MATERNAL HEALTH CARE SERVICES IN HIMACHAL PRADESH: AN EMPIRICAL ANALYSIS

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DOCTOR OF PHILOSOPHY

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Economics

By

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DECLARATION

I, hereby declare that the presented work in the thesis entitled "Maternal Health Care Services in Himachal Pradesh: An Empirical Analysis" in fulfilment of degree of **Doctor of Philosophy (Ph. D.)** is the outcome of research work carried out by me under the supervision of Dr. Pooja Kansra, working as Professor, in the Mittal School of Business, of Lovely Professional University, Punjab, India. In keeping with the general practice of reporting scientific observations, due acknowledgments have been made whenever work described here has been based on the findings of other investigators. 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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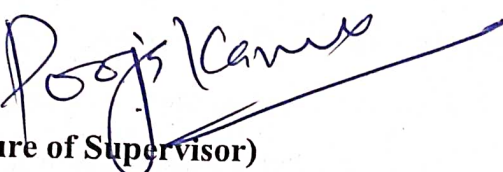
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CERTIFICATE

This is to certify that the work reported in the Ph. D. thesis entitled "Maternal Health Care Services in Himachal Pradesh: An Empirical Analysis" submitted in fulfillment of the requirement for the award of degree of **Doctor of Philosophy (Ph.D.)** in the Mittal School of Business is a research work carried out by Vedica Awasthi,11814662, is bonafide record of his/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

Maternal healthcare has been designated as the utmost health priority both in developing and under-developed countries (World Health Organization, 2018). Maternal health is acknowledged as well-being during pregnancy, childbirth and post-partum phase. Maternal health care services are divided into Ante Natal Care (ANC), Intranatal (INC) Post Natal Care (PNC) which includes: vaccinations, institutional delivery, iron folic acid tablets (IFAs) and many more (Sheth et al., 2013; Gupta et al., 2016; Idoko et al., 2017). Ante Natal Care is referred to pregnancy health which is generally provided by a doctor or some health professionals. It helps in detecting the signs of complications that may arise at the time of childbirth and treating them and providing them counselling related to a good diet, preventive care (Central Bureau of Health, 2018)**.** Antenatal visits help a mother to have a good understanding of maternal care during and after pregnancy. Intranatal care refers to the care provided to the mother as well as to the newborn at the time of childbirth or during delivery (Bhimani et al., 2017). Postnatal period which is also known as post-partum period is the most critical period for mother as well as for child still it is the most neglected period which causes most of the maternal deaths (World Health Organization, 2013). It is very important for a mother to have a postnatal check-up within a few hours of delivery (Ministry of Health and Family Welfare, 2007). Generally, maternal deaths occur after 48 hours of delivery. Post-partum period can be classified into three phases: 6-12 hours after delivery is known as the first one is acute/initial phase; 2-6 weeks after delivery is known as sub-acute phase; and up to six months after delivery is known as delayed postpartum phase (Romano et al., 2010). The main objectives of the study were to study the awareness, explore socio-economic determinants of utilization, estimate the cost, identify the catastrophic healthcare expenditure and examine the quality of maternal healthcare services.

A cross-sectional study was carried out in Himachal Pradesh, India. The study was based broadly on primary data. Only those women who delivered a child within last one year at the time of data collection and residing in the selected study area were included in the study. The data was collected with the help of a structured

questionnaire. The questionnaire was validated and pilot study was carried before data collection.

A multi-stage stratified random sampling design was adopted in respect of the three administrative divisions of Himachal Pradesh State (Kangra, Mandi and Shimla). At the first stage, two districts were selected from each of the three divisions on the basis of literacy rate (on the basis of Census data, 2011; Statistical year book of Himachal Pradesh 2015-16) *viz.* one district with highest literacy level and one with lowest literacy level in that administrative division. The reason for adopting this practice was in line with the existing literature (Letamo and Rakgoasi, 2003; Chhabra et al., 2011; Dabade et al. 2013; Kulkarni and Durge, 2013; Sanneving et al., 2013; Saxena et al., 2013; Nigatu et al., 2014; Tsawe and Susuman, 2014; Shahabuddin et al., 2017; Adhikari, 2016; Acharya et al., 2016; Goli et al., 2016; Govil et al., 2016; Haddad et al., 2016; Bhandari et al., 2017; Obeidat et al., 2017; Haider et al., 2017; Aregbeshola and Khan, 2018; Deepak et al., 2018; Mersha, 2018) that education is one of the significant determinant of utilization of health care services. Further, from districts, two tehsils were selected on the basis of literacy level again. Respondents were selected with the help of simple random sampling. The data analysis was done with the help of Chi-square, Kruskal Wallis test, mean, median, headcount, overshoot, mean positive overshoot (MPO) and logistic regression (LR).

The study reveals that respondents in Himachal Pradesh are partially aware about maternal health care services. A majority of approximately 80.4 percent of the participants believe that enrolling oneself during pregnancy is crucial, with 63.2 percent believing that registration should take place during the first trimester of the gestational period. There was an absence of understanding regarding the importance of antenatal check-ups during pregnancy. The majority of women hold the belief that antenatal care (ANC) plays a crucial role in obtaining knowledge regarding the well-being of the developing baby throughout pregnancy. The frequency of antenatal care visits during pregnancy was highest for the category of 5-6 visits, followed by 3-4 visits and 7-8 visits. A notable percentage, specifically 40 percent, exhibited a lack of awareness regarding the importance of Tetanus Toxoid vaccinations for pregnant

women. Only 23.3 percent of respondents rightly acknowledged that the application of tetanus toxoid (TT) injections has the dual function of protecting both the mother and the baby from tetanus. A significant percentage of participants were aware of a single dose of Tetanus Toxoid (TT), but only 42.7 percent understood the imperative nature of taking two doses. Only 31.6 percent of participants demonstrated correct knowledge of the need to consume three doses, while a minimal 1.7 percent were unaware. A substantial majority of participants exhibited knowledge regarding the significance of consuming iron and folic acid (IFA) tablets in the first trimester of pregnancy. A minority, comprising 0.5 percent, held the belief that such supplementation was unnecessary. A significant proportion of 15.5 percent conveyed a sense of ambiguity concerning the imperative nature of consuming IFA tablets during this pivotal timeframe. When asked about the rationale behind the utilization of IFA tablets, a substantial majority of 72.2 percent demonstrated awareness of its role in preventing maternal anemia. When asked about the appropriate dosage of IFA pills during pregnancy, only 10.9 percent of the participants were aware that 180 tablets should be taken. The survey findings indicate that hypertension, gestational diabetes, anemia, bleeding during pregnancy, breast- related problems, and fetal distress collectively contribute to a very small percentage of instances. Factors such as literacy, type of family, birth order, monthly income or economic status of the household influence utilization of maternal healthcare services in Himachal Pradesh. The cost of healthcare increases with complications, and poor Indian households spend more on healthcare than high-income households, leading to out-of-pocket expenditure.

The geographical division of childbirth among women in three regions: Kangra, Mandi, and Shimla was also found in the study. Within Kangra, a significant majority of women (81.4 percent) opt for public healthcare facilities, whereas a smaller proportion (8.6 percent) prefer private hospitals. Factors contributing to non-delivery include insufficient road communication and restricted vehicle access. In the Mandi region, the majority of individuals (91.6 percent) express a preference for public hospitals, while a smaller proportion (1.9 percent) opt for private hospitals. In Shimla, 83.5 percent of people choose for public hospitals, while 9.9 percent prefer private hospitals. The study offers useful insights on women's delivery preferences and

challenges they encounter, which can guide healthcare strategy and enhance service accessibility. The survey revealed that a significant proportion of participants in Kangra, Mandi, and Shimla experienced normal deliveries, accounting for 61.1 percent of the total. However, caesarean section deliveries were also prevalent, constituting 38.9 percent, 40.6 percent, and 30.9 percent in the corresponding regions. Most deliveries were mostly performed by doctors, with traditional birth attendants playing a relatively low role. Nurses were significantly involved in 27.9 percent, 26.4 percent, and 35.8 percent of deliveries, respectively. A significant proportion of individuals experienced issues during childbirth, with 37.2 percent in Kangra, 15.1 percent in Mandi, and 6.2 percent in Shimla encountering difficulties.

The utilization rate of postnatal care (PNC) services in the Himachal was only 36.3 percent, with Shimla having the greatest utilization rate at 34.8 percent. Most people choose to visit public hospitals for PNC services, with Mandi being the most popular choice at 40.9 percent. Private hospitals exhibit lower utilization rates, varying from 0.4 percent to 1.7 percent. A considerable percentage of babies were healthy, with Kangra reporting an excellent rate of 97.5 percent, Mandi at 99.1 percent, and Shimla at 95.5 percent. The time of discharge after labor seems to differ among different areas, with Mandi having the highest incidence of discharges after 24 hours at 30.2 percent. There is regional variation in consumption, with Mandi having the largest consumption of iron and folic acid (IFA) supplements.

The research findings indicate that those above the age of 40 incur the greatest average expenses for maternal health care in Himachal Pradesh, followed by individuals aged between 35 and 40, as well as those aged between 25 and 30. Participants from Mandi and Shimla indicated that the expenses for maternal health care were lower compared to those from Kangra. The cost of maternal health care was significantly influenced by geographic location, with no significant variation found in expenses based on religion throughout Himachal Pradesh. The majority of participants preferred "buying only a part of medicines" and "help from family members" as their main strategy for managing the expenses related to maternal healthcare. More than half of the participants never participated in the practice of selling their assets or mortgaging assets to manage the costs associated with maternity healthcare. A minority of persons admitted to considering seeking a loan, but 15.5

percent expressed their resistance of using their savings to meet these expenses.

The study also analyzed the impact of healthcare costs on individuals and families in various locations with defined thresholds. In Kangra, if healthcare costs account for 5 percent of an individual's income or spending, the actual expenses exceed this threshold by an average of 23.7 percent. Similarly, in Mandi, the observed expenditures cross the threshold by an average of 10.3 percent, and in Shimla, they exceed it by an average of 16.7 percent. Healthcare expenses in all regions exceed 10 percent of the total income or expenditure by a margin of 20.7 percent. The mean positive gap was calculated as 38.9 percent, 49 percent, and 53.8 percent for 20 percent, 30 percent, and 40 percent, respectively. The findings reveal crucial factors that lead to the incidence of catastrophic healthcare expenses in maternal health care in Himachal Pradesh. An extensive analysis with a binary logistic model demonstrated that certain factors, such as age, career, and family structure, do not exert a substantial influence on catastrophic health expenditure (CHE). However, the caste, literacy rate, and the occupational position of the husband exhibit a significant correlation with CHE. Particularly, persons between the age of 20 and 25 are less likely to get CHE, but those in the high-income category had a lower risk. Furthermore, joint family households have a greater likelihood of experiencing catastrophic health expenditure (CHE), but this association was determined to be statistically insignificant.

The relationship between satisfaction and various dimensions (tangible, assurance, reliability, responsiveness, empathy) in the context of women utilizing hospital services was observed. The results showed that all dimensions had a positive and significant influence on satisfaction. Tangible (factors such as visually appealing buildings and clean wards), assurance, which refers to patient confidence, reliability (trustworthiness), responsiveness (attentiveness to needs), and empathy (understanding of feelings) had influence on satisfaction.

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विद्या ददाति विनयं, विनयात् याति पात्रताम्।

पात्रत्वात् धनम् आप्नोति, धनाद्धर्मं ततः सुखम्॥

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

S.NO.	DESCRIPTION	ABBREVIATION
1.	Antenatal Care	ANC
2.	Catastrophic Health Expenditure	CHE
3.	Cephalopelvic Disproportion	CPD
4.	Comptroller and Auditor General of India	CAG
5.	Corona Virus Disease	COVID
6.	Intranatal Care	INC
7.	Iron Folic Acid	IFA
8.	Janani Shishu Suraksha Karyakaram	JSSK
9.	Janani Suraksha Yojana	JSY
10.	Maternal Health Care	MHC
11.	Maternal Mortality Rate	MMR
12.	Mean Positive Overshoot	MPO
13.	Meconium Aspiration Syndrome	MAS
14.	Ministry of Health and Family Welfare	MHFW
15.	National Rural Health Mission	NHRM
16.	Out-Of-Pocket Expenditure	OOPE
17.	Postnatal Care	PNC
18.	Postpartum Haemorrhage	PPH
19.	Premature/ Prelabor Rupture of Membrane	PROM
20.	Service Quality	SERVQUAL
21.	Tetanus Toxoid	TT
22.	United Nations Children's Fund	UNICEF
23.	Vesico Vaginal Fistula	VVF
24.	World Health Organization	WHO

CHAPTER - I

INTRODUCTION

1.1 Background of Maternal Health Care Services

Maternal health refers to the well-being of women throughout pregnancy, labour, and the period following childbirth. The scope of this includes the healthcare aspects related to family planning, preconception, prenatal, and postnatal care. The goal is to ensure a positive and satisfactory experience in the majority of cases, while also reducing instances of maternal morbidity and mortality in certain situations (WHO, 2023; Alkali & Hussain, 2016). This encompasses the holistic well-being of women, encompassing their physical, emotional, and social aspects, during the course of pregnancy and childbirth. Enhancing maternal health is a crucial factor in the progress of any nation, as it promotes fairness and diminishes poverty (Ministry of Health & Family Welfare, 2014). Maternal health refers to the well-being of women during the stages of pregnancy, labour, and the period following childbirth. The scope of this field includes the aspects of healthcare related to family planning, preconception, prenatal, and postnatal care. Its goal is to offer a happy and satisfying experience for most individuals, while also reducing the occurrence of illness and death among mothers (WHO, 2023; Alkali & Hussain, 2016). This encompasses the holistic well-being of women encompassing their physical, emotional, and social aspects during the period of pregnancy and childbirth. Enhancing maternal health is a crucial factor in the progress of any nation, as it promotes fairness and diminishes poverty (Ministry of Health & Family Welfare, 2014).

The fragile health situation of developing countries due to scarce resources coupled with the medicalization of simple remedial health issues has become a serious concern leading to a debate on the medicalization of health (Clark, 2014). Developing countries, like other regions of the world, are faced with the challenge of making the best possible use of limited resources to improve the health of all and particularly of women and children (Mariani, 2017). Effective maternal and pediatric care practices play an essential role since they address the needs of the most vulnerable groups in society. Women play a significant role in reproduction, exerting a tremendous impact on the offspring even prior to its birth (Ayed, 2010). Women's reproductive rights, including behaviors related to maternal and child care, are a crucial aspect of women's

human rights. Primary health care services are essential for safeguarding women's reproductive rights and ensuring the survival of children. The right to access maternal healthcare services and its awareness towards women is the main aspect of utilizing maternal healthcare services (Ali & Chauhan, 2020). A lack of awareness or knowledge about maternal health is a major concern. In terms of maternal mortality, the majority of fatalities that occur as a result of maternal causes can be avoided if pregnant women receive proper antenatal care throughout their pregnancy, if they have delivered their babies in hygienic settings with the support of qualified medical practitioners, and if they receive postnatal care that is both suitable and timely (Kulkarni et al., 2019; Ouedraogo et al., 2019). Immunization of pregnant women against tetanus reduces maternal and neonatal mortality. It has been observed that countries with low maternal mortality rates have a high proportion of deliveries conducted in medical institutions or by trained health professionals.

Maternal mortality is a serious problem which is being faced by developing countries. Many studies have found that having information about maternal healthcare services and their utilization can play a vital role in decreasing the maternal mortality rate. Maternal mortality refers to the death of a mother due to any complication during pregnancy or during or after six weeks of childbirth (Phoxay et al., 2001; Nikiema et al., 2009; Ossai & Uzochukwu, 2015; Geleto et al., 2019; Musa et al., 2019; Choudhury et al., 2021). Maternal mortality rate refers to the number of mothers' death per one lac live births. This rate represents the maternal health situation of any country or state. Awareness of not only the gestation period but also of postpartum period is essential. The postpartum period is six weeks or forty-two days from the day baby gets delivered. This period is crucial and generally, deaths occur in this period (Abera, 2015; Khan & Kotecha, 2019; Mustafa, 2020). It has been observed that countries with low maternal mortality rates have a high proportion of deliveries conducted in medical institutions or by trained health professionals (Berhan & Berhan, 2014). Institutional delivery ensures that a health professional assists the pregnant woman, mainly a qualified allopathic doctor, who can also attend to complications or arrange appropriate referrals. It thus reduces the risk of both maternal and infant mortality.

Human capital plays a crucial role in determining both the demand for and quality of maternal health services, which impacts maternal health outcomes. Higher level of education is an important aspect of human capital which provides women with

2

essential knowledge regarding pregnancy, childbirth and postpartum health, which helps in strengthen their ability to make smart decisions about their health and seek suitable medical attention. A positive correlation was found between higher levels of women education and maternal health care utilization (Adhikari, 2016; Acharya et al., 2016; Goli et al., 2016; Govil et al., 2016; Haddad et al., 2016; Bhandari et al., 2017; Obeidat et al., 2017; Haider et al., 2017; Aregbeshola and Khan, 2018; Deepak et al., 2018; Mersha, 2018).

1.2 Epidemiology of Maternal Health

About 287,000 women died during and following pregnancy and childbirth in 2020. WHO (2015) showed that roughly 303,000 women died during and following pregnancy and childbirth. It was observed that 830 women die daily from preventable causes related to pregnancy and childbirth and 99 percent of maternal deaths occur in developing countries. In the past few decades, there has been notable global advancement in the reduction of maternal mortality. However, it is important to recognize that a significant number of mothers, including those who are adolescents, continue to experience a high mortality rate. This is primarily due to preventable or curable causes, such as infections and complications arising during pregnancy or delivery. Complications arising from pregnancy and delivery continue to be a prominent cause of severe morbidity and mortality among women in the majority of developing nations. In 2015, a majority of maternal deaths worldwide occurred in developing countries. Maternal morbidity may serve as a more effective measure for evaluating the level of maternity care in comparison to maternal mortality (Mansuri and Mall, 2019). Lately, there has been a concerning trend of challenges in the realm of women's health, specifically in relation to maternal mortality rates, which have either shown an increase or remained stagnant across almost all countries worldwide. The lack of equitable access to accessible and excellent healthcare and services poses a significant barrier for numerous nations in their efforts to enhance maternal mortality rates and decrease the occurrence of stillbirths. A considerable percentage of maternal and neonatal fatalities took place within scenarios that include conflict or displacement (Dawkins et al., 2021).

India's maternal mortality ratio (MMR) has declined to 130 per 100,000 live births (Ministry of Health and Family Welfare, 2021). According to UNICEF, the most recent

report from the national Sample Registration System (SRS) data, the maternal mortality ratio (MMR) of India during the period of 2018-20 was recorded at 97 per 100,000 live births (UNICEF, India). A significant decrease of 17 points in the Maternal Mortality Ratio (MMR) compared to the previous MMR of 130 per 100,000 live births was reported between 2014 and 2016 which demonstrates substantial improvement since the year 2000. In seventeen years, South Asia has achieved the most significant overall percentage reduction in MMR, with a reduction of 59 per cent (from 395 to 163 maternal deaths per 100,000 live births). MMR in India was 167 per 1,00,000 live births in 2015. The maternal mortality rate in Himachal has declined to 55 per 1,00,000 live births which is better than the envisaged global target. The maternal mortality rate in the state has experienced a decline reaching 55 per 100,000 live births (UNICEF).

1.3 Indicators of Maternal Health

Indicators of maternal health refer to quantifiable measurements or factors that are employed to evaluate the state of mental and physical health of expectant women and recently delivered mothers.

1.3.1 Antenatal Care (ANC):

1.3.1 Antenatal Care (ANC): Ante natal care is referred to pregnancy health which a doctor or some health professionals generally provide. It helps detect the signs of complications that may arise during childbirth, treat them, and provides them with counselling related to good diet preventive care (UNICEF, 2022). Antenatal visits help a mother to have a good understanding of maternal care during and after pregnancy. ANC is the care that a woman receives during pregnancy that helps ensure a healthy pregnancy outcome. Antenatal care ensures maternal and fetal health well-being and also prepares women physically fit for labour, delivery and the postpartum period (WHO, 2016). The ANC ensures that all pregnant women receive primary and specialist services at healthcare institutions. Antenatal care visits commence with confirmation of pregnancy and persist at intervals of four weeks over the initial seven months of gestation, followed by biweekly visits until birth. The services provided by ANC encompass the enrollment of expectant mothers in healthcare facilities, a minimum of three visits to healthcare institutions for prenatal care throughout the pregnancy, administration of Iron folic acid tablets to pregnant women, two doses of tetanus toxoid (TT) vaccine, regular check-ups including abdominal examinations, monitoring of blood pressure, urine analysis, and assessment of fetal growth,

4

identification and treatment of anemia, and the management and referral of pregnancies at high risk (Ministry of Health and Family Welfare, 2010; Sarkar et al., 2020). Regular antenatal care helps in the physical and mental preparation of women. It helps them relax during pregnancy & after delivery and, at the same time, plays a vital role in reducing maternal & neonatal morbidity, abortions, congenital disabilities and low birth weight (LBW) baby (Bale et al., 2003; Downe et al., 2019). Complications during pregnancy and childbirth are unpredictable and often occur suddenly without warning; therefore, focused ANC helps in the early detection and timely treatment of diseases, improving maternal outcomes. The detection and treatment of high blood pressure and anaemia prevents eclampsia and anaemic conditions (WHO, 2017; Salomon et al, 2019).

1.3.2 Intranatal Care (INC): Intranatal care refers to the care provided to the mother and the new born at the time of childbirth or during delivery. Institutional delivery is helpful to avoid any complications occurring during delivery because all pregnant women are at risk of life-threatening complications, many of which are unpreventable and unpredictable (The Global Health Observatory, 2023; Nigusie et al., 2021). It is also to be ensured that delivery should be conducted by trained birth attendant (TBA) or in the supervision of a qualified medical practitioner to identify potential complications and, thereby, timely treatment. To ensure the safe delivery principle of five cleans must be necessarily adopted, i.e. clean environment, clean hand, clean blade, clean surface and clean thread if deliveries are conducted at home (Esteves et al., 2020). This help avoids unwanted infections or sepsis during the delivery process and lack of care which may result in the death of the mother, child or both (Brizuela et al., 2019).

1.3.3 Postnatal Care (PNC): Postnatal period also known as the postpartum period, is the most critical period for the mother and child. It is still the most neglected period, which causes most maternal deaths. A mother must have a postnatal check-up within a few hours of delivery (Department of Maternal, Newborn, Child and Adolescent Health 2013; Esteves et al., 2020; Noble & Sheppard, 2022). Generally, maternal deaths occur after 48 hours of delivery. The postpartum period can be classified into three phases: 6-12 hours after delivery is known as the first one is acute/initial phase; 2-6 weeks after delivery is known as the sub-acute phase; and up to six months after delivery is known as the delayed postpartum phase (WHO, 1998; Romano et al., 2010; Chauhan &

Tadi, 2022). It is when the mother's body returns to normal; therefore, mothers need to receive care during the postnatal period. According to Gill (2007), states that almost 60% of maternal deaths occur in the postnatal era. The demise of a mother increases the vulnerability of her newly born offspring to significant health issues and premature mortality. Receiving PNC is crucial for the survival of both the mother and kid, as it can determine their ability to endure life or death. The postnatal care includes routine visits to the health centre after childbirth, exclusive breastfeeding, immunization of the child, maintenance of warmth and early identification of danger signs/complications and timely referral.

1.3.4 Maternal Mortality Rate: Maternal mortality refers to the mother's death due to any complication during pregnancy or during or after six weeks of childbirth. However, it does not account for variations in fertility levels within a population. The maternal mortality ratio (whose denominator is the number of women of reproductive age), which reflects not only the risk of maternal death per pregnancy or birth but also the level of fertility in the population (WHO, 2023). The maternal mortality ratio, which is calculated by dividing the number of maternal deaths by the number of live births, reflects the risk faced by women during pregnancy and childbirth. However, it does not account for variations in fertility levels within a population. The maternal mortality ratio (MMR) is a quantitative measure that calculates the ratio of maternal deaths occurring within a specific timeframe to the number of live births during that same period, expressed as a rate per 100,000 live births.

The maternal mortality ratio (MMR) is classified as high when it reaches a threshold of 300 or more maternal deaths per 100,000 live births. If the MMR exceeds 1000 maternal deaths per 100,000 live births, it is considered extremely high. Conversely, MMR is categorized as low when it falls within the range of 20-99 maternal deaths per 100,000 live births and as moderate when it ranges from 100-299 maternal deaths per 100,000 live births.

MMR=Number of maternal deaths / Number of live births×100000

1.4 Complications of Maternal Health

Following are some common complications occur during gestational and postpartum period:

Figure 1.1 Complications of Maternal Health
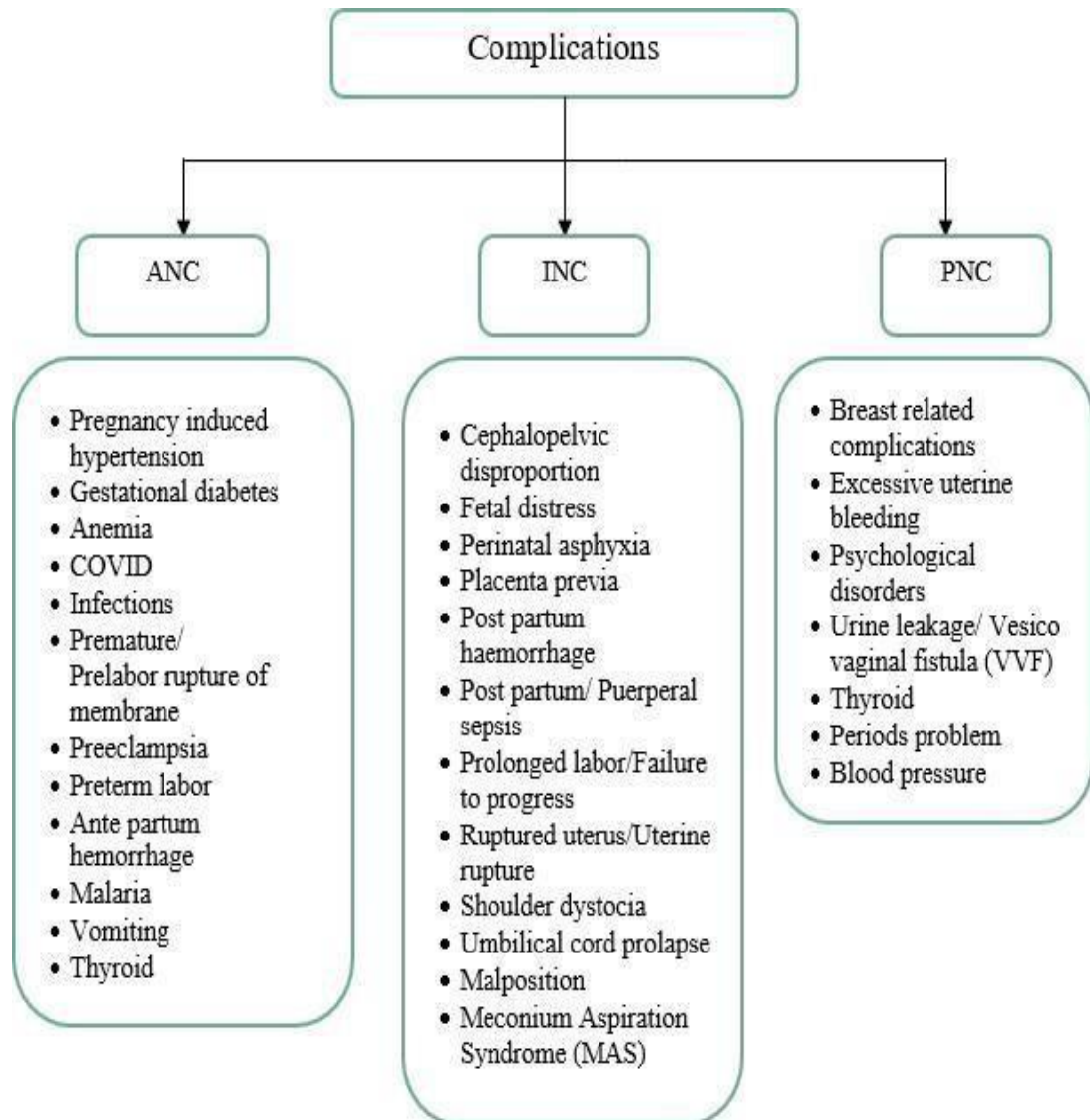
Source: Author's Compilation

i. **Pregnancy-induced hypertension:** Pregnancy-induced hypertension (PIH), alternatively referred to as gestational hypertension, is a medical condition that shows up during pregnancy and is distinguished by elevated blood pressure levels. Gestational hypertension generally manifests itself subsequent to the 20th week of gestation and typically abates following parturition.

ii.   **Gestational diabetes:** Gestational diabetes mellitus (GDM) is a type of metabolic disorder that manifests itself during the gestational period of pregnancy. Gestational diabetes mellitus (GDM) is a condition marked by elevated levels of blood glucose that manifest for the initial period during pregnancy and typically resolve following childbirth. Gestational diabetes manifests when the body's insulin production is insufficient during the course of pregnancy. Gestational diabetes mellitus (GDM) has a prevalence ranging from 2% to 10% among pregnant women.

iii.   **Anemia:** Anemia is a medical condition that is distinguished by a reduction in the quantity of red blood cells or a diminished level of hemoglobin within the bloodstream.

iv.   **COVID:** COVID-19 is an abbreviated form of the term Coronavirus Disease 2019, is a viral respiratory ailment that is instigated by a newly identified coronavirus known as SARS-CoV-2.

v.   **Infections:** In the context of maternal health, infections pertain to the occurrence of infectious diseases in women during pregnancy or in the immediate postpartum period. These infections can have significant consequences for both the mother and the newborn. These infections may occur as a result of multiple factors, such as previous medical history, alterations in the immune system during pregnancy, or medical interventions related to the process of childbirth.

vi.   **Premature/ Prelabor rupture of membrane:** Premature rupture of membranes (PROM), alternatively referred to as prelabor rupture of membranes, denotes the occurrence of the amniotic membrane sac rupturing prior to the initiation of labour. Typically, those membranes undergo rupture either during labour or at the onset of the birthing process, resulting in the discharge of amniotic fluid.

vii.   **Preeclampsia:** Preeclampsia is a significant medical condition that impacts expectant mothers and is distinguished by elevated levels of blood pressure (hypertension) and organ disability, commonly affecting the liver and kidneys.

viii.   **Preterm labor:** Preterm labour, also known as preterm birth, is characterized by the initiation of consistent contractions in the uterus and cervical modifications that culminate in labour and delivery transpiring prior to the completion of the 37th week of gestation. A pregnancy duration that is considered to be complete is typically defined as lasting between 37 and 42 weeks The occurrence of preterm

labour can lead to the premature delivery of the infant, thereby presenting potential hazards and complexities.

ix. **Ante partum hemorrhage:** Antepartum hemorrhage, or vaginal bleeding during pregnancy, is characterized by the occurrence of blood loss from the vagina between the 20th week of pregnancy and the delivery of the fetus.

x. **Malaria:** The term "malaria in maternal health" pertains to the occurrence of malaria infection in pregnant women and its consequences for both the mother and the developing fetus.

xi. **Vomiting:** Vomiting in the context of maternal health pertains to the occurrence of nausea and the physical process of expelling gastric contents through the oral cavity in the course of pregnancy. Nausea and vomiting, commonly known as "morning sickness," is a prevalent symptom frequently encountered by pregnant women. Nevertheless, it has the potential to happen at any point during the day and experience for the duration of the pregnancy.

xii. **Thyroid:** The importance of thyroid in maternal health pertains to the involvement of the thyroid gland and its influence on the well-being of expectant mothers. During gestation, thyroid function assumes heightened importance due to its essential role in the overall health of both the mother and baby.

xiii. **Cephalopelvic disproportion:** Cephalopelvic disproportion (CPD) refers to a medical condition characterized by an insufficient or incompatible alignment between the fetal head (cephalus) and the maternal pelvis, resulting in difficulties during the process of childbirth. The condition arises when the circumference of the infant's cranium exceeds the capacity of the maternal pelvic region, thereby impeding the passage of the fetus through the birth canal during the process of childbirth.

xiv. **Fetal distress:** Fetal distress, alternatively referred to as non-reassuring fetal status, denotes a state wherein indications arise suggesting insufficient oxygen supply to the fetus or a compromise in its overall welfare. The term "fetal distress" is employed to characterize atypical fetal heart rate patterns or other indicators observed during the course of labour or pregnancy, which may imply that the fetus is undergoing distress.

xv. **Perinatal asphyxia:** Perinatal asphyxia, alternatively referred to as neonatal asphyxia or birth asphyxia, denotes a state wherein there is insufficient provision

of oxygen to an infant during the perinatal phase, encompassing the time immediately preceding, during, and subsequent to birth. Perinatal asphyxia is characterized by a disturbance in the oxygenation or blood circulation of the neonate, which can result in possible harm to vital organs and tissues.

xvi.   **Placenta previa:** Placenta previa is a medical condition that develops during pregnancy, wherein the placenta partially or entirely obstructs the internal os, which refers to the opening of the cervix. Typically, placenta adheres to the uterine wall in a manner that enables it to provide sustenance and oxygen to the developing fetus, thereby supporting its growth and development.

xvii.   **Post-partum hemorrhage:** Postpartum hemorrhage (PPH) is characterized by the occurrence of excessive bleeding afterwards to delivery. This phenomenon is a substantial contributor to maternal morbidity and mortality on a global scale.

xviii. **Post-partum/ Puerperal sepsis:** Postpartum or puerperal sepsis refers to a significant infection that manifests in the reproductive system subsequent to the process of childbirth. This condition possesses the potential to jeopardize an individual's life and necessitates urgent medical intervention. Puerperal sepsis generally occurs within the initial six weeks following childbirth, although it may also manifest at a later stage.

xix.   **Prolonged labor/Failure to progress:** Prolonged labour, alternatively referred to as failure to progress, denotes a medical condition characterized by an extended duration of the labour process beyond anticipated timeframes or a failure to advance at a typical pace. The condition is identified when there is insufficient cervical dilation or a lack of descent of the fetus through the birth canal.

xx.   **Ruptured uterus/Uterine rupture:** Uterine rupture is an uncommon yet significant obstetric complication characterized by the occurrence of a tear or aperture in the uterine wall, also known as the womb. The occurrence of this condition could happen during the stages of pregnancy, labour, or delivery, and is accompanied by notable risks for both the maternal and fetal health.

xxi.   **Shoulder dystocia:** Shoulder dystocia is a complication during childbirth characterized by the impaction of one or both of the baby's shoulders behind the mother's pubic bone, resulting in a delay or obstruction of the delivery of the baby's body subsequent to the delivery of the head.

xxii. **Umbilical cord prolapse:** Umbilical cord prolapse is an infrequent yet significant obstetric complication characterized by the fall of the umbilical cord through the cervix and into the birth canal preceding the fetus. The occurrence of this event may arise either during the process of labour or delivery, and is regarded as a critical circumstance necessitating prompt medical intervention.

xxiii. **Malposition:** In the context of delivery, malposition pertains to an atypical positioning of the fetus within the uterine cavity or birth canal. This indicates that the infant is not situated in the most advantageous position for a seamless and uncomplicated childbirth.

xxiv. **Meconium Aspiration Syndrome (MAS):** Meconium Aspiration Syndrome (MAS) is a medical condition characterized by the inhalation or aspiration of meconium, the initial excrement produced by a newborn, into the respiratory system prior to, during, or following the birthing process. Meconium refers to a fluid, sticky greenish-black substance that gathers within the fetal gastrointestinal tract during gestation and is typically expelled shortly following delivery.

xxv. **Breast related complications:** Following childbirth, certain women can suffer from breast-related complications that can have an impact on the process of breastfeeding or result in discomfort. These complications might appear as swelling and fullness of the breasts, blockage of milk ducts, and soreness of the nipples.

xxvi. **Psychological disorders:** Postpartum mental health disorders, also known as psychological disorders that may appear following childbirth, are frequently observed in individuals. Postpartum disorders have the potential to impact women subsequent to giving birth, exhibiting a spectrum of severity from minor to serious. It is imperative to acknowledge that postpartum mental health disorders have the potential to impact women of all ages, backgrounds, and prior mental health histories. One of the conditions that individuals may experience is postpartum depression. Some of them are postpartum, anxiety disorders, postpartum psychosis, and baby blues.

xxvii. **Urine leakage/ Vesico vaginal fistula (VVF):** Urine leakage and Vesicovaginal Fistula (VVF) are interconnected medical conditions characterized by the involuntary passage of urine from the urinary bladder into the vaginal canal.

xxviii. **Periods problem:** Following the process of childbirth, numerous women undergo alterations in their menstrual cycle. It is usual for the menstrual cycle to undergo a

period of adjustment before returning to its typical pattern, with variations in the particular alterations experienced by individual women. Several common symptoms associated with it are menstrual cycles include irregular periods, variations in flow intensity, alterations in cycle length, dysmenorrhea, and modifications in premenstrual symptoms.

