSCRS)

When things go wrong in our lives or don't work out as we hoped, and we feel we could have done better, we sometimes have *negative and self-critical thoughts and feelings*. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of themselves. Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and circle the number that best describes how much each statement is true for you.

Please use the scale below.

Not at all likeme 0	A little bit likeme 1	Moderately likeme 2	Quite a bit likeme 3	Extremely likeme 4

When things go wrong for me:

1.	I am easily disappointed with myself.	0	1	2	3	4
2.	There is a part of me that puts me down.	0	1	2	3	4
3.	I am able to remind myself of positive things About myself.	0	1	2	3	4
4.	I find it difficult to control my anger and Frustration at myself.	0	1	2	3	4
5.	I find it easy to forgive myself.	0	1	2	3	4
6.	There is a part of me that feels I am not good enough.	0	1	2	3	4
7.	I feel beaten down by my own self-critical thoughts.	0	1	2	3	4
8.	I still like being me.	0	1	2	3	4
9.	I have become so angry with myself that I want to Hurt or injure myself.	0	1	2	3	4
10.	I have a sense of disgust with myself.	0	1	2	3	4
11.	I can still feel lovable and acceptable.	0	1	2	3	4
12.	I stop caring about myself.	0	1	2	3	4
13.	I find it easy to like myself.	0	1	2	3	4
14.	I remember and dwell on my failings.	0	1	2	3	4
15.	I call myself names.	0	1	2	3	4
16.	I am gentle and supportive with myself.	0	1	2	3	4
17.	I can't accept failures and setbacks without Feeling inadequate.	0	1	2	3	4
18.	I think I deserve my self-criticism.	0	1	2	3	4
19.	I am able to care and look after myself.	0	1	2	3	4
20.	There is a part of me that wants to get rid of the Bits I don't like.	0	1	2	3	4
21.	I encourage myself for the future.	0	1	2	3	4
22.	I do not like being me.	0	1	2	3	4

THE FORMS OF SELF-CRITICISING /ATTACKING & SELF-
REASSURING SCALE (FSCRS)

SCORING:

1.is	I am easily disappointed with myself.	0	1	2	3	4
2.is	There is apart of me that puts me down.	0	1	2	3	4
3.rs	I am able to remind my self of positive things About myself.	0	1	2	3	4
4.is	I find it difficult to control my anger and Frustration at myself.	0	1	2	3	4
5.rs	I find it easy to forgive myself.	0	1	2	3	4
6.is	There is a part of me that feels I am not good enough.	0	1	2	3	4
7.is	I feel beaten down by my own self-critical thoughts.	0	1	2	3	4
8.rs	I still like being me.	0	1	2	3	4
9.hs	I have become so angry with myself that I want to Hurt or injure myself.	0	1	2	3	4
10.hs	I have a sense of disgust with myself.	0	1	2	3	4
11.rs	I can still feel lovable and acceptable.	0	1	2	3	4
12.hs	I stop caring about myself.	0	1	2	3	4
13.rs	I find it easy to like myself.	0	1	2	3	4
14.is	I remember and dwell on my failings.	0	1	2	3	4
15.hs	I call myself names.	0	1	2	3	4
16.rs	I am gentl eand supportive with myself.	0	1	2	3	4
17.is	I can't accept failures and setbacks without Feeling inadequate.	0	1	2	3	4
18.is	I think I deserve myself-criticism.	0	1	2	3	4
19.rs	I am able to care and look after myself.	0	1	2	3	4
20.is	There is a part of me that wants to get rid of the Bits I don't like.	0	1	2	3	4
21.rs	I encourage myself for the future.	0	1	2	3	4
22.hs	I donot like being me.	0	1	2	3	4

KEY FOR SUBSCALES:

is=Inadequateself,

rs=reassure self,

hs=hatedself

SCALE DESCRIPTION

This scale was developed by Gilbert, Clarke, Hempel, Miles and Irons (2004). It was developed to measure self-criticism and the ability to self-reassure. It is a 22 item scale, which measures different ways people think and feel about themselves when things go wrong for them. The items make up three components, there are two forms of self-criticalness; inadequate self, which focuses on a sense of personal inadequacy (I am easily disappointed with myself), and hated self, this measures the desire to hurt or persecute the self (I have become so angry with myself that I want to hurt or injure myself), and one form to self-reassure, reassure self (I am able to remind myself of positive things about myself). The responses are given on a 5-point Likert scale (ranging from 0 = not at all like me, to 4 = extremely like me). Cronbach alphas were 0.90 for inadequate self and 0.86 for hated self and reassured self respectively.

REFERENCE

Gilbert, P., Clark, M., Hempel, S., Miles, J.N.V. & Irons, C. (2004) Criticising and reassuring oneself: An exploration of forms, styles and reasons in female students. *British Journal of Clinical Psychology*, 43, 31-50.

