A SOCIO-ECONOMIC ANALYSIS OF THE MID-DAY MEAL SCHEME IN HARYANA

Thesis Submitted for the Award of the Degree of

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in

Economics

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2023

DECLARATION

I, hereby declared that the presented work in the thesis entitled "A Socio-Economic Analysis of Mid-Day Meal in Haryana" in fulfillment of degree of **Doctor of Philosophy (Ph. D.)** is outcome of research work carried out by me under the supervision Dr Rajender Singh, working as Associate Professor, in the Economics Department of Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.

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CERTIFICATE

This is to certify that the work reported in the Ph. D. thesis entitled "A Socio-Economic Analysis of Mid-Day Meal Scheme in Haryana" submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the Economics is a research work carried out by Mr. Ram Gopal, Registration No. 41800925 is bonafide record of his original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

(Signature of Supervisor)

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By the grace of almighty, I am able to complete this research work.

This work includes a lot of effort put in by my well-wishers by motivating me wherever I deviated from my path.

I am grateful to express my sincerest feeling of gratitude to my worthy guide Dr. Rajender Singh. The present work could only be completed because of my affectionate attitude and able guidance of my guide. Investigator will never forget him for the inspiration and valuable help rendered by him.

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Ram Gopal

Ph.D. Scholar

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LIST OF ABBREVIATIONS

S.NO.	DESCRIPTION	ABBREVIATIONS
1.	Mid-Day-Meal	MDM
2.	Mid-Day-Meal Program	MDMP
3.	Upper Class	UC
4.	Upper Middle Class	UMC
5.	Middle Class	MC
6.	Lower Middle Class	LMC
7.	Lower Class	LC
8.	National Food Security Act	NFSA
9.	National Achievement Survey	NAS
10.	Body Mass Index	BMI
11.	Global Hunger Index	GHI
12.	World Food Program	WFP
13.	Low Female Literacy	LFL
14.	Revised Public Distribution System	RPDS
15.	Recommended Daily Allowance	RDA
16.	Farmers Producer Organization	FPO
17.	Districts Institute of Education and Training	DIET
18.	National Child Labour Project	NCLP
19.	United Nations International Children's Emergency Fund	UNICEF
20.	World Health Organization	WHO
21.	International Monetary Fund	IMF

Abstract

Background

A country's future prosperity hinges on the health and education of its children. Conversely, a nation faces a bleak future when its children suffer from malnutrition, stunting, and lack of education. Article 6 of the UN Convention on the Rights of the Child emphasizes every child's right to life, entailing access to clean water, medical care, and adequate nutritious meals (UNICEF, 1990). In September 2012, an expert committee advising the UN on World Food Security proposed measures to combat chronic childhood hunger, advocating for a "food security floor" encompassing nutrition, literacy, sanitation, primary healthcare, and access to clean drinking water.

In the 21st century, numerous countries have achieved significant progress in science and technology. However, hunger and poverty remain persistent challenges in the global community. Addressing these dual issues necessitates coordinated efforts from international agencies, governments, and society at large. The UN Millennium Development Goals (2000) recognized hunger and poverty as critical priorities under the first MDG, "Eradicate Extreme Poverty and Hunger." Therefore, true technological advancement cannot be claimed until malnutrition is eradicated alongside these enduring social issues.

In India, about 20% of the population is under the age of 14 (Census 2011). Government schools have become an asylum for the lower socio-economic strata of society and these children suffer from malnutrition. These poor parents are unable to meet the nutritional requirements of their wards. So it is the constitutional and moral duty of administration to ensure nutritious and healthy meal in government schools.

To address the issue of education and health, the Government of India launched the World's Largest School Lunch Program (MDMP) on 15 August 1995 to improve educational attainment and nutritious meals in 2408 blocks of the country. The

Government of India issued letter number F-6-2/95 containing guidelines for the National Nutrition Support Program for School Education. The Mid Day Meal Program was implemented across the country in 1997-98. It is a centrally funded scheme. It is a 100% centrally supported system for the Union Territory. The three-phase program involved all governments, local bodies and government primary schools in all union territories and states.

At present, PM Poshan Scheme is the largest school meal program in the world. In this scheme, 11.59 crore students are the beneficiary in India, and 25.95 lakh Cook cum Helpers from weaker sections of society. (mdm.nic.in retrieved on 31st March 2020). The performance in implementing the Mid-Day Meal differs as per the efficiency and sensitivity of the state governments. Many states like TN, and Gujarat are role models for effective execution of this program (Grover and Kaur, 2012).

Socioeconomic conditions are important for living a quality life. Society in Haryana has a high degree of structural inequality among different castes. the socio-economic conditions of SC and BC category people have improved due to the execution of reservation policy and various welfare schemes run by state and central governments. But still, these category people are lagging behind upper caste people in respect of economic, living, educational status, and other parameters of human beings (Dharamvir Mahajan, 2021).