1.5 Government Programmes to Improve the Utilization of Maternal Healthcare Services

The government has taken measures and started many schemes on the state and national level. Some of the schemes are discussed as below:

1.5.1 Pradhan Mantri Matru Vandana Yojana: This scheme has been implemented from January 1, 2017, in accordance with the provision of National Food Security Act, 2013. Under this scheme, pregnant and lactating mothers who are not regular workers with central and state government will be given a sum of cash of ₹5,000 in three installments for their first child in the family. The first installment of ₹1000 will be given at the time of registration of pregnancy at any recognized health facility or Anganwadi centers. The second installment of ₹2,000 will be given after the six months and having at least one ANC visit. The third installment of ₹2,000 will be provided after the child is registered and done with first cycle of immunizations like BCG, OPV, DPT and Hepatitis-B.

1.5.2 Pradhan Mantri Surakshit Matritva Yojana Abhiyan: This scheme was introduced by Hon'ble Prime Minister on July 31, 2016 in Mann ki Baat and was launched by Ministry of Health and Family Welfare, Government of India. The main objective of this scheme is to give free and complete quality ANC to all pregnant women on 9th of every month by Obstetrics and Gynecology specialists/Radiologist/physicians. In this scheme, the service is provided at both public health facilities as well as in private clinics. 27,655,855 Pregnant Women were examined under PMSMA scheme till 15 March, 2021 and there are 18,470 facilities providing PMSMA services.

1.5.3 Janani Suraksha Yojana (JSY): Janani Suraksha Yojana is the safe motherhood intervention of government under the National Rural Health Mission with the main aim of reducing maternal and neo-natal mortality by encouraging institutional delivery or delivery in any health facility by skilled birth attendant among poor

pregnant women. This scheme was launched on April 12, 2005, by the Honorable Prime Minister, and is being executed in all the states and UTs. It generally targets the women from poor households in order to ensure that they avail the maternal health care services and don't ignore facilities due to financial reason (Kaur et al., 2015; Pandey and Kaur, 2016). Under the scheme, women from poor households get free institutional delivery and free transportation facility. Total of ₹6,000 will be provided under this scheme including ₹5000 of Pradhan Mantri Matru Vandana Yojana.

1.5.4   Janani Shishu Suraksha Karyakaram (JSSK): On June 1, 2011, under the Ministry of Health and Family Welfare, Government of India has taken initiative to ensure better facilities of mother and new born child. It ensures more of institutional delivery over delivery at home or by unskilled birth attendant. The programme guarantees all pregnant women who give birth in public health institutions the entitlement to receive institutional delivery, including C-section, free of cost. The entitlements covers complimentary medications and consumables, diagnostic tests, blood when needed, and complimentary meals for three days during a normal delivery and 7 days for a C-section. Furthermore, this programme offers free transport services from the home to the institution.

1.5.5   DAKSHATA Initiative: The Dakshata Initiative was launched in 2018 with the objective of improving the quality of maternity and newborn care in public health facilities. By enhancing the quality of care in labour rooms, the program seeks to decrease maternal and newborn mortality rates. The key aspects of this initiative encompass a quality improvement, training and capacity building initiatives for healthcare providers, enhancements to infrastructure and consistent monitoring and assessment. Furthermore, the programme seeks to guarantee secure childbirths and enhance healthcare provisions in public health institutions.

1.5.6   HIMCARE: HIMCARE is a health insurance programme initiated by the Government of Himachal Pradesh on October1, 2016 with the aim of offering substantial financial coverage for the medical costs incurred by its residents. The program provides cashless care at hospitals within its network and includes a predetermined total insured amount to cover a range of medical costs for which one has to make a card by doing registration with the documents as proof. The programme includes coverage for hospitalization and expenses related to pre and post-

hospitalization procedures. The eligibility criteria are limited to permanent residents of Himachal Pradesh with weak economic status.

1.5.7   SUMAN (Surakshit Matritva Aashwasan): This national project by the Indian government seeks to guarantee that all pregnant women, newborns, and mothers up to six months postpartum have free, dignified, and high-quality healthcare at public health facilities. The initiative aims to decrease unnecessary maternal and neonatal fatalities by providing various services, including antenatal examinations, neonatal care, and the management of childbirth-related problems.

1.6 Indicators of Maternal Health Care of Himachal Pradesh and India

Table 1.1 shows maternal health indices of Himachal Pradesh and India based on NFHS-5 survey of moms who gave birth within five years. It was seen that about 85 percent of women in Himachal and India were benefitted from antenatal care (ANC) provided by skilled healthcare providers. In India (92.6 percent) had at least one antenatal care (ANC) visit, which higher than Himachal. Whereas, Himachal had higher women attending a minimum of four ANC visits as compared to India which is 70.6 percent. In Himachal, a higher percentage of women (72.4 percent) initiated antenatal care (ANC) during the first trimester of pregnancy compared to the national average of 70 percent in India. The percentage of women in Himachal who received two or more tetanus injections during pregnancy was low (77.6 percent) as compared to national average (83.1 percent). Himachal demonstrated superior performance compared to India in the consumption of iron and folic acid (IFA) tablets among women in Himachal, a higher percentage (67.2 percent) took IFA tablets for a minimum of 100 days compared to India (44.1 percent). Furthermore, for a minimum of 180 days, 43 percent in Himachal took IFA whereas, 26 percent took in India). The level of awareness among fathers at Himachal, 68.2 percent of fathers had a comprehensive understanding of the significance of giving birth at a healthcare facility, which is lower than the national average of 72.5 percent.

Table 1.1: Indicators of Maternal Health Care Practices

Indicators (Data from mothers who delivered baby within last 5 years of survey)	Himachal (N%)	India (N%)
Women who received ANC from skilled healthcare provider	85.3	85.1
Women who had at least 1 ANC visit	88.2	92.6
Women who had at least 4 ANC visits	70.6	58.5
Women who had ANC visit in first trimester of pregnancy	72.4	70.0
Women who received 2 or more TT injections during delivery	77.6	83.1
Women who took IFA for at least 100 days	67.2	44.1
Women who took IFA for at least 180 days	43.0	26.0
Fathers who knew the importance of delivering the baby in healthcare facility	68.2	72.5

Source: Ministry of Health and Family Welfare, 2021

1.7 Healthcare Infrastructure in Himachal Pradesh

Himachal Pradesh is a northern state of India which has done advancements of in its healthcare system. However, due to its topography and dispersed population it has to face many restraints for its access.

- The primary health infrastructure in the state consists of a well-developed network of primary health centers (PHCs), which serves as the primary point of contact for rural communities. As per the data of National Health System Resource Centre (2021), there are five hundred sixty-four PHCs in Himachal Pradesh.

- Sub-Centers SCs are small units which are usually located in remote and rural areas. They are the most peripheral point in the health care system, generally staffed by skilled healthcare professionals, such as Auxiliary Nurse Midwives (ANMs), who deliver basic healthcare services and health education. There are two thousand and ninety-two SCs in Himachal Pradesh (National Health System Resource Centre, 2021).

- Community Health Centres (CHCs): Comprehensive Health Centres (CHCs) are equipped to handle more complex medical conditions and offer a wider range of medical treatments, including maternity care and surgery. They serve as referral hubs for Primary Health Centres (PHCs). There are eighty-five CHCs in Himachal Pradesh (National Health System Resource Centre, 2021).

- District Hospitals (DHs): In addition to providing more specialized medical services including emergency care, surgery, and cutting-edge diagnostic tools, each district hospital has its own facility. In order to provide secondary healthcare medical services, these hospitals are essential. There are twelve DHs in Himachal Pradesh (National Health System Resource Centre, 2021).
- Medical Colleges: There are six medical colleges which functions as centers for medical education and research in addition to offering cutting-edge care.

1.8 Research Objectives

Specific objectives of the proposed study are:

1. To study the awareness of women towards various aspects of maternal health.
2. To explore the socio-economic determinants of utilization of maternal health care services.
3. To estimate the cost of utilization of maternal health care services.
4. To identify the determinants of catastrophic health care expenditure of maternal health services.
5. To examine the quality of maternal health care services received by women.

1.9 Rationale of the Study

Women's reproductive period is the most critical and crucial in her life. Every day, about 830 women die due to complications and cause related to pregnancy worldwide, which India shares about 20 per cent of (Alkema et al., 2016; Sharma et al., 2018). Maternal deaths lead to infant deaths as maternal health directly relates to the infant's health condition. In order to decrease the maternal mortality rate, the focus should be on the proper utilization of maternal healthcare services from the pre- pregnancy period. If proper maternal health is provided, maternal deaths can be prevented. Direct and hidden costs are the main barriers to institutional delivery for women from remote regions (Acharya et al., 2016).

In the present scenario, India's percentage of institutional delivery is 78.9 per cent. Himachal Pradesh has a lower institutional delivery percentage than the national value, as mentioned in NFHS (Ministry of Health and Family Welfare, 2017). Himachal Pradesh's hospital-population ratio is 0.79 hospitals per lakh persons, much less than other hilly states of India, with 2.20 hospitals per lakh persons (Dadhwal & Bhutani, 2017; National Health Profile, 2011). The state is ranked at 25th position out of 36 states

and union territories in institutional delivery rate, ranked 22nd for taking IFAs for ninety days or more, and ranked at 17th position for at least three antenatal visits, which indicates that women have limited awareness of the importance of each aspect of maternal healthcare (Government of India, 2017; NITI Ayog, 2017). Out of 500 primary health centres in Himachal Pradesh, only 81 are promoted to provide continuous delivery services. However, none of these had the essential availability of a gynecologist, staff nurses and skilled birth attendants, and only 192 PHCs had labour room facilities, and 7 had newborn care units (The Hindu, 2016). Various studies have been done on maternal healthcare services on the global and national levels. However, there is a dearth of literature on maternal health in Himachal Pradesh. The present study is expected to provide a comprehensive overview of maternal health to state government, policymakers and researchers.

1.10   Structure of the Study

The present study is structured into eight chapters. Chapter I provides a brief introduction to maternal health care. Chapter II presents a comprehensive review of the literature on maternal health care and its dimensions, such as utilization, cost, complications, and coping strategies. Chapter III highlights the research methodology, instruments, statistical tools for data analysis and limitations. Chapter IV discusses the level of awareness of women on various aspects of maternal health. The socio-economic characteristics and determinants of diabetes are described in Chapter V. Chapter VI examines and compares the utilization, cost and coping strategies of maternal health care services in Himachal Pradesh. Chapter VII examines the incidence and intensity of out-of-pocket payments and identifies the key determinants of catastrophic healthcare expenditure in Himachal Pradesh. The summary, conclusion and policy implications are discussed in Chapter VIII.

CHAPTER - II
REVIEW OF LITERATURE

The chapter highlights prior studies on maternal health and its associated aspects. In this chapter, a detailed literature evaluation has been conducted at the national and international levels to highlight the various challenges associated with the present study. The literature draws attention to research gaps and gives researchers and academics insight into multiple dimensions. The literature is evaluated on various aspects, such as awareness of women on various aspects of maternal health, utilization of maternal health care services, cost and copying strategies employed to utilize maternal health care services and quality of maternal health services received by women.

2.1   Awareness of Women on Various Aspects of Maternal Health

Awareness of the right to access maternal health services is critical to securing the accessibility of services. Prior research has demonstrated that a lack of knowledge about warning signs during pregnancy is a major factor in delays in seeking medical attention and a higher incidence of maternal mortality due to issues related to pregnancy (Nikiéma et al., 2009; Geleto et al., 2019). Enhancing knowledge and understanding pertaining to antenatal care (ANC) represents a viable strategy for mitigating pregnancy-related hazards. The ANC programme includes various health awareness initiatives aimed at addressing the early identification, treatment, and prevention of maternal health conditions (Choudhury et al., 2021). A study from Maharashtra highlighted that more awareness should be created through health education regarding antenatal visits and the utilization of maternal healthcare services (Dabade et al., 2013). Men's level of knowledge regarding obstetric danger signs and their involvement is very important to frame policies regarding awareness of men and enhancing their engagement in maternal health (Mersha, 2018). Staff shortage, lack of awareness of maternal health, affordability or financial crisis are main barriers to the accessibility of maternal health services (Tsawe & Susuman, 2014). According to Sheth et al., 2013 and Aregbeshola and Khan, 2018 suggested encouraging women to utilize maternal healthcare services can be helpful for maternal health care management.

A correlation between female literacy with age at marriage, fertility rates and child mortality was observed. Further, a positive correlation between age at marriage and level of education is also observed (Kumar et al., 2017; Sheikh & Loney, 2018). Early marriages, early pregnancies and short-spaced pregnancies are also some of the factors underlying such high rates of maternal deaths and vice-versa (UNICEF, 2001; Raj et al., 2010; Pillai et al., 2013). Some factors like the number of pregnancies, miscarriages, abortions, stillbirth, reproductive health problems, and antenatal, prenatal and postnatal care relate to the safety of the life of women in her reproductive age. Awareness through media, conducting educational programmes, community participation, campaigns and awareness, framing better policies and coverage in rural areas and some other strategies like these can play a better role inthe accessibility of maternal health (Ranjit et al., 2010; Sheth et al., 2013; Tsawe & Susuman, 2014). Broadcast media, including radio and television, play a crucial role in disseminating health-related knowledge with the aim of informing, educating, influencing, and modifying the public's health behaviors. This is done while acknowledging the immense importance on well-being of community as a whole (Chidinma, 2019).

2.2   Utilization of Maternal Health Care Services

Maternal health is a social phenomenon and a medical event where utilization of maternal health care services is influenced by many factors but education, social status of the household and the economic condition of the household is found to be highly significant (Chakrabarti & Chaudhury, 2007; Chhabra et al., 2011; Kulkarni & Durge, 2013; Sanneving et al., 2013; Saxena et al., 2013; Nigatu et al., 2014; Adhikari, 2016; Haddad et al., 2016; Aregbeshola & Khan, 2018; Deepak et al., 2018). Education plays a vital role in the utilization of maternal health care services. Many studies have found that the higher a woman is educated, the more likely she isto utilize maternal healthcare services (Letamo & Rakgoasi, 2003; Chhabra et al., 2011; Adhikari, 2016; Shahabuddin et al., 2017; Haider et al., 2017). H o w e v e r, o ther factorslike location of residence, viz. urban or rural, monthly household income, and the main occupation of the household also influence the utilization of maternal health care positively (Bloom et al., 2001; Letamo & Rakgoasi, 2003; Chhabra et al., 2011; Nigatu et al., 2014; Singh et al., 2014; Adhikari, 2016; Shahabuddin et al., 2017; Haider et al., 2017; Aregbeshola & Khan, 2018). Besides all these demographic factors such as age, caste,

and religion; availability of labour rooms, number of ANC visits and amplification of public health infrastructure also influence the utilization of MHC services (Chhabra et al., 2011; Sanneving et al., 2013; Singh etal., 2014; Adhikari, 2016; Deepak et al., 2018) One more factor, i.e. women autonomy also plays a major role in the direct relation with the utilization pattern of maternal health care services. Women having high autonomy are more likely to use antenatal care services (Bloom et al., 2001; Adhikari, 2016; Haider et al., 2017). Factors like poverty inversely influence the utilization of maternal health services (Bloom et al., 2001; Letamo & Rakgoasi, 2003; Saxena et al., 2013). A study from Aurangabad showed that most women went to private hospitals than government hospitals, and very few had delivery at home. Women had three or more three antenatal visits, less than half of the respondents had their 1st ANC visit in the first trimester, and around 5 percent had never taken an ANC visit. Similarly, studies from Lucknow and Ahmadabad have shown that women preferred government hospitals to private hospitals, and women generally took 2-3 ANC visits. It was observed that 50 percent of the respondents took their 1st ANC visit in 2nd trimester. A study from Northwest Ethiopia showed 3-4 ANC visits, mostly found in the second trimester followed by the third trimester.

2.3 Cost and Catastrophic Healthcare Expenditure of Maternal Health Care Services

Although some countries have tried to reduce the cost of health services in recent years, skilled healthcare remains too expensive for many women. Due to frequent service utilization and higher visit costs, maternal healthcare costs are significantly higher (Kes et al., 2015). The hidden cost is a barrier to institutional delivery for women from rural households and remote regions. Households with lower incomes tend to spend a higher percentage of their income on seeking health care than those with higher incomes (Bidgoli et al., 2015). However, variation in out-of-pocket expenditure (OOPE) was influenced by the type of delivery, place of ANC and complications in pregnancy. Factors such as the economic status of a household, women's education and complications in pregnancy were found as the determinants of OOPE (Acharya et al., 2016; Govil et al., 2016). The poorest Indian households spent almost twice and Kenya households spent almost ten times on seeking care (Bidgoli et al., 2015). More than 60 percent spent their savings and about 22 percent sold

assets to meet the out-of-pocket expenditure payments, whereas some women were so poor that they could not afford payments and skipped treatment (Dalinjong et al., 2018). Taking money from a partner or any household member and using own savings were the most common coping mechanisms (Bidgoli et al., 2015). Higher costs occur due to complications during pregnancy, resulting in increased expenditure (Kes et al., 2015). Factors like mode of delivery, family monthly income and travel time between the hospital and the respondent's house were found to be significant with the hidden cost of delivery services provided by the hospital (Acharya et al., 2016).

The association between poverty and maternal mortality and morbidity poses a significant concern in India. India's maternal mortality rate is persistently high, with 136,000 maternal deaths and 1 million neonatal deaths occurring year, despite a decade of significant economic growth (World Health Organization, 2005). The utilization of prenatal care (ANC), delivery care, and postnatal care (PNC) remains low, particularly in distant and sparsely populated regions (Peters et al., 2002; International Institute for Population Sciences 2007). During the tenth five- year plan (2002–2007), the Government of India's working group on health of women and children outlined unachieved goals for reducing maternal and neonatal mortality rates (Planning Commission, 2002). Throughout the eleventh plan period (2008–2012), the Indian government reiterated its dedication to decrease maternal mortality from 4 per 1000 births to 1 per 1000 births (Indian Government 2006b). India's low utilization of maternal health care and poor maternal health outcomes can be attributed to a multitude of factors. Maternal health outcomes are adversely affected by external factors, such as inadequate maternal nutrition, short intervals between births, early marriage, low levels of education in women, and imbalanced gender relations (Filippi et al., 2006; Ronsmans et al., 2006). Moreover, the expenses of healthcare and the financing of maternity services might significantly influence the utilization of maternal services. Low-income households may encounter financial challenges as a result of expenses related to motherhood. Several extensive studies have been conducted on the financial outlays of mothers in South Asia, with a specific focus on India (Nahar & Costello, 1998; McCord et al., 2001; McCord & Chowdhury, 2003; Afsana, 2004; Borghi et al., 2004; Duggal, 2004; Sharma et al., 2007; Borghi et al., 2006b; Borghi et al., 2006c; Balaji et al., 2007). In Bangladesh and Nepal, maternal healthcare cost ranges from $20 to $400 per household (Nahar & Costello, 1998; McCord et al., 2001;

McCord & Chowdhury, 2003; Afsana, 2004; Borghi et al.,2004; Duggal, 2004; Sharma et al., 2007; Borghi et al., 2006b; Borghi et al., 2006c). Similarly, a study conducted in India indicated a significant disparity in maternal health expenses (McCord et al., 2001; Balaji et al., 2007; Duggal, 2004; Sharma et al.,2007). Different study, study sites, client and provider backgrounds, and the scope of services included by the study, among other things, account for the substantial difference in maternal expenditures amongst studies from India. The Indian studies have two major shortcomings.

Due to India's geographical diversity and complexity, most of this research are based on small, constrained geographical areas that are difficult to generalize to other places. Secondly, maternal costs were computed independently from total family costs. The most important empirical question that remains unsolved is whether maternal expenses are sufficiently expensive to compel the sacrifice of consumption of other products, possibly including basic needs, or to restrict the utilization of maternal health care, especially in an emergency. The concept is based on the premise that such high spending indicates an excessive opportunity cost of other consumption in the short or long term and may contribute to an overestimate of overall poverty levels as assessed by total household consumption expenditure (Berki, 1986; Wyszewianski, 1996; Murray et al., 2000; Wagstaff & Van Doorslaer, 2003; Xu et al., 2003). The literature on health finance refers to such amounts of health care expenses as "catastrophic." In general, the assessment for catastrophic healthcare expenses has been limited to "total" healthcare spending and, more specifically, to curative healthcare expenditure in a specified reference period (i.e. one year). Historically, catastrophic healthcare expenses have been defined as a very arbitrary proportion of total household expenditure (10 percent) or of totalexpenditure minus subsistence expenditure (40 percent) for the same reference period (Berki, 1986; Wyszewianski, 1996; Murray et al., 2000; Kawabata et al., 2002; Wagstaff & van Doorslaer, 2003; Xu et al., 2003; Bonu et al., 2007). India has a high incidence of 'catastrophic' maternal health care expenses. The second definition somewhat addresses the issue with the first definition, which indicates that when thereare significant financial limits, the majority of available funds are spent on necessities such as food, leaving little for health care. It is more likely that calculating maternal expenditure in relation to a household's 'capacity to pay' will reveal the proportion of households that may require direct assistance for maternal services than an indicator that measures maternal expenditure as a percentage of total household

consumption expenditure. It may be required for the poorest households to get direct economic support to overcome their financial limitations and have access to maternal services and for women from low homes to choose between private and public facilities. Almost no studies have examined and completely applied the same concept to maternal healthcare expenditures in order to ascertain the size of catastrophic maternal costs.

Owens (2007) remarked that when a family or an individual must pay for healthcare, the cost can be excessively high in relation to income, resulting in a financial catastrophe. People are forced to cut back on necessities such as clothing, food, and even their children's education due to the exorbitant cost of healthcare. Each year, about 44 million homes, or 150 million people, suffer financial catastrophe (FC), and 25 million households or more than 100 million people, are forced into poverty due to the high expense of health care. In addition, the reasons for out-of-pocket healthcare expenses are not limited to catastrophic spending. Numerous individuals may choose not to utilize the services if they cannot afford direct or indirect expenditures, which include consultation, drugs, and laboratory tests. Due to the detrimental impact of their sickness on their earnings and well-being, low-income individuals are more likely to experience worsening their financial situation. Policymakers aim to shield individuals from poverty and financial devastation caused by out-of-pocket expenses for diverse healthcare services. According to Owens et al. (2007) home living conditions are significantly affected. The unpredictability of medical bills decreases well-being. Households may incur long-term debt if they borrow money to cover sudden medical bills. Consequently, opportunities to eliminate poverty through human capital investments may be lost. When credit is unavailable, as is normal in less developed countries, medical expenses are always covered by the current budget or resources. Multiple households may be able to finance their medical bills through savings, asset sales, or reduced consumption of non-essential items. The majority of economically challenged households may be driven back into poverty and thus forced to return to subsistence levels. Thus, disease causes the household to choose between spending on health care and other expenses, i.e. the household must either spend on health care or skip health services atthe expense of health.

Diana et al. (2016) determined the burden of out-of-pocket payments, catastrophic expenditures, and poverty in Kenya using data from the 2007 Household

Expenditure and Utilization Survey. 11.7 percent of respondents reported catastrophic expenditures, and 4 percent of respondents were pushed into poverty as a result of the high expense of healthcare. In addition, the exorbitant cost of healthcare pushed almost 2.5 million individuals back into poverty. In conclusion, area of interest has experienced significant catastrophic household expenditures. The researchers utilized the household budget survey with a sample size of 10020 households and the logistic regression model. They discovered that out-of-pocket costs are a significant issue in Portugal and presented a way to reduce the amount of out-of-pocket healthcare expenses. When a household is compelled to pay for unaffordable healthcare, it leads to financial devastation. This has an effect on the home's subsistence and non-subsistence expenses and, in some cases, the education of the family's children. According to Myint et al. (2018), a community-based cross-sectional survey was done in Myanmar with 759 females who had given birth in the preceding 12 months in order to measure poverty and the level of catastrophic expenditures due to the financial burden of prenatal and delivery care. The poll employed a three-stage cluster sampling strategy. This study indicated that poverty has increased by up to 4.3 percent among women receiving antenatal care, whereas those receiving delivery care have fallen back into poverty by around 1.3 percent. And about 6.1 percent were pushed into poverty when using both. Future policy considerations should also include efforts to increase regulation and collaboration between the private and public sectors providing maternal health care.

2.4   Quality of Maternal Health Services Received by Women

Pregnant women and new mothers depend on maternal healthcare services to maintain their health and well-being. The quality of maternal health care services is the degree to which they are secure, effective, timely, efficient, equitable, and patient-centered, resulting in positive health outcomes for both the mother and the infant (WHO). High-quality maternal health care services include prenatal care, labour and delivery care, postpartum care, and family planning services. The quality of maternal health care services is crucial because it directly impacts the health and survival of both the mother and the infant. High-quality maternal health care services can prevent maternal and neonatal morbidity and mortality, reduce complications during pregnancy and childbirth, and improve the mother and infant's health. World Health Organization

defines quality of care as "*the extent to which health care services provided to individuals and patient populations improve desired health outcomes. In order to achieve this, health care must be safe, effective, timely, efficient, equitable and people-centred*" (World Health Organization, 2014). The coverage level of ANC utilization varies from country to country, but the quality of maternal health services matters (Haddad et al., 2016). Factors like lack of information, leadership and political commitments, geographical barriers *viz.* rural and mountainous areas where there is weak infrastructure; quality of clinics, affordability, introduction by the healthworker, details of the inspection process, approval seeking and confidential protection, lack of career enhancement and development of skills were found in healthworkers, limited and inadequate material, human resources, staff skills, poor communication between women and health professional and lack of motivation and supervision of health workers (Marthias & Trisnantoro, 2012; Kambala et al., 2015; Mkoka et al., 2015; Obeidat et al., 2017; John et al., 2018; Miteniece et al., 2018). The difference in the quality of care was related to the disability status, not the caste factor (Devkota et al., 2017). Interaction with providers, attentiveness of providers, privacy during the consultation, adequate facilities and availability of drugs were the factors influencing the quality of ANC (Atinga and Baku, 2013).

The quality of healthcare service refers to the discrepancy between client perceptions and their expectations regarding the services provided. Within the healthcare field, patients are regarded as the primary asset of the institution. Meeting and maintaining client satisfaction, medical service delivery has become imperative (Arasli et al., 2008). In a study, Cronin & Taylor (1992) established a strong association between the provision of healthcare services and the level of pleasure experienced by consumers. In addition, Badri et al. (2018) acknowledged that patientscan recognize the key elements of the hospital: the evaluation and implementation of healthcare services. (Shabbir et al., 2016 and Asif et al., 2019) demonstrated a correlation between patient satisfaction and the quality of healthcare services. It is already known that satisfaction has a significant impact on whether a person seeks further medical advice, adheres to the treatment they received, and keeps a stable and positive relationship with a healthcare provider (Bekele et al., 2008; Larsen et al., 1976; Westaway et al.,2003). Patients' satisfaction with healthcare quality has becomea critical issue for governments worldwide, and they are trying to keep their citizens happy (Ampah &

Ali, 2019).

SERVQUAL is commonly regarded as a measure used to assess service quality in various service industries. The SERVQUAL instrument was first created and evaluated, and its possible uses were described by (Parasuraman et al., 1988). Since then, numerous researchers from various industry sectors have embraced, modified and reviewed it extensively (Babakus & Boller, 1992; Chen *et al.,* 1994; Carman, 1990; Brown & Swartz, 1989; McAlexander *et al.,* 1994; Woodside *et al.,* 1989). The SERVQUAL approach has been utilized in numerous countries to assess the quality of service in hospitals and healthcare facilities (Purcărea et al., 2013; Altuntas et al., 2012; Al-Borie et al., 2013; Akter et al., 2008). Service quality and customer satisfaction study results show that SERVQUAL is an effective service quality measure (Cronin & Taylor, 1992; Zeithaml et al., 1993). SERVQUAL has five significant areas of measurement such as tangibility, reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1981; Torres et al., 2004).

2.5   Summary

Access to maternal health services is crucial for preventing pregnancy-related hazards and reducing maternal deaths. Developing knowledge and understanding of antenatal care (ANC) is essential for mitigating these risks. Policies should focus on men's involvement in maternal health, staff shortages, affordability, and financial crises. Factors such as early marriages, early pregnancies, and short-spaced pregnancies contribute to high maternal deaths rates. Media, educational programs, community participation, campaigns, and better policies can enhance maternal health accessibility. Broadcast media, including radio and television, plays a crucial role in disseminating health-related knowledge and promoting community well-being.

Maternal health is a social phenomenon and medical event influenced by various factors, including education, social status, and economic condition. Higher education is associated with increased utilization of maternal healthcare services. Other factors include location of residence, monthly household income, and occupation. Demographic factors like age, caste, religion, labor room availability, andpublic health infrastructure also influence the utilization of MHC services. Women's autonomy also plays a significant role in the utilization pattern of maternal health careservices. Factors like poverty inversely influence the utilization of MHC services. Studies show that

most women prefer private hospitals over government hospitals, and they generally take 2-3 antenatal visits. In Northwest Ethiopia, 3-4 ANC visits aremostly in the second trimester followed by the third trimester. Maternal healthcare costs in India remain high due to frequent service utilization and higher visit costs, particularly for women from rural households and remote regions. The hidden cost of delivery services is a barrier to institutional delivery, especially for women from rural households and remote regions. Factors such as economic status, women's education, and pregnancy complications determinants of out-of-pocket expenditure (OOPE) include the type of delivery, place of ANC, and complications in pregnancy. The poorest Indian households spend almost twice as much on seeking care as those with higher incomes. Factors like mode of delivery, family monthly income, and travel time between the hospital and the respondent's house are significant with the hidden cost of delivery services provided by the hospital.

The most important empirical question remains unsolved is whether maternal expenses are sufficiently expensive to compel the sacrifice of consumption of other products or restrict the utilization of maternal health care, especially in emergencies. The literature on health finance refers to such amounts of healthcare expenses as "catastrophic," but the assessment for such expenses has been limited to total healthcare spending in a specified reference period. Maternal healthcare services are crucial for the health and well-being of pregnant women and new mothers. Quality of maternal health care services is essential for preventing morbidity and mortality, reducing complications during pregnancy and childbirth, and improving the mother and infant's health. Factors influencing the quality of maternal health care include lack of information, leadership, political commitments, geographical barriers, clinic quality, affordability, introduction by health workers, approval seeking, confidentiality protection, career enhancement, limited resources, staff skills, poor communication between women and health professionals, and lack of motivation and supervision. Customer satisfaction is a critical issue for governments worldwide, as it significantly impacts whether a person seeks further medical advice, adheres to treatment, and maintains a stable and positive relationship with a healthcare provider. The SERVQUAL scale is an effective measure for measuring service quality across service sectors, with five significant areas of measurement such as tangibility, reliability, responsiveness, assurance, and empathy.