It has been used in a number of other studies

Permission Mirror work

(dated 07-04-2022)

Editorial <editorial@hayhouse.com>

To: Seena James

Thu, 7 Apr at 12:36 am

Dear, Seena.

Thank you so much for thinking of Hay House. We have reviewed your request and are happy to grant permission for you to cite Louise Hay's method from *Mirror Work* in your research proposal provided that you follow our citation guidelines, which are at the end of this message.

Thank you again for your interest in Hay House. We wish you the best of luck in all your endeavors.

Sincerely,

Monica O'Connor

Editorial Assistant

Hay House, Inc.

P.O. Box 5100

Carlsbad, CA 92018-5100

Hours: 7 a.m. to 5:30 p.m., Mon.–Thurs.

hayhouse.com

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SRI RAJARAJESWARI INDEPENDENT ETHICS COMMITTEE
NO 25, VEMBULI AMMAN KOIL STREET EXTN- PALAVANTHANGAL –CHENNAI 600114

10-Apr-2022

To,

Ms.Seena Jose

Shrusti Hospital

Ramaparuaam- Chennai

Protocol Title: The Efficacy of Pranayama, Mirror Work and Gratitude Journal Writing on Self Compassion in Women with Polycystic Ovarian Syndrome

Protocol Number: N/A

Dear Ms Seena Jose

With reference to the above Sri Rajeswari Independent Ethics Committee met on 10 April 2022 around to 3.00 to 4.00 PM reviewed and discussed your application to conduct the clinical trial and also the following below mentioned documents were reviewed.

1. Study protocol version
2. Informed Consent Form (English version)
3. Informed Consent Form (Tamil version)

The following members of Sri Rajeswari Independent Ethics Committee were present at the meeting held on 10-Apr-2022 between 3.00 to 4.00 PM

1. Dr. Srinivasan - Chairperson
2. Dr. Kavya- Basic Medical Scientists
3. Dr. Venkat- Clinician
4. Mr. Farook - Legal Expert
5. Mr. Arun- Social worker
6. Ms. Uma- Lay person
7. Ms. Vidya - Member Secretary

We approved the trial to be conducted in its presented form.

The Ethics Committee to be informed about the progress of the study, any Serious adverse events (SAE) occurring in the course of the study, any changes in the protocol and Patient Information or Informed Consent and to be provided with the copy of the final report.

Your Sincerely,

S. Vidya

Member Secretary
Sri Rajeswari Independent Ethics Committee

Socio demographic details

சமூக மக்கள்தொகை விவரங்கள்

Pl answer all the questions as appropriate by ticking or writing

தயவு செய்து அனைத்து கேள்விகளுக்கும் பொருத்தமான டிக் அல்லது எழுதுவதன் மூலம் பதிலளிக்கவும்

Write your answer below

உங்கள் பதிலை கீழே எழுதுங்கள்

1	Your code Number (உங்கள் குறியீடு எண்)	
2	E mail (மின்னஞ்சல்)	
3	Age (வயது)	
4	Height in Centimeter (உயரம்; சென்டிமீட்டரில்)	
5	Weight in Kg (எடை; கிலோ)	
6	Which state you belong (நீங்கள் எந்த மாநிலத்தைச் சேர்ந்தவர்)	
7	Do you belong to (நீங்கள் சொந்தமா) Urban – city (நகரம்) Rural - town / village (கிராமம்)	
8	Your highest education (உங்கள் உயர்ந்த கல்வி) PhD Professional degree Post graduate Graduate Plus 2 10 th Less than 10th standard	
9	Marital status (திருமண நிலை) Married (திருமணமானவர்) / How many years over after marriage? (திருமணம் முடிந்து எத்தனை ஆண்டுகள் ஆகின்றன?) Unmarried (திருமணமாகாதவர்)	

9	Employment status (பணி நிலை) Employed (வேலைவாய்ப்பு) Do you have night shifts? (உங்களுக்கு இரவு வேலைகள் உள்ளதா?) Unemployed (வேலையில்லாதவர்) Student (மாணவர்) Home maker (வீட்டு தயாரிப்பாளர்) Self employed / Business (சுய தொழில் / வணிகம்)	
10	Are you aware of a condition called PCOS? PCOS எனப்படும் ஒரு நிலை பற்றி உங்களுக்குத் தெரியுமா? Yes / NO	
11	Are you a known PCOS / PCOD (நீங்கள் அறியப்பட்டவரா பாலிசிஸ்டிக் ஓவரி சிண்ட்ரோம் / பாலிசிஸ்டிக் கருப்பை நோய்) Yes / NO	
12	Is there a history of PCOS in your family? உங்கள் குடும்பத்தில் PCOS வரலாறு உள்ளதா? Yes / No	
13	Do you have excess hair growth on your face / body (உங்கள் முகம் / உடலில் அதிகப்படியான முடி வளர்ச்சி உள்ளதா ?) Yes / NO	
14	Do you have Acne /pimples? (உங்களுக்கு முகப்பரு இருக்கிறதா?) Yes / NO	
15	Do you have irregular periods with long gap? (நீண்ட இடைவெளியுடன் ஒழுங்கற்ற மாதவிடாய் உள்ளதா?) Yes / NO	
16	How many hours of sleep do you get every day? நீங்கள் தினமும் எத்தனை மணிநேரம் தூங்குகிறீர்கள்?	