Significance of Study

The issue of malnutrition and inadequate academic achievement becomes significantly concerning when intertwined with social stratification. An apparent paradox surfaces upon examining the Haryana State Profile, the National Family Health Survey-IV (2015-16), and the National Achievement Survey 2017. The dismal outcomes in health and academic metrics underscore that the Mid-Day Meal program is falling short of its objectives. Students from economically disadvantaged backgrounds performed even worse compared to their peers both within the state and nationwide. Therefore, there is an urgent requirement to evaluate the performance of the MDMP alongside a cost-effectiveness analysis.

In Haryana, numerous post-graduate studies have examined the 'nutrition' and 'satisfaction' levels of the Mid-day Meal Program, yet hardly any study has delved into a comprehensive socio-economic analysis of the scheme. Recognizing this gap, the researcher perceived the necessity to thoroughly investigate the MDMP and conduct a socio-economic analysis specific to Haryana to understand its operational dynamics. This study aims to provide a comprehensive overview of the MDMP's status in the region. Such an analysis would be instrumental in refining or reinforcing current practices and policies associated with the program. Since its revision in April 2004, the Mid-Day Meal Program has been in operation for 16 years, making it imperative to assess its efficacy at this stage. Given the heightened significance of the MDMP during the COVID-19 pandemic, a fresh survey is crucial to deeply analyze its status in Haryana, focusing on aspects like enrollment, attendance, retention, satisfaction levels, and the academic and physical achievements among beneficiaries from diverse socio-economic backgrounds.

Objectives of the Study:

1. To ascertain the role of MDMP in increasing enrolment, attendance and retention among various socio-economic groups of students.
2. To analyze the contribution of MDMP in improving the educational attainment among various socio-economic groups of students.
3. To assess the satisfaction level of students, teachers, and parents about MDMP in government schools.
4 To examine the role of MDMP in improving the physical standards of students among various socio-economic groups of students.
5. To carry out comparative analysis of achievements of MDMP at Revenue Division level.
6. To suggest strategies for making the MDM efficient.

Delimitation of the Study:

The study was delimited as stated below:

The study was delimited as stated below:

1. The study was limited to elementary classes from 1st to 8th class in Haryana state. Cooked hot meal was provided since 2004, so data are analysed from 2004.
2. The study of views and perceptions expressed by students, teachers, and parents was restricted to only 12 out of 22 districts of Haryana.
3. The age of the children under study was 5 to 14 years.
4. Students, teachers' and parents' perceptions were taken from selected sample schools only.
5. The study was confined to the following variables: Enrolment, attendance, retention, Scores in English; Scores in Mathematics; Scores in Science/EVS, Height, Weight, BMI, Body Mass Index and Academic Achievement Index.

Research Design: It was a cross-sectional study conducted in the North Indian state Haryana. It has six divisions and 22 districts. This study was carried out in 12 out of 22 districts in Haryana. The data were collected from Mid-Day Meal stakeholders in both rural and urban areas through Pareek Socio-economic Scale, a self-structured questionnaire, Anthropic measurements, a semi-structured interview, and a self-structured achievement test for classes 5 and 8 of government schools.

Reference Period: The research survey was conducted in the duration of July 2022 to September 2022 in 12 districts of Haryana it was particularly ensured that in the survey students belonging to all types of socio-economic categories are included.

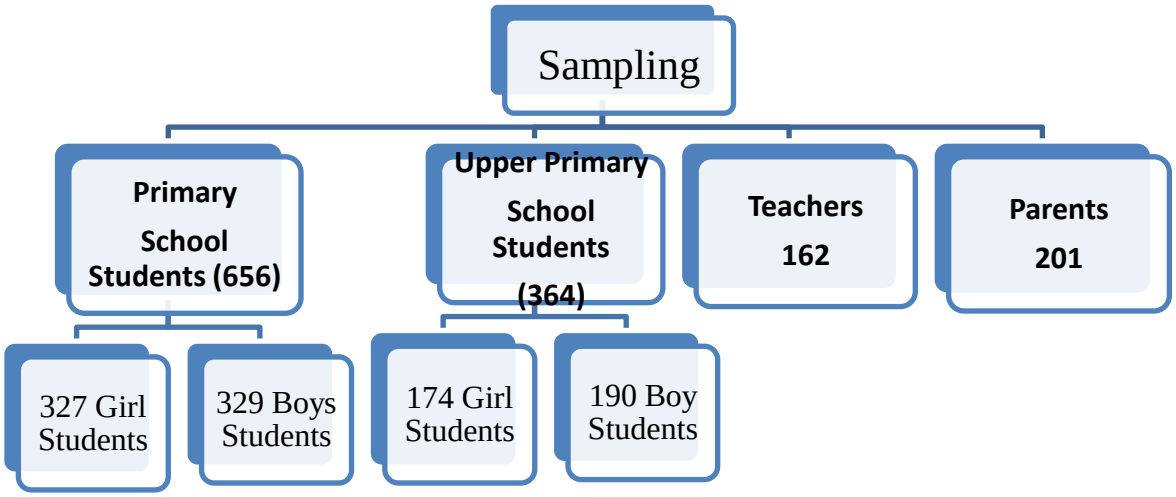
iv) **Types of Data:** In this study, both primary and secondary data were collected. The details of these data are described objective-wise in the following pages.