The existing literature on maternal health in Himachal Pradesh is limited, with the majority of it focused on wider regional or national patterns without sufficiently addressing the distinctive needs and constraints encountered by women in Himachal Pradesh. Prior research has mostly focused on broad measures of maternal health, availability of healthcare services, and the execution of government programs. However, there is a significant dearth of comprehensive research that concurrently investigate the awareness, utilization, cost, and quality of maternal healthcare services in Himachal Pradesh. The existing study rarely provides a zone-wise analysis, which is essential for comprehending the varied geographical and socio-economic elements that impact maternal health outcomes in the state. To bridge these gaps, it is necessary to do focused research that not only examines current empirical findings but also gathers primary data to provide a comprehensive overview of maternal health care in Himachal Pradesh. The present study aims to address this gap by doing a comprehensive examination of the present state of maternal health in the region, with a specific emphasis on the crucial aspects of awareness, utilization, cost, and quality of maternal health care services.

CHAPTER - III
RESEARCH METHODOLOGY

Before embarking on research design, a comprehensive understanding of research methods and data analysis is required. Thus, present study design establishes the framework for data collection and its analysis. This chapter lucidly describes the research methodology in-depth, including the population studied, sample design, the sample size and statistical techniques used to analyze the data. This present chapter is divided into three sections. Section I deliberates the research design and provides details regarding the research topic, objectives, hypotheses, sample design and sample size estimation. Section II emphasizes the research instrument, validity and reliability. Section III describes a detailed description of statistical tools for data analysis.

SECTION – I

3.1 RESEARCH DESIGN

The present study is a cross-sectional based on descriptive research design and was conducted in the north Indian state of Himachal Pradesh, where data is collected from the respondents of both rural and urban areas, through a self-structured questionnaire adapted from the "*WHO STEP wise approach to surveillance*".

3.1.1. Research Topic

"Maternal Health Care Services in Himachal Pradesh: An Empirical Analysis"

3.1.2. Sample Design

According to the Census 2011, Himachal Pradesh has an area of 55,673 sq. km which accounts 1.75 percent of India's total area. Himachal Pradesh is the state of 12 districts and these are Chamba, Kangra, Una, Bilaspur, Hamirpur, Kullu, Mandi, Lahaul & Spiti, Kinnaur, Shimla, Sirmaur and Solan with a total population of 68,64,602 and the state is divided into three administrative divisions: Kangra, Mandi and Shimla.

Figure 3.1: Different Administrative Zones of Himachal Pradesh
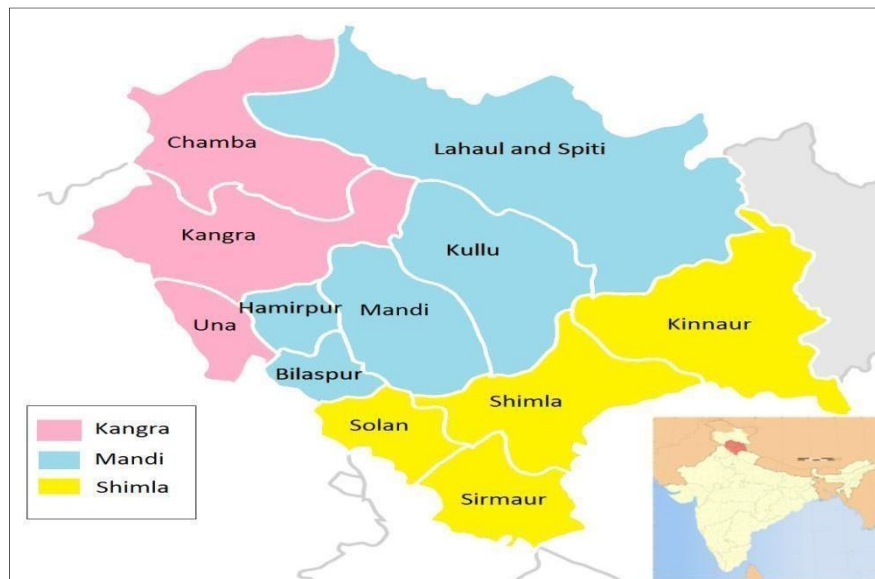
Source: Statistical Abstract of Himachal Pradesh, 2018

Figure 3.2: Categorization of Districts under Different Divisions
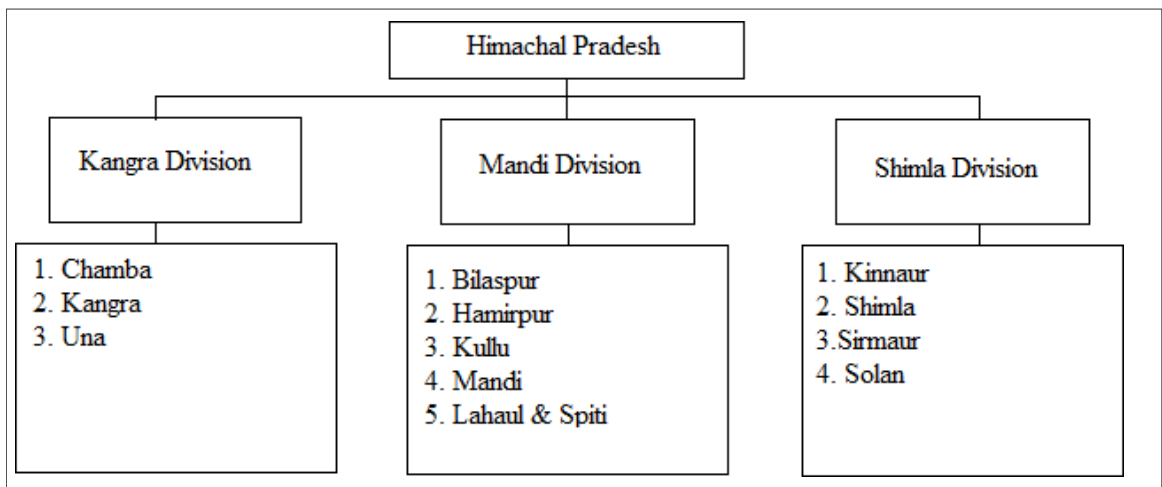
Source: Statistical Abstract of Himachal Pradesh, 2018

A Multi stage stratified random sampling design is adopted in respect of the three administrative divisions of Himachal Pradesh State (Kangra, Mandi and Shimla). At the **first stage**, two districts are selected from each of the three divisions on the basis of literacy rate (on the basis of Census data, 2011; Statistical year book of Himachal Pradesh 2015-16) *viz.* one district with highest literacy level and one with lowest literacy level in that administrative division. The reason for adopting this practice was in line with the existing literature (Letamo and Rakgoasi, 2003; Chhabra et al., 2011; Dabade et al. 2013; Kulkarni and Durge, 2013; Sanneving et al., 2013; Saxena

et al., 2013; Nigatu et al., 2014; Tsawe and Susuman, 2014; Shahabuddin et al., 2017; Adhikari, 2016; Acharya et al., 2016; Goli et al., 2016; Govil et al., 2016; Haddad et al., 2016; Bhandari et al., 2017; Obeidat et al., 2017; Haider et al., 2017; Aregbeshola and Khan, 2018; Deepak et al., 2018; Mersha, 2018) that education is one of the significant determinant of utilization of health care services.

As per aforementioned criteria, districts selected in the sample were as follows:

(i)   From Kangra division, Una district was selected with the highest literacy rate and Chamba district was selected with the lowest literacy rate;

(ii)   From Mandi division, Hamirpur district was selected with the highest literacy rate and Lahaul & Spiti district was selected with the lowest literacy rate; and

(iii)   From Shimla division, Solan district was selected with the highest literacy rate and Sirmaur district was selected with the lowest literacy rate.

Figure 3.3: Selection of Districts and Tehsils on the basis of Literacy Level of Women
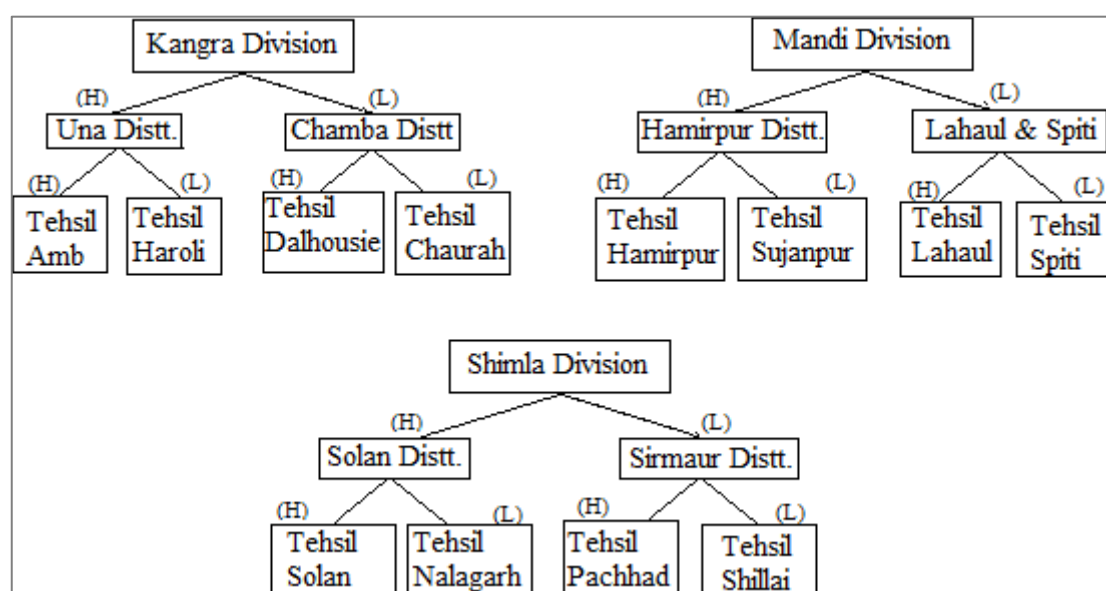
Source: Statistical Abstract of Himachal Pradesh, 2018

In the **second stage** two tehsils were proposed to be selected from each district on the basis of the highest and the lowest literacy level as follows:

(i)   From district Una, tehsil Amb was selected with the highest literacy rate and tehsil Haroli was selected with the lowest literacy rate;

(ii)   From Chamba district, tehsil Dalhousie was selected with the highest literacy level and tehsil Chaurah was selected with the lowest literacy level;

(ii)   From district Hamirpur, tehsil Hamirpur was selected with the highest literacy rate and tehsil Tira Sujanpur was selected with the lowest literacy rate;

(iii)   From district Lahaul & Spiti, tehsil Lahaul was selected with the highest literacy level and tehsil Spiti was selected with the lowest literacy level;

(iv)   From district Solan, tehsil Solan was selected with the highest literacy level and tehsil Nalagarh was selected with the lowest literacy level; and

(v)   From district Sirmaur, tehsil Pachhad was selected with the highest literacy level and tehsil Shillai was selected with the lowest literacy level.

In the **third stage**, a suitable number of respondents were selected through simple random sample (so that overall size of the sample size of the sample becomes to the tune of the desired size of 576 respondents). The selection of the respondents was be done on the basis of women who delivered a child within one year at the time of the survey. Only those women who delivered a child within last one year at the time of data collection period and are residing in the selected study area were included.

3.1.3. Sample Size

The sample size is calculated from 95 percent of confidence interval and the recommended margin error of 5 percent (0.05) as per STEPS manual (World Health Organization, 2005). Total sample size estimate achieved was adjusted for the design effect (1.5). Using these values, the optimum sample size was obtained by adopting the following formulation (World Health Organization, 2005):

$$\text{Sample Size (n)} = Z^2 \, (p) \, (1-p) \, / \, e^2$$

where, Z = level of confidence whose value taken as 1.96 probability value which is associated with a 95% confidence interval, p= estimated prevalence of the risk factor and e= margin error. As per the calculations, the desired size of the sample turned out to be 576.

3.2 RESEARCH INSTRUMENT

A self-structured schedule has been used for the present study to access maternal health care services. The schedule has been divided into four different sections. Section 1 discusses the *'demographic and socio-economic profile of the households'*. *'Awareness of Women towards Various Aspects of Maternal Health'* are discussed in Section 2. Further, Section 3 of the schedules measures the *'Utilization and Cost of Utilization of Maternal Health Care Services'*. Lastly, *'Quality of Maternal Health Care Services received by Women'*, for which the likert scale was used, has been shown in section 4.

3.2.1 Content Validity

The term "content validity" refers to assessing content's relevance, clarity and modification. According to Kimberlin and Winterstein (2008), content validity is the degree to which the items developed to operationalize the construct provide a sufficient and representative sample of all the items that can be used to assess the target construct. Content validity is the evaluative process that assesses whether our questionnaire includes activities pertinent to the area (Dar & Mishra, 2019). According to Kumar and Sadeeq (2020), "Content validity is determined by relying on the expertise of experts with an in-depth understanding of the studied topic or concept." These subject matter experts are requested to comment on the topic, ambiguity and phrasing. For a particular study, most subject experts advised that medical terminology be minimal, that the language be kept simple, and that a few build components be removed. Therefore, with the incorporation of the experts' recommendations, the language of the research instrument is straightforward, transparent, effective and comprehensible to the study respondents.

3.2.2. Pilot Testing

According to Verma and Bashir (2016), "*Pilot testing is done to check the internal consistency of the statements by analyzing Cronbach's Alpha.*" A pilot study was performed in the districts of Himachal Pradesh (from Amb Tehsil and Hamirpur Tehsil). Women who delivered a child within one year were surveyed for the particular study, and the respondents for pilot testing were from different backgrounds. On average, each respondent required between 20 and 25 minutes to submit their response.

3.2.3. Reliability

The concept of "reliability" relates to the consistency of the findings. According to Joppe (2000), "Reliability is the degree to which results are consistent across time and appropriately represent the entire population under study; if the results of a study can be duplicated using a similar method, the research instrument is considered reliable" (Samrah and Hazarika, 2012). According to Farooq (2017), "the most commonly used approach to test reliability is Cronbach's alpha, which runs from 0 to 1 and may be used to measure the reliability of dichotomous, Likert, nominal and ordinal scales." In a study by Nunnally (1978), to establish the validity of the research instrument, the threshold value of "Cronbach Alpha" should not be less than 0.70. The greater the alpha number, the greater the measure's trustworthiness, whereas alpha scores below 0.70 are regarded as unreliable. The results are presented in Table 3.1. The value of "Cronbach's alpha" for risk factors, coping strategies and prevention strategies constructs was above 0.70, as presented in Table 3.1, thereby certifying the reliability of all the constructs. Therefore, all the scales were established to be reliable.

Table 3.1 Reliability of Coping Mechanism, Quality Expectations and Quality Perceived.

Construct	Item Code	Items Label	Cronbach's Alpha
Coping Mechanism	1	Post Savings	0.82
	2	Help from family members	
	3	Help from friends	
	4	Loan	
	5	Mortgaging assets	
	6	Selling assets/ Gold	
	7	Health Insurance	
	8	Government assistance (Ayushman Bharat National Health Protection Mission, Pradhan Mantri Surakshit Matritva Abhiyan, Janani Suraksha Yojna etc)	
	9	Reduced number of visits to the doctor	
	10	Reduced other household expenses	
	11	Buying only a part of medicines	
Quality Expectations	**Tangibles**		
	Tan1	Building is visually appealing	0.97
	Tan2	Equipments are up to date	
	Tan3	Equipments are in good working condition	
	Tan4	Hospital employees are neat and clean	
	Tan5	Hospital wards are clean	
	Assurance		
	Assu1	Hospital employees attitude towards pregnant women is good	0.96
	Assu2	Interaction with doctors is confidential	
	Assu3	Nurses are attentive towards pregnant women	
	Assu4	Doctors are knowledgeable	
	Assu5	Doctors are capable of handling cases	
	Reliability		
	Reli1	Promised services are fulfilled	0.98
	Reli2	Reputation of doctors is good	
	Reli3	Transparency of expenses	
	Reli4	Treatment is done on time	
	Reli5	Doctors make sure your wellness before discharging	

	Reli6	Services are provided on reasonable cost	
	Responsiveness		
	Resp1	Process of registration is simple	
	Resp2	Services are provided on time	
	Resp3	Personnel understand the specific needs	
	Resp4	Personnel are always ready to help	0.96
	Resp5	Nurses provide sufficient information to pregnant women	
	Resp6	Immediate response on complaints and suggestions	
	Empathy		
	Emp1	Staff is polite towards pregnant women	
	Emp2	Doctors are caring towards pregnant women	
	Emp3	Provide personalized service	0.95
	Emp4	Nurses do well explanation of prescription	
	Emp5	Doctor always meet at the time of consultancy	
	Satisfaction		
	Sat1	Overall rating of hospital	
	Sat2	Communication with doctors	
	Sat3	Communication about medicine with pharmacist	0.82
Quality Perceived	**Tangibles**		
	TanP1	Building is visually appealing	
	TanP2	Equipments are up to date	
	TanP3	Equipments are in good working condition	0.83
	TanP4	Hospital employees are neat and clean	
	TanP5	Hospital wards are clean	
	Assurance		
	AssuP1	Hospital employees attitude towards pregnant women is good	
	AssuP2	Interaction with doctors is confidential	
	AssuP3	Nurses are attentive towards pregnant women	0.82
	AssuP4	Doctors are knowledgeable	
	AssuP5	Doctors are capable of handling cases	
	Reliability		
	ReliP1	Promised services are fulfilled	0.91
	ReliP2	Reputation of doctors is good	

	ReliP3	Transparency of expenses	
	ReliP4	Treatment is done on time	
	ReliP5	Doctors make sure your wellness before discharging	
	ReliP6	Services are provided on reasonable cost	
	Responsiveness		
	RespP1	Process of registration is simple	
	RespP2	Services are provided on time	
	RespP3	Personnel understands the specific needs	
	RespP4	Personnel are always ready to help	0.88
	RespP5	Nurses provide sufficient information to pregnant women	
	RespP6	Immediate response on complaints and suggestions	
	Empathy		
	EmpP1	Staff is polite towards pregnant women	
	EmpP2	Doctors are caring towards pregnant women	
	EmpP3	Provide personalized service	
	EmpP4	Nurses do well explanation of prescription	0.89
	EmpP5	Doctor always meet at the time of consultancy	
	EmpP6	24*7 service	
	Satisfaction		
	SatP1	Overall rating of hospital	
	SatP2	Communication with doctors	
	SatP3	Communication about medicine with pharmacist	0.91

Source: Author's calculation based on primary data

SECTION - III

3.3 CONCEPTUAL MODEL TO EXAMINE THE AWARENESS, UTILIZATION, COST AND QUALITY OF MATERNAL HEALTH

Maternal health has been a matter of precedence for countries worldwide. It has been designated as the utmost health priority in developing and under-developed countries. Maternal health is considered well-being during pregnancy, childbirth and postpartum. The suboptimal access and utilization of maternal healthcare can increase the incidence of maternal mortality. For the progression of a country and its women's status, advancement in maternal healthcare is a prerequisite. Awareness of the right to access maternal health services is critical to securing the accessibility of services. Previous studies showed that a lack of awareness of pregnancy danger signs significantly contributed to delays in seeking obstetric care and increased maternal deaths caused by pregnancy-related complications. Demographic, social and economic determinants collectively determine the utilization and awareness of maternal healthcare. Sometimes, despite the awareness and knowledge, there are some barriers to the non-utilization of maternal healthcare (MHC). The present model demonstrates the various pathways through which utilization of maternal healthcare can be influenced and various coping mechanisms used to utilize the MHC services. Demographic characteristics and cost impact the utilization of maternal healthcare. Maternal healthcare is divided into 3 phases: ANC (Antenatal Care), INC (Intranatal Care/Delivery) and PNC (Postnatal Care). As the quality of services also influences the utilization of maternal healthcare services, various aspects can be accessed for measuring the quality of maternal healthcare services so that utilization of MHC can be increased. Barriers can be removed and awareness can be spread more effectively.

Figure 3.3: Conceptual Model to Examine the Awareness, Utilization, Cost and Quality of Maternal Health

Utilization of Maternal Health Care Services

No

Yes

Demographic Factors
- Age
- Caste
- Religion
- Literacy Level
- Work Status
- Literacy Level of Husband
- Work Status of Husband
- Income of Household
- Birth Order
- Type of Family
- Place/ Location of residence

Antenatal Care (ANC)
- Registration
- Total Visits
- IFA & Calcium intake
- TT Doses
- Checkups

Delivery/ Intranatal Care (INC)
- Place of delivery
- Type of delivery
- Complications incurred
- Discharge

Postnatal Care (PNC)
- Total Visits
- Checkups

Direct Cost
- Consultation fee
- Cost of hospitalization
- Bedding expenses
- Laboratory tests expenses
- Medicine Expenses
- Blood transfusion
- Food expenses
- Transportation expenses

Reasons for not Utilizing Maternal Health Care Services
- Not Necessary
- High Cost
- Too Far/ Inconvenient
- Poor Quality
- Lack of Time
- Family didn't Allow
- Lack of Knowledge
- No Female Provider

Awareness of Maternal Health Care
- Registration
- Required Visits
- Consumption of IFA and Calcium Tablets
- TT doses
- Danger Signs
- Complications

Cost for Utilizing Maternal Health Care Services
- Total cost for utilizing ANC services
- Total cost for utilizing INC services
- Total cost for utilizing PNC services

Indirect Cost
- Reduced unemployment benefits in terms of money

Quality of Maternal Health Care Services
- Tangible
- Assurance
- Reliability
- Responsiveness
- Empathy

Source: Author's Compilation

39

3.3.1 Hypotheses

H_{01}: There is no significant association between the socio-economic variables and awareness of women regarding maternal healthcare.

H_{02}: There is no significant relationship between the socio-economic variables and utilization of maternal health care services.

H_{03}: There is no significant relationship between the socio-economic variables and catastrophic health care expenditure.

<div align="center">

SECTION - IV

</div>

3.4 STATISTICAL TOOLS FOR DATA ANALYSIS

3.4.1 Mean

Mean $\bar{x}$ is a fundamental statistical and mathematical notion. It is a measure of the central tendency of a probability distribution in statistics. Estimating the mean involves dividing the sum of all observations in a data collection by the total number of observations (Kumar and Sadeeq, 2020). Mean has been calculated to examine the cost of utilization of maternal health care services as well as the quality of the service utilized.

$$\overline{X} = \frac{\Sigma X}{N}$$

Where,

ΣX = Summation of all observations N = Number of observations

3.4.2 Chi-Square

"The Chi-square χ^2 statistic is a method for calculating the difference between the observed and predicted frequencies of event outcomes" (Kumptala et al., 2013). Chi-square is utilized to determine whether two variables are linked. It is useful for comparing categorical variables, especially when research variables are nominal in character (viz. Gender, Region, etc.). Chi-square has been used to examine the association between socio-demographic variables and awareness of women towards

$$\chi 2 = \sum \frac{(Oi - Ei)^2}{Ei}$$

Where,

Oi = Observed frequency

Ei = Expected frequency

3.4.3 Kruskal Wallis Test

In 1952, "William Kruskal" and "W. A. Wallis" proposed a non-parametric technique of testing whether the samples (more than two) are originated from the same population is termed as "Kruskal-Wallis test" or "One-way ANOVA on ranks". Kruskal-Wallis test expands the "*Mann-Whitney U test*" to more than two samples. Since, this test is a non-parametric technique, it doesn't presume a distribution to be normal of the residuals. Kruskal Wallis has been used to examine the cost of utilizing maternal health care services by socio-demographic variables in Himachal.

$$H = \frac{12}{N(N+1)} \sum \frac{Ri^2}{ni} - 3(N + 1)$$

Where,

N = Total number.

ni = Number in ith group.

Ri = Summation of ranks in ith group.

3.4.4 Headcount

According to Ghosh (2011), "the incidence of catastrophic health expenditures is estimated with the Headcount method." Headcount is defined as the proportion of families whose monthly out-of-pocket (OOP) expenditures, as a ratio of monthly household income, above a predefined catastrophic threshold level for monthly outpatient expenditures. The majority of research accept and employ 5% and 10% as desired threshold levels. The current study assessed the headcount at 5 percent, 10

percent, 20 percent and 30 percent threshold levels. ==Headcount has been used as per the following formula to find the proportion of families whose monthly out-of-pocket expenditure exceeds the threshold level.==

$$\text{Headcount} = \frac{1}{n} \sum_{i=1}^{N} Ei$$

Where,

E = Indicator equal to one, if Oi/Yi > z or else zero Pi = Out-of-pocket expenditure of household

Yi = Income of household

Z = Catastrophic threshold level N = Sample size

3.4.5 Overshoot

Headcount approach displays the percentage share of out-of-pocket spending by household that exceeds the threshold level, but does not highlight the intensity of out-of-pocket spending by household that exceeds the threshold level. According to Bhojani et al. (2012), "Overshoot indicates the extent to which an average OOP spend (across the entire sample) exceeded the specified catastrophic threshold." ==It was also used to measure the catastrophic health expenditure of maternal healthcare in Himachal. The formula used for overshoot is,==

$$\text{Overshoot} = \frac{1}{n} \sum_{i=1}^{N} Oi$$

Where,

Oi = Ei((Pi/Yi)-Z)

3.4.6 Mean Positive Overshoot

According to Bhojani et al. (2012), "Mean positive overshoot (MPO) gauges the extent to which the average out-of-pocket expenditures of disaster-affected households surpass the set threshold level". ==MPO has been used to measure the catastrophic health expenditure of maternal healthcare in Himachal==. The formula for mean positive overshoot is,

$$\boxed{\text{MPO} = \frac{\text{Overshoot}}{\text{Headcount}}}$$

Where,

If household "*j*" experience catastrophic health expenditure, the household might have spent (MPO + Threshold level) percent of income on cost of illness.

3.4.7 Logistic Regression

When dependent variable is nominal or categorical in nature, this method is employed. According to Field (2009), "logistic regression determines the influence of many independent variables presented simultaneously in order to predict membership in one of the two dependent variable categories".

In logistic regression, a logistic transformation of the odds serves as the dependent variable:

$$\text{Log (odds)} = \text{Logit (P)} = \ln\left(\frac{P}{1-P}\right) \tag{1}$$

Taking the above dependent variable and adding a regression equation for independent variables, logistic regression is:

$$\text{Logit (P)} = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots + b_i x_i \tag{2}$$

The equation for the probability (P) is:

$$P = \frac{\exp(a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots + b_i x_i)}{1 + \exp(a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots + b_i x_i)} \tag{3}$$

Where,

P = Probability that a case is in a particular category.

exp = Exponential function.

a = Intercept of the equation.

b = Coefficient of the predictor variable.

Logistic regression has been used to identify socio-economic determinants of health care utilization and catastrophic healthcare expenditure of maternal health care services in Himachal Pradesh.

3.4.8 Correlation

Correlation measures the extent to which two variables are related, either positively, negatively, or not at all. The value of the correlation coefficient always ranges between 1 and -1. Correlation was used to find the relation between various attributes of the quality of maternal healthcare services received by women.

$$r = [n(\Sigma xy) - \Sigma x \Sigma y] \Big/ \sqrt{[n(\Sigma x^2) - (\Sigma x)^2][n(\Sigma y^2) - (\Sigma y)^2]}$$

Where

x = independent variable,

y = dependent variable,

n = sample size, and

Σ = summation of all values.

3.4.9 SERVQUAL

SERVQUAL model is the model of service quality that is used for measuring service quality and customer satisfaction. The SERVQUAL scale was developed by Parasuraman in 1985 and is widely used for measuring patient satisfaction with services. It consists of five components: tangibility, reliability, responsiveness, assurance and empathy. Tangibility refers to the physical amenities of the healthcare center. Reliability refers to the ability of the provider to deliver the required healthcare. Responsiveness relates to the staff's eagerness to serve and address patients' needs promptly. Assurance refers to the degree of patient confidence in the services received. Empathy refers to the attitudes and behavior of medical practitioners towards their patients. SERVQUAL has been used to measure the perceived quality of maternal health care services availed by the respondents of the study.

3.5 LIMITATIONS OF THE PRESENT STUDY

The results and conclusion of the present study cannot be applied generally before considering the following limitations:

(i)   This study was limited to Himachal Pradesh only.

(ii)   Dependent variable used in this study was dichotomous variable (a) awareness of maternal health care or not and (b) utilization of maternal health care services or not. It is sometimes misleading to assume that people always make dichotomous choices.

(iii)   Due to cultural, geographical or socio-economic disparities, the results are mere an indication and may or may not be applicable to the whole maternal health care and its services in India.

CHAPTER - IV

AWARENESS OF WOMEN TOWARDS VARIOUS ASPECTS OFMATERNAL HEALTHCARE IN HIMACHAL PRADESH

Awareness of the right to access maternal health services is a significant part of securing the convenience of services (Mpembeni et al., 2019). Reproductive rights encompassing mother and childcare practices are essential to women's rights. For the protection of the reproductive rights of women, maternal health care (MHC) services are of basic and essential requirement (Bracke, 2022). Earlier studies showed that inadequate knowledge of pregnancy-related danger signs considerably hampered seeking care related to pregnancy and enlarged the number of maternal demise due to pregnancy-related complications (Phoxay et al., 2001; Nikiema et al., 2009; Ossai & Uzochukwu, 2015; Geleto et al., 2019; Choudhury et al., 2021). A study from Maharashtra highlighted that more awareness should be created through health education regarding antenatal visits and utilization of maternal health care (MHC) services (Zhao et al., 2009; Dabade et al., 2013). Men's awareness of pregnancy- related danger signs and their involvement is essential to frame policies regarding awareness and knowledge of men and enhance their engagement in maternal health (Mersha, 2018). The shortage of staff, lack of awareness of maternal health, affordability, or financial crisis was the main barriers to the accessibility of maternal health services (Griffiths & Stephenson, 2001; Tsawe & Susuman, 2014). Sheth et al., (2013) and Aregbeshola and Khan, (2018) suggested encouraging women to utilize the MHC services.

Therefore, present chapter discusses the level of awareness of women towards various aspects of maternal healthcare in Himachal Pradesh. The present chapter is divided into three sections. Section I highlights the demographic profile, awareness and association between the socio-demographic profile and awareness with the help of chi-square in the sample size. Section II highlights awareness and the association between the socio-demographic profile and respondent's awareness. Section III concludes the summary.

SECTION-I

4.1 DEMOGRAPHIC CHARACTERISTICS AND AWARENESS TOWARDS MATERNAL HEALTH

4.1.1 Demographic Characteristics of the Respondents

Table 4.1.1 illustrates the descriptive statistics of the respondents' demographic profiles from all three Himachal Pradesh regions. As a result, out of 576 respondents in Himachal Pradesh, majority of the respondents belonged to the age group of 25- 30 years (35.9), followed by 20-25 (33.7 percent), 30-35 (21.2 percent), up to 20 (5.2 percent) and 35-40 (3.8 percent). Furthermore, it was found that the majority of the respondents belonged to the Hindu religion in all three regions of Himachal Pradesh which is 99.1 percent in Kangra, 100 percent in Mandi, and 97.9 in Shimla, and the rest were Muslim (0.69 percent), and Sikh (0.17 percent). It was witnessed that the proportion of general caste respondents was 49.8 percent in Kangra, 5.9 percent in Mandi, and 52.3 percent in Shimla. In contrast, it was 51 percent overall in Himachal Pradesh as compared to OBC (24.3 percent), SC (20.7 percent) and ST (4 percent), respectively.

It was found that around 30 percent of the respondents in Himachal Pradesh completed their studies up to higher secondary, which was followed by graduation (25.2 percent), secondary (17.7 percent), primary (15.5 percent), post-graduation (7.8 percent) and 2 percent had no formal education. The work status revealed that 92.5 percent of women in Himachal Pradesh were homemakers, followed by private jobs, government jobs, and businessman. It was found that in all zones of Himachal Pradesh, i.e., Shimla, Kangra, and Mandi, most of the mothers were homemakers however, it was observed that in Shimla zone, 4 percent of women indulge in private jobs. The literacy level of the husband was highest in higher secondary (37 percent), followed by graduation (24.3 percent), post-graduation (15.3 percent), secondary (7.8 percent), primary (8.3 percent), and 1 percent had no formal education overall. It was found that the literacy level of the husband in Shimla and Kangra was highest as higher secondary, i.e., 32.9 percent and 29.6 percent respectively. However, in the Mandi, the literacy level of the husband was highest as graduation (32.1 percent).

The analysis revealed that out of 576 respondents, most of the respondents'

husbands were laborers. Furthermore, it was found that 34.4 percent of respondents in Kangra, 37.7 percent in Mandi and 25.5 percent in Shimla, and 31.8 percent in overall Himachal Pradesh are working in government jobs, private jobs, businesses, and work in agricultural land. On the other hand, it was found that in Shimla, 25.5 of the respondents' husbands in Shimla is having their businesses, and in Kangra, it was found that 28.2 percent of husbands had govt jobs, and like in Mandi, 29.2 percent of husbands had govt job.

The respondents with monthly household income up to ₹15,000 were in large proportion, followed by ₹15,000-₹30,000, ₹30,000-₹45,000, ₹45,000-₹60,000 and more than ₹60,000. In Himachal Pradesh, 52 percent of the respondents live in joint family, while 48 percent live in a nuclear family, but in Shimla, it was found that 55.6 percent were nuclear families. Further, the head of the family is father-in-law (56.8 percent), followed by the husband (28.6 percent) and mother-in-law (14.6 percent) in Himachal Pradesh. The results revealed that in most families, head of the family is the father-in-law followed by the husband and mother-in-law. The birth status revealed that mothers of two children were highest in all zones followed by one child.