Letter of Candidacy



Centre for
Research Degree Programmes

LPU/CRDP/PHD/EC/20210602/001342

Dated: 28 Sep 2021

Seena Jose

Registration Number: 41800406

Programme Name: Doctor of Philosophy (Psychology)

Subject: Letter of Candidacy for Ph.D.

Dear Candidate,

We are very pleased to inform you that the Department Doctoral Board has approved your candidacy for the Ph.D. Programme on 03 Mar 2021 by accepting your research proposal entitled: "The Efficacy of Pranayama, Mirror Work and Gratitude Journal Writing on Self Compassion in Women with Polycystic Ovarian Syndrome" under the supervision of Dr. Jahangeer Majeed.

As a Ph.D. candidate you are required to abide by the conditions, rules and regulations laid down for Ph.D. Programme of the University, and amendments, if any, made from time to time.

We wish you the very best!!

In case you have any query related to your programme, please contact Centre of Research Degree Programmes.

Head

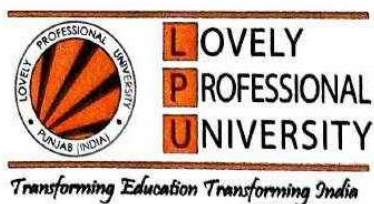
Centre for Research Degree Programmes

Note:- This is a computer generated certificate and no signature is required. Please use the reference number generated on this certificate for future conversations.

Jalandhar-Delhi G.T.Road, Phagwara, Punjab (India) - 144411

Ph : +91-1824-444594 E-mail : drp@lpu.co.in website : www.lpu.in

Permission Letter from LPU



Centre for Research Degree Programmes

LPU/CRDP/EC/181121/01

Date: 18th Nov, 2021

TO WHOM IT MAY CONCERN

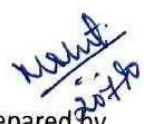
This is to certify that Ms. Seena Jose (Registration number – 41800406) is pursuing Ph.D. (Psychology) [Part Time] at Lovely Professional University. She is working under the guidance of Dr. Jahangeer Majeed, Assistant Professor, Lovely Professional University.

Further, she may approach your esteemed library/organization/institute/hospital to use knowledge resources for the above said research.

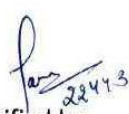
Your act of favourable consideration is sincerely solicited and shall be acknowledged in her Ph.D. thesis.


Head

Center for Research Degree Programmes,
Lovely Professional University,
Phagwara, Punjab (India) – 144411


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	Dr. MGR-Janaki College of Arts & Science for Women Sathyabama MGR Maligai 11 & 13, Durgabai Deshmukh Road, R A Puram, Chennai - 28	
Department of Psychology		
		
This is to certify that the paper entitled		
ADDRESSING THE PSYCHOLOGICAL PERSPECTIVES AMONG THE YOUNGER GENERATION TOWARDS THE NEW NORMAL		
authored by		
SEENA JOSE, RESEARCH SCHOLAR, LPU, PUNJAB		
was presented in the International E-Conference on THE NEW NORMAL - PSYCHOLOGICAL PERSPECTIVES held on 26 & 27 March, 2021.		
 DR. RAGITHA RADHAKRISHNAN Head of the Department	 MR. KUMAR RAJENDRAN Chairman	

National Positive Psychology Association (NPPA)

Certificate Of Participation

THIS IS TO CERTIFY THAT

SEENA JOSE

HAS PRESENTED A PAPER TITLED

Unraveling Self-Compassion Disparities in Women with and without Polycystic Ovary Syndrome (PCOS)

AUTHORED & CO - AUTHORED BY

SEENA JOSE & DR. JAHANGEER MAJEED

IN THE SCIENTIFIC ORAL SESSION OF THE

2ND INTERNATIONAL CONFERENCE ON POSITIVE PSYCHOLOGY BY NPPA 2024

HELD ONLINE ON 19TH - 20TH APRIL 2024

Vimala Veeraraghavan

Prof. Vimala Veera Raghavan
President - NPPA



Singh

Prof. Kamlesh Singh
Secretary & Treasurer-NPPA

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HUMAN RESOURCE DEVELOPMENT CENTER

[Under the Aegis of Lovely Professional University, Jalandhar-Delhi G.T Road, Phagwara (Punjab)]



Certificate No. 243565

Certificate of Participation

This is to certify that **Ms. Seena Jose D/o Sh. Mathai Jose** participated in **Short Term Course on Scale Development and Standardization** organized by Lovely Professional University w.e.f. **April 04, 2022** to **April 09, 2022** and obtained "A" Grade.