v) **Level of Precision:** In the study, a 5% margin of error was accepted and the confidence level was 95% chosen.

vi) **Sample Size:** Determining the sample size is critical for research work. The sample size is a compromise between precision and budget, and other operational constraints. While deciding the sample size, the following factors were considered without compromising precision

vii) **Precision Level:** If more accuracy is required then a larger sample size is required (Dermatol, AB 2014), so a large sample size (1020) is required to reduce the risk of inaccuracy.

Sample Size of Primary Schools & Upper Primary Schools:



Development of Questionnaire

The researcher has used multiple options to gather the required data from the students. It included a semi-structured interview, questionnaire, and Anthropometric measurement. The questionnaire was developed to gather requisite information. The questionnaire was prepared with the help of a subject expert English language expert, three Principals, two Block Education Officers, one professor of the Central University of Haryana, and two professors of Lovely Professional University. Each item was analyzed before finalizing for its relevance and objectivity. The questionnaire was designed on a five-point Likert Scale.

3.4: Result of Reliability Test

Questionnaire	No. of Items		Cronbach's Alpha Test	
	Before Deletion	After Deletion	Before Deletion	After Deletion
Students' Satisfaction	37	23	.521	.719
Parents' Satisfaction	21	14	.529	.749
Teachers' Satisfaction	25	18	.512	.723
English Subject 8th Class	15	10	.511	.744
Math Subject 8th Class	15	10	.499	.723
Science Subject 8th Class	15	10	.507	.705
EVS Subject 5th Class	15	10	.791	.862
Math Subject 5th Class	15	10	.763	.860
English Subject 5th Class	15	10	.818	.861

Validity: - The content validity of the test will be measured with the help of views expressed by judges that included subject experts in the English language, three Principals, two Block Education Officers, one professor of the Central University of Haryana, and two professors of Lovely Professional University.

Statistical Technique: Paired Sample t-test is used to analyze the contribution of MDMP in improving educational attainment, enrolment, physical standards in government schools. ANOVA test was used for finding the impact of Mid Day Meals in various socio-economic groups of students. Man Whitney U test was used to analyze the satisfaction level of teachers and parents.

Role of MDMP in increasing enrolment, attendance, and Retention of students:

The Midday meal program played a significant role in increasing the attendance of pupils before MDM and after MDM in 1st grade classes. After the introduction of the Mid-day meal program, the average attendance of female students increased from 99.8 to 131.6, which was a significant increase, and in the same way, the attendance of boys also increased from 105.3 to 128.9 after the introduction of this program. Compared to boys, girls' attendance increased more, which had a positive effect on social development.

The mid-day meal program plays a significant role in student retention in government primary schools in Haryana. The average retention of pupils studying in elementary schools increased from 62.36 to 93.3 after the introduction of the Midday Meals program.

Contribution of MDMP in improving educational attainment:

Mid-day meal program plays a significant role in the reading skills of government primary school students in Haryana. The average reading proficiency of upper primary school pupils increased from 88.31 to 80.9 following the introduction of the Mid Day Meal Scheme.

1. The average numerical skill of primary school students was 27.56 marks which increased significantly to 32.98 marks after the introduction of Mid Day Meal Scheme in Haryana.
2. There was a significant difference exists in the score of English subjects among various socio-economic groups of students in Haryana. The mean value of UMC, MC, LMC, and LC was 6.65, 6.17, 5.32, and 4.29 respectively which show that lower socio-economic group students scored low marks in comparison with the higher strata groups. Lower Class students have the lowest mean marks in schools.
3. There was a significant difference exists in the score in Math subjects among various socio-economic groups of students in Haryana. The mean value of UMC, MC, LMC, and LC was 5.70, 5.75, 4.80, and 4.22 respectively which show that lower socio-economic group students scored low marks in comparison with the higher strata groups. Lower Class students have the lowest mean marks in schools.