Table 4.1.1 Demographic Characteristics of Respondents

Socio-Demographic Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Age				
Up to 20 years	11 (4.8)	08 (7.5)	11 (4.5)	30 (5.2)
20-25 years	80 (35.2)	40 (37.7)	74 (30.5)	194 (33.7)
25-30 years	86 (37.9)	35 (37.7)	86 (35.4)	207 (35.9)
30-35 years	41 (18.1)	21 (19.8)	60 (24.7)	122 (21.2)
35-40 years	08 (3.5)	02 (1.9)	12 (4.9)	22 (3.8)
40 years & above	01 (0.4)	00 (00)	00 (00)	01 (0.2)
Religion				
Hindu	225 (99.1)	106 (100.0)	238 (97.9)	569 (98.7)
Muslim	00 (00)	00 (00)	04 (1.6)	04 (0.69)
Sikh	2 (0.9)	00 (00)	01 (0.4)	03 (0.17)
Caste				
General	113 (49.8)	54 (50.9)	127 (52.3)	294 (51.0)
OBC	47 (20.7)	32 (30.2)	61 (25.1)	140 (24.3)
SC	54 (23.8)	16 (15.1)	49 (20.2)	119 (20.7)
ST	13 (5.7)	04 (3.8)	06 (2.5)	23 (4.0)

Literacy level of respondent				
No formal education	06 (2.6)	00 (00)	06 (2.5)	12 (2.1)
Primary	40 (17.6)	16 (15.1)	33 (13.6)	89 (15.5)
Secondary	39 (17.2)	23 (21.7)	40 (16.5)	102 (17.7)
Higher Secondary	80 (35.2)	31 (29.2)	72 (29.6)	183 (31.8)
Graduation	49 (21.6)	34 (32.1)	62 (25.5)	145 (25.2)
Post- Graduation	13 (5.7)	02 (1.9)	30 (12.3)	45 (7.8)
Work status of respondent				
Business	00 (00)	00 (00)	04 (1.6)	04 (0.7)
Government Job	00 (00)	01 (0.9)	10 (4.1)	11 (1.9)
Private Job	04 (1.8)	03 (2.8)	13 (5.3)	20 (3.5)
Laborer	07 (3.1)	00 (00)	01 (0.4)	08(1.2)
Homemaker	216 (95.2)	102 (96.2)	215 (88.5)	533 (92.5)
Monthly income of respondent				
Upto ₹15,000	11 (4.8)	03 (2.8)	17 (7.0)	31 (73.8)
₹15,000-₹30,000	00 (00)	00 (00)	07 (2.9)	07 (16.6)
₹30,000-₹45,000	00 (00)	00 (00)	03 (1.2)	03 (07.1)
More than ₹60,000	00 (00)	01 (0.9)	00 (00)	01 (02.3)
Literacy level of husband				
No formal education	04 (1.8)	00 (00)	03 (1.2)	07 (1.2)
Primary	22 (9.7)	05 (4.7)	21 (8.6)	48 (8.3)
Secondary	35 (15.4)	11 (10.4)	34 (14.0)	80 (13.9)
Higher Secondary	86 (37.9)	46 (43.4)	81 (33.3)	213 (37.0)
Graduation	43 (18.9)	30 (28.3)	67 (27.6)	140 (24.3)
Post-Graduation	37 (16.3)	14 (13.2)	37 (15.2)	88 (15.3)
Work status of husband				
Business	43 (19)	17 (16.0)	62 (25.5)	119 (20.7)
Government Job	64 (28.2)	31 (29.2)	42 (17.3)	137 (23.8)
Private Job	38 (16.7)	18 (17.0)	68 (28.0)	124 (21.5)
Laborer	78 (34.4)	40 (37.7)	62 (25.5)	183 (31.8)
Work in agriculture land	04 (1.8)	00 (00)	09 (3.7)	13 (2.3)
Monthly income of household				
Upto ₹15,000	95 (41.9)	39 (36.8)	93 (38.3)	227 (39.4)
₹15,000-₹30,000	74 (32.6)	35 (33.0)	76 (31.3)	185 (32.1)
₹30,000-₹45,000	39 (17.2)	17 (16.0)	33 (13.6)	89 (15.5)
₹45,000-₹60,000	05 (2.2)	02 (1.9)	10 (4.1)	17 (3.0)
More than ₹60,000	14 (6.2)	13 (12.3)	31 (12.7)	60 (10)
Monthly expenditure of household				
Upto ₹15,000	133 (58.6)	57 (53.8)	144 (59.3)	334 (57.9)
₹15,000-₹30,000	76 (33.5)	34 (32.1)	79 (32.5)	189 (32.8)
₹30,000-₹45,000	17 (7.5)	14 (13.2)	19 (7.8)	50 (08.6)
₹45,000-₹60,000	01 (0.4)	00 (00)	01 (0.4)	02 (00.3)

More than ₹60,000	00 (00)	01 (0.9)	00 (00)	01 (00.1)
Type of family				
Nuclear	102 (44.9)	39 (36.8)	135 (55.6)	276 (47.9)
Joint	125 (55.1)	67 (63.2)	108 (44.4)	300 (52.1)
Head of family				
Mother-in-law	35 (15.4)	20 (18.9)	29 (11.9)	84 (14.6)
Father-in-law	131 (57.7)	50 (47.2)	146 (60.1)	327 (56.8)
Husband	61 (26.9)	36 (34.0)	68 (28.0)	165 (28.6)
Birth order				
1st	88 (38.8)	38 (35.8)	106 (43.6)	232 (40.3)
2nd	122 (53.7)	67 (63.2)	118 (48.6)	307 (53.3)
3rd	11 (4.8)	01 (0.9)	16 (6.6)	28 (4.9)
4th	04 (1.8)	00 (00)	02 (0.8)	06 (1.0)
5th	02 (0.9)	00 (00)	00 (00)	02 (0.3)
6th	00 (00)	00 (00)	01 (0.4)	01 (0.2)

Source: Author's calculation based on primary data

4.1.2 Awareness of Women Regarding Various Aspects of Maternal Health

Table 4.1.2 presents significant findings regarding women's perspectives on pregnancy registration and its perceived significance. Among the sample of 576 participants, a significant majority, nearly 88.4 percent, expressed the perception that registering during pregnancy is paramount. The findings suggest that the respondents in the three regions, i.e., Kangra, Mandi, and Shimla, possess a notable degree of consciousness and acknowledgement regarding the importance of registering a pregnancy. However, a minority of the participants, specifically 6.4 percent, believed that pregnancy registration lacked significance. Although this represents a minority, it nevertheless underscores the existence of an entire group of women who may possess limited comprehension regarding the advantages or imperative nature of enrolling their pregnancies. Particularly, a smaller subset of respondents (5.2 percent) expressed uncertainty regarding the significance of registration. Consequently, there is a potential for educational initiatives to be implemented in order to bridge this informational divide. This finding suggests that a minority of the participants may hold misconceptions regarding the right timing for registering a pregnancy.

The data presented in the table 4.1.2 highlights a prevailing favorable opinion towards registering pregnancies among the survey participants, with a significant majority acknowledging its significance. Nevertheless, the finding also underscores the

necessity of addressing the minority of participants who perceive the matter as lacking importance or express uncertainty regarding its significance. Furthermore, initiatives to provide women with information regarding the most advantageous period for pregnancy registration, particularly within the initial trimester, can potentially enhance maternal and child healthcare results. The data of timing of pregnancy registration reveals that, 63.2 percent of the participants, believed that registration ought to take place following a three-month gestation period. This finding indicates that many women may perceive the initial trimester as a period wherein immediate registration is not deemed necessary. In comparison, a smaller proportion of participants (26.6 percent) perceived that women should report their pregnancies within the initial three months. The potential reason for this phenomenon could be attributed to cultural or healthcare beliefs that have the potential to impact the perceived level of urgency associated with registering during the first trimester.

Table 4.1.2 Awareness of Women Regarding Registration of Pregnancy

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Is registration important?				
Yes	201 (88.5)	94 (88.7)	214 (88.1)	509 (88.4)
No	12 (5.3)	05 (4.7)	20 (8.2)	37 (6.4)
Don't know	14 (6.2)	07 (6.6)	09 (3.7)	30 (5.2)
At which month women should register her pregnancy?				
Within 3 months	70 (30.8)	25 (23.6)	58 (23.9)	153 (26.6)
After 3 months	130 (57.3)	74 (69.8)	160 (65.8)	364 (63.2)
At any time	06 (2.6)	07 (6.6)	25 (10.3)	06 (1.0)
Don't know	21 (9.3)	00 (00)	00 (00)	53 (9.2)
A pregnant woman should consult doctor every month?				
Yes	197 (86.8)	87 (82.1)	224 (92.2)	508 (88.2)
No	01 (0.4)	00 (00)	00 (00)	01 (0.2)
Don't know	29 (12.8)	19 (17.9)	19 (7.8)	67 (11.6)

Source: Author's calculation based on primary data

4.1.3 Awareness of Women Regarding Antenatal Care (ANC)

Table 4.1.3 depicts the awareness of women regarding antenatal care (ANC). It was found that out of 576 respondents, specifically 9 percent were unaware of the necessity of antenatal care (ANC) for expectant mothers. It indicates a lack of certainty regarding the necessity of antenatal check-ups in pregnancy. Most women believe that ANC is of significant importance in acquiring knowledge about the baby's condition during pregnancy. The respondents cited the most frequently mentioned reason. The perception that ranked second in terms of frequency was the recognition of the significance of ANC in monitoring the maternal health status throughout pregnancy. A notable proportion, precisely 20 percent of the participants, was unaware of the significance of antenatal check-ups for expectant mothers. This finding indicates that many women lacked awareness regarding the specific rationales underlying the implementation of ANC. The majority of women hold the belief that it is necessary to have a minimum of one to two ANC visits throughout their pregnancy. The frequency of visits described here was widely perceived as the most common. The frequency of ANC visits during pregnancy was perceived to be highest for the category of 5-6 visits, followed by 3-4 visits and 7-8 visits. Approximately 8 percent of the participants lacked knowledge regarding the recommended number of ANC visits during pregnancy. This finding suggests that a subset of women lacked knowledge regarding the appropriate frequency of visits for adequate antenatal care. The study revealed that a significant proportion of the participants precisely 40 percent, lacked knowledge regarding the necessity of Tetanus Toxoid injections for pregnant women. This finding indicates that many women lacked awareness regarding the significance of vaccinations during pregnancy.

In the Kangra region, 89.9 percent of the respondents expressed their belief in the necessity of ANC during pregnancy. However, only 1.8 percent of respondents held the opposing view, while 8.4 percent of the participants reported being unaware of the importance of ANC. The primary rationale cited by the respondents in Kangra for the importance of ANC was "To ascertain the well-being of the infant," which was selected by 55.0 percent of the participants. According to the respondents, suggested frequency of antenatal visits in Kangra was predominantly 1-2 visits (38.3 percent), with 5-6 visits being the subsequent choice (29.5 percent). In the region of Mandi, a significant

majority of the respondents, precisely 88.7 percent, expressed their belief in the necessity of ANC during pregnancy. It is worth noting that no respondents indicated a negative stance towards ANC. However, a small proportion, comprising 11.3 percent of the participants, reported being unaware of the importance of ANC. The primary rationale identified by the respondents in Mandi for the importance of ANC was the desire to monitor the baby's well-being, as indicated by 70.7 percent of the participants. According to the respondents, suggested number of antenatal visits in Mandi varied. Most respondents (37.7 percent) recommended 5-6 visits, while a smaller proportion (24.5 percent) suggested 1-2 visits.

In Shimla zone, a significant majority of 92.6 percent of the respondents expressed their belief in the necessity of ANC during pregnancy. Notably, there were no respondents who expressed disagreement with this viewpoint. However, small proportion of 7.4 percent indicated uncertainty by selecting the response option "Do not know." The major basis identified by the respondents in Shimla for the importance of ANC was "To know the well-being of the baby," selected by 44.5 percent of the participants. The respondents said the suggested number of antenatal visits in Shimla varied. It was observed in the study that 37.4 percent recommended 1-2 visits, while 25.9 percent suggested 5-6 visits.

Table 4.1.3 Awareness of Women Regarding Antenatal Care (ANC)

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Do you think that antenatal care (ANC) is necessary?				
Yes	204 (89.9)	94 (88.7)	225 (92.6)	523 (90.8)
No	04 (1.8)	00 (00)	00 (00)	04 (0.7)
Don't know	19 (8.4)	12 (11.3)	18 (7.4)	49 (8.5)
Why antenatal checkup is necessary?				
To know the condition of baby	125 (55.0)	75 (70.7)	108 (44.5)	308 (53.5)
To know the health of the mother	36 (15.9)	12 (11.3)	76 (31.3)	124 (21.5)
To avoid complications	05 (2.2)	00 (00)	01 (0.4)	06 (1.0)
For safe delivery	02 (0.9)	00 (00)	01 (0.4)	03 (0.5)
Don't know	48 (21.1)	12 (11.3)	52 (21.4)	112 (19.5)
How many antenatal visits are required to a pregnant woman?				

1-2 visits	87 (38.3)	26 (24.5)	91 (37.4)	204 (35.4)
3-4 visits	41 (18.1)	20 (18.9)	44 (18.1)	105 (18.2)
5-6 visits	67 (29.5)	40 (37.7)	63 (25.9)	170 (29.5)
7-8 visits	18 (7.9)	08 (7.5)	25 (10.3)	51 (8.9)
Don't know	14 (6.2)	12 (11.3)	20 (8.2)	46 (8.0)

Source: Author's calculation based on primary data

4.1.4 Awareness of Women Regarding Maternal Health Care

Table 4.1.4 displays data about pregnant women's awareness and knowledge levels regarding various aspects of maternal health, such as TT injections, IFA tablets, iron calcium supplementation, and understanding of obstetric dangers in the present study. The subsequent explanation further elucidates these findings. It was found that 85.4 percent of the participants demonstrated awareness regarding the importance of administering TT injections to pregnant women. However, a mere 0.5 percent of respondents believed such injections were unnecessary, with an additional 14.1 percent expressing uncertainty. When asked about the significance of TT injections, a mere 1.6 percent of respondents demonstrated awareness that the primary purpose is to safeguard the mother against tetanus. However, 10.9 percent of participants erroneously believed the injections were intended to protect the child from tetanus. Encouragingly, a notable proportion of 23.3 percent accurately recognized that the administration of TT injections serves the dual purpose of safeguarding both the mother and child from tetanus. Nevertheless, 64.2 percent of respondents expressed uncertainty regarding the underlying cause.

It was observed that 25 percent of the respondents knew about administering a single dose of TT. On the other hand, a more significant proportion of respondents, precisely 42.7 percent, demonstrated awareness of the necessity for two doses. A mere 30.6 percent of participants accurately recognized the requirement of consuming three doses, while a negligible 1.7 percent expressed uncertainty. The analysis indicates that a significant majority of respondents, precisely 84.0 percent, demonstrated awareness regarding the importance of consuming iron and folic acid (IFA) tablets during the initial trimester of pregnancy. A small proportion, amounting to 0.5 percent, believed that such supplementation was not required. Furthermore, a notable percentage of 15.5 percent expressed uncertainty regarding the necessity of IFA tablet intake during this

crucial period. When asked about the bases behind the consumption of IFA tablets, a significant majority of 72.2 percent were aware of its purpose in averting maternal anemia. However, a mere 0.3 percent acknowledged its efficacy in preventing low birth weight. A minute proportion of individuals (0.5 percent) accurately recognized that it serves a dual function. However, a notable proportion of respondents, precisely 26.9 percent, expressed uncertainty regarding the underlying factors contributing to the phenomenon under investigation. When queried regarding the recommended dosage of IFA tablets for consumption during pregnancy, a mere 10.9 percent of respondents knew that 180 tablets should be ingested. Conversely, 9.0 percent of participants believed that the quantity should be less than 100 tablets, while 12.5 percent opined that it should exceed 100 tablets. The most significant proportion of respondents (67.5 percent) expressed uncertainty regarding the appropriate quantity.

In Kangra, a substantial majority of respondents believed that administering tetanus toxoid (TT) injections is crucial for pregnant women. However, a smaller percentage of 12.8 percent of respondents expressed uncertainty regarding this matter. The primary aim of administering these injections is to provide maternal protection against tetanus, with only 9.7 percent of individuals aware that the primary objective is safeguarding the child. Furthermore, it was found that 26.4 percent of the participants in the survey possess knowledge regarding the dual benefits of TT injections, which include protecting both the mother and the child. A notable portion of participants expressed support for implementing a solitary administration of TT, whereas 47.1 percent endorsed the notion of two doses and 27.3 percent endorsed the notion of three doses. A limited proportion of respondents (3.5 percent) indicated uncertainty regarding the optimal dosage. In the region of Mandi, a significant majority of respondents, precisely 77.4 percent, expressed the belief that pregnant women must receive TT injections. Conversely, a smaller proportion, comprising 22.6 percent of the respondents, expressed uncertainty regarding this matter. The findings indicate that 7.5 percent of the participants understood the intended purpose of TT injections, explicitly recognizing their role in protecting the mother from tetanus. Moreover, a significant proportion of participants (30.2 percent) demonstrated awareness regarding the protective function of TT injections in children. In Shimla, a significant majority of 87.2 percent of the participants expressed their inclination towards administering TT

injections to pregnant women. However, a portion of the respondents, precisely 11.5 percent, expressed uncertainty about this particular issue. Only a small proportion of respondents, specifically 2.1 percent, demonstrated knowledge regarding the purpose of TT injections to protect the mother against tetanus. Conversely, a slightly larger percentage, namely 13.6 percent, possessed awareness that the primary goal of TT injections is to safeguard the child. A total of 17.3 percent of the participants understood that TT injections can protect both the mother and the child.

It was observed that in Kangra, most participants believed pregnant women should incorporate iron and folic acid tablets into their dietary regimen during the first trimester. However, a notable proportion of individuals, precisely 17.2 percent, expressed uncertainty regarding this matter. The majority of participants (73.6 percent) believed that IFA tablets are primarily designed to prevent maternal anemia. However, a mere 0.8 percent of respondents were aware of the additional benefit of these tablets in preventing low birth weight. A minority of individuals (0.9 percent) believed that IFA tablets serve the dual purpose of preventing maternal anemia and low birth weight.

In the region of Mandi, a significant majority of respondents, precisely 78.3 percent, expressed the belief that pregnant women should incorporate iron and folic acid tablets into their dietary regimen during the initial trimester of pregnancy. However, a notable proportion of respondents, precisely 21.7 percent, expressed uncertainty regarding this issue. Most participants (67.0 percent) believed that IFA tablets effectively prevent maternal anemia, whereas 33.0 percent expressed uncertainty regarding the underlying rationale for using IFA tablets. In the context of Shimla, a significant majority of respondents, precisely 79.0 percent, expressed the belief that providing iron-calcium supplementation is crucial during pregnancy. Conversely, a smaller proportion of respondents, precisely 19.3 percent, reported uncertainty regarding the necessity of such supplementation. A small proportion of individuals (1.6 percent) believe it is not crucial. The findings indicates that most participants residing in the Kangra have exhibited a noteworthy level of consciousness regarding the potential obstetric hazards that may lead to significant health complications for maternal individuals. However, a smaller proportion of participants, precisely 20.7 percent, have expressed uncertainty about this issue.

Table 4.1.4 Awareness of Women Regarding Maternal Health Care

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Is it necessary for pregnant women to take Injection Tetanus Toxoid (TT)?				
Yes	198 (87.2)	82 (77.4)	212 (87.2)	492 (85.4)
No	00 (00)	00 (00)	03 (1.2)	03 (0.5)
Do not know	29 (12.8)	24 (22.6)	28 (11.5)	81 (14.1)
Why TT (tetanus) injections are important?				
To protect mother from tetanus	4 (1.8)	08 (7.5)	05 (2.1)	09 (1.6)
To protect child from tetanus	22 (9.7)	00 (00)	33 (13.6)	63 (10.9)
Both	60 (26.4)	32 (30.2)	42 (17.3)	134 (23.3)
Do not know	141 (62.1)	66 (62.3)	163 (67.1)	370 (64.2)
How many doses of TT should be taken?				
Single dose	50 (22.0)	27 (25.5)	67 (27.6)	144 (25.0)
Two doses	107 (47.1)	31 (29.2)	108 (44.4)	246 (42.7)
Three doses	62 (27.3)	46 (43.4)	68 (28.0)	176 (30.6)
Don't know	08 (3.5)	02 (1.9)	00 (00)	10 (1.7)
Is it necessary for pregnant women to take IFA (Iron Folic Acid) tablets in first three months of pregnancy?				
Yes	188 (82.8)	83 (78.3)	213 (87.7)	484 (84.0)
No	00 (00)	00 (00)	03 (1.2)	03 (0.5)
Don't know	39 (17.2)	23 (21.7)	27 (11.1)	89 (15.5)
What are the reasons for IFA tablet consumption?				
To prevent from maternal anemia	167 (73.6)	71 (67.0)	178 (73.3)	416 (72.2)
To prevent low birth weight	00 (00)	00 (00)	02 (0.8)	02 (0.3)
All of the above	02 (0.9)	00 (00)	01 (0.4)	03 (0.5)
Don't know	58 (25.6)	35 (33.0)	62 (25.5)	155 (26.9)
How many IFA (Iron Folic Acid) tablets should be consumed during pregnancy period?				
Less than 100	19 (8.4)	13 (12.3)	20 (8.2)	52 (9.0)
More than 100	31 (13.7)	08 (7.5)	33 (13.6)	72 (12.5)
180 during whole pregnancy	29 (12.8)	16 (15.1)	18 (7.4)	63 (10.9)
Don't know	148 (65.2)	69 (65.1)	172 (70.8)	389 (67.5)
Is it necessary to take iron calcium supplementation during pregnancy?				
Yes	173 (76.2)	64 (60.4)	192 (79.0)	429 (74.5)
No	01 (0.4)	00 (00)	04 (1.6)	05 (0.9)
Don't know	53 (23.3)	42 (39.6)	47 (19.3)	142 (24.7)
Do you know about obstetric dangers amounting to serious ill-health of mother?				
Yes	165 (72.7)	72 (67.9)	179 (73.7)	416 (72.2)
No	47 (20.7)	24 (22.6)	50 (20.6)	121 (21.0)

Source: Author's calculation based on primary data

4.1.5   Awareness of Women Regarding Obstetric Danger Signs

Table 4.1.5 outlines the awareness of the respondents regarding danger signs during pregnancy. Many respondents were aware of swelling of feet/hands/face, followed by severe abdominal pain, constant headache, loss of consciousness, vomiting, dizziness, fast or difficult breathing, fever, blurred vision, excessive vaginal bleeding, foul-smelling vaginal discharge and fits. The awareness of women regarding obstetric complications during the gestational period was analyzed using descriptive table. It was found that in Kangra and Mandi, most of the women were aware of Severe abdominal pain, whereas, in Shimla and Himachal Pradesh, it was found that most of the women were aware of the swelling of feet/hands and face. Awareness regarding loss of consciousness was high in Kangra followed by Mandi and Shimla. Lack of awareness was found regarding the blurred vision, foul- swelling vaginal discharge and excessive vaginal bleeding in Mandi and Shimla.

Table 4.1.5 Awareness of Women Regarding Obstetric Danger Signs

S. No.	Complication	Kangra (%)	Mandi (%)	Shimla (%)	Overall (%)
1.	Blurred vision	14	0	0	10
2.	Fast or difficult breathing	28	19	0	22
3.	Fever	15	0	20	14
4.	Fits	8	3	2	4
5.	Foul-smelling vaginal discharge	5	0	7	5
6.	Loss of consciousness	49	38	36	41
7.	Severe abdominal pain	68	63	59	63
8.	Constant headache	44	49	52	48
9.	Excessive vaginal bleeding	16	11	4	10
10.	Swelling of feet/hands/face	68	60	68	66
11.	Vomiting	34	25	41	36
12.	Dizziness	37	46	29	35

Source: Author's calculation based on primary data

4.1.6   Awareness of Women Regarding Pregnancy-Related Complications

Table 4.1.6 exhibits that most of the respondents were aware of pregnancy-related complications in Kangra, Mandi, and Shimla zone, expressed in percentages. The Kangra zone exhibits a distinguished prevalence of high blood pressure or hypertension, affecting 57 percent of the population, with gestational diabetes closely following at a rate of 46 percent. Anemia is a significant concern in this region, with a prevalence rate of 41 percent among individuals. Furthermore, the occurrence rates of illnesses such as antepartum hemorrhage, breast-related problems, and fetal distress are comparatively low, with each condition being reported at 1 percent or below. In the Mandi zone, a notable issue exists about elevated blood pressure, with a prevailing rate of 73 percent. This figure signifies a more significant occurrence in comparison to the Kangra zone. Gestational diabetes and anemia exhibit a notable prevalence, impacting 49 percent and 45 percent of the population. Other problems, namely malposition and extended labor, indicate substantial incidence rates, namely 11 percent and 43 percent, correspondingly. Within Shimla zone, it is evident that the occurrence of hypertension is significantly reduced, with a prevalence rate of 47 percent. Conversely, the prevalence rates of gestational diabetes and anemia are reported at 34 percent and 33 percent respectively. Preterm labor and premature rupture of membranes are frequently seen problems in this geographical area, with prevalence rates of 30 percent and 6 percent, correspondingly.

Overall, the study revealed that awareness regarding hypertension, commonly known as high blood pressure, was highest throughout the entire region, exhibiting a prevalence rate of 55 percent. This finding suggests that most individuals in this geographical area encounter this issue throughout their pregnancy. Awareness regarding gestational diabetes and anemia remain second and third highest as 41 percent and 38 percent in pregnant women. Additional complications, including antepartum bleeding, issues connected to the breast, and fetal distress, cumulatively account for a minor proportion of cases in awareness, with each difficulty occurring at a rate of 1 percent or less. It is noteworthy that disorders such as post-partum hemorrhage, post-partum sepsis, preeclampsia, and shoulder dystocia exhibit no awareness in respondents.

Table 4.1.6 Awareness of Women Regarding Pregnancy-Related Complications

S. No.	Complication	Kangra (%)	Mandi (%)	Shimla (%)	Overall (%)
1.	High blood pressure/ Hypertension	57	73	47	55
2.	Gestational diabetes	46	49	34	41
3.	Anemia	41	45	33	38
4.	Ante partum hemorrhage	1	0	0	1
5.	Breast related complications	1	0	0	1
6.	Cephalopelvic disproportion	2	0	0	1
7.	COVID	37	54	29	37
8.	Fetal distress	1	0	2	2
9.	Malaria	2	0	0	1
10.	Malposition	12	11	11	12
11.	Perinatal asphyxia	1	0	0	1
12.	Placenta previa	7	4	4	5
13.	Post partum hemorrhage	0	0	0	0
14.	Post partum sepsis/Puerperal sepsis	1	0	0	0
15.	Preeclampsia	0	0	0	0
16.	Preterm labor	46	46	30	39
17.	Premature/ Prelabor rupture of membrane	5	0	6	4
18.	Prolonged labour/ Failure to progress	34	43	22	30
19.	Ruptured uterus/Uterine rupture	4	0	5	4
20.	Shoulder dystocia	0	0	0	0
21.	Stillbirth	34	1	26	32
22.	Umbilical cord prolapsed	4	1	3	3
23.	Thyroid	8	108	11	8
24.	MAS (Meconium Aspiration Syndrome)	32	25	41	35
25.	Don't know	0	1	1	0

Source: Author's calculation based on primary data
Note: Multiple responses are possible

SECTION - II

4.2 ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC VARIABLES AND AWARENESS OF WOMEN TOWARDS MATERNAL HEALTH CARE

4.2.1 Awareness of Women regarding Maternal Health Care and its Association between Socio-Demographic Variables in Himachal Pradesh

Table 4.2.1 exhibits the association of awareness of women regarding maternal health care with socio-demographic variables using Chi-Square *(χ2)*. The χ2 test value of 43.534 in Kangra, 30.593 in Mandi and 53.105 in Himachal Pradesh (*p* = 0.000) revealed a significant association between the age and necessity of ANC care during the pregnancy. In contrast, no significant association was witnessed between age and ANC is necessary for Shimla. Age revealed a significant association with injection TT is necessary during pregnancy in Kangra with a chi-square test value of 34.854 (p=0.000). In Mandi, with χ2 test value of 16.044 (*p* ≤ 0.05) and overall, with 49.148 χ2 value (p = 0.000). Similarly, age and awareness of obstetrics danger have a significant association with a χ2 test value of 39.299 (*p* = 0.000) in Kangra and χ2 test value of 36.955 (*p* = 0.000) in Mandi and 44.89 in χ2 value (*p* = 0.000) overall. In contrast, age has no significant association with TT and awareness of obstetric dangers in Shimla. In Shimla, age displayed a significant association with iron calcium supplementation during pregnancy is necessary with a χ2 value of 22.952 (*p* ≤ 0.05).

It was found that caste is significantly associated with awareness of obstetric danger during pregnancy in all zones of Himachal Pradesh. Similarly, it was found that a significant association exists in literacy level with registration, TT, IFA, Iron calcium supplement and awareness of obstetric danger in Kangra and Overall. At the same time, literacy and awareness of women regarding MHC were not found to have a significant association in Mandi and Shimla. Moreover, the work status of the husband observed a statistically significant association with doctors' consultation every month, ANC and TT and IFA are necessary during pregnancy, iron calcium and awareness of obstetric danger (*p* = 0.000) in Kangra. In contrast, it was witnessed that the work status of a husband has a significant association with ANC. TT is necessary during pregnancy in Shimla, and it was observed that the work status of a husband has a statistical association

with all variables of awareness of women regarding MHC in Himachal Pradesh. In contrast, no statistically significant association was witnessed between the work status of the husband with all variables of awareness of women regarding MHC in Mandi.

Furthermore, monthly income of respondents was found to be statistically significant with the association consultation with a doctor every month, ANC, TT, Iron calcium and awareness in Kangra; monthly income was significant in Shimla with registration to nutrition in Himachal with registration, consultation with awareness of obstetric dangers. However, an insignificant association was found with women's awareness regarding MHC in Mandi. Similarly, it was evident that type of family was statistically associated with registration in a nutrition center consulting doctor every month ANC and awareness of obstetric danger in all zones of Himachal Pradesh. Besides these variables, the type of family is statistically associated with ANC and TT necessity during pregnancy ($p = 0.000$ and 0.025).

The head of the family revealed a significant association with all the variables of awareness of women regarding MHC. In contrast, IFA displayed an insignificant association with the head of the family in Kangra and Mandi. However, In Shimla, the head of the family was statistically associated with all variables except registration in the nutrition center with a $\chi2$ value of 11.055 ($p \leq 0.05$). Overall, all variables are statistically significant with the head of the family. Birth order revealed a significant association with registration in nutrition centers, iron and supplementation in Kangra and Shimla, birth order has a significant association with iron and supplementation, and ANC is necessary for women's health in Shimla, whereas in Mandi. All variables were not associated with birth order. Overall, it was found that except for consultation with a doctor every month and TT is necessary for the mother, all variables have statistically significant with the birth order.