Date of Issue :09-04-2022
Place : Phagwara (Punjab), India

Prepared by
(Administrative Officer-Records)

Checked By
Program Coordinator

Head
Human Resource Development Center

HUMAN RESOURCE DEVELOPMENT CENTER

[Under the Aegis of Lovely Professional University, Jalandhar-Delhi G.T Road, Phagwara (Punjab)]



Certificate No. 283273

Certificate of Participation

This is to certify that **Ms. Seena Jose D/o Sh. Mathai Jose** participated in **Workshop on Research Methodology and Data Analysis Using SPSS for Social Sciences** organized by Lovely Professional University w.e.f. **June 19, 2023 to June 28, 2023** and obtained **"A" Grade**.

Date of Issue : 08-08-2023

Place : Phagwara (Punjab), India

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(Administrative Officer-Records)

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Program Coordinator

Head
Human Resource Development Center



Teaching Learning Centre, Ramanujan College
University of Delhi
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RAMANUJAN COLLEGE



This is to certify that

Seena Jose

of

**Psychology, School of Social Sciences & Languages, Lovely
Professional University, , Phagwara, Punjab, India**
has successfully completed TWO-WEEK

"ONLINE REFRESHER COURSE In PSYCHOLOGY"

from 12 - 26 April, 2021

and obtained Grade **A⁺**.



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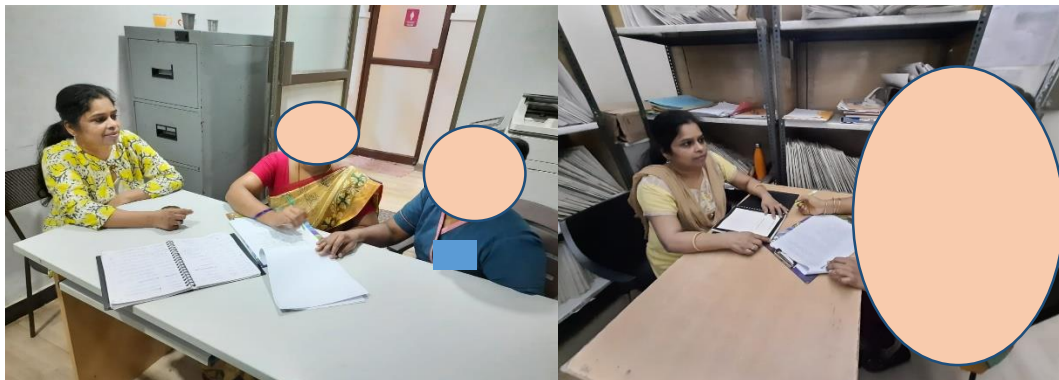
PROF. S.P. AGGARWAL
(Director, TLC)
Ramanujan College

DR. D. N. TIWARI
(Programme Convener)
Ramanujan College



**Discussion with Senior Doctors: Dr Samundi Sankari and
Dr. Divya Selvamani at Srushti Hospital**

SRUSHTI HOSPITAL



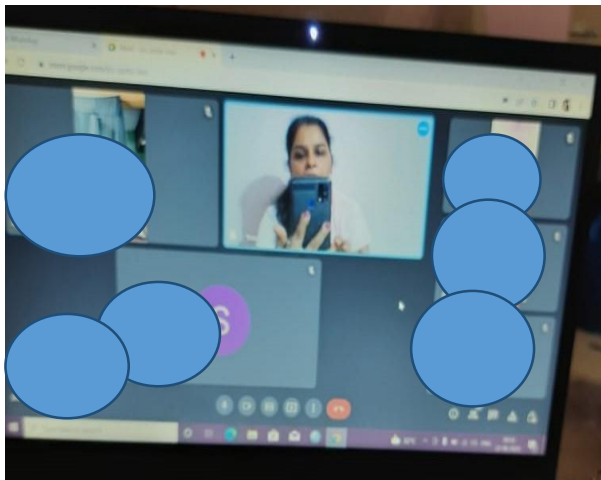
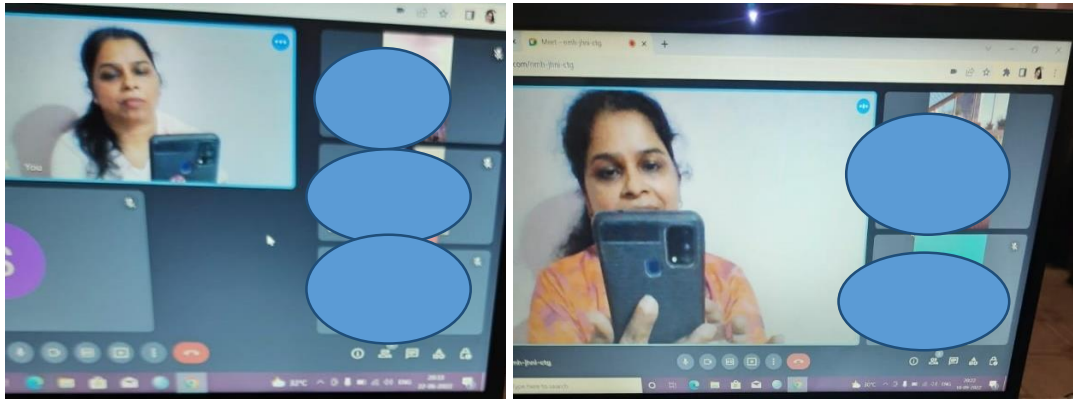
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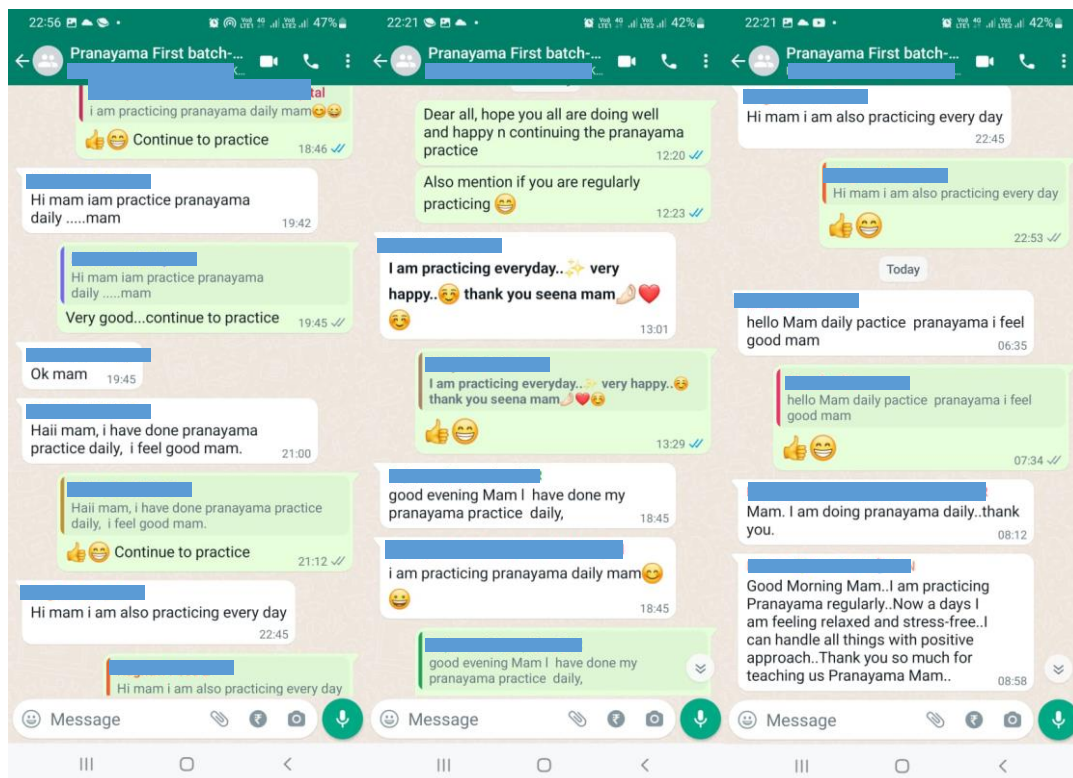