Table 4.2.1 Association between Socio-Demographic Variables and Awareness of Women regarding Maternal Health Care

Zone	Variables		Registration in nutrition center	Consultation of doctor every month	Antenatal care (ANC) is necessary	Injection Tetanus Toxoid (TT) is necessary	IFA (Iron Folic Acid) tablets are necessary	Iron calcium supplementation during pregnancy is necessary	Awareness of obstetric dangers
Kangra	Age	Chi-square	12.900	4.787	43.534	34.854	4.020	22.785	39.299
		P-value	.229	.905	.000*	.000*	.547	.012	.000*
	Caste	Chi-square	21.380	5.507	10.085	11.316	3.633	9.205	23.607
		P-value	.002*	.481	.121	.010	.304	.162	.001*
	Literacy level	Chi-square	53.972	19.856	83.125	52.762	48.589	80.176	58.330
		P-value	.000*	.031	.000*	.000*	.000*	.000*	.000*
	Work status	Chi-square	8.574	1.760	1.303	1.693	.897	3.608	2.221
		P-value	.073	.780	.861	.429	.639	.462	.695
	Literacy level of husband	Chi- square	58.936	21.890	63.447	22.346	30.409	25.252	50.655
		P-value	.000*	.016	.000*	.000*	.000*	.005*	.000*
	Work status of husband	Chi-square	21.734	39.083	28.545	51.080	26.625	38.143	30.657
		P-value	.017	.000*	.001*	.000*	.000*	.000*	.001*
	Monthly income	Chi-square	16.597	25.669	25.007	35.968	8.685	26.458	25.897
		P-value	.035	.001*	.002*	.000*	.069	.001*	.001*
	Type of family	Chi-square	13.987	14.026	19.377	2.517	.273	.936	12.129
		P-value	.001*	.001*	.000*	.113	.602	.626	.002*
	Head of the family	Chi-square	36.744	20.744	31.514	35.713	5.977	43.485	48.531
		P-value	.000*	.000*	.000*	.000*	.050	.000*	.000*
	Birth Order	Chi-square	27.774	2.106	13.469	1.186	9.599	22.956	16.256
		P-value	.001*	.978	.097	.880	.048	.003*	.039

Mandi	Age	Chi-square	51.409	3.393	30.593	16.044	11.154	7.893	36.955
		P-value	.000*	.494	.000*	.003*	.025	.096	.000*
	Caste	Chi-square	5.241	4.732	1.663	.859	14.266	4.377	25.261
		P-value	.513	.192	.645	.835	.003*	.224	.000*
	Literacy level	Chi-square	9.143	7.348	5.983	7.811	3.920	10.245	19.633
		P-value	.330	.119	.200	.099	.417	.036	.012
	Work status	Chi-square	3.770	.708	.531	1.217	1.152	2.728	4.850
		P-value	.438	.702	.767	.544	.562	.256	.303
	Literacy level of husband	Chi-square	10.727	9.408	9.408	13.308	25.434	15.312	71.179
		P-value	.218	.052	.008	.010	.000*	.004*	.000*
	Work status of husband	Chi-square	15.699	11.937	15.088	6.757	7.103	4.981	30.688
		P-value	.015	.008*	.002*	.080	.069	.173	.000*
	Monthly income	Chi-square	17.911	3.393	7.548	.934	5.735	7.818	16.909
		P-value	.022	.494	.110	.920	.220	.098	.031
	Type of family	Chi-square	10.229	9.896	17.521	1.090	.565	.051	22.328
		P-value	.006*	.002*	.000*	.296	.452	.822	.000
	Head of the family	Chi-square	17.919	32.453	26.312	32.920	1.867	29.746	31.100
		P-value	.001*	.000*	.000*	.000*	.393	.000*	.000*
	Birth Order	Chi-square	7.877	7.580	7.877	2.882	1.591	2.014	9.930
		P-value	.096	.023	.019	.237	.451	.365	.042
	Age	Chi-square	8.747	5.735	7.656	16.719	11.315	22.952	16.018
		P-value	.364	.220	.105	.033	.184	.003*	.042
	Caste	Chi-square	7.818	3.343	3.151	3.867	15.229	11.391	18.559
		P-value	.252	.342	.369	.695	.019	.077	.005*
	Literacy level	Chi-square	8.130	9.715	5.772	4.862	11.364	11.608	11.279
		P-value	.616	.084	.329	.900	.330	.312	.336

Shimla	**Work status**	**Chi- square**	3.346	2.544	22.894	22.733	8.455	8.816	3.945
		P-value	.911	.637	.004*	.004*	.390	.358	.950
	Literacy level of husband	**Chi-square**	5.584	7.674	8.006	13.897	5.568	21.536	11.105
		P-value	.349	.175	.628	.178	.850	.018	.349
	Work status of husband	**Chi-square**	7.869	15.373	9.856	5.177	8.005	25.366	25.366
		P-value	.164	.009	.453	.879	.628	.005*	.005*
	Monthly income	**Chi-square**	37.895	2.595	9.034	6.466	8.026	15.260	12.714
		P-value	.000*	.762	.108	.775	.626	.123	.240
	Type of family	**Chi-square**	24.010	21.114	15.552	4.552	2.552	3.316	13.213
		P-value	.000*	.000*	.000*	.103	.279	.191	.001*
	Head ofthe family	**Chi-square**	11.055	34.928	50.029	50.222	16.388	56.223	42.894
		P-value	.026	.000*	.000*	.000*	.003*	.000*	.000*
	Birth Order	**Chi-square**	18.764	2.001	20.593	8.027	12.263	37.475	20.586
		P-value	.016	.736	.000*	.431	.140	.000*	.008
	Age	**Chi-square**	12.306	12.34	53.105	49.148	14.95	39.24	44.89
		P-value	0.265	0.263	.000*	.000*	0.134	.000*	.000*
	Religion	**Chi-square**	0.933	0.949	0.718	1.21	1.347	2.428	1.469
		P-value	0.92	0.917	0.949	0.876	0.853	0.658	0.832
	Caste	**Chi-square**	24.172	10.091	11.937	7.069	18.195	10.996	29.268
		P-value	.000*	0.121	0.063	0.315	0.006*	0.089	.000*
	Literacy level	**Chi-square**	43.024	18.942	30.824	36.514	53.251	74.219	50.772
		P-value	.000*	0.041*	0.001*	.000*	000*	.000*	000*
	Work status	**Chi-square**	8.508	4.194	4.719	53.991	53.394	15.962	10.495
		P-value	0.579	0.938	0.909	.000*	000*	0.101	0.398
	Literacy level of husband	**Chi-square**	28.054	28.275	41.498	14.049	41.935	21.224	65.002
		P-value	0.002*	0.002*	.000*	0.171	.000*	0.02*	.000*

Overall	Work status of husband	Chi-square	17.851	44.005	18.159	21.789	18.685	23.691	44.572
		P-value	0.058	.000*	0.052	0.016*	0.044*	0.008*	.000*
	Monthly income	Chi-square	50.942	24.03	13.767	16.38	18.269	31.231	11.835
		P-value	.000*	0.008*	0.184	0.089	0.051	0.001*	0.296
	Type of family	Chi-square	45.955	47.247	48.408	7.351	3.297	2.182	37.692
		P-value	.000*	.000*	.000*	0.025*	0.192	0.336	.000*
	Head of the family	Chi-square	53.239	85.452	107.249	120.696	22.875	125.475	121.024
		P-value	.000*	.000*	.000*	.000*	.000*	.000*	.000*
	Birth Order	Chi-square	51.262	5.344	38.594	5.515	20.658	29.815	45.505
		P-value	.000*	0.867	.000*	0.854	0.024*	0.001*	.000*

Source: Author's calculation based on primary data
*Note: * Significant at 5 percent*

SECTION - III

4.3   SUMMARY

This chapter provides an in-depth study of women's knowledge and understanding of many dimensions of maternity healthcare in Himachal Pradesh. This study examines the demographic characteristics of the participants, their level of awareness of pregnancy registration, the significance of antenatal care (ANC), their knowledge about TT injections and IFA tablets, their comprehension of obstetric risks, and the correlations with socio-demographic factors. The chapter commences with an overview of the demographic characteristics of the participants hailing from the three distinct regions of Himachal Pradesh. The age group with the highest representation among the respondents was 25-30 years, followed by the age groups of 20-25 and 30-35. Most participants self- identified as adherents of the Hindu faith, with a notable portion belonging to the general caste. Regarding education, a significant number of individuals had successfully attaineda higher secondary level of education, while the prevailing majority were primarily engaged in homemaking activities. The literacy proficiency of husbands exhibited a rangeof levels, with the attainment of a higher secondary education being the prevailing level. The husbands of the majority of respondents were engaged in labor-intensive occupations, with government and private sector employment following as the subsequent categories. The monthly household income exhibited variability, with a notable fraction of households belonging to the lower income brackets. A considerable proportion of individuals resided in households characterized by joint family structures when the father-in-law typically assumed the role of the family patriarch. The majority of participants reported having two offspring. The survey findings indicate that a substantial proportion of participants believe that registering during pregnancy is of utmost importance. At the same time, a minority of respondents perceive it as excessive or express confusion regarding its significance. It is essential to highlight that a minority of individuals had the belief that registration may take place at any stage throughout pregnancy. This underscores the necessity of educational programs to narrow the knowledge disparity and emphasize the significance of timely

67

pregnancy registration. Although the majority of participants acknowledged the necessity of ANC, a considerable portion demonstrated a lack of awareness of its value. The frequency of antenatal care (ANC) visits during pregnancy exhibited variability, as many participants advocated for a range of 5-6 visits. Several participants demonstrated a lack of awareness of the appropriate frequency of antenatal care (ANC) visits, highlighting the necessity for improved educational initiatives on this subject matter. The chapter examines women's awareness level regarding the administration of Tetanus Toxoid (TT) injections and Iron and Folic Acid (IFA) tablets. Although a substantial majority of individuals demonstratedawareness of the significance of TT injections and IFA tablets, there existed misconceptions pertaining to the precise objectives of these interventions. In the context of tetanus toxoid (TT) injections, certain participants believed these injections primarily safeguarded the kid rather than the mother. This underscores the necessity for comprehensive and unambiguous teaching on the subject matter.

Likewise, although the significance of IFA tablets in preventing maternal anemia was widely acknowledged, there was a lesser comprehension of their influence on the occurrence of low birth weight. There was also a lack of consensus regarding the optimal dosage of iron-folic acid (IFA) tablets. This chapter additionally examines women's awareness level regarding obstetric risks that may arise during pregnancy. The majority of participants demonstrated knowledge on typical indicators of risk, including the presence of edema in the hands, feet, or face, intense abdominal discomfort, and persistent headaches. Nevertheless, certain regions exhibited a lower level of awareness about symptoms such as hazy vision, malodorous vaginal discharge, and heavy vaginal bleeding. This implies a necessity for a comprehensive educational program on obstetric hazards to guarantee prompt identification and intervention. The discussion also encompassed the incidence of obstetric problems in various districts of Himachal Pradesh. The prevalence of high blood pressure or hypertension was observed across all regions, with gestational diabetes and anemia being subsequent health concerns. The prevalence rates of particular problems differed across different regions, underscoring the necessity for healthcare interventions tailored to each specific region. The study assessed the correlation between

women's knowledge of maternity healthcare and several socio-demographic factors. A strong correlation was observed between age and antenatal care (ANC) utilization, tetanus toxoid (TT) shots, and awareness of obstetric risks in certain places. The variables of caste, literacy level, husband's work status, and monthly income showed significant associations with different dimensions of awareness. There was a substantial correlation observed between the family structure and the familial authority figure, and many factors of women's knowledge and understanding of maternity healthcare. The phenomenon of birth order shown diverse correlations with several facets of consciousness.

The present chapter significantly contributes to women's knowledge and understanding of maternity healthcare in Himachal Pradesh. Although there is considerable recognition of specific elements, such as the significance of antenatal care (ANC), tetanus toxoid (TT) injections, and iron and folic acid (IFA) pills, there nevertheless exist misconceptions and deficiencies in understanding. Regional disparities in the occurrence of obstetric problems necessitate the implementation of customized healthcare measures. Various socio-demographic characteristics, such as age, caste, education, husband's employment position, income, family structure, and household leadership, influence women's level of awareness regarding maternal healthcare. The findings above highlight the significance of implementing focused educational initiatives and healthcare programs that consider the distinct socio-demographic attributes of various geographical areas. Enhancing women's knowledge of maternal healthcare is imperative in Himachal Pradesh to safeguard the welfare of both mothers and children.

CHAPTER - V

HEALTHCARE UTILIZATION, COST AND COPING STRATEGIES OF MATERNAL HEALTHCARE SERVICES IN HIMACHAL PRADESH

A proper utilization of antenatal and postnatal care services is important in order to reduce maternal and infant mortality rates. The persistent lack of accessibility and underutilization of antenatal and other healthcare services remains a significant contributing factor to the elevated rates of maternal death, alongside many socioeconomic determinants. Improving the utilization of maternal healthcare services is a global challenge for the health system in low- and middle-income countries. Poor maternal health delivery in developing countries results in more than half a million maternal deaths during pregnancy, childbirth or within a few weeks of delivery. The majority of maternal deaths occur during labor, delivery and immediate postpartum period. Utilization of maternal health care is determined by various factors such as literacy level, low economic status, religion, age, social status, occupation of household, region of living and cost of maternal healthcare services (Bloom et al., 2001; Chhabra et al., 2011; Kulkarni & Durge, 2013; Sanneving et al., 2013; Singh et al., 2014; Haddad et al., 2016; Shahabuddin et al., 2017). The main factor influencing institutional delivery is the number of ANC visits and cost of services. It was observed that more the number of ANC visits, more the women likely to utilize institutional delivery (Kulkarni & Durge, 2013; Acharya et al., 2016; Shahabuddin et al., 2017; John et al., 2018). The cost of maternal healthcare utilization increases with an increase in complications during pregnancy or delivery (Kes et al., 2015; Govil et al., 2016). Direct and hidden costs are the main barriers to institutional delivery for women from remote regions (Acharya et al., 2016). The hidden cost is the cost which is not recorded physically for any good or service but it is hidden in the overall expenditure. Poor Indian households spend a higher percentage of their household income to seek care, which is almost twice that of households with high income, leading to out-of-pocket expenditure to meet the cost of maternal healthcare services (Bidgoli et al., 2015). Out-of-pocket expenditure can be varied due to many factors like the type of delivery i.e., normal delivery or C-section delivery; place of antenatal care and complications during pregnancy or delivery (Govil et al., 2016).

The present chapter estimates and compares healthcare utilization, cost and coping strategies of maternal health among mothers in Himachal Pradesh. The study aims to estimate the cost of MHC, complications and its cost by socio-demographic variables. The chapter has been categorized into four different sections. Section I of the chapter estimates and compares healthcare utilization. Section II discusses zone-wise healthcare utilization and cost of maternal healthcare services in Himachal Pradesh. Section III of this chapter explains coping strategies of MHC in Himachal Pradesh. Lastly, Section IV highlights the summary and conclusion.

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SECTION - I

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5.1   HEALTHCARE UTILIZATION OF ANC, INC AND PNC SERVICES

5.1.1   Utilization of Maternal Health Care Services

Table 5.1.1 shows that all women utilized maternal healthcare services which means all women have utilized either ANC, INC or PNC services. Table 5.1.1 depicted that out of 576 respondents, all women from Kangra, Mandi and Shimla utilized maternal healthcare services. Furthermore, it was found that 94.1 per cent of respondents utilized ANC services. It exhibits that in Mandi all of the respondents utilized the ANC properly whereas in Shimla (97 per cent) and Kangra (87.2 percent) utilized ANC services. It was found that 11.9 percent of respondents in Kangra have not used ANC services because they think that it's not necessary. Most respondents took 5-6 visits, followed by 3-4 visits, 1-2 visits and 7-8 visits for ANC. It was outlined from the data, out of 576 respondents, a large proportion of respondents i.e., 62.4 percent of respondents from Kangra, 73.6 percent from Mandi and 74.5 percent from Shimla utilized ANC from public hospital. Whereas 24.8 percent from Kangra, 26.4 percent in Mandi and 23.5 percent in Shimla utilized ANC services from the private hospital. Lastly, it was found that a large proportion of the respondents used public hospitals with 69.6 percent.

However, it was revealed that a large proportion of respondents took 2 doses of TT injection followed by 1 dose and 3 doses. The results show that out of 576 respondents, a

small proportion faced complications before and during delivery. It was found that only 34.5 percent in Kangra, 48.1 percent of respondents from Mandi and 37.8 percent of respondents from Shimla faced complications before delivery whereas overall 55.8 percent of respondents were not faced any complications before the delivery. The results exhibit that majority of mothers gave and preferred normal delivery, it was found from the analysis 64.2 percent of respondents preferred normal delivery and most of the deliveries happened in public hospitals. It was found that in Kangra 75.7 percent of respondents preferred private hospitals for delivery purpose and 77.4 percent respondents from Mandi and 85.6 percent from Shimla. Furthermore, analysis exhibits that of the respondents from Shimla 67.2 percent of mothers did not utilize PNC services. The analysis revealed that a large proportion of 63.7 per cent from Himachal Pradesh did not utilize PNC services. It was observed that 97.9 percent of respondents gave birth to healthy babies whereas 1.7 percent of respondents delivered low birth weight babies. However, it was observed that most of the women get discharged after 3 days from the hospital after the delivery. It was found that 34.1 percent of respondents were discharged after three days followed by 29.2 percent of respondents who were discharged after 24 hours of delivery and 22.4 percent after 48 hours. Lastly, it was found that a large proportion of the respondents in Shimla (72.8 percent) consumed IFA tablets after delivery for 42 days followed by 56.2 percent in Kangra and 50 percent in Mandi.

Table 5.1.1 Utilization of Antenatal Care (ANC) Services

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Have you utilized maternal health care services?				
Yes	214 (94.2)	106 (100.0)	241 (99.2)	561 (97.4)
No	13 (5.8)	00 (00)	02 (0.8)	15 (2.6)
Who made decisions related to your utilization of maternal health care services?				
Myself	02 (0.9)	01 (0.9)		3 (0.5)
Both me and my husband	84 (37.2)	61 (57.5)	96 (39.5)	242 (42.0)
Only Husband	14 (6.2)	06 (5.7)	09 (3.7)	29 (5.0)
Mother-in-law	00 (00)	01 (0.9)	-	01 (0.2)
Whole family	114 (50.0)	37 (34.9)	136 (56.0)	286 (49.7)
Have you utilized ANC services?				

Yes	198 (87.2)	106 (100.0)	238 (97.9)	542 (94.1)
No	29 (12.8)	00 (00)	05 (2.1)	34 (5.9)
If no, what were the reasons?				
Not necessary	28 (11.9)	00 (00)	04 (1.6)	31 (5.4)
Lack of knowledge	01 (0.4)	00 (00)	01 (0.4)	02 (0.3)
If yes, how many times you took ANC visit?				
1-2 visits	61 (26.5)	24 (22.6)	92 (37.9)	176 (30.6)
3-4 visits	40 (17.7)	22 (20.8)	45 (18.5)	107 (18.6)
5-6 visits	92 (40.7)	60 (56.6)	89 (36.6)	242 (42.0)
7-8 visits	05 (2.2)	00 (00)	12 (4.9)	17 (3.0)
If yes, from where you utilized antenatal care (ANC) services?				
Public Hospital	142 (62.4)	78 (73.6)	181 (74.5)	401 (69.6)
Private Hospital	56 (24.8)	28 (26.4)	57 (23.5)	141 (24.5)
How many times have you been vaccinated by Injection Tetanus Toxoid (TT)?				
1 time	79 (34.5)	51 (48.1)	92 (37.9)	221 (38.4)
2 times	109 (48.2)	48 (45.3)	128 (52.7)	286 (49.7)
3 times	10 (4.4)	07 (6.6)	18 (7.4)	35 (6.1)
How many iron folic acid tablets (IFA) have you consumed?				
Less than 50 tablets	17 (7.1)	12 (11.3)	12 (4.9)	40 (6.9)
At least 100 tablets	137 (60.6)	71 (67.0)	198 (81.5)	406 (70.5)
At least 180 tablets	44 (19.5)	23 (21.7)	28 (11.5)	96 (16.7)

Source: Author's calculation based on primary data

5.1.2 Complications during Antenatal Care (ANC)

Table 5.1.2 depicts whether women faced complications or being hospitalized during ANC period. It was observed that the prevalence rates of prepartum difficulties among respondents in different regions were 34.4 percent in Kangra, 48.1 percent in Mandi and 37.8 percent in Shimla. However, the percentage of participants who did not have any difficulties was 65.6 percent in Kangra, 51.9 percent in Mandi and 62.2 percent in Shimla. After conducting an analysis of the rate of hospitalization associated with pre- childbirth complications, the results indicated that 7 percent of the participants in Kangra,

8.5 percent in Mandi and 3.7 percent in Shimla had encountered hospitalization. Nevertheless, it is worth noting that a significant proportion of the population, specifically 93 percent, 91.5 percent and 96.2 percent in the districts of Kangra, Mandi and Shimla respectively, did not require hospitalization. It was observed that the proportions of participants who reported the experience of problems prior to birth were 38.4 percent for

those who responded affirmatively and 55.8 percent for those who responded negatively. Similarly, it was shown that persons who answered affirmatively had a hospitalization rate of 5.9 percent. Whereas those who answered negatively had a higher risk of 94.1 percent due to complications. This analysis aims to provide a comprehensive understanding of the variations in maternal complications and hospitalization rates across different regions, thereby contributing valuable insights into healthcare landscape of these areas.

Table 5.1.2 Complications during Antenatal Care (ANC)

Variables	Kangra	Mandi	Shimla	Overall
	N (%)	N (%)	N (%)	N (%)
Have you faced any complication(s) before delivery?				
Yes	78 (34.4)	51 (48.1)	92 (37.8)	221 (38.4)
No	149 (65.6)	55 (51.9)	151 (62.2)	321 (55.8)
Have you ever been hospitalized before delivery due to any complication?				
Yes	16 (7.0)	09 (8.5)	09 (3.7)	34 (5.9)
No	211 (93.0)	97 (91.5)	229 (96.2)	542 (94.1)

Source: Author's calculation based on primary data

5.1.3 Utilization of Intranatal Care (INC) Services

Table 5.1.3 provides information regarding the geographical distribution of childbirth among women and the key factors contributing to the decision not to deliver at a healthcare facility. The data is categorized into three regions, namely Kangra, Mandi and Shimla, with an accompanying summary encompassing the entire dataset. The data is shown with the number of women and the proportion they represent in the overall population of each respective region. In the Kangra region, a considerable proportion of women, precisely 81.4 percent, choose to give birth to their infants in public healthcare facilities. A lesser proportion of individuals, namely 8 percent, chose private hospitals, while the remaining 10.6 percent delivered their baby home. Among individuals who did not give birth at healthcare facilities, the top factors contributing to this decision were inadequate road communication (4 percent) and limited access to transportation (0.4 percent). A negligible proportion of respondents identified distance as a significant

hindrance (0.4 percent).

In the region of Mandi, a significant proportion of women, precisely 90.6 percent, preferred utilizing public hospitals as their preferred choice for birthing. Conversely, 1.9 percent of women opted for private hospitals, while 7.5 percent decided to deliver at home. The chart does not include specific information regarding the factors contributing to the non-delivery of services in health institutions in Mandi. In Shimla, a significant proportion of women, precisely 83.5 percent, opted to give birth in public hospitals. Conversely, a smaller percentage of women, 9.9 percent, made the decision to deliver their babies in private hospitals. Additionally, a minority of women, comprising 6.6 percent, chose to have home births. Within the cohort of individuals who did not avail themselves of health services at institutions in Shimla, a notable proportion of 7.5 percent identified "insufficient time" as the critical factor influencing their decision, while a smaller fraction of 0.3 percent attributed their choice to unspecified reasons categorized as "others." The data reveals that 84 percent of women opted for public hospitals as their delivery setting, 7.6 percent chose private hospitals and 8.3 percent preferred home births across all three areas. Among those who did not give birth in health institutions, the primary factors contributing to this decision were "insufficient time" (6.1 percent) and other considerations. Although "lack of transportation" and "distance" were also cited, they had a minor impact. The study offers significant insights into women's preferences about the place of childbirth, as well as the obstacles they encounter in these regions. These findings give crucial information for healthcare strategizing and enhancing the availability of health services. The predominant preference for childbirth is public hospitals, with the rationales for not selecting healthcare facilities differing, encompassing logistical difficulties and temporal limitations.

Table 5.1.3 Utilization of Intranatal Care (INC) Services

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Where did you deliver your baby?				
Public Hospital	183 (81.4)	96 (90.6)	203 (83.5)	484 (84.0)
Private Hospital	18 (8.0)	02 (1.9)	24 (9.9)	44 (7.6)
Home	24 (10.6)	08 (7.5)	16 (6.6)	48 (8.3)
If you did not deliver your baby at any health institution, what is the main reason behind it?				
Distance	01 (0.4)	00 (00)	00 (00)	01 (0.2)
No proper communication of roads	09 (4.0)	00 (00)	00 (00)	09 (1.6)
Lack of transportation	01 (0.4)	00 (00)	00 (00)	01 (0.2)
No time	11 (4.9)	08 (7.5)	16 (6.6)	35 (6.1)
Others	02 (0.9)	00 (00)	00 (00)	02 (0.3)

Source: Author's calculation based on primary data

5.1.4 Type of Delivery and Complications during Delivery

Table 5.1.4 reveals the findings regarding the type of delivery, the involvement of healthcare professionals and the prevalence of delivery complications, classified by zones, namely Kangra, Mandi and Shimla. It was observed that 61.1 percent of the participants in Kangra, 59.4 percent in Mandi and 69.1 percent in Shimla reported normal deliveries, resulting in an aggregate proportion of 64.2 percent. The prevalence of cesarean section (C-section) deliveries in Kangra, Mandi and Shimla were 38.9 percent, 40.6 percent and 30.9 percent, respectively, collectively constituting 35.8 percent of the overall deliveries. The percentage of deliveries performed by doctors in Kangra, Mandi, Shimla were 60.6 percent, 65.1 percent, 57.6 percent, respectively, however, overall, it was 60.2 percent. The study revealed that 'Dai' played a role in 11.5 percent of deliveries in the Kangra region, 8.5 percent in Mandi and 6.6 percent in Shimla, resulting in an aggregate contribution of 8.9 percent across the studied areas. However, in Kangra, nurses were involved in 27.9 percent of deliveries, while in Mandi, their participation accounted for 26.4 percent. In Shimla, nurses were present in 35.8 percent of deliveries. Among three regions, overall percentage of deliveries conducted by nurses were 30.9 percent.

Regarding complications encountered during childbirth, survey participants indicated that proportions of respondents who reported confronting complications were

76

37.2 percent in Kangra, 15.1 percent in Mandi and 6.2 percent in Shimla, collectively constituting an overall proportion of 11.6 percent. The percentage of individuals who did not encounter any issues was 62.8 percent in Kangra, 84.9 percent in Mandi and 93.8 percent in Shimla, collectively accounting for 88.3 percent of the population.

Table 5.1.4 Type of Delivery and Complications during Delivery

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
What type of delivery did you have?				
Normal delivery	137 (61.1)	63 (59.4)	168 (69.1)	370 (64.2)
C-Section delivery	88 (38.9)	43 (40.6)	75 (30.9)	206 (35.8)
Who conducted your delivery?				
Doctor	137 (60.6)	69 (65.1)	140 (57.6)	347 (60.2)
Dai	26 (11.5)	09 (8.5)	16 (6.6)	51 (8.9)
Nurse	64 (27.9)	28 (26.4)	87 (35.8)	178 (30.9)
Did you face any complication(s) during delivery?				
Yes	84 (37.2)	16 (15.1)	19 (6.2)	67 (11.6)
No	142 (62.8)	90 (84.9)	228 (93.8)	509 (88.3)

Source: Author's calculation based on primary data

5.1.5   Utilization of Postnatal Care (PNC) Services

Table 5.1.5 presents a comprehensive analysis of the coverage of postnatal care variables associated with maternal health throughout the three zones, Kangra, Mandi and Shimla. The utilization rate of postnatal care (PNC) services has achieved a record high of 36.3 percent across all geographical zones. The findings of the zone-wise study indicated that Shimla exhibits the highest utilization rate (35.8 percent), followed by Mandi (34.9 percent) and Kangra (34.5 percent). In each geographical region, participants who availed themselves of PNC services preferred receiving healthcare in a public hospital. Mandi exhibits the highest utilization rate of PNC services from public hospitals, with a percentage of 40.6 percent. Following closely behind is Shimla, with a utilization rate of 35.4 percent and Kangra, with a utilization rate of 32.5 percent. The utilization rates of PNC services offered by private hospitals are consistently low with percentages ranging from 0.4 percent to 1.7 percent across various geographic zones. It was observed that a significant proportion of infants had favorable health conditions across various temporal

and geographical contexts. The proportions of neonates exhibiting favorable health conditions were remarkably consistent across different regions, with Kangra reporting 97.8 percent, Mandi reporting 99.1 percent and Shimla reporting 97.5 percent. In Kangra and Mandi, premature births were virtually absent, whereas in Shimla, such deliveries constituted 0.8 percent of the total number of births.

Similarly, neonates with low birth weight were observed in all zones with Kangra exhibiting the highest number of babies with low birth weight at 2.2 percent. Based on the obtained data variations in the timing of hospital discharges following childbirth exist, contingent upon the geographical region. The period of patient discharge after three days had the most significant proportion of responders across all zones. Specifically, Kangra had a population density of 33.6 percent, Mandi had 38.7 percent and Shimla had 32.5 percent. The Mandi region had the highest prevalence of discharges after twenty- four hours, with a rate of 30.2 percent. This was closely followed by Shimla, which had a prevalence rate of 30.9 percent and Kangra, with a rate of 27 percent. There was observed variability in the discharges that transpired over 48 hours, with the most notable proportion being documented in Kangra (24.3 percent), succeeded by Shimla (21.8 percent) and, subsequently, Mandi (19.8 percent). There existed notable discrepancies in the utilization of iron and folic acid (IFA) supplements following childbirth, spanning 42 days in different geographical regions. It was found that the highest consumption rate in Himachal Pradesh is observed in Mandi, accounting for 50 percent. Which Kangra follows with a consumption rate of 56.2 percent, while Shimla exhibits the highest consumption rate at 72.8 percent. However, there was a notable disparity in the proportion of individuals who did not consume IFA tablets throughout the regions of Shimla (27.2 percent), Kangra (43.8 percent) and Mandi (50 percent).

Table 5.1.5 Utilization of Postnatal Care (PNC) Services

Variables	Kangra N (%)	Mandi N (%)	Shimla N (%)	Overall N (%)
Did you utilize PNC services?				
Yes	78 (34.5)	37 (34.9)	87 (35.8)	209 (36.3)
No	148 (65.5)	69 (65.1)	156 (64.2)	367 (63.7)
If yes, from where did you utilize PNC services?				
Public Hospital	74 (32.5)	43 (40.6)	86 (35.4)	203 (35.24)
Private Hospital	04 (1.7)	01 (1.0)	01 (0.4)	06 (1.0)
Your baby at the time of birth was				
Healthy	222 (97.8)	105 (99.1)	237 (97.5)	564 (97.9)
Premature	00 (00)	00 (00)	02 (0.8)	02 (0.3)
Low Birth Weight	05 (2.2)	01 (0.9)	04 (1.6)	10 (1.7)
After delivery, when were you discharged from hospital?				
Immediately after delivery	05 (2.2)	00 (00)	07 (2.9)	12 (2.1)
After 24 hours of delivery	61 (27.0)	32 (30.2)	75 (30.9)	168 (29.2)
After 48 hours of delivery	55 (24.3)	21 (19.8)	53 (21.8)	129 (22.4)
After 3 days	77 (33.6)	41 (38.7)	79 (32.5)	197 (34.1)
Did you consume IFA tablets after delivery for 42 days?				
Yes	128 (56.2)	53 (50.0)	177 (72.8)	358 (62.2)
No	99 (43.8)	53 (50.0)	66 (27.2)	218 (37.8)

Source: Author's calculation based on primary data

5.1.6 Socio-Economic Determinants of Utilization of Maternal Health Care Services in Himachal Pradesh

The key socio-economic determinants of mothers in Himachal Pradesh were identified by using the binary logistic regression model as shown in table 5.1.6. Based on the Omnibus test of model the value of 0.000 exhibits the model to be significant. The results revealed that age was not a significant determinant (p = 0.867 and 0.843). The analysis exhibits in education secondary, higher secondary and graduation above were a significant determinant highlighting a lower probability in ANC, INC and PNC (p= 0.25,0.031 and 0.0991). Secondary level, higher secondary and graduation level of education is a significant determinant in ANC and INC but an insignificant in PNC. Further, results of the study revealed that with increase in the level of education, probability of incidence of maternal health reduces significantly among educated respondents as compared to illiterates.

The analysis exhibits that joint family (p = 0.002) was a significant socio- economic determinant with ANC compared to PNC and INC. Moreover, income group ₹ 30,000 and above were four times more likely to experience a higher incidence of ANC, PNC and INC as compared to low-income group respondents (₹15000 to ₹30,000) with (p=0.052) in overall Himachal Pradesh. Similarly, birth order was not a significant determinant in ANC and PNC but the results revealed that the odds of incidence of INC rises in birth order respondents.

Table 5.1.6 Socio-Economic Determinants of Utilization of Maternal Health Care Services in Himachal Pradesh

Variable	ANC			INC			PNC			Total		
	Odd Ratio	Std. Err.	p-value	Odd Ratio	Std. Err.	p-value	Odd Ratio	Std. Err.	p-value	Odd Ratio	Std. Err.	p-value
Education level (Not formal education)												
Up to primary	4.424	4.490	0.143	1.926	1.505	0.401	3.032	2.504	0.601	4.443	5.209	0.203
Secondary	13.721	15.430	0.020**	4.330	3.473	0.068*	2.460	2.028	0.489	30.958	47.271	0.025**
Higher Secondary	8.684	8.921	0.035**	14.590	12.241	0.001***	2.440	1.987	0.494	13.778	16.716	0.031**
Graduation and above	26.154	32.222	0.008**	66.073	71.303	0.000***	3.828	3.153	0.762	38.112	59.323	0.019**
Age (Up to 25 year)												
25-30 years	0.464	0.264	0.178	0.764	0.325	0.527	1.166	0.264	0.748	0.887	0.635	0.867
Above 30 years	1.196	0.863	0.804	1.018	0.605	0.976	0.977	0.268	0.571	1.204	1.129	0.843
Caste (Unreserved)												
Reserved	1.258	0.628	0.646	1.062	0.392	0.871	1.711	0.327	1.175	1.835	1.213	0.358
Type of family (Nuclear)												
Joint	6.970	3.712	0.000***	0.783	0.294	0.514	0.959	0.183	0.660	3.073	2.012	0.086*
Order of birth (1st child)												
More than 2 children	2.239	1.184	0.127	3.755	1.474	0.001***	0.866	0.166	0.594	1.245	0.849	0.748
Monthly Household Income (Up to Rs. ₹15000)												
₹15000 to 30000	8.962	5.957	0.001	3.648	1.454	0.001***	1.131	0.243	0.568	9.521	10.092	0.033**
More than ₹ 30000	6.645	4.460	0.005**	14.419	10.698	0.000***	1.978	0.432	0.002**	7.936	8.450	0.052**
Model Summary												
No. of Observations= 576												
Prob > chi2	0.000			0.000			0.062			0.000		
Pseudo-R2	0.367			0.179			0.029			0.245		

Source: Author Calculation based on primary data.

Note: * Significant at 10 percent

**** Significant at 5 percent**

***** Significant at 1 percent**

SECTION - II

5.2 HEALTHCARE COST FOR MATERNAL HEALTHCARE SERVICES IN HIMACHAL PRADESH

5.2.1. Mean Cost for Utilizing Maternal Health Care Services by Socio- Demographic Variables in Himachal

The table 5.2.1 displays socio-demographic factors and their respective average cost values for several groups in the Kangra, Mandi, and Shimla districts, as well as an overall average. The factors encompass age, religion, caste, literacy level of respondents, work position, type of family, head of family, and birth order. Across all districts, the age group "40 years & above" exhibits the greatest average cost, with Kangra district having the highest average cost of ₹19,000. When it comes to religion, Sikhs in Kangra have the greatest average cost of ₹32,500, while Muslims in Shimla have an average cost of ₹2,000. The caste reveals that individuals from the general group exhibit the greatest average cost across all districts, with Kangra district recording an average cost of ₹6,283. The cost of respondents is also influenced by their literacy level, with post-graduates having the highest average cost, especially in Kangra (₹20,692). The cost of individuals is greatly influenced by their employment position, with private sector employees earning the greatest average cost across all districts, particularly in Mandi (₹13,333). The type of family and the family head's role also have a significant role in economic inequality, with nuclear families and men as family leaders tending to have higher average wages. Birth order has a discernible impact on cost, as the eldest child tends to have the greatest average cost (₹7,091) across all districts, particularly in Kangra.