Pranayama Training at Srushti Hospital

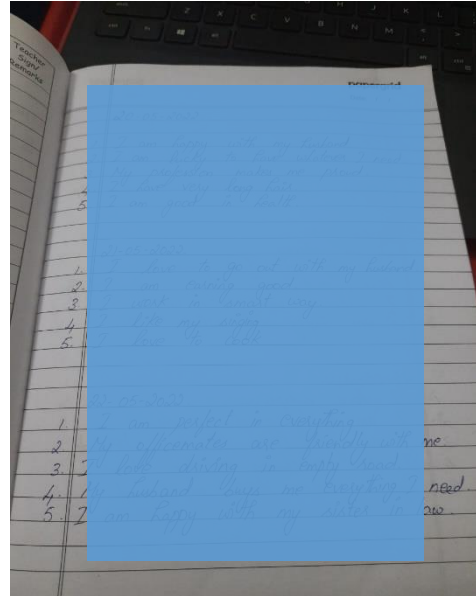
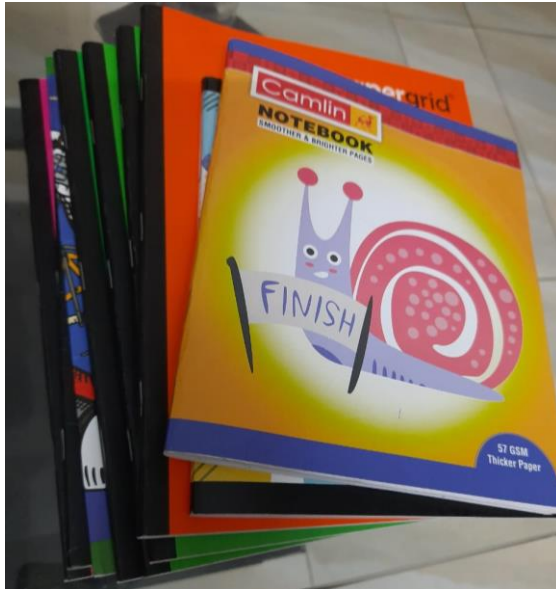
Pranayama practices - Online Training and Monitoring



Pranayama Experimental Group - Practice monitoring through WhatsApp

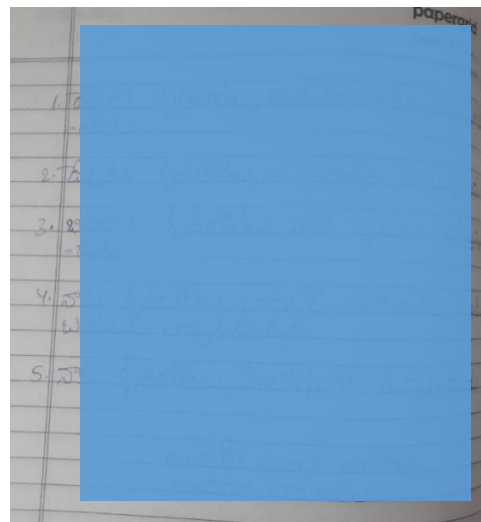
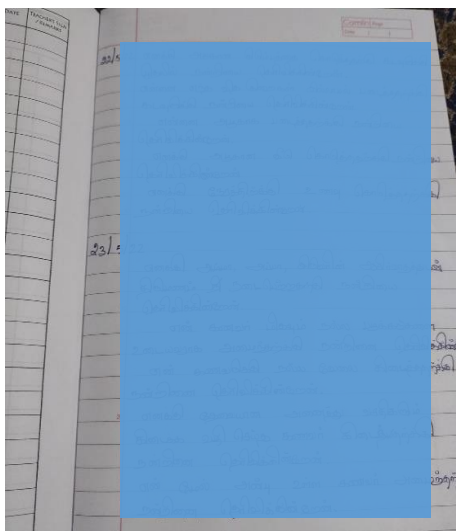


Gratitude Journal writing



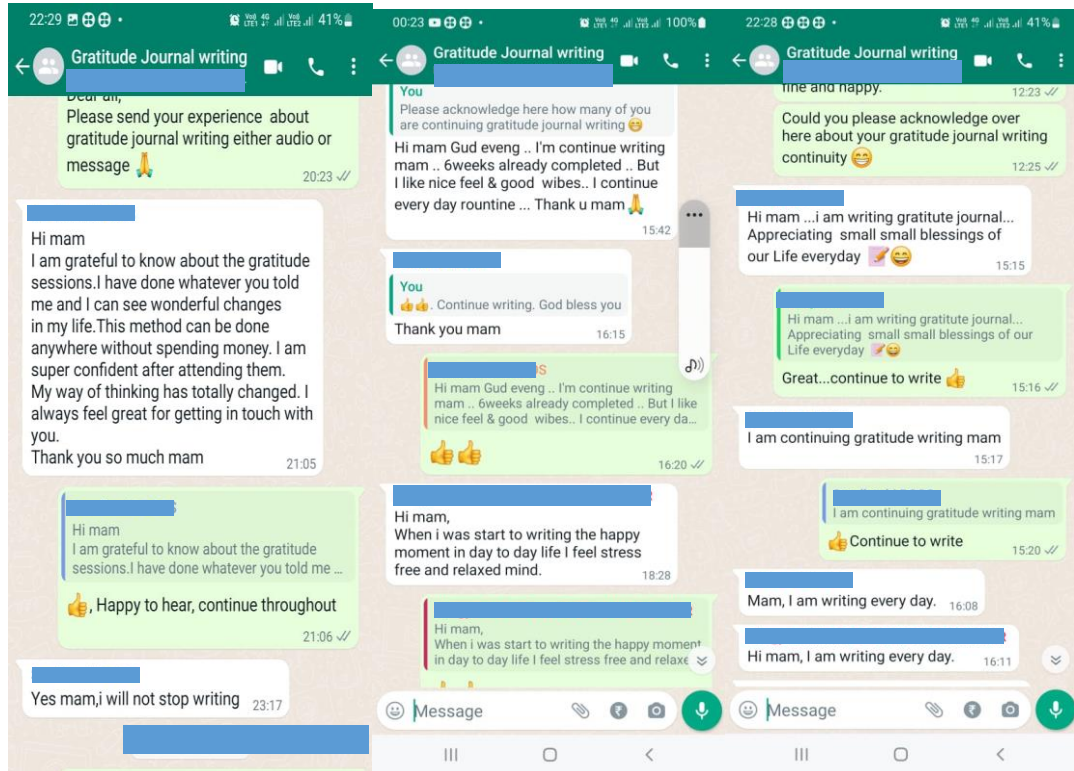
Gratitude journal written books

Sample Gratitude Journal written

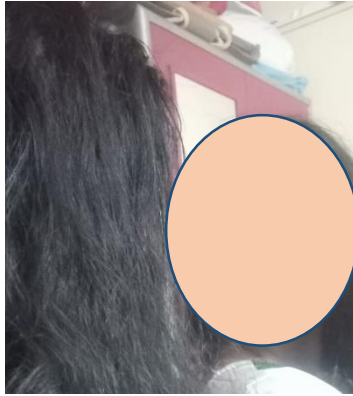
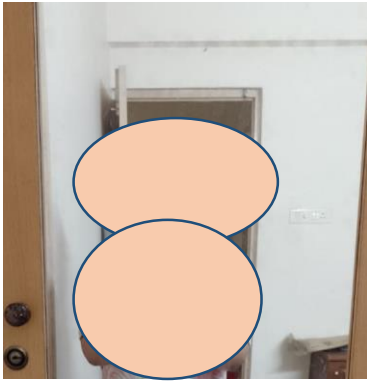
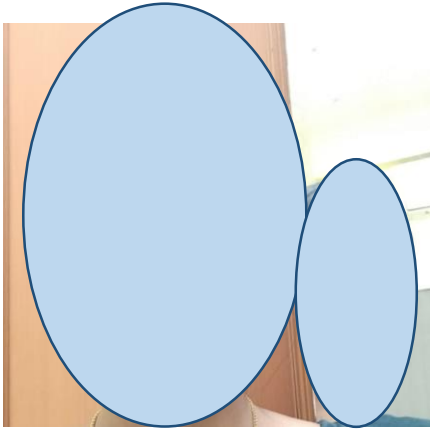


Sample Gratitude Journal written

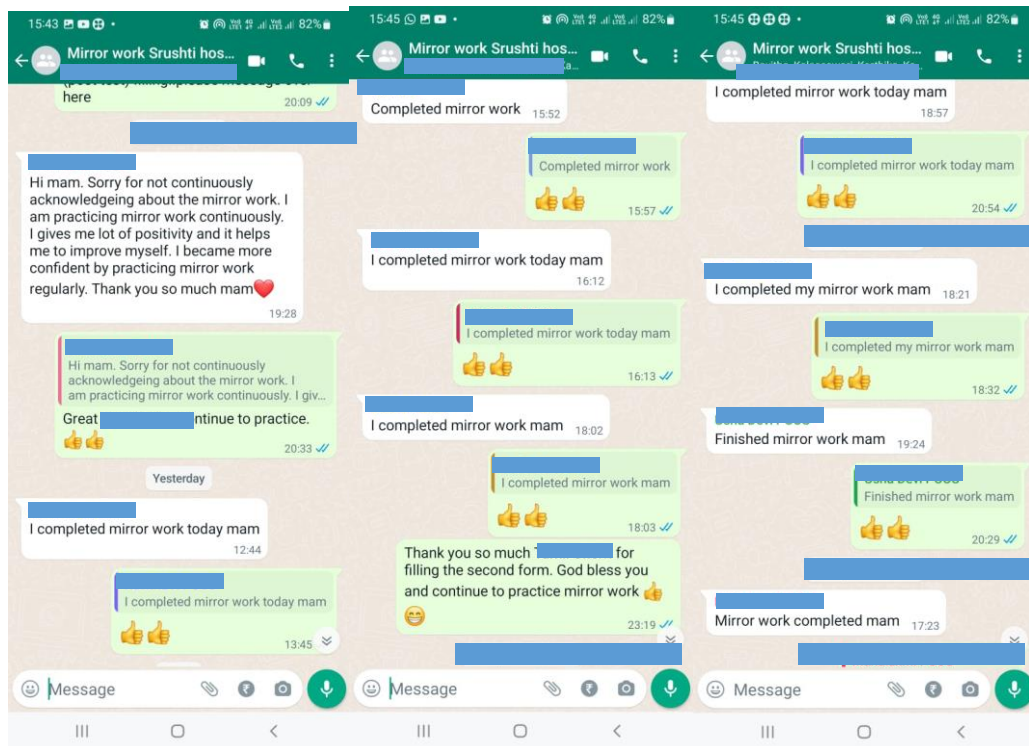
Gratitude Journal writing practice monitoring with WhatsApp Group