Table 5.2.1 Mean Cost for Utilizing Maternal Health Care Services by Socio-Demographic Variables in Himachal

Socio-Demographic Variables	Kangra	Mandi	Shimla	Overall
	Mean	Mean	Mean	Mean
Age				
Up to 20 years	₹ 4364	₹ 2375	₹ 5182	₹ 4133
20-25 years	₹ 4813	₹ 3825	₹ 4486	₹ 4485

25-30 years	₹ 7791	₹ 3257	₹ 4930	₹ 5836
30-35 years	₹ 6439	₹ 4095	₹ 4417	₹ 5041
35-40 years	₹ 4750	₹ 3000	₹ 8167	₹ 6455
40 years & above	₹ 19000	-	-	₹ 19000
Religion				
Hindu	₹ 6040	₹ 3295	₹ 4819	₹ 5068
Muslim	-	-	₹ 2000	₹ 6750
Sikh	₹ 32500	-	₹ 2000	₹ 22333
Caste				
General	₹ 6283	₹ 2868	₹ 5449	₹ 5395
OBC	₹ 7979	₹ 3281	₹ 4443	₹ 5364
SC	₹ 5685	₹ 3188	₹ 4020	₹ 4664
ST	₹ 2462	₹ 9500	₹ 2667	₹ 3739
Literacy level of respondent				
No formal education	₹ 1333	-	₹ 6333	₹ 3833
Primary	₹ 2975	₹ 3125	₹ 4000	₹ 3382
Secondary	₹ 6256	₹ 3000	₹ 3025	₹ 4255
Higher Secondary	₹ 5287	₹ 3032	₹ 4833	₹ 4727
Graduation	₹ 7367	₹ 3727	₹ 5048	₹ 5717
Post- Graduation	₹ 20692	₹ 5000	₹ 7467	₹ 11177
Work status of respondent				
Business	-	-	₹ 2750	₹ 2750
Government Job	-	₹ 30000	₹ 3000	₹ 5455
Private Job	₹ 4000	₹ 13333	₹ 10538	₹ 9650
Laborer	₹ 1000	-	-	₹ 1000
Work in agricultural land	-	-	₹ 3000	₹ 3000
Homemaker	₹ 6486	₹ 3020	₹ 4640	₹ 5079
Type of Family				
Nuclear	₹ 7990	₹ 4282	₹ 5452	₹ 6225
Joint	₹ 4872	₹ 3149	₹ 4074	₹ 4200
Head of Family				
Mother-in-law	₹ 4314	₹ 2200	₹ 3759	₹ 3619
Father-in-law	₹ 6946	₹ 4640	₹ 5301	₹ 5859
Husband	₹ 5951	₹ 2833	₹ 4309	₹ 4593
Birth Order				
1st	₹ 7091	₹ 3816	₹ 6396	₹ 6237
2nd	₹ 6025	₹ 3433	₹ 3652	₹ 4547
3rd	₹ 5455	₹ 3000	₹ 3750	₹ 4392
4th	₹ 750	-	₹ 2500	₹ 1333
5th	₹ 1000	-	-	₹ 1000
6th	-	-	₹ 2000	₹ 2000

Source: Author's calculation based on primary data

5.2.2 Cost for Utilizing Maternal Health Care Services by Socio-Demographic Variables in Himachal

The analysis of socio-demographic variables across different regions (Kangra, Mandi, Shimla, Overall) reveals significant variations in several aspects. Regarding age, there is a substantial difference overall, as indicated by the statistical analysis (Chi-square = 17.479, p = 0.004). Specifically, Shimla stands out with a notable disparity in age distribution, with a Chi-square value of 15.459 and a p-value of 0.026. Religion also shows variability, particularly in Kangra (Chi-square= 2.072, p = 0.024). However, caste disparities are evident, with Kangra exhibiting significant differences (Chi-square = 11.530, p = 0.012). The literacy levels of respondents vary significantly among different locations, with Kangra having the most distinct impact (Chi-square value of 32.772, p= 0.000). Similarly, the overall variation in literacy levels is statistically significant (Chi-square= 27.755 and a p = 0.000). The work status of the respondents shows significant variance overall, as indicated by a large Chi-square value of 16.965 and a p = 0.005. This variety is particularly evident in Kangra, where the Chi-square value is 7.980 and the p = 0.004. There is no substantial variation observed in the family type and family head characteristics across the locations. However, birth order reveals considerable variances, particularly in the case of Kangra, which shows a notable disparity (Chi-square = 10.691, p = 0.021).

Table 5.2.2 Cost for Utilizing Maternal Health Care Services by Socio-Demographic Variables in Himachal

Socio-Demographic Variables	Kangra			Mandi			Shimla			Overall		
	Chi-square	Kruskal-Wallis	p- value	Chi-square	Kruskal-Wallis	p- value	Chi-square	Kruskal-Wallis	p- value	Chi-square	Kruskal-Wallis	p- value
Age	18.558	9.956	0.076*	5.274	3.220	0.522	15.459	11.067	0.026*	17.479	**12.251**	0.004*
Religion	2.072	5.067	0.024*	-	-	-	1.775	0.645	0.724	2.540	1.332	0.281
Caste	11.530	10.971	0.012*	4.552	1.476	0.688	5.000	1.955	0.582	8.498	9.423	0.37
Literacy level of respondent	32.772	40.846	0.000*	4.502	3.079	0.545	8.100	7.501	0.186	27.755	20.543	0.000*
Work status of respondent	7.980	11.037	0.004*	1.720	5.605	0.061*	4.468	1.935	0.748	16.965	5.485	0.005*
Type of Family	2.293	0.230	0.631	0.634	0.363	0.547	0.436	0.011	0.917	0.358	0.142	0.549
Head of Family	4.750	2.719	0.257	10.648	17.048	0.000*	1.884	3.654	0.161	13.527	20.424	0.001*
Birth Order	10.691	11.604	0.021*	3.060	1.877	0.391	1.231	0.581	0.965	11.730	10.283	0.039

Source: Author's calculation based on primary data
*Note: * Significant at 10 percent*
*** Significant at 5 percent*
**** Significant at 1 percent*

SECTION - III

5.3 COPING STRATEGIES OF MATERNAL HEALTHCARE SERVICES IN HIMACHAL PRADESH

5.3.1. Coping Strategies to Deal with Maternal Health Care Expenses

Table 5.3.1 outlined the coping strategies employed by households to meet the maternal healthcare expenditure in Himachal Pradesh. It was found that a large proportion of respondents preferred "buying only a part of medicines" and "help from family members "as the foremost coping strategies in Himachal Pradesh. It was found that, 2.6 percent of respondents observed "selling assets" as the least preferred coping strategy. The results of the analysis revealed that 41.7 percent of respondents strongly agreed "buying only a part of medicines" was the most preferred coping strategy followed by "help from family members" with 37.8 percent. Whereas, 67.5 percent of respondents never utilized "selling assets" and 55.0 percent from "mortgage assets" to cope with maternal health care services" as coping strategies. Lastly, it was found that a small proportion 3.3 percent respondents agreed to utilize "loan" as a coping strategy to meet the financial burden of maternal health care services. Whereas, 15.5 percent respondents disagreed to utilize "post savings" as coping strategy in Himachal Pradesh.

Table 5.3.1 Coping Strategies of Maternal Health Care Services in Himachal Pradesh

Coping Strategies	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
Post Savings	169 (29.3)	66 (11.5)	71 (12.3)	166 (28.8)	89 (15.5)
Help from family members	218 (37.8)	34 (5.9)	93 (16.1)	151 (26.2)	65 (11.3)
Help from friends	45 (7.8)	103 (17.9)	329 (57.1)	53 (9.2)	31 (5.4)
Loan	19 (3.3)	33 (5.7)	16 (2.8)	214 (37.2)	279 (48.4)
Mortgaging assets	42 (7.3)	5 (0.9)	15 (2.6)	182 (31.6)	317 (55.0)
Selling assets/ Gold	15 (2.6)	32 (5.6)	3 (0.5)	122 (21.2)	389 (67.5)
Health Insurance	99 (17.2)	202 (35.1)	170 (29.5)	45 (7.8)	45 (7.8)
Government assistance	136 (23.6)	220 (38.2)	125 (21.7)	53 (9.2)	27 (4.7)
Reduced other household expenses	107 (18.6)	297 (51.6)	89 (15.5)	48 (8.3)	20 (3.5)
Reduced number of visits to the doctor	213 (37.0)	117 (20.3)	70 (12.2)	143 (24.8)	18 (3.1)
Buying only a part of medicines	240 (41.7)	74 (12.8)	180 (31.3)	42 (7.3)	25 (4.3)

Source: Author's calculation based on primary data

SECTION - IV

5.4   SUMMARY

The chapter extensively explores the subject of maternal healthcare in Himachal Pradesh, offering valuable perspectives on the utilization of services, related expenses, and the various socio-economic aspects that impact healthcare practices for pregnant women. The data has been meticulously categorized into divisions to offer a thorough comprehension of the maternal healthcare scenario in the state.   The results demonstrate a significant utilization rate of maternal healthcare services in Kangra, Mandi, and Shimla, suggesting the presence and ease of access to these services. The majority of participants demonstrated efficient utilization of prenatal care (ANC) facilities, with Mandi exhibiting the greatest utilization rate, followed by Shimla and Kangra. The frequency of antenatal care (ANC) visits shown variability, with the majority of women attending 5-6 appointments. A significant proportion of women seeking antenatal care (ANC) services showed a strong preference for public hospitals,

particularly in Kangra, Mandi, and Shimla, where the use rate was notably high. However, a percentage of the participants encountered difficulties prior to and after childbirth, with Kangra exhibiting the greatest proportion, trailed by Mandi and Shimla. Despite these difficulties, the majority of mothers still favored vaginal delivery, with public hospitals being the primary option for giving birth in all areas. However, a substantial proportion of participants from Shimla did not utilize postnatal care (PNC) facilities. Most women experienced uncomplicated childbirth without any notable health issues. The study additionally identified disparities in maternal healthcare expenses according to socio-demographic factors, with older women and individuals with advanced education facing elevated prices. Kangra region exhibited the most elevated mean expenditure.

This chapter contributes to understanding the utilization, expenses and adaptive measures associated with maternal healthcare in Himachal Pradesh. It emphasizes the significance of considering socio-economic issues to enhance maternal and newborn health outcomes within the given geographical area. Policymakers and healthcare practitioners can utilize these findings to customize programs and support systems to address mothers' unique requirements in various socio-demographic circumstances.

CHAPTER - VI

CATASTROPHIC HEALTHCARE EXPENDITURE OF MATERNAL HEALTH CARE SERVICES IN HIMACHAL PRADESH

According to Xu et al. (2003), "Catastrophic healthcare expenditure refers to situations where households make OOP payments for healthcare above a reasonable proportion of their income". One of the primary outcomes of experiencing catastrophic healthcare expenditure (CHE) is a decrease in expenditures on basic necessities, including but not limited to food, clothing, and housing. According to Ghosh's (2011) findings, it can be inferred that, "Out-of-pocket (OOP) spending's are the primary source of healthcare finance in the majority of developed and developing Asian economies and India is no exception".

Catastrophic expenditure is defined as that level of OOP health expenditure which exceeds some fixed proportion of household income or household's capacity to pay. The term catastrophic OOP payments (Berki, 1986) refer to the extreme out-of-pocket medical bills that might create serious financial difficulty. Catastrophic OOP health expenditure is concerned with high levels of OOP health expenditure which might affect household's standard of living. Xu et al. (2003) asserted that it is imperative to consider the share of out-of-pocket (OOP) expenditure in relation to a household's ability to pay. Nevertheless, proportion of overall healthcare expenditure attributed to out-of-pocket costs is increasing on a global scale (WHO, 2019). To cope with financial difficulties, numerous households choose to borrow funds from acquaintances, family members, or usurers, selling off assets, or reducing their expenditures (Russell & Abdella, 2002; Bogale et al., 2005). The empirical data shows that direct payments made by individuals result in excessive expenditures and economic adversity (Whitehead et al., 2001). For predicting catastrophic compensation, however, the literature suggests varying 10% to 25% threshold values. In 2010, it was estimated that the global prevalence of catastrophic spending at the 10% level would be 11.7%. No evidence was discovered to establish a correlation between the occurrence of catastrophic payments and the proportion of the population presumed to possess health coverage. Furthermore, it was observed that the incidence of catastrophic payments in countries fluctuated over time, even when there were no alterations in

health coverage rates (Wagstaff et al., 2018). A negative correlation between the occurrence of financial catastrophe and the degree to which nations allocate resources to their healthcare systems through prepayment mechanisms, such as taxes or insurance. On the contrary, a positive correlation between catastrophe and the relative significance of out-of-pocket payments in overall health expenditure was found (Xu et al., 2007). The health policies are concerned not only with improving health status of population but also with protecting households from financial catastrophe of illness (Peters et al., 2012). Research investigating OOP healthcare expenses sheds light on the impact of illness on the economic welfare of households. The notion of catastrophic out-of-pocket health expenditure holds significant relevance within this particular context.

Thus, present chapter estimates the incidence and intensity of OOP payments in Himachal Pradesh. The chapter has been divided into three sections. Section I of the chapter estimates the catastrophic healthcare expenditure (CHE) of maternal health care services at the household level in Himachal. Section II and identifies the key determinants of catastrophic health expenditure (CHE) in Himachal. Lastly, Section III highlights the summary and conclusion.

<div align="center">SECTION - I</div>

6.1 HEADCOUNT, OVERSHOOT AND MEAN POSITIVE OVERSHOOT OF CATASTROPHIC HEALTHCARE EXPENDITURE OF MATERNAL HEALTH CARE SERVICES

6.1.1 Incidence and Intensity of Healthcare Expenditure of Maternal Health Care Services

Table 6.1.1 depicts the headcount percentage of people who experienced catastrophic healthcare expenditure decreases as the threshold level increases in all three zones and the total for all three zones. The headcount percentage of people experiencing CHE decreases as the threshold level increases in all three zones and the total for all three zones. At the threshold level of 5 percent, it is observed that 82.4 percent of the population residing in the Kangra zone encounters catastrophic healthcare expenditure, indicating that their healthcare costs surpass 5 percent of their income. As the threshold level rises, there is a corresponding decrease in the headcount

percentage, suggesting a reduction in the proportion of individuals within the zone who experience catastrophic healthcare expenses relative to their income.

Likewise, within the Mandi zone, when the threshold level is set at 10 percent, 49.1 percent of the population encounters healthcare expenses that can be classified as catastrophic. In the Shimla zone, when the threshold level is set at 20 percent, 21.4 percent of the population encounters significant healthcare expenses that can be classified as catastrophic. Overall, at the threshold level of 5 percent, the percentage of the total headcount is 85.2 percent. This implies that roughly 85 percent of the entire population residing in the region encounters catastrophic healthcare expenditure when their healthcare costs surpass 5 percent of their income. At the threshold level of 10 percent, the percentage of the total headcount is 54.3 percent, suggesting that 54.3 percent of the entire population encounters catastrophic healthcare expenditure when their healthcare expenses surpass 10 percent of their income.

Table 6.1. 1 Headcount of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Zone	Measures of Catastrophic Healthcare Expenditure (CHE)	Threshold level to measure catastrophic healthcare expenditure (CHE)				
		5%	10%	20%	30%	40%
Kangra	Headcount (percent)	82.4	58.6	24.7	15.9	11.0
Mandi	Headcount (percent)	84.9	49.1	13.2	5.7	2.8
Shimla	Headcount (percent)	88.1	53.5	21.4	14.0	11.9
Overall	Headcount (percent)	85.2	54.3	21.2	13.2	9.9

Source: Author's calculation based on primary data

6.1.2 Overshoot of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Table 6.1.2 depicts the comparison of healthcare expenditure burdens across various zones, enabling an assessment of the overall healthcare situation across all

zones. The term "overshoot" refers to the extent to which the actual healthcare expenditure surpasses the designated threshold level. Higher levels of overshoot are indicative of a larger percentage of households surpassing the designated threshold levels, rendering them susceptible to incurring substantial healthcare expenses that could potentially have catastrophic consequences. In the Kangra region, when considering a threshold level of 5 percent, the observed overshoot is 19.5 percent, whereas at a threshold level of 10 percent, the observed overshoot is 15.9 percent. Likewise, the degree of overshoot is observed to be 11.7 percent, 9.7 percent, and 8.3 percent at the respective levels of 20, 30, and 40 percent. In the Mandi region, when considering a threshold level of 5 percent, the observed overshoot is 8.7 percent, whereas at a threshold level of 10 percent, the observed overshoot is 5.4 percent. Likewise, the degree of overshoot is observed to be 2.4 percent, 1.3 percent, and 1 percent at the respective levels of 20, 30, and 40 percent. In the Shimla region, when considering a threshold level of 5 percent, the observed overshoot is 14.7 percent, whereas at a threshold level of 10 percent, the observed overshoot is 11 percent. Likewise, the degree of overshoot is observed to be 7.4 percent, 5.7 percent, and 4.4 percent at the respective levels of 20, 30, and 40 percent. Overall, it was found that overshoot was 15.5, 11.9, 8.2, 6.5, 5.3 at 5, 10, 20, 30 and 40 percent respectively.

Table 6.1.2 Overshoot of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Zone	Measures of Catastrophic Healthcare Expenditure (CHE)	Threshold level to measure catastrophic healthcare expenditure (CHE)				
		5%	10%	20%	30%	40%
Kangra	Overshoot (percent)	19.5	15.9	11.8	9.7	8.3
Mandi	Overshoot (percent)	8.7	5.4	2.4	1.3	1.0
Shimla	Overshoot (percent)	14.7	11.0	7.4	5.7	4.4
Overall	Overshoot (percent)	15.5	11.9	8.2	6.5	5.3

Source: Author's calculation based on primary data

6.1.3 Mean Positive Overshoot of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Table 6.1.3 depicts extent to which healthcare expenses become catastrophic for individuals or households in different zones when compared to specific threshold levels. In the context of Kangra, when healthcare costs represent 5 percent of an individual or household's income or expenditure, the observed expenses surpass the previously stated threshold by an average of 23.7 percent. It surpasses 10 percent of the overall income/expenditure by a margin of 27.1 percent. The study revealed that the mean positive gap was observed to be 0.5 percent, 0.6 percent, and 0.8 percent at 20 percent, 30 percent, and 40 percent, respectively. In the region of Mandi, it has been observed that when individuals' healthcare expenses amount to 5 percent of their income or expenditure, the actual expenses tend to exceed the threshold by a mean of 10.3 percent. On average, healthcare expenditures. It surpasses 10 percent of the overall income/expenditure by a margin of 11 percent. The analysis revealed that the mean positive gap was determined to be 18.4 percent, 23.6 percent, and 34.4 percent at 20 percent, 30 percent, and 40 percent, respectively. In the context of Shimla, when healthcare costs constitute 5 percent of an individual's or household's income or expenditure, the observed expenses tend to exceed the aforementioned threshold by a mean of 16.7 percent. On average, healthcare expenditures in the Shimla zone surpass 10 percent of the total income/expenditure by a margin of 20.7 percent. The study revealed that the average positive gap was determined to be 34.7 percent, 40.6 percent, and 36.9 percent at 20 percent, 30 percent, and 40 percent, respectively. When healthcare expenses represent 5 percent of an individual's or household's income or expenditure, the average actual expenditures surpass the threshold by 18.2 percent. On average, healthcare expenditures across all regions surpass 10 percent of the total income/expenditure by a margin of 21.9 percent. The study revealed that the average positive gap was determined to be 38.9 percent, 49 percent, and 53.8 percent at 20 percent, 30 percent, and 40 percent, respectively.

Table 6.1. 3 Mean Positive Overshoot of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Zone	Measures of Catastrophic Healthcare Expenditure (CHE)	Threshold level to measure catastrophic healthcare expenditure (CHE)				
		5 %	10 %	20 %	30 %	40 %
Kangra	Mean Positive Overshoot (percent)	23.7	27.1	0.5	0.6	0.8
Mandi	Mean Positive Overshoot (percent)	10.3	11.0	18.4	23.6	34.4
Shimla	Mean Positive Overshoot (percent)	16.7	20.7	34.7	40.6	36.9
Overall	Mean Positive Overshoot (percent)	18.2	21.9	38.9	49.0	53.8

Source: Author's calculation based on primary data

SECTION - II

6.2 DETERMINANTS OF CATASTROPHIC HEALTHCARE EXPENDITURE OF MATERNAL HEALTH CARE SERVICES

6.2.1 Determinants of Catastrophic Healthcare Expenditure (CHE) of Maternal Health Care (MHC) Services in Overall Himachal Pradesh

The table 6.2.1 shows the key determinants of catastrophic healthcare expenditure (CHE) of maternal health care (MHC) in Himachal Pradesh were identified using binary logistic model (Table 7.2.1). However, at 5 percent threshold of age (in years), homemaker and type of family observed an insignificant association with catastrophic healthcare expenditure (CHE) whereas OBC Caste ($p = 0.051$), literacy rate of higher secondary ($p= 0.006$), literacy rate of more than higher secondary ($p = 0.004$) and work status of husband under labor and work in agriculture land ($p = 0.155$), monthly income of household more than ₹30,000 (0.000) observed a significant association with catastrophic healthcare expenditure (CHE).

The analysis revealed that odds of incurring catastrophic healthcare expenditure was less among respondents of age 20-25 years (OR= 0.410). Respondents with income more than ₹30,000 were observed significant determinants but the odds of incurring catastrophic healthcare expenditure was low among high income group respondents. At 5 percent threshold level respondents with literacy level were four times likely to experience catastrophic healthcare expenditure (OR= 4.616) and three times in higher secondary (3.613) whereas secondary level education was insignificant. Finally, joint family (OR= 1.306) likely to incur catastrophic healthcare expenditure but observed as insignificant determinant. The value of Pseudo R^2 of the goodness of fit suggests that this model is a good fit to the data as with value 0.246.

At 10 percent catastrophic threshold level income OBC (p = 0.002), more than higher secondary (0.009) and monthly income of household more than ₹30,000 (0.000) witnessed significant association with catastrophic healthcare expenditure. The results of binary logistic regression revealed that age of the respondents was likely to experience catastrophic healthcare expenditure but observed as insignificant determinants Moreover, the probability of incurring catastrophic healthcare expenditure was high among the respondents with more than higher secondary (OR= 2.711). At 10 percent threshold level OBC and more than higher secondary education respondents were most likely to experience catastrophic healthcare expenditure.

Further, results revealed that at 30 percent threshold level odds of experiencing catastrophic healthcare expenditure was low among the respondents of age group of more than 30 years as compared to 20-25 years and 25- 30 years respondents. Irrespective of the results of more than 30 years were more likely significant to incur catastrophic healthcare at 30 percent catastrophic threshold level. Literacy level of respondents with higher education, government job a joint family were observed as significant determinant at all levels, the odds of incurring catastrophic healthcare expenditure was lowest among low-income group respondents as compared to high income group respondents.

Table 6.2.1 Determinants of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Socio-Demographic Variables	Threshold Level to Measure Catastrophic Health Expenditure (CHE)							
	5 %		10 %		20 %		30 %	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Age (Upto 20 years)								
20-25 years	0.410	0.255	1.467	0.423	0.596	0.316	0.537	0.344
25-30 years	0.721	0.692	1.900	0.201	0.523	0.246	0.529	0.368
More than 30 years	0.486	0.385	1.016	0.975	0.333	0.057**	0.391	0.19
Caste (General)								
OBC	2.146	0.051*	2.213	0.002**	1.336	0.319	1.373	0.363
SC & ST	0.775	0.461	1.096	0.717	0.807	0.459	0.699	0.303
Literacy level of respondent (Upto Primary)								
Secondary	1.685	0.268	0.906	0.775	0.695	0.417	0.560	0.332
Higher Secondary	3.613	0.006**	1.031	0.925	0.889	0.767	1.190	0.724
More than Higher Secondary	4.616	0.004**	2.711	0.009**	3.285	0.009**	3.390	0.016**
Work status of respondent (Others)								
Homemaker	1.139	0.795	1.210	0.603	0.902	0.796	1.299	0.585
Work status of husband (Business)								
Government Job	1.321	0.519	1.124	0.692	0.632	0.187	0.304	0.009**
Private Job	0.742	0.498	1.104	0.750	1.182	0.623	1.356	0.430
Labor and Work in agricultural land	1.827	0.155	1.390	0.266	0.757	0.438	0.982	0.968
Monthly income of household (less than ₹30,000)								
More than ₹30,000	0.036	0.000***	0.119	0.000***	0.461	0.003**	1.098	0.771
Type of family (Nuclear)								
Joint	1.306	0.348	0.989	0.953	0.679	0.086**	0.498	0.011**
Model Summary								
No. of Observations= 576								
Chi-Square	118.64		110.18		51.76		50.24	
Prob>Chi-Square	0.000		0.000		0.000		0.000	
Pseudo R^2	0.246		0.139		0.087		0.112	

Source: Author's calculation based on primary data

*Note: * Significant at 10 percent threshold level, ** Significant at 5 percent threshold level, *** Significant at 1 percent threshold level*

6.2.2 Zone-Wise Determinants of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

In the Kangra region, the odds ratio of 0.207 indicates that individuals belonging to the "Upto 20 years" age group have a decreased likelihood of encountering catastrophic health expenditure in comparison to the reference category. However, it is important to note that this finding lacks statistical significance. The odds ratio of 2.909 (in the Kangra region) indicates that individuals belonging to the "20-25 years" age group have a greater likelihood of encountering catastrophic health expenditure when compared to the reference category. However, it is important to note that this finding does not reach statistical significance. The calculated odds ratio of 59.126 in the Mandi region indicates that individuals belonging to the "25-30 years" age group exhibit significantly elevated odds of encountering catastrophic health expenditure when compared to the reference category. The obtained p-value suggests that there is statistical significance in the observed association. The odds ratio quantifies the alteration in the odds of encountering catastrophic health expenditure among individuals belonging to the "More than 30 years" age group in relation to the reference category. The observed associations within this particular age group do not exhibit statistically significant differences across the various regions. In the Kangra region, the calculated odds ratio of 3.013 indicates that individuals belonging to the other backward classes (OBC) category are more likely to encounter catastrophic health expenditure. This observed relationship is statistically significant. In the region of Mandi, the odds ratio of 3.892 indicates that individuals belonging to the SC and ST categories are more likely to encounter catastrophic health expenditure. This association demonstrates marginal significance, as evidenced by a p-value. The odds ratio of 4.984 in the context of Mandi indicates that individuals who have attained a higher secondary level of education are more likely to encounter catastrophic health expenditure when compared to the reference category. The obtained p-value suggests that there is a statistically significant association between the variables under investigation. The odds ratio of 1.703 in Shimla indicates that there is a slight increase in the likelihood of homemakers experiencing catastrophic health expenditure. However, it is important to note that this finding is not statistically significant. The odds ratio of 10.507 in the context of

Mandi indicates that individuals whose husbands are engaged in labour and work in agricultural land have significantly greater odds of encountering catastrophic health expenditure when compared to the reference category. Nevertheless, the association exhibits a marginal level of significance, as indicated by a p-value. The odds ratio quantifies the likelihood of households with monthly incomes exceeding 30,000 experiencing catastrophic health expenditure, relative to the reference category. The statistical significance of the associations observed in this variable across different regions indicates that households with higher incomes have a reduced likelihood of encountering catastrophic health expenditure. In the Kangra region, the calculated odds ratio of 3.110 indicates that individuals belonging to joint families are more likely to encounter catastrophic health expenditure. This observed association is deemed statistically significant, as evidenced by a p-value.

Table 6.2.2 Zone-Wise Determinants of Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

Socio-Demographic Variables	Threshold Level to Measure Catastrophic Health Expenditure (CHE)					
	Kangra 5 %		Mandi 5 %		Shimla 5 %	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Age (Upto 20 years)						
20-25 years	0.207	0.275	2.909	0.586	0.598	0.707
25-30 years	0.267	0.372	59.126	0.119	1.545	0.768
More than 30 years	0.089	0.109	5.465	0.586	0.962	0.979
Caste (General)						
OBC	3.013	0.158	2.239	0.365	2.178	0.221
SC & ST	0.297	0.016**	3.892	0.311	6.730	0.031**
Literacy level of respondent (Upto Primary)						
Secondary	2.669	0.223	0.435	0.517	1.115	0.903
Higher Secondary	2.088	0.289	4.984	0.315	8.782	0.026**
More than Higher Secondary	8.092	0.02**	1.805	0.75	4.031	0.161
Work status of respondent (Others)						
Homemaker	1.703	0.526	-	-	0.505	0.426
Work status of husband (Business)						
Government job	1.863	0.393	1.844	0.657	0.592	0.539
Private job	1.079	0.929	0.228	0.398	0.534	0.357
Labor and work in agricultural land	1.433	0.583	10.507	0.084**	2.203	0.341
Monthly income of household (less than ₹30,000)						
More than ₹30,000	0.062	0.000***	0.00318	0.001***	0.003	0.000***
Type of family (Nuclear)						
Joint	3.110	0.014**	0.189	0.118	1.567	0.42
Model Summary						
No. of Observations= 576						
Chi-Square	118.64		110.18		51.76	
Prob>Chi-Square	0.000		0.000		0.000	
Pseudo R^2	0.246		0.139		0.087	

Source: Author's calculation based on primary data
*Note: * Significant at 10 percent threshold level ** Significant at 5 percent threshold level *** Significant at 1 percent threshold level*

6.3   SUMMARY

This chapter comprehensively examines catastrophic healthcare expenditure in Himachal Pradesh, specifically emphasizing maternal healthcare services. This statement underscores the significance of comprehending the economic ramifications of catastrophic healthcare expenditure (CHE). Incorporating threshold levels, overshoot percentages, and determinants analysis contributes to a more comprehensive comprehension of this pivotal matter in healthcare economics. The research paper establishes the concept of catastrophic healthcare spending as a scenario wherein households experience out-of-pocket (OOP) healthcare expenses surpassing a reasonable proportion of their income. This statement highlights the growing global phenomenon of healthcare expenses being financed through out-of-pocket (OOP) payments, potentially resulting in financial hardships for households. The passage also emphasizes that individuals confronted with exorbitant healthcare expenses frequently turn to borrowing money, liquidating assets, or cutting back on their expenditures, which can lead to financial hardship.

This study utilizes multiple threshold levels (5%, 10%, 20%, 30%, and 40%) to evaluate the prevalence of catastrophic health expenditure (CHE) across different zones within the region of Himachal Pradesh. The results indicate a negative relationship between the threshold level and the headcount percentage of individuals experiencing catastrophic healthcare expenses (CHE). This suggests that as the threshold level increases, there is a decrease in the proportion of individuals confronting healthcare expenses that are considered catastrophic with their income. The provided information is of utmost importance in comprehending the financial implications of healthcare expenses on several demographic groups.

Furthermore, the study explores the concept of "overshoot," which pertains to the degree to which actual healthcare expenditure exceeds the predetermined threshold level. Higher levels of overshoot indicate a more significant proportion of households above the designated threshold and encountering considerable healthcare costs. The provided text

presents precise statistical information regarding the percentages of overshoot seen at various threshold levels for each region in Himachal Pradesh. This comprehensive data offers a thorough and detailed overview of the current situation.

Moreover, the research examines the fundamental factors that contribute to the occurrence of catastrophic healthcare costs. The results of binary logistic models are employed in this study to examine the relationship between several characteristics, including age, caste, education, income, and family structure, and their link with catastrophic health expenditure (CHE) at different threshold levels. The results suggest a considerable correlation between variables such as income and education level and the probability of experiencing catastrophic healthcare costs. These observations can provide valuable information for developing specific policy initiatives aimed at safeguarding vulnerable people from experiencing financial devastation due to healthcare costs.

CHAPTER - VII

QUALITY OF MATERNAL HEALTH CARE SERVICES RECEIVED BY WOMEN IN HIMACHAL PRADESH

World Health Organization defines quality of care as "the extent to which health care services provided to individuals and patient populations improve desired health outcomes (Ten and Neves, 2021). In order to achieve this, health care must be safe, effective, timely, efficient, equitable and people-centered. Pregnant women and new mothers are dependent on maternal health care services to maintain their health and well-being. The quality of maternal health care services is the degree to which they are secure, effective, timely, efficient, equitable, patient-centered and ultimately result in positive health outcomes for both the mother and the infant. High-quality maternal health care services include prenatal care, labor and delivery care, postpartum care and family planning services, among others. The quality of maternal health care services is crucial because it has a direct impact on the health and survival of both the mother and the infant.

Coverage level of ANC utilization varied from country to country, but the quality of maternal health services matters (Haddad et al., 2016). Factors like lack of information, leadership and political commitments, geographical barriers *viz*. rural and mountainous areas where there is weak infrastructure; quality of clinics, affordability, introduction by health worker, details of inspection process, approval seeking and confidential protection, lack of career enhancement and development of skills were found in health workers, limited and inadequate material, human resources, staff skills, poor communication between women and health professional and lack of motivation and supervision of health workers (Marthias and Trisnantoro, 2012; Kambala et al., 2015; Mkoka et al., 2015; Obeidat et al., 2017; John et al., 2018; Miteniece et al., 2018). Difference in quality of care was related with the disability status not with caste factor (Devkota et al., 2017). Interaction with providers, attentiveness of providers, privacy during consultation adequate facilities and availability of drugs came out as the factors influencing the quality of ANC (Atinga and Baku, 2013).

7.1   QUALITY OF MATERNAL HEALTH CARE SERVICES USING CORRELATION AND MULTIPLE REGRESSION ANALYSIS

7.1.1   Reliability and Validity of all the Attributes

Table 7.1.1 provides the results of factor analysis using principal component analysis of underlying six dimensions with the 32 items resulting in a significant Bartlett's test of sphericity (p = .000) and KMO (0.97). The KMO measure of sampling adequacy was 0.97, which is labelled "marvelous" by Kaiser (1974). The Bartlett test of sphericity and KMO values shows the data matrix is sufficient and appropriate for the factor analysis. Therefore, all the 32 items of six dimensions were appropriate for analysis. The dimensions were (1) tangible was loaded with the five items (2) assurance, which had five items loaded, (3) reliability had six items, (4) responsiveness had six items, (5) empathy had six items loaded and (6) satisfaction comprised of four items.