Sample Mirror work practice



Mirror work practice monitoring with WhatsApp group



LIST OF ABBREVIATIONS

PCOS	Polycystic Ovary Syndrome
DASS 21	DASS 21 Scale (Depression Anxiety Stress Scale 21)
SCS	Self Compassion Scale
FSCRS	Forms of Self Criticism / Attacking and Self Reassuring Scale
is	Inadequate self
hs	Hated self
NP	Non PCOS
EXP	Experimental Group
Cont	Control Group
GE	Gratitude Experimental Group
ME	Mirror Work Experimental Group
PE	Pranayama Experimental Group
GC	Gratitude Control Group
MC	Mirror Work Control Group
PC	Pranayama Control Group
PreGE	Pre test Gratitude Experimental Group Sl nos
PreME	Pre test Mirror work Experimental Group Sl nos
PrePE	Pre test Pranayama Experimental Group Sl nos
PreGC	Pre test Gratitude Control Group Sl nos
PreMC	Pre test Mirror work Control Group Sl nos
PrePC	Pre test Pranayama Control Group Sl nos
PostGE	Post test Gratitude Experimental Group Sl nos
PostME	Post test Mirror work Experimental Group Sl nos
PostPE	Post test Pranayama Experimental Group Sl nos
PostGC	Post test Gratitude Control Group Sl nos
PostMC	Post test Mirror work Control Group Sl nos
PostPC	Post test Pranayama Control Group Sl nos
QoL	Quality of Life
HPA axis	Hypothalamic-pituitary-adrenal (HPA) axis

List of Publications

1. Research paper on Impact of Mirror Work Intervention on Mental Health of Women with PCOS. Published in Scopus journal, Cuestiones de Fisioterapia. 2025.54(3):1165-1173, ISSN:1135-8599
2. Research paper on Mental Health Among Patients Of Polycystic Ovary Syndrome (PCOS) Published in journal, African Journal of Biological Sciences. 6(Si4) (2024) ISSN:2663-2187
3. Review paper on The Impact of Gratitude On Polycystic Ovary Syndrome (PCOS) Patients: A Review. Published in journal, Educational Administration: Theory and Practice. 2024, 30(4), 8716-8720 ISSN:2148-2403
4. Research paper on Impact of Gratitude Journal writing Intervention on Depression, Anxiety, Stress, Self Criticism and Self Compassion In “Women with PCOS” published in Journal for Re Attach Therapy and Developmental Diversities eISSN:2589-7799 2023 Dec; 6(07s: 858-870.
5. Article on Depression and Mental Health co-authored and Published in Journal for Re Attach Therapy and Developmental Diversities. eISSN:2589-7799 2023 Dec; 6(07s: 845-847.
6. Book Chapter Published: Applications and Benefits of Positive Psychology EVERY DAY STUFF PSYCHOLOGY ISBN:978-93-5506-909-2
7. Review article on Quality of life published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 846-857
8. Review article on Mental wellbeing and life satisfactionco-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 858-868
9. Review article on Mental Health co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4),908-916
10. Review article on Mental Health and Optimism co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 917-927

11. Review article on Religiosity and Optimism: Exploring the Interconnection co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 928-938
12. Review article on Understanding Human Behavior co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 939-949
13. Review article on Health and Well Being co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 950-960
14. Review article on Anxiety and Optimism: Exploring the Relationship and Impact on Mental Health co-authored and published in International Journal of Research and Analytical Reviews. ISSN 2348-1269, Dec 2024, 11 (4), 897-907

List of Conferences

1. Presented Paper entitled Addressing the Psychological Perspectives among the Younger Generation towards the New Normal presented in the International E-Conference held on 26&27th March 2021 at Dr MGR Janaki College of Arts & Science for Women, Chennai under the topic The new normal Psychological Perspectives
2. Presented Paper entitled Unravelling Self Compassion Disparities in women with and without Polycystic ovary syndrome (PCOS) presented in the 2nd International Conference on Positive Psychology (online) held on 19th& 20th Apr 2024 by National Positive Psychology Association (NPPA)

List of workshops

1. SPSS Course conducted by - COMMACAD
2. Scale development and standardization course conducted by - LPU
3. SPSS Course conducted by - LPU
4. Refresher course in Psychology course by Ramanujan College, University of Delhi.
5. Yoga wellness Instructor course conducted by Yoga certification board, Ministry of Ayush, Govt. of India.

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