Table 7.1.1: Reliability and Validity of all the Attributes

Variable	Factor loadings	EV	Variance explained (cumulative variance explained)	Cronbach's alpha
Tangible				
TanP1	0.80			
TanP2	0.80			
TanP3	0.79	5.50	17.17 (17.17)	0.97
TanP4	0.79			
TanP5	0.80			
Assurance				
AssuP1	0.76			
AssuP2	0.76			
AssuP3	0.77	5.33	16.64 (33.82)	0.96
AssuP4	0.75			
AssuP5	0.76			
Reliability				
ReliP1	0.80			
ReliP2	0.80			
ReliP3	0.81			
ReliP4	0.80	5.20	16.25 (50.07)	0.98
ReliP5	0.82			
ReliP6	0.80			
Responsiveness				
RespP1	0.79			
RespP2	0.77			
RespP3	0.78			
RespP4	0.78	4.55	14.20 (64.27)	0.96
RespP5	0.77			
RespP6	0.78			
Empathy				
EmpP1	0.78			
EmpP2	0.78			
EmpP3	0.77			
EmpP4	0.76	4.22	13.18 (77.45)	0.95
EmpP5	0.78			
EmpP6	0.77			
Satisfaction				
SatP1	0.71			
SatP2	0.72	3.38	10.58 (88.02)	0.91
SatP3	0.81			
Note: KMO: 0.97; Bartlett's Test of Sphericity (significance level): .000.				
Note: Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 7 iterations.				

Source: Author's calculation based on primary data

7.1.2 Correlation of the Attributes

Table 7.1.2 states the correlation between the dimensions of service quality and satisfaction of pregnant women were analyzed in Table 3. The highest significant positive correlation was between assurance and responsiveness with correlation of 0.670** (p<0.01) in the context of customer satisfaction. Tangible and reliability have a positive correlation of 0.627** (p<0.01), indicating a strong positive relationship between tangible factors and empathy (e.g., understanding, compassion) in the context of customer satisfaction. Tangible and empathy have a positive correlation of 0.626** (p<0.01), indicating a moderate positive relationship between tangible factors (e.g., physical appearance, facilities) and assurance (e.g., trustworthiness, competence) in the context of customer satisfaction. Tangible and reliability have a positive correlation of 0.718** (p<0.01), indicating a moderate positive relationship between tangible factors and reliability (e.g., consistency, dependability) in the context of customer satisfaction. Tangible and responsiveness have a positive correlation of 0.657** (p<0.01), indicating a moderate positive relationship between tangible factors and responsiveness in the context of customer satisfaction. Tangible and satisfaction have a positive correlation of 0.624** (p<0.01), indicating a moderate positive relationship between tangible factors and overall customer satisfaction. Assurance and reliability have a positive correlation of 0.695** (p<0.01), indicating a moderate positive relationship between assurance and reliability in the context of customer satisfaction. Assurance and empathy have a positive correlation of 0.706** (p<0.01), indicating a moderate positive relationship between assurance and empathy in the context of customer satisfaction. Assurance and satisfaction have a positive correlation of 0.649** (p<0.01), indicating a moderate positive relationship between assurance and overall customer satisfaction. Reliability and responsiveness have a positive correlation of 0.707** (p<0.01), indicating a moderate positive relationship between reliability and responsiveness in the context of customer satisfaction. Reliability and empathy have a positive correlation of 0.717** (p<0.01), indicating a moderate positive relationship between reliability and empathy in the context of customer satisfaction. Reliability and satisfaction have a positive correlation of 0.641** (p<0.01), indicating a

moderate positive relationship between reliability and overall customer satisfaction. Responsiveness and empathy have a positive correlation of 0.717** (p<0.01), indicating a moderate positive relationship between responsiveness and empathy in the context of customer satisfaction. Responsiveness and satisfaction have a positive correlation of 0.642** (p<0.01), indicating a moderate positive relationship between responsiveness and overall customer satisfaction. Empathy and satisfaction have a positive correlation of 0.645** (p<0.01), indicating a moderate positive relationship between empathy and overall customer satisfaction.

Table 7.1.2 Correlation Analysis

	Tangible	Assurance	Reliability	Responsiveness	Empathy	Satisfaction
Tangible	1					
Assurance	.615**	1				
Reliability	.627**	.626**	1			
Responsiveness	.567**	.670**	.591**	1		
Empathy	.626**	.590**	.622**	.590**	1	
Satisfaction	.596**	.619**	.613**	.601**	.603**	1
*Note: ** Correlation is significant at the 0.01 level (2-tailed).*						

Source: Author's calculation based on primary data

7.1.3   Multiple Regression Results

Table 7.1.3 shows the relationship between satisfaction (sat) and various dimensions (tangible, assurance, reliability, responsiveness, empathy) are statistically significant (p<0.05). Also, the adjusted R^2 value, 0.529, indicates that the relationship is statistically significant. It was found that tangibilty had positive and significant influence (β = 0.142, p-value = 0.007) on the satisfaction of women utilizing the services from hospitals. This shows that the buildings are visually appealing to the patients, equipments are in good working condition, hospital employees are neat and clean, hospital wards are clean. Our study results are aligned with (Ramez, 2012; Kondasani & Panda, 2015; Xesfingi & Vozikis, 2016; Windi et al., 2022). Assurance refers to the patient's confidence was also found to be positively associated with the satisfaction (β = 0.189, p- value = 0.001). This shows that hospital employees attitude towards pregnant women is good,

106

interaction with doctors is confidential, nurses are attentive towards pregnant women, doctors are knowledgeable and are capable of handling cases. Our study results are aligned with (Ramez, 2012; Xesfingi & Vozikis, 2016; Windi et al., 2022). The third dimension, reliability means the 'quality of being able to be trusted' which has also positive influence on satisfaction ($\beta = 0.175$, p-value = 0.001). This shows that promised services are fulfilled, reputation of doctors is good, transparency of expenses, treatment is done on time, doctors make sure your wellness before discharging and services are provided on reasonable cost. Our study results are aligned with (Ramez, 2012; Kondasani & Panda, 2015; Xesfingi & Vozikis, 2016; Windi et al., 2022). The fourth dimension, responsiveness refers to attentiveness to meeting the needs or providing fast services has also positive association with the satisfaction ($\beta = 0.154$, p-value = 0.006). This shows that process of registration is simple, services are provided on time, personnel understand the specific needs, personnel are always ready to help, nurses provide sufficient information to pregnant women and immediate response on complaints and suggestions. Our study results are aligned with (Ramez, 2012; Kondasani & Panda, 2015; Xesfingi & Vozikis, 2016; Windi et al., 2022). Lastly, empathy refers to the ability to understand another person's feelings or sentiments from their point of view and was found to be positively associated with the satisfaction of women utilizing maternal health care services ($\beta = 0.173$, p-value = 0.002). This shows that staff is polite towards pregnant women, doctors are caring towards pregnant women, provide personalized service, nurses do well explanation of prescription and doctor always meet at the time of consultancy. Our study results are aligned with (Ramez, 2012; Xesfingi & Vozikis, 2016; Windi et al., 2022).

Table 7.1.3 Multiple Regression Results

	β	SE	t	Sig
(Constant)	0.25	0.16	1.59	0.113
Tangible	0.16	0.04	3.68	0.000
Assurance	0.18	0.04	4.18	0.000
Reliability	0.19	0.04	4.39	0.000
Responsiveness	0.18	0.04	4.08	0.000
Empathy	0.19	0.04	4.23	0.000
Note: Dependent Variable: Satisfaction				
Predictors: (Constant), Tangible, Assurance, Reliability, Responsiveness, Empathy				

Source: Author's calculation based on primary data
*Note: * Significant at 10 percent*
*** Significant at 5 percent*
**** Significant at 1 percent*

SECTION - II

7.2   SERVQUAL ANALYSIS OF DIFFERENT ATTRIBUTES

7.2.1   Tangible

The data presented in the table highlights how patients' expectations and perceptions of their hospital experience differ across various tangible factors. These findings were collected through the use of the SERVQUAL framework. The largest gap of 0.36 is seen in the category of hospital employees' cleanliness. This means that the average expectation for employee cleanliness is 4.38, while the perceived average is 4.02. This difference suggests that there is a noticeable difference between what patients anticipate in terms of the cleanliness and neatness of hospital staff and what they actually experience. This could indicate an area in need of improvement concerning the maintenance of staff hygiene and appearance. Furthermore, other dimensions such as the visual appeal of the hospital building and the condition of equipment also display notable gaps, with discrepancies of 0.29 each. This further emphasizes the need for addressing factors that contribute to the overall patient experience within the hospital setting.

Table 7.2.1 Tangible Gap

Tangibles	Expectation		Perceived		Gap
	Mean	**SD**	**Mean**	**SD**	
Building is visually appealing	4.39	0.73	4.10	0.88	0.29
Equipments are up to date	4.37	0.69	4.08	0.88	0.29
Equipments are in good working condition	4.37	0.71	4.05	0.89	0.32
Hospital employees are neat and clean	4.38	0.71	4.02	0.91	0.36
Hospital wards are clean	4.39	0.71	4.05	0.90	0.34
Total	4.38	0.02	4.06	0.01	0.32

Source: Author's Calculation

7.2.2   Assurance

The analysis of the data on service quality in a hospital's maternity services, conducted using the SERVQUAL framework, reveals significant discrepancies. The discrepancies are especially noticeable in the assurance dimension and they provide insight into patients' perceptions of the hospital's service quality. There is a significant disparity of 1.23 in the perception of hospital employees' attitudes towards pregnant women. The difference is quite substantial, as the average expectation is 4.34, whereas the perceived average is significantly lower at 3.11. The existence of this gap clearly signifies disparity in the manner in which patients perceive the quality of interpersonal interactions and the attitudes exhibited by hospital employees towards pregnant women. To align the assurance dimension with patients' expectations and foster a positive and supportive environment for pregnant women, it is imperative to address this gap. In addition, the analysis also identified discrepancies in perception in various aspects, including the privacy of doctor-patient interactions, the level of attentiveness shown by nurses towards pregnant women and the knowledge and proficiency of doctors.   The observed gaps in the range of 0.72 to 0.97 suggest areas for improvement in maintaining confidentiality, enhancing nurse attentiveness and ensuring that doctors are perceived as knowledgeable and competent by patients. Addressing these discrepancies is crucial for instilling patients' trust in the proficiency and reliability of healthcare practitioners, resulting in an overall enhancement in the level of assurance in the quality of maternity services offered by the hospital.

Table 7.2.2 Assurance Gap

Assurance	Expectation		Perceived		Gap
	Mean	SD	Mean	SD	
Hospital employees attitude towards pregnant women is good	4.34	0.69	3.11	0.94	1.23
Interaction with doctors is confidential	4.34	0.64	3.37	0.93	0.97
Nurses are attentive towards pregnant women	4.36	0.67	3.53	0.89	0.83
Doctors are knowledgeable	4.36	0.67	3.64	0.97	0.72
Doctors are capable of handling cases	4.37	0.66	3.60	0.93	0.77
Total	4.35	0.02	3.45	0.03	0.90

Source: Author's Calculation

7.2.3 Reliability

The study highlights inconsistencies in the reliability dimension of service quality at a hospital, as assessed using the SERVQUAL framework. The disparities are evident across various indicators. The largest disparity, measuring 1.36, exists in the perception of doctors' reputation. The average expectation is 4.37, but the perceived average is significantly lower at 3.01. This significant discrepancy underscores a distinct disparity between the perceived and anticipated standing of doctors, suggesting that patients may not hold as favorable an opinion of doctors as they initially expect.

There are perceptual gaps ranging from 0.57 to 1.22 in other aspects such as the delivery of promised services, transparency in expenses, promptness of treatment, and doctors prioritizing patient well-being before discharge. These gaps offer potential for enhancing the delivery of promised services, fostering transparency in expenditures, ensuring timely care and prioritizing the welfare of patients prior to their discharge. It is essential to address these gaps in order to improve the reliability of service quality, align patients' expectations with their perceptions and establish trust and confidence in the hospital's ability to deliver excellent healthcare services.

Table 7.2.3 Reliability Gap

Reliability	Expectation		Perceived		Gap
	Mean	**SD**	**Mean**	**SD**	
Promised services are fulfilled	4.36	0.72	3.38	0.92	0.98
Reputation of doctors is good	4.37	0.71	3.01	0.92	1.36
Transparency of expenses	4.35	0.72	3.53	0.93	0.82
Treatment is done on time	4.35	0.73	3.39	0.94	0.96
Doctors make sure your wellness before discharging	4.37	0.72	3.15	0.91	1.22
Services are provided on reasonable cost	4.37	0.75	3.80	0.93	0.57
Total	4.36	0.72	3.38	0.92	0.98

Source: Author's Calculation

7.2.4   Responsiveness

The table illuminates the disparities in the responsiveness dimension of service quality at a hospital, as evaluated using the widely acknowledged SERVQUAL framework. Multiple indicators demonstrate significant disparities, highlighting opportunities for enhancement. The most prominent disparity, with a margin of 1.65, relates to the simplicity of the registration procedure. The average anticipated value is 4.37, whereas the real perception is notably lower at 2.72. The substantial disparity indicates a noteworthy divergence between patients' expectations and their actual encounters during the registration process, implying that it may be more intricate than initially assumed.

Furthermore, perceptual gaps are ranging from 0.72 to 1.86 in other aspects such as the timeliness of services, the personnel's understanding of individual needs, the willingness of staff to assist, the adequacy of information provided by nurses to expectant mothers and the prompt response to feedback and complaints. These gaps offer potential for improving the registration process, guaranteeing prompt services, enhancing personnel's preparedness and comprehension of patients' requirements, delivering sufficient information and promptly addressing grievances and recommendations. To enhance the responsiveness of service quality, it is imperative to address these gaps, ensuring that patients' expectations are aligned with their actual experiences. This will foster a healthcare environment that is attentive and responsive to their needs.

Table 7.2.4 Responsiveness Gap

Responsiveness	Expectation		Perceived		Gap
	Mean	**SD**	**Mean**	**SD**	
Process of registration is simple	4.37	0.73	2.72	0.91	1.65
Services are provided on time	4.36	0.68	3.17	0.89	1.19
Personnel understands the specific needs	4.35	0.72	3.43	0.91	0.92
Personnel are always ready to help	4.33	0.70	2.47	0.90	1.86
Nurses provide sufficient information to pregnant women	4.35	0.70	3.48	0.91	0.87
Immediate response on complaints and suggestions	4.35	0.72	3.63	0.92	0.72
Total	4.37	0.73	2.72	0.91	1.65

Source: Author's Calculation

7.2.5 Empathy

The study's findings illuminate the specific areas in which the empathy dimension of service quality in a hospital's maternity services is lacking. The SERVQUAL framework has identified substantial discrepancies across various indicators, highlighting the necessity for enhancement. One of the most significant disparities, with a margin of 1.77, exists in the level of courtesy exhibited by staff towards pregnant women. This data reveals a distinct discrepancy between the anticipated and observed conduct of the staff, as the average expectation of patients is 4.34, whereas the average perception is merely 2.57. This discrepancy underscores the significance of improving staff engagement with expectant mothers to more closely align with patient expectations.

In addition, there are perceptual gaps ranging from 0.94 to 1.64 in other aspects such as the doctors' caring attitude, personalized service, nurses' explanations of prescriptions and the punctuality of doctors in meeting consultation times. These findings indicate potential areas for enhancement in multiple facets of service provision, including doctors' demeanor towards patients, individualized attention, lucid explanations of prescriptions and prompt consultations. To enhance the empathy aspect of service quality, it is important to address these deficiencies. This will help meet patients' expectations and promote a caring and patient- focused atmosphere in the hospital's maternity services.

Table 7.2.5 Empathy Gap

Empathy	Expectation		Perceived		Gap
	Mean	**SD**	**Mean**	**SD**	
Staff is polite towards pregnant women	4.34	0.70	2.57	0.89	1.77
Doctors are caring towards pregnant women	4.33	0.66	2.74	0.87	1.59
Provide personalized service	4.34	0.71	2.70	0.90	1.64
Nurses do well explanation of prescription	4.36	0.68	3.41	0.89	0.95
Doctor always meet at the time of consultancy	4.33	0.67	3.39	0.85	0.94
24*7 service	4.45	0.50	4.22	0.86	0.23
Total	4.34	0.70	2.57	0.89	1.77

Source: Author's Calculation

SECTION- III

7.3 ZONE-WISE QUALITY OF MATERNAL HEALTH CARE SERVICES USING CORRELATION AND MULTIPLE REGRESSION ANALYSIS

7.3.1 Zone-Wise Correlation Analysis

In the Kangra region, the strongest correlation is observed between the variables reliability and satisfaction (r = 0.436**). This is followed by the correlations between assurance and satisfaction (r = 0.377**), empathy and satisfaction (r = 0.406**), responsiveness and satisfaction (r = 0.434**) and tangible and satisfaction (r = 0.377**). In a manner identical to Shimla, the degree of trustworthiness attributed to services in Kangra exhibits the most robust positive correlation with customer satisfaction. In Mandi, the variable with the highest correlation coefficient is tangible with satisfaction (r = 0.208*). This is followed by the correlation between reliability-satisfaction (r = 0.238*), assurance-satisfaction (r = 0.208*), empathy-satisfaction (r = 0.147) and responsiveness-satisfaction (r = 0.179). In the region of Mandi, as opposed to Shimla and Kangra, it is observed that the tangible elements of services exhibit the most significant positive correlation with customer satisfaction. In the context of Shimla, it is observed that the variable reliability exhibits the strongest positive correlation with the variable satisfaction (r = 0.818**). This is closely followed by the variables assurance-satisfaction (r =

0.813**), empathy-satisfaction (r = 0.799**), tangible-satisfaction (r = 0.810**) and responsiveness-satisfaction (r = 0.773**). This finding indicates a significant positive correlation between the perceived reliability of services in Shimla and customer satisfaction.

Table 7.3.1 Zone-Wise Correlation Analysis

Zone		Tangible	Assurance	Reliability	Responsiveness	Empathy	Satisfaction
Kangra	Tangible	1					
	Assurance	.299**	1				
	Reliability	.440**	.373**	1			
	Responsiveness	.162*	.505**	.352**	1		
	Empathy	.385**	.333**	.407**	.288**	1	
	Satisfaction	.377**	.515**	.436**	.434**	.406**	1
Mandi	Tangible	1					
	Assurance	0.021	1				
	Reliability	0.020	0.054	1			
	Responsiveness	0.051	-0.059	0.144	1		
	Empathy	0.139	0.045	0.013	-0.079	1	
	Satisfaction	.208*	0.038	.238*	0.179	0.147	1
Shimla	Tangible	1					
	Assurance	.873**	1				
	Reliability	.867**	.884**	1			
	Responsiveness	.831**	.827**	.806**	1		
	Empathy	.829**	.800**	.818**	.781**	1	
	Satisfaction	.810**	.813**	.818**	.773**	.799**	1

Source: Author's Calculation
*Note: **. Correlation is significant at the 0.01 level (2-tailed).*

7.3.2 Zone-Wise Multiple Regression Results

In Kangra, the coefficient (β = 0.158) demonstrates a positive and statistically significant relationship (p = 0.022) between the tangible aspect and satisfaction, suggesting that an increase in tangible leads to a favorable effect on satisfaction. the coefficient (β = 0.266) demonstrates a positive and statistically significant relationship (p < 0.001) between assurance and satisfaction, indicating a robust positive influence of assurance on satisfaction. the coefficient (β= 0.141) demonstrates a positive and statistically significant relationship (p = 0.027) between reliability and satisfaction, suggesting that reliability

114

positively impacts satisfaction. the analysis reveals that the coefficient for responsiveness, denoted as β, is 0.178. this coefficient is statistically significant at a level of p = 0.007. these findings indicate a positive relationship between responsiveness and satisfaction, suggesting that an increase in responsiveness leads to an increase in satisfaction. The coefficient for empathy (β= 0.158) demonstrates a positive and statistically significant relationship (p = 0.018), suggesting that empathy positively impacts satisfaction.

The coefficient (β= 0.316) exhibits a positive direction in Mandi, although it does not reach statistical significance (p = 0.062). This implies inadequate evidence to support the claim that tangible substantially impacts satisfaction in Mandi. The coefficient (β= 0.082) demonstrates a positive association; however, it is not statistically significant (p = 0.779), suggesting no substantial correlation between assurance and satisfaction in the context of Mandi. The coefficient (β= 0.356) demonstrates a statistically significant positive relationship (p = 0.028) between reliability and satisfaction, suggesting that reliability has a favourable influence on satisfaction. the analysis indicates that the coefficient for responsiveness (β= 0.261) is positive but lacks statistical significance (p = 0.114). This implies that there is insufficient evidence to support the claim that Responsiveness significantly impacts Satisfaction in the context of Mandi. The coefficient (β= 0.229) of empathy exhibits a positive direction, albeit lacking statistical significance (p = 0.169), thereby suggesting the absence of a significant association between empathy and satisfaction in the context of Mandi.

In Shimla, the coefficient (β= 0.139) exhibits a positive trend but lacks statistical significance (p = 0.091). this implies inadequate evidence to support the claim that tangible significantly impacts satisfaction in Shimla. The coefficient for Assurance (β= 0.193) demonstrates a positive and statistically significant relationship (p = 0.020), suggesting that assurance has a favourable effect on satisfaction. the obtained coefficient (β= 0.224) exhibits a positive and statistically significant relationship (p = 0.006), indicating that reliability positively impacts satisfaction. the analysis reveals that the coefficient (β= 0.120) of responsiveness exhibits a positive direction, albeit lacking statistical significance (p = 0.061). this suggests that there is no substantial association between responsiveness

and satisfaction in the context of Shimla. the coefficient (β= 0.256) of empathy exhibits a positive and statistically significant relationship ($p < 0.001$), indicating a robust positive influence of empathy on satisfaction.

In broader terms, the regression findings indicate that the constructs of assurance, reliability, responsiveness and empathy exert statistically significant positive influences on Satisfaction within distinct zones. However, the impact of tangible exhibits variability across these zones. "Constant" denotes the intercept or baseline value of satisfaction when all predictor variables have a zero value. Nevertheless, this aspect does not hold significant relevance in the present analysis.

Table 7.3.2 Zone-Wise Multiple Regression Results

Zones		β	Std. Error	t	Sig
Kangra	(Constant)	0.317	0.352	0.900	0.369
	Tangible	0.158	0.069	2.304	0.022
	Assurance	0.266	0.062	4.258	0.000
	Reliability	0.141	0.063	2.230	0.027
	Responsiveness	0.178	0.065	2.737	0.007
	Empathy	0.158	0.067	2.375	0.018
Mandi	(Constant)	1.458	1.881	-0.775	0.440
	Tangible	0.316	0.168	1.889	0.062
	Assurance	0.082	0.291	0.281	0.779
	Reliability	0.356	0.160	2.223	0.028
	Responsiveness	0.261	0.164	1.596	0.114
	Empathy	0.229	0.165	1.385	0.169
Shimla	(Constant)	0.199	0.151	1.314	0.190
	Tangible	0.139	0.082	1.698	0.091
	Assurance	0.193	0.083	2.333	0.020
	Reliability	0.224	0.081	2.763	0.006
	Responsiveness	0.120	0.064	1.882	0.061
	Empathy	0.256	0.065	3.949	0.000

Source: Author's Calculation

Note: Dependent Variable: Satisfaction

Predictors: (Constant), Tangible, Assurance, Reliability, Responsiveness, Empathy

7.4   SUMMARY

This chapter focuses on the relationship between service quality, tangible elements of services and satisfaction among pregnant women in hospitals. The data was analyzed using principal component analysis of six dimensions, with 32 items loaded. The Bartlett test of sphericity and KMO values showed that the data matrix is sufficient and appropriate for the factor analysis. Service quality and satisfaction dimensions were analyzed, with the highest significant positive correlation between tangible factors and customer satisfaction (0.670**). Tangible and reliability had a positive correlation of 0.627**, indicating a strong positive relationship between tangible factors and empathy (e.g., understanding, compassion) in the context of customer satisfaction. Tangible and empathy had a positive correlation of 0.626**, indicating a moderate positive relationship between tangible factors and assurance in the context of customer satisfaction. Assurance refers to the patient's confidence, which is positively associated with the satisfaction of pregnant women utilizing hospital services. Hospital employees' attitude towards pregnant women is good, interaction with doctors is confidential, nurses are attentive and doctors are knowledgeable and capable of handling cases. The third dimension, reliability, means the quality of being able to be trusted, which also positively influences satisfaction ($\beta = 0.175$, p-value = 0.001). This shows that promised services are fulfilled, the reputation of doctors is good, transparency of expenses, treatment is done on time, doctors ensure wellness before discharging and services are provided at a reasonable cost. Responsiveness refers to attentiveness to meeting the needs or providing fast services and is positively associated with satisfaction ($\beta = 0.154$, p-value = 0.006). This shows that the registration process is simple, services are provided on time, personnel understand the specific needs, personnel are always ready to help, nurses provide sufficient information to pregnant women and they immediate response to complaints and suggestions. Empathy refers to the ability to understand another person's feelings or sentiments from their point of view and was found to be positively associated with the satisfaction of women utilizing maternal health

care services ($\beta = 0.173$, p-value = 0.002). This shows that the staff is polite towards pregnant women, doctors are caring towards pregnant women, provide personalized service, nurses do well-explaining prescriptions and doctors always meet during consultancy.

In the Kangra region, the strongest correlation is observed between reliability and satisfaction (r = 0.436**), followed by the correlations between assurance and satisfaction (r = 0.377**), empathy and satisfaction (r = 0.406**), responsiveness and satisfaction (r = 0.434**) and tangible and satisfaction (r = 0.377**). In the Mandi region, the tangible elements of services exhibit the most significant positive correlation with customer satisfaction. In the context of Shimla, it is observed that the variable reliability exhibits the strongest positive correlation with the variable satisfaction (r = 0.818**), closely followed by the variables assurance-satisfaction (r = 0.813**), empathy-satisfaction (r = 0.799**), tangible-satisfaction (r = 0.810**) and responsiveness-satisfaction (r = 0.773**). This finding indicates a significant positive correlation between the perceived reliability of services in Shimla and customer satisfaction. The study examines the relationship between tangible, assurance, reliability, responsiveness and empathy in different regions of India. In Kangra, the coefficient ($\beta = 0.158$) shows a positive and statistically significant relationship (p = 0.022), suggesting that an increase in tangible leads to a favourable effect on satisfaction. In assurance, the coefficient ($\beta = 0.266$) shows a positive and statistically significant relationship (p < 0.001), indicating a robust positive influence of assurance on satisfaction. In reliability, the coefficient ($\beta = 0.141$) shows a positive and statistically significant relationship (p = 0.027), suggesting that reliability positively impacts satisfaction. In Mandi, the coefficient ($\beta = 0.316$) shows a positive direction but lacks statistical significance, suggesting inadequate evidence to support the claim that tangible substantially impacts satisfaction. In Shimla, the coefficient ($\beta = 0.139$) shows a positive trend but lacks statistical significance, suggesting inadequate evidence to support the claim that tangible significantly impacts satisfaction in Shimla.

In Shimla, the coefficient ($\beta = 0.139$) shows a positive trend but lacks statistical significance, suggesting inadequate evidence to support the claim that tangible significantly impacts satisfaction in Shimla. The coefficient for assurance ($\beta = 0.193$) shows a positive and statistically significant relationship ($p = 0.020$), suggesting that assurance has a favourable effect on Satisfaction. In Shimla, the coefficient ($\beta = 0.224$) shows a positive and statistically significant relationship ($p = 0.006$), indicating that reliability positively impacts satisfaction. In conclusion, the study reveals that the constructs of assurance, reliability, responsiveness and empathy exert statistically significant positive influences on satisfaction within distinct zones. However, the impact of tangible exhibits variability across these zones. The constant (constant) value of satisfaction is not significant in the present analysis.

CHAPTER - VIII

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

Maternal health care services are essential for ensuring safe pregnancies, decreasing maternal and newborn mortality rates, and enhancing the quality of life for women and their families. These services include antenatal care, expert attendance during childbirth, postnatal care, family planning, and the treatment and prevention of pregnancy and childbirth-related problems. Maternal health is an essential aspect of public health and a basic human right. It comprises the health and survival of mothers and their newborns throughout pregnancy, childbirth, and the postpartum period. The availability of maternal health care services is essential for protecting the health of women and children, enhancing gender equality, and accomplishing goals of sustainable development. Despite progress, persistent challenges and disparities require sustained efforts to strengthen health systems, improve accessibility, and address the complex determinants of maternal health.

8.1   Rationale of the Study

Reproductive period of women is the most important as well as crucial time period in her life. Every single day, about 830 women die due to complications and causes related to pregnancy worldwide in which India shares about 20 percent to it (Alkema et al., 2016; Sharma et al., 2018). Maternal deaths lead to infant deaths as maternal health condition has a direct relation with the infant health condition. In order todecrease the maternal mortality rate focus should be on the proper utilization of maternal healthcare services from the pre-pregnancy period. If proper maternal health would be provided, maternal deaths can be prevented. Direct cost and hidden cost is the main barrier for the institutional delivery for the women from the remote regions (Acharya et al., 2016).

In present scenario, percentage of institutional delivery in India is 78.9 percent. Himachal Pradesh is the state with low institutional delivery percentage than the national value as mentioned in NFHS (Ministry of Health and Family Welfare, 2017).

Himachal Pradesh hospital-population ratio is 0.79 hospitals per lakh persons which is much less than other hilly states of India where there are 2.20 hospitals per lakh persons (Dadhwal and Bhutani, 2017; National Health Profile, 2011). The state is ranked at 25th position out of 36 states and union territories in institutional delivery rate; ranked at 22nd for taking IFAs for ninety days or more and ranked at 17th position for at least three ante natal visits which shows that women are not much aware about the importance of every part of maternal health care (Government of India, 2017; NITI Ayog, 2017). Out of 500 primary health centres in Himachal Pradesh, only 81 are promoted to provide continuous delivery services but none of these had basic availability of a gynecologist, staff nurses and skilled birth attendants and only 192 PHCs had labour room facility and 7 had new born care units (The Hindu, 2016; as sourced in Comptroller and Auditor General of India (CAG) report and National Rural Health Mission (NHRM)). On the global and national level, various studies have been done in the field of maternal health care services but there is a dearth of literature on maternal health in Himachal Pradesh. The present study is expected to provide a comprehensive overview of maternal health to state government, policy makers and researchers. Following are the objectives of the present study:

(i)   To study the awareness of women towards various aspects of maternal health.
(ii)   To explore the socio-economic determinants of utilization of maternal health careservices.
(iii)   To estimate the cost of utilization of maternal health care services.
(iv)   To identify the determinants of catastrophic health care expenditure of maternalhealth services.
(v)   To examine the quality of maternal health care services received by women.

8.2   Awareness About Maternal Health Care Services Among Women in Himachal Pradesh

The result of the analysis revealed that respondents in Himachal Pradesh were partially aware about maternal health care services. Within the studied sample of 576 individuals, a substantial majority of 88.4 percent conveyed the belief that enrolling oneself during the period of pregnancy holds utmost importance. Majority of women were unaware of the fact that why registration of pregnancy is important. A majority of 63.2 percent of the participants hold the perception that registration ought to take place

during the first trimester of the gestational period. There exists an absence of understanding pertaining to the imperative nature of antenatal check-ups during pregnancy. The majority of women hold the belief that antenatal care (ANC) plays a crucial role in obtaining knowledge regarding the well-being of the developing baby throughout pregnancy. The prevailing consensus among women is that it is imperative to undergo a minimum of one to two antenatal care (ANC) visits during the course of their pregnancy. The participants' perception indicated that the frequency of antenatal care (ANC) visits during pregnancy was seen to be greatest for the category of 5-6 visits, followed by 3-4 visits and 7-8 visits. A group of women had an absence in theirawareness of the recommended frequency of visits for sufficient antenatal care. In all regions, 'To know the condition of baby' was the commonly answered by respondents when asked about 'Why Antenatal checkup is necessary?'. Furthermore, the findings of the study also indicated that a notable percentage, specifically 40 percent, of the participants exhibited a lack of awareness regarding the importance of Tetanus Toxoid vaccinations for pregnant women. When asked about the significance of TT injections, a mere 1.6 percent of respondents demonstrated awareness that the primary purpose is to safeguard the mother against tetanus. However, 10.9 percent of participants erroneously believed the injections were intended to protect the child from tetanus. Only 23.3 percent of respondents rightly acknowledged that the application of tetanus toxoid (TT) injectionshas the dual function of protecting both the mother and the baby from tetanus. A finding emerged from the study, indicating that 25 percent of the participants were aware of a single dose of Tetanus Toxoid (TT). However, a notable percentage of participants, specifically 42.7 percent, exhibited an understanding of the imperative nature of taking two doses. Only 30.6 percent of participants demonstrated correct knowledge of the need to consume three doses, whereas a minimal 1.7 percent were unaware. The findings of theanalysis reveal that a substantial majority of participants, specifically 84.0 percent, exhibited knowledge regarding the significance of consuming iron and folic acid (IFA) tablets in the first trimester of pregnancy. A minority, comprising 0.5 percent, held the belief that such supplementation was unnecessary. Moreover, a significant proportion of 15.5 percent of individuals conveyed a sense of ambiguity concerning the imperative nature of consuming IFA tablets during this pivotal timeframe. When queried about the rationale

behind the utilization of IFA tablets, a substantial majority of 72.2 percent demonstrated awareness of its role in preventing maternal anemia. When asked about the appropriate dosage of IFA pills during pregnancy, only 10.9 percent of the participants were aware that 180 tablets should be taken. A notable majority of participants (67.5 percent) conveyed a sense of ambiguity when it came to determining the right quantity.

Respondents were when inquired about the awareness regarding danger signs during pregnancy, 'Swelling of feet/hands/face', 'Severe abdominal pain', 'Loss of consciousness', 'Vomiting' were the commonly highest among respondents. In general, the survey findings indicate that hypertension, sometimes referred to as high blood pressure, presents a significant issue over the entire region, with a prevalence rate of 55 percent. Gestational diabetes and anemia continue to be significant issues, affecting 41 percent and 38 percent of pregnant individuals, respectively. Other complications, including as antepartum hemorrhage, breast-related disorders, and fetal distress, collectively contribute to a relatively small percentage of instances, with each complication occurring at a rate of 1 percent or lower.

The survey findings indicate that awareness regarding complication named hypertension, sometimes referred to as high blood pressure, was highest in more than half of the respondents. Awareness regarding gestational diabetes and anemia was followed byhypertension. Awareness regarding other complications, such as bleeding during pregnancy, breast-related problems, and fetal distress, collectively contribute to a verysmall percentage of instances.

8.3 Healthcare Utilization, Cost and Coping Strategies of Maternal Healthcare Services in Himachal Pradesh

The result of the analysis revealed that factors such as literacy, type of family, birth order and monthly income or economic status of the household influence utilization. The cost of healthcare increases with complications, and poor Indian households spend more on healthcare than high-income households, leading to out-of-pocket expenditure. Itwas found that all women in Kangra, Mandi, and Shimla utilized maternal healthcare services, with 94.1 per cent using ANC services. Most of the respondents took 5-6 visits for ANC, with a large proportion using public hospitals. Most mothers preferred normal delivery, with most in public hospitals. Most women

were discharged after three days, and a large proportion consumed IFA tablets after delivery for 42 days. A small proportion faced complications before and during delivery.

The study reveals that prepartum difficulties were prevalent in various regions, with 34.4 percent in Kangra, 48.1 percent in Mandi, and 37.8 percent in Shimla. However, 65.6 percent in Kangra, 51.9 percent in Mandi, and 62.2 percent in Shimla did not experience any difficulties. Hospitalization rates were found to be higher in areas with pre-childbirth complications, with a higher risk of complications for those who answered affirmatively. This analysis provides insights into the healthcare landscape in different regions. The geographical division of childbirth among women in three regions: Kangra, Mandi, and Shimla was also found in the study. Within Kangra, a significant majority of women, specifically 81.4 percent, opt for public healthcare facilities, whereas a smaller proportion of 8.6 percent prefer private hospitals. The factors that contribute to non-delivery are insufficient road communication and restricted vehicle access. Within the Mandi region, the majority of individuals, specifically 91.6 percent, express a preference for public hospitals. A smaller proportion, 1.9 percent, opt for private hospitals, while 7.5 percent opt for home births. 83.5 percent of people in Shimla choose for public hospitals, while 9.9 percent prefer private hospitals. The decision was mostly influenced by a shortage of time, whereas considerations such as lack of transportation and distance had only small effects. The study offers useful insights on women's delivery preferences and the challenges they encounter, which can guide healthcare strategy and enhance service accessibility.

The survey revealed that a significant proportion of participants in Kangra, Mandi, and Shimla experienced normal delivery, accounting for 61.1 percent of the total. However, caesarean section deliveries were also prevalent, constituting 38.9 percent, 40.6percent, and 30.9 percent in the corresponding regions i.e., Kangra, Mandi and Shimla. Particularly, 60.6 percent of the total the deliveries were mostly performed by doctors. However, 'Dai', who are traditional birth attendants, participated in a relatively low proportion of deliveries, accounting for 8.9 percent, 8.5 percent, and 6.6 percent in Kangra, Mandi, and Shimla, respectively. In Kangra, Mandi, and Shimla, nurses were significantly involved in 27.9 percent, 26.4 percent, and 35.8 percent of

deliveries, respectively. A significant proportion of individuals experienced issues during childbirth, with 37.2 percent in Kangra, 15.1 percent in Mandi, and 6.2 percent in Shimla encountering difficulties.

The utilization rate of postnatal care (PNC) services in the Himachal was only 36.3 percent. Shimla has the greatest utilization rate at 34.8 percent, followed closely by Mandi at 34.9 percent and Kangra at 34.5 percent. Particularly, it was revealed that most people choose to visit public hospitals for postnatal care (PNC) services, with Mandi being the most popular choice at 40.6 percent. On the other hand, private hospitals exhibit lower utilization rates, varying from a meagre 0.4 percent to 1.7 percent. It was found that a considerable percentage of babies were healthy, with Kangra reporting an excellent rate of 97.8 percent, Mandi at 99.1 percent, and Shimla at 97.5 percent. It is important to mention that Kangra and Mandi have an extremely low occurrence of premature births. However, Kangra does have a little larger prevalence of newborns with low birth weight, accounting for 2.2 percent of the total. The time of discharge after labour seems to differ among different areas. Mandi has the highest incidence of discharges after 24 hours, with a frequency rate of 30.2 percent. There is regional variation in consumption, with Mandi having the largest consumption of iron and folic acid (IFA) supplements.

The research findings indicate that those above the age of 40 incur the greatest average expenses for maternal health care in Himachal Pradesh which is followed by individuals aged between 35 and 40, as well as those aged between 25 and 30. Further, participants from Mandi and Shimla indicated that the expenses for maternal health care were lower compared to those from Kangra. Furthermore, the overall expenditures for maternal health care were also lower in these regions. The cost of maternal health care was significantly influenced by geographic location. There was no significant variation found in expenses based on religion throughout Himachal Pradesh. Furthermore, persons who have completed post-graduate studies had the greatest average expenditure for maternal health care, whereas those with no formal education had a far lower cost. The Kruskal-Wallis test provided more evidence that there was a significant difference in maternal health expenditures based on educational achievement. However, in Kangra, there was no notable disparity in maternal health expenses and education in comparison to other areas of Himachal Pradesh was found. Furthermore, individuals

who were working in private jobs in Mandi and Shimla had the greatest average expenses. In particular, there was no significant variation in expenses depending on employment status was found. Further, joint-family households had lower levels of expenditure in comparison to nuclear-family households. However, participants who have a father-in- law as the patriarch of their household.

It was also revealed that the majority of participants preferred "buying only a part of medicines" and "help from family members" as their main strategy for managing the expenses related to maternal healthcare. However, it was found that the option of selling assets was the least favored choice among the individuals questioned. Furthermore, the study revealed that more than half of the participants never participated in the practice of "selling their assets" and "mortgage assets" in order to manage the costs associated with maternity healthcare. A minority of persons admitted to considering seeking a loan, however 15.5 percent expressed their resistance of using their savings to meet these expenses.

8.4   Catastrophic Healthcare Expenditure of Maternal Health Care Services in Himachal Pradesh

The result of the analysis revealed a fall in the proportion of individuals experiencing outrageous healthcare expenses as the threshold level increases across all three zones. This pattern is similar in all three zones, as well as in the overall population. When the threshold level is set at 5 percent, an astonishing 82.4 percent of the population in the Kangra zone experiences catastrophic healthcare expenses that exceed 5 percent of their income. However, when the threshold level rises, the percentage of individuals declines, suggesting a reduction in the proportion of individuals coping with expensive healthcare expenses relative to their income. Within the Mandi zone, 49.1 percent of the population experiences overbearing healthcare costs when the threshold criterion is set at 10 percent. In contrast, within the Shimla zone, around 21.4 percent of the population experiences high healthcare expenses when the threshold is set at 20 percent. At a threshold level of 5 percent, a significant 82.2 percent of the overall population is experiencing catastrophic healthcare spending, which exceeds 5 percent of their income.

A comprehensive examination of healthcare expenditure across several regions

to obtain a complete knowledge of the overall healthcare environment. The study examined the idea of "overshoot," which quantifies the extent to which healthcare spending surpasses the acceptable threshold. A greater proportion of households encountering overshoot indicates an increased vulnerability to substantial healthcare expenses. In the Kangra region, the amount by which the criterion was exceeded was 19.5 percent, but at athreshold of 10 percent, it was 15.9 percent. Similarly, the Mandi region experienced an overshoot of 8.7 percent, and when considering a threshold of 10 percent, the overshoot was 5.4 percent. In the Shimla region, the amount by which the criterion was exceeded was 14.7 percent, and when the threshold was set at 10 percent, it was 11 percent. In general, it was discovered that when the thresholds were set at 5 percent, 10 percent, 20 percent, 30 percent, and 40 percent, the amount of overshoot was 15.5 percent, 11.9 percent, 8.2 percent, 6.5 percent, and 5.3 percent, respectively.

The effect of healthcare costs on people and families in various locations with defined thresholds was analyzed. In Kangra, if healthcare costs account for 5 percent of an individual's income or spending, the actual expenses exceed this threshold by an average of 23.7 percent. Similarly, in Mandi, the observed expenditures crossed the threshold by an average of 10.3 percent, and in Shimla, they exceed it by an average of 16.7 percent. Healthcare expenses in all regions exceed 10 percent of the total income or expenditure by a margin of 20.7 percent. The mean positive gap was determined to be 34.7 percent, 40.6 percent, and 36.9 percent for 20 percent, 30 percent, and 40 percent, respectively. Furthermore, expenses in all regions exceed the threshold by 18.2 percent. Across all regions, healthcare expenses typically surpass 10 percent of the overall incomeor expenditure by a significant margin of 21.9 percent. Overall, the mean positive gap was calculated as 38.9 percent, 49 percent, and 53.8 percent for 20 percent, 30 percent, and 40 percent, respectively.

The findings reveal crucial factors that lead to the incidence of catastrophic healthcare expenses in maternal health care in Himachal Pradesh. An extensive analysis with a binary logistic model has demonstrated that certain factors, such as age, career, and family structure, do not exert a substantial influence on CHE. However, caste, literacy rate, and the occupational position of the husband, exhibit a significant correlation with catastrophic health expenditure (CHE). Particularly, personsbetween

the age of 20 and 25 years are less likely to get CHE, but those in the high-income category had a lower risk. Furthermore, it was shown that joint family households have a greater likelihood of experiencing catastrophic health expenditure (CHE), but this association was determined to be statistically insignificant.

The odds ratio in the Kangra region indicates that persons between the age of 20 and 25 years have a reduced probability of encountering catastrophic health expenditure in comparison to the reference category. However, this finding does not hold statistical significance. Individuals between the age of 25 and 30 years in the Mandi region are at a much-increased risk of incurring catastrophic health expenses. The finding reveled that in Kangra, the respondents belong to the OBC are more likely to experiencing significant financial burden due to healthcare expenses followed by scheduled caste (SC) and scheduled tribe (ST) categories. Households with higher earnings are less likely to experience it. In Kangra and Mandi, joint families are at a higher risk of experiencing higher healthcare costs.

8.5 Quality of Maternal Health Care Services Received by Women in Himachal Pradesh

The result of the analysis revealed that six dimensions with 32 items was found using factor analysis using principal component analysis was done. The Bartlett's test of sphericity and KMO values indicate the data matrix is sufficient and appropriate for analysis. It was found that all dimensions were appropriate for analysis, including tangible, assurance, reliability, responsiveness, empathy, and satisfaction.

The study analyzed the correlation between service quality and satisfaction of pregnant women, revealing a positive correlation between assurance and responsiveness. Tangible factors, such as physical appearance and facilities, showed a strong positive relationship with empathy, while it showed a moderate positive relationship with reliability. Tangible factors were also found positively correlated with satisfaction. Assurance and reliability also showed a moderate positive relationship with empathy, while reliability and responsiveness showed a moderate positive relationship with empathy.

Positive correlations were identified between different characteristics and consumer satisfaction in the Kangra, Mandi, and Shimla regions. The city of Kangra

exhibits the highest degree of positive association between reliability and satisfaction, followed by assurance, empathy, responsiveness, and tangibility. Customers in Kangra prioritize reliable and trustworthy services, resulting in higher satisfaction ratings. Similarly, in the Mandi region, there is a strong positive correlation between satisfaction and the tangible features of services. This indicates that customers in this region place high importance on the physical elements of their service experience. In Shimla, reliability exhibits the most significant positive correlation with satisfaction, followed by assurance, empathy, tangibility, and responsiveness. This highlights the importance of perceived reliability in determining customer satisfaction in Shimla.

The study examined the relationship between satisfaction and various dimensions (tangible, assurance, reliability, responsiveness, empathy) in the context of women utilizing hospital services. The results showed that all dimensions had a positive and significant influence on satisfaction. Tangible factors such as visually appealing buildings and clean wards were found to be significant. Assurance, which refers to patient confidence, was positively associated with satisfaction, as were reliability (trustworthiness), responsiveness (attentiveness to needs), and empathy (understanding of feelings).

The gaps in the data highlight areas where there are significant differences between patients' expectations and their actual experiences in various dimensions of service quality at the hospital. These gaps suggest areas that need improvement in order to align patients' expectations with their perceptions and enhance the overall patient experience. The largest gaps are seen in categories such as hospital employees' cleanliness, hospital employees' attitudes towards pregnant women, doctors' reputation, and the simplicity of the registration procedure. Other dimensions with notable gaps include the visual appeal of the hospital building, the condition of equipment, the privacy of doctor-patient interactions, the level of attentiveness shown by nurses towards pregnant women, the knowledge and proficiency of doctors, the delivery of promised services, transparency in expenses, promptness of treatment, doctors prioritizing patient well-being before discharge, the timeliness of services, personnel's understanding of individual needs, the willingness of staff to assist, the adequacy of information provided by nurses to expectant mothers, the prompt response to feedback and complaints, and the level of courtesy exhibited by staff towards pregnant women.

These gaps indicate areas where improvements can be made to enhance the reliability, responsiveness, and empathyof service quality in the hospital's maternity services.

8.6   Policy Implications

1.   The present study had found that sampled women lack proper understanding of antenatal care (ANC), tetanus toxoid (TT) injections and iron and folic acid (IFA) pills. Moreover, regional differences in the occurrence of obstetric problems necessitate the implementation of customized healthcare measures to safeguard expecting mothers.

2.   The study has identified that socio-economic variables influence women's awareness towards maternal healthcare. Thus, it is required to implement focused educational initiatives that consider distinct socio-demographic attributes. Moreover, along with women if males were also made aware of basic maternal healthcare services, then families can encourage women to utilize maternal healthcare services on a timely basis to avoid further complications.

3.   It is suggested that early detection of complications of high-risk individuals and effective management of the identified patients should be prioritized to reduce the incidence and intensity of catastrophic healthcare expenditure.

4.   It was observed in the present study that women's autonomy to seek health care utilization was limited. Thus, with the help of grassroots organizations, it is imperative to improve women's autonomy in order to get better health outcomes during maternal period.

5.   The study has identified differences between expectations and perceptions of the quality of maternal healthcare services. Thus, it is essential to address such gaps in order to improve the quality and reliability of maternal service quality align with patient's expectations and perceptions and trust and confidence in the hospital's ability to deliver excellent healthcare services.

6.   It is suggested to focus on strengthening healthcare facilities by improving infrastructure, well-conditioned and modern equipment's and skilled healthcare professionals.

7.   There is need to design comprehensive packages as per the needs of the expecting mothersand newborn in order to get viable results.

8. The government should invest in regular monitoring and evaluation of maternal health programs provided by public hospitals to identify gaps in order to get evidence-based policy solutions for the maternal healthcare.

9. The Janani Suraksha Yojana (JSY) should be extended to ensure comprehensive coverage throughout the gestational period.

8.7 Scope for Future Research

i. Maternal health care service quality analysis of public hospitals and private hospitals in both urban and rural areas.

ii. Incidence and intensity of catastrophic health care expenditure of all districts of Himachal Pradesh.

iii. Comparative analysis of the socio-economic implications of women with and without health insurance policy.

iv. Evaluation of the existing health care schemes designed to provide maternal health care services.

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Questionnaire

Dear Respondent, I am PhD. Research Scholar of Lovely Professional University doing research in Economics. My research topic is **"Maternal Health Care Services in Himachal Pradesh: An Empirical Analysis"**. The information provided by you will be kept confidential and will be used for academic research purpose only.
Thank You.
Vedica Awasthi
Research Scholar
Lovely Professional University, Punjab

Division: _____ **District:** _____ **Tehsil:** _____ **Date:** _____ **Phone Number:** _____

Section- I: Demographic Profile

Variables	Codes	Response
Name of the respondent		
Age (in years)	Up to 20= 1 20-25= 2 25-30= 3 30-35= 4 35-40= 5 40 & Above= 6	
Religion	Hindu= 1 Muslim= 2 Sikh= 3 Christian= 4 Others= 5(Specify)	
Caste	General= 1 OBC= 2 SC= 3 ST= 4	
Literacy level	No formal education= 1 Primary= 2 Secondary=3 Higher Secondary= 4 Graduation= 5 Post-Graduation= 6 Others= 7 (Specify)	
Work Status	Business =1 Government job =2 Private job= 3 Laborer= 4 Work in agriculture land= 5 Homemaker= 6 Others= 7 (Specify)	
Monthly Income (if working) (In Rupees)	Upto 15000= 1 15000-30000= 2 30000-45000= 3 45000-60000= 4 More than 60000= 5	
Literacy level of husband	No formal education= 1 Primary= 2 Secondary=3 Higher Secondary= 4 Graduation= 5 Post- Graduation= 6 Others= 7 (Specify)	
Work Status of husband	Business =1 Government job =2 Private job= 3 Laborer= 4 Work in agriculture land= 5 Others= 6 (Specify)	
Monthly household income (In Rupees)	Upto 15000= 1 15000-30000= 2 30000-45000= 3	

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	45000-60000= 4 More than 60000= 5	
Total monthly household expenditure (In Rupees)		
Total monthly household food expenditure (In Rupees)		
Do you have any land holdings?	Yes= 1 No= 2	
Size of land holdings		
Type of family	Nuclear= 1 Joint= 2	
Head of the family	Mother-in-law= 1 Father-in-law= 2 Husband= 3 Respondent= 4 Other= 5 (Specify)	
Birth Order		

Section- II: Awareness of Women towards Various Aspects of Maternal Health

Questions	Codes	Response
1. Do you think that the pregnant women should be registered in the community nutrition center?	Yes= 1 No= 2 Don't know= 3	
2. In which month of pregnancy, a woman should register?	Within 3 months= 1 After 3 months= 2 At any time= 3 Don't know= 4	
3. A pregnant woman should consult doctor every month?	Yes= 1 No= 2 Don't know= 3	
4. Do you think that antenatal care (ANC) is necessary?	Yes= 1 No= 2 Don't know= 3	
5. Why antenatal checkup is necessary?	To know the condition of baby= 1 To know the health of the mother= 2 To avoid complications= 3 For safe delivery= 4 Don't know= 5	
6. How many antenatal visits are required to a pregnant woman?	1-2 visits= 1 3-4 visits= 2 5-6 visits= 3 7-8 visits= 4 Don't know= 5	
7. Is it necessary for pregnant women to take Injection Tetanus Toxoid (TT)?	Yes= 1 No= 2 Don't know= 3	
8. Why is Injection Tetanus Toxoid (TT) injection given to pregnant women?	To protect child from tetanus= 1 To protect mother from tetanus= 2 Both= 3 Don't know= 4	
9. How many Injection Tetanus Toxoid (TT) dose should be taken?	Single dose= 1 Two doses= 2 Three doses= 3 Don't know= 4	
10. Is it necessary for pregnant women to take IFA (Iron Folic Acid) tablets in first three months of pregnancy?	Yes= 1 No= 2 Don't know= 3	
11. Why are IFA (Iron Folic Acid) tablets given to pregnant women?	To prevent from maternal anemia= 1 To prevent from puerperal sepsis= 2 To prevent low birth weight= 3 Preterm birth= 4 All of the above= 5 Don't know= 6	
12. How many IFA (Iron Folic Acid) tablets should be consumed during pregnancy period?	Less than 100= 1 More than 100= 2 180 during whole pregnancy=3 Don't know= 4	

13. Is it necessary to take iron calcium supplementation during pregnancy?	Yes= 1 No= 2 Don't know= 3	
14. Do you know about obstetric dangers amounting to serious ill-health of mother?	Yes= 1 No= 2 Don't know= 3	

15. Are you aware of these following danger signs occurring during pregnancy?

S. No.	Danger Signs	Yes	No
1.	Blurred vision		
2.	Fast or difficult breathing		
3.	Fever		
4.	Fits		
5.	Foul- smelling vaginal discharge		
6.	Loss of consciousness		
7.	Severe abdominal pain		
8.	Constant headache		
9.	Excessive vaginal bleeding		
10.	Swelling of feet/hands/face		
11.	Any other? (Specify)………..		

16. What are some common complications that can occur before, during or after delivery? (Multiple responses possible)	High blood pressure/ Hypertension= 1 Gestational diabetes=2 Anemia= 3 Ante partum hemorrhage= 4 Breast related complications= 5 Cephalopelvic disproportion= 6 COVID= 7 Fetal distress= 8 Malaria= 9 Malposition= 10 Perinatal asphyxia= 11 Placenta previa= 12 Post partum hemorrhage= 13 Post partum sepsis/Puerperal sepsis= 14 Preeclampsia= 15 Preterm labor= 16 Premature/ Prelabor rupture of membrane= 17 Prolonged labour/ Failure to progress= 18 Ruptured uterus/Uterine rupture= 19 Shoulder dystocia= 20 Stillbirth= 21 Umbilical cord prolapsed= 22 Thyroid= 23 Don't know= 24 Others (Specify)= 25	
17. What should be the adequate difference between the births of two babies?	At least 1 year= 1 At least 2 years= 2 At least 3 years= 3 At least 5 years= 4	
18. When should the breast feed be started?	Immediately after birth= 1 Within 24 hours= 2 After 24 hours= 3 Don't know= 4	

Section- III: Utilization and Cost of Utilization of Maternal Health Care Services

Questions	Codes	Responses
19. Have you utilized maternal health care services?	Yes= 1 No= 2 (If yes, skip to Q.21)	
20. If no, what were the reasons? (Multiple response possible)	Not necessary= 1 High cost= 2 Inconvenient/ too far= 3 Poor quality= 4 Lack of time= 5 Family did not allow =6	

III

	Lack of knowledge= 7 No female provider= 8 Others (Specify)= 9 _____	
21. Who took decision related your utilization of maternal health care services?	Myself= 1 Both me and my husband= 2 Only Husband= 3 Mother-in-law= 4 Father-in-law= 5 Whole family= 6	
22. Where were you stayed during pregnancy?	In- laws= 1 Biological mother's house= 2	

Antenatal Care (ANC)

23. Have you utilized ANC services?	Yes= 1 No= 2 (If yes, skip to Q.25)	
24. If no, what were the reasons?	Not necessary= 1 High cost= 2 Inconvenient/ too far= 3 Poor quality= 4 Lack of time= 5 Family did not allow= 6 Lack of knowledge= 7 No female provider= 8 Others (Specify)= 9 _____	

25. If yes, from where you utilized antenatal care (ANC) services?

ANC visit	From where you utilized services Public Hospital= 1, Private Hospital= 2, Primary Health Centre (PHC)= 3, Other= 4 (Specify)	At which week you took visit	Cost per visit
1st visit			
2nd visit			
3rd visit			
4th visit			
5th visit			
6th visit			
7th visit			
8th visit			

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26. How many times you were vaccinated by Injection Tetanus Toxoid (TT)?	1 time= 1 2 times= 2 3 times= 3	
27. How many Iron Folic Acid tablets (IFA) you consumed?	Less than 50 tablets= 1 At least 100 tablets= 2 At least 180 tablets= 3 More than 180 tablets= 4 Didn't consume= 5	
28. Which checkups you got in ANC? (Multiple responses possible)	Abdominal= 1 Height= 2 Weight= 3 Blood Pressure= 4 Hemoglobin= 5 Sugar = 6 Malaria= 7 HIV= 8 All of the above= 9 Others= 9 (Specify)	

Complications Before Delivery

29. Have you faced any complication(s) before delivery?	Yes= 1 No= 2 (If yes, skip to Q. 30)	
30. If yes, What were the complication(s) you faced before delivery (Multiple responses possible)	Pregnancy induced hypertension= 1 Gestational diabetes= 2 Anemia= 3 COVID= 4	

		Infections= 5	
		Premature/ Prelabor rupture of membrane= 6	
		Preeclampsia= 7	
		Preterm labor= 8	
		Ante partum hemorrhage= 9	
		Malaria= 10	
		Vomiting= 11	
		Thyroid= 12	
		Others= 13 (Specify)	
31. Have you ever hospitalized before delivery due to any complication?		Yes= 1 No= 2	
32. Distance to the facility from where you utilized ANC from your home (in Kilometres)			
33. Mode of transportation?		Hospital Ambulance=1 Own Vehicle= 2 Rented Vehicle= 3 Public Transport= 4 Others= 5 (Specify) _____	

34. Cost for utilizing ANC services including complications (In Rupees): _____

	Direct Medical Expenses	
1	Consultation fee	
2	Laboratory tests expenses	
3	Medicine Expenses	
4	Food expenses	
5	Transportation expenses	
6	Cost of hospitalization (In case of any complication(s))	
7	Blood transfusion	
8	Other (Specify)	
	Total Direct medical expenses	
	Indirect Expenses	
1	Did you take leave from work? (If no, skip to 4)	
2	If yes, for how many days?	
3	What is the opportunity cost of leave?	
4	Did accompanying person take leave from work?	
5	If yes, for how many days?	
6	What is the opportunity cost of his leave?	
7	Other (Specify)	
	Total Indirect expenses	

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Delivery (Intranatal care)

35. Where did you deliver your baby?	Public hospital= 1 Private hospital= 2 Primary health centre= 3 Home= 4 Other= 5 (Specify)	
36. If you did not deliver your baby at any health institution, what is the main reason behind it?	Distance= 1 No proper communication of roads= 2 Lack of transportation= 3 Financial problems= 4 No time= 5 Other= 6 (Specify)	
37. Distance to the facility where you delivered your baby from your home (in Kilometres)		
38. Mode of transportation?	Hospital Ambulance=1 Own Vehicle= 2 Rented Vehicle= 3 Public Transport= 4 Others= 5 (Specify)	
39. What type of delivery you had?	Normal delivery= 1 Caesarean/C=Section delivery= 2	
40. Who conducted your delivery?	Doctor= 1 ANM= 2 Trained person= 3 Dai= 4	

	Nurse= 5 Others= 6 (Specify)	
41. Who accompanied you to delivery?	ANM= 1 ASHA= 2 AWW= 3 Family member – 4 Others (Specify)= 5	
42. Did you face any complication(s) during delivery?	Yes= 1 No= 2 (If no, skip to Q. 48)	
43. If yes, What kind of complication(s) you faced during delivery? (Multiple responses possible)	Cephalopelvic disproportion= 1 Excessive bleeding= 2 Fetal distress= 3 Perinatal asphyxia= 4 Placenta previa= 5 Post partum haemorrhage= 6 Post partum/ Puerperal sepsis= 7 Prolonged labor/Failure to progress= 8 Ruptured uterus/Uterine rupture= 9 Shoulder dystocia= 10 Umbilical cord prolapse= 11 Malposition= 12 Meconium Aspiration Syndrome (MAS)= 13 Others (Specify)= 14	

44. Total cost incurred during delivery (In Rupees): _____

	Direct Medical Expenses	
1	Consultation fee	
2	Cost of hospitalization	
3	Bedding expenses	
4	Laboratory tests expenses	
5	Medicine Expenses	
6	Blood transfusion	
7	Food expenses	
8	Transportation expenses	
9	Others (Specify)	
	Total Direct medical expenses	
	Indirect Expenses	
1	Did you take leave from work? (If no, skip to 4)	
2	If yes, for how many days?	
3	What is the opportunity cost of leave?	
4	Did accompanying person take leave from work?	
5	If yes, for how many days?	
6	What is the opportunity cost of his leave?	
7	Others (Specify)	
	Total Indirect expenses	

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Postnatal Care (PNC)

45. From where did you utilize PNC services?

PNC visit	From where you utilized services **Public Hospital= 1, Private Hospital= 2, Primary Health Centre (PHC)= 3, Other= 4 (Specify)**	At which week you took visit	Cost per visit
1st visit			
2nd visit			
3rd visit			

46. Distance to the facility from where you utilized PNC from your home (in Kilometres)		
47. Mode of transportation?	Hospital Ambulance=1 Own Vehicle= 2 Rented Vehicle= 3 Public Transport= 4 Others=5 (Specify)	
48. Did you face any complication(s) after delivery?	Yes= 1 No= 2	

		(If no, skip to Q. 56)	
49. If yes, what kind of complication(s) you faced after delivery? (Multiple responses possible)		Breast related complications= 1 Excessive uterine bleeding= 2 Psychological disorders= 3 Urine leakage/ Vesico vaginal fistula (VVF)= 4 Thyroid= 5 Periods problem= 6 Blood pressure= 7 Others= 8 (Specify)	
50. Which services you utilized in PNC?		Check for bleeding= 1 Temperature= 2 Examined the breasts to prevent mastitis= 3 Provided Vitamin A supplements= 4 Counseling= 5 Others= 6 (Specify)	
51. Your baby at the time of birth was		Healthy= 1 Premature= 2 Low birth weight= 3	
52. After delivery, when were you discharged from hospital?		Immediately after delivery= 1 After 24 hours of delivery= 2 After 48 hours of delivery= 3 After 3 days= 4 Others (Specify)	
53. Did you consume IFA tablets after delivery for 42 days?		Yes= 1 No= 2	

54. Cost of utilizing PNC services (In Rupees): _____

	Direct Medical Expenses	
1	Consultation fee	
2	Medicine Expenses	
3	Cost of hospitalization (In case of any complication(s))	
4	Laboratory tests expenses	
5	Blood transfusion	
6	Bedding	
7	Food expenses	
8	Transportation expenses	
9	Other (Specify)	
	Total Direct medical expenses	
	Indirect Expenses	
1	Did you take leave from work? (If no, skip to 4)	
2	If yes, for how many days?	
3	What is the opportunity cost of leave?	
4	Did accompanying person take leave from work?	
5	If yes, for how many days?	
6	What is the opportunity cost of his leave?	
7	Others (Specify)	
	Total Indirect expenses	

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55. Following statements relate to various coping mechanisms for utilizing maternal health care services. Please indicate your level of agreement or disagreement:

Coping Mechanism	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Post Savings					
Help from family members					
Help from friends					
Loan					
Mortgaging assets					
Selling assets/ Gold					
Health Insurance					
Government assistance (Ayushman Bharat National Health Protection Mission, Pradhan Mantri Surakshit Matritva Abhiyan, Janani Suraksha Yojna etc)					
Reduced number of visits to the doctor					
Reduced other household expenses					
Buying only a part of medicines					

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Section-IV: Quality of Maternal Health Care Services received by Women

56. Evaluation of Quality of services expected by mothers from maternity care center:

Sr. no.	Attributes	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1.	**Tangibles**					
(i)	Building is visually appealing					
(ii)	Equipments are up to date					
(iii)	Equipments are in good working condition					
(iv)	Hospital employees are neat and clean					
(v)	Hospital wards are clean					
2.	**Assurance**					
(i)	Hospital employees attitude towards pregnant women is good					
(ii)	Interaction with doctors is confidential					
(iii)	Nurses are attentive towards pregnant women					
(iv)	Doctors are knowledgeable					
(v)	Doctors are capable of handling cases					
3.	**Reliability**					
(i)	Promised services are fulfilled					
(ii)	Reputation of doctors is good					
(iii)	Transparency of expenses					
(iv)	Treatment is done on time					
(v)	Doctors make sure your wellness before discharging					
(vi)	Services are provided on reasonable cost					
4.	**Responsiveness**					
(i)	Process of registration is simple					
(ii)	Services are provided on time					
(iii)	Personnel understands the specific needs					
(iv)	Personnel are always ready to help					
(v)	Nurses provide sufficient information to pregnant women					
(vi)	Immediate response on complaints and suggestions					
5.	**Empathy**					
(i)	Staff is polite towards pregnant women					
(ii)	Doctors are caring towards pregnant women					
(iii)	Provide personalized service					
(iv)	Nurses do well explanation of prescription					
(v)	Doctor always meet at the time of consultancy					
(vi)	24*7 service					
6.	**Satisfaction**					
(i)	Overall rating of hospital					
(ii)	Communication with doctors					
(iii)	Communication about medicine with pharmacist					

57. Evaluation of Quality of services perceived by mothers from maternity care center:

Sr. no.	Attributes	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1.	**Tangibles**					
(i)	Building is visually appealing					
(ii)	Equipments are up to date					
(iii)	Equipments are in good working condition					
(iv)	Hospital employees are neat and clean					
(v)	Hospital wards are clean					
2.	**Assurance**					

(i)	Hospital employees attitude towards pregnant women is good					
(ii)	Interaction with doctors is confidential					
(iii)	Nurses are attentive towards pregnant women					
(iv)	Doctors are knowledgeable					
(v)	Doctors are capable of handling cases					
3.	**Reliability**					
(i)	Promised services are fulfilled					
(ii)	Reputation of doctors is good					
(iii)	Transparency of expenses					
(iv)	Treatment is done on time					
(v)	Doctors make sure your wellness before discharging					
(vi)	Services are provided on reasonable cost					
4.	**Responsiveness**					
(i)	Process of registration is simple					
(ii)	Services are provided on time					
(iii)	Personnel understands the specific needs					
(iv)	Personnel are always ready to help					
(v)	Nurses provide sufficient information to pregnant women					
(vi)	Immediate response on complaints and suggestions					
5.	**Empathy**					
(i)	Staff is polite towards pregnant women					
(ii)	Doctors are caring towards pregnant women					
(iii)	Provide personalized service					
(iv)	Nurses do well explanation of prescription					
(v)	Doctor always meet at the time of consultancy					
(vi)	24*7 service					
6.	**Satisfaction**					
(i)	Overall rating of hospital					
(ii)	Communication with doctors					
(iii)	Communication about medicine with pharmacist					

Thank you for your valuable time