5.4.3 Satisfaction level of students, teachers and parents about MDMP

A Students

1. Higher strata students do not consider much that they come to school regularly because they get a tasty meal here in comparison to lower class students. It was evident that students belonging to Lower class strata were allured by Mid Day Meal.
2 Almost all category students observed that they were getting changed in the MDM on daily basis, so their scores ranged from 3.41 to 3.06. It was evident that MDM was prepared as per the menu.
3. Students belonging to poor strata were taking MDM more regularly than students belonging to higher strata.
4. Students belonging to all strata do not like the MDM menu because their scoring was below 3 on a five-point Likert Scale. It was also revealed that higher strata students like less MDM than the lower strata students.
5. All students were satisfied that they were getting the equal and desired quantity of Mid Day Meals. In comparison, students belonging to Lower Class were less satisfied than students belonging to the Upper Middle Class in terms of equal and desired quantity of Mid Day Meal.

B. Teachers Satisfaction

1. Both Primary and Upper Primary School teachers agreed that MDM was prepared according to the menu.
2. Both Primary and Upper Primary School teachers agreed that MDM was prepared timely.
3. Both Primary and Upper Primary School teachers agreed that MDM was prepared hygienically.

C) Parents' Satisfaction

1. Parents of Upper Primary Schools comparatively perceive that their ward comes to school due to MDM more than the parents of Primary Schools.

2. Parents of Upper Primary Schools comparatively perceive that their wards get MDM more regularly than the parents of Primary Schools.
3. Parents of Upper Primary Schools comparatively perceive that hygienic conditions were especially observed while preparing MDM than the parents of Primary Schools.

Role of MDMP in improving the physical standards of students.

1. Boy students' BMI increased significantly from 16.53 to 17.01 after the implementation of MDMP.
2. Girl students' BMI increased from 16.11 to 17.35 after the implementation of MDMP.
3. BMI of students belonging to higher classes has more BMI than students belonging to Lower Classes. There is a direct relationship between the socioeconomic status of a student and BMI. Students belonging to Upper Middle Class have the highest BMI 18.84 and LC students have the lowest BMI 16.49.

Cost effectiveness analysis of MDMP at Revenue Division level

1. By spending one extra rupee Ambala division can increase academic achievement by 1.54 marks and the Hisar division by 1.51 points.
2. The cost-effectiveness diagram shows that by spending one extra rupee, the Hisar division can increase academic achievement by 1.46 marks and the Ambala division by 1.45 marks by spending one rupee extra on Mid Day Meal.
3. The cost-effectiveness shows that by spending one extra rupee Hisar division can increase BMI by 1.65 points and the Rohtak division by 1.49 points.

Conclusion: MDMP is one of the centrally sponsored welfare schemes implemented in all states of India. Government schools have become an asylum for students belonging to lower sections of society. This research was mainly focused on the effects of MDMP on students belonging to various socio-economic groups in Haryana. The findings clearly indicated that MDMP is a boon to students, especially those belonging to the LMC and

LC of society. The study found that MDMS was able to improve the attendance and retention of students in primary schools, but it could not improve the enrolment of students. Enrolment of students decreased, which may be due to the trend of English-medium private schools. The study found that the educational achievement of students increased after the implementation of MDMP, but it was again less beneficial for the lower sections of society comparatively. Analysis of the data further reveals that both girl and boy students' physical standards improved after the execution of MDMP, but girl students got more benefits from MDMP than boys.

Students were satisfied with the hygiene, flavour, and timing of MDMP, but they were not satisfied with the menu or its quality. Students want to get a change in the menu, and interestingly, they want to get food articles like fruits, ghee, Halwa, Puri, Kheer, Rasgulla, Maggi, etc. All the students were in favour of continuing MDMP. In the same way, teachers of primary and upper primary wings were not satisfied with the quality and nutrition level of students. Both categories of teachers agreed that the attendance and retention rate of students increased after the implementation of MDMP. The majority of teachers wanted MDMP to be continued. In the same way, parents were satisfied that their wards were getting MDM regularly, food was prepared hygienically, and their wards had not faced any health problems after taking MDM. Parents were also satisfied that their wards did not face any caste discrimination while taking MDM; it ensured that our societies were accepting change. Students have not observed any improvement in their health standards. Parents wanted that MDMP be continued.

The cost-effectiveness showed that by spending one extra rupee, the Hisar division can increase BMI by 1.38 points and the Rohtak division by 1.32 points. By spending one extra rupee, the Ambala division can increase academic achievement by 1.54 marks and the Hisar division by 1.51 points. The Hisar division has the highest cost-effectiveness (1.46 marks), and the Faridabad division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the

Hisar division can increase academic achievement by 1.46 marks and the Ambala division by 1.45 marks by spending one rupee extra on the mid-day meal.

In the nutshell, India is a country of diversity, so it requires ‘Inclusive Development’ for the upliftment of downtrodden people. Second, delivery of any government scheme depends upon design execution, structures for delivery mechanisms, and monitoring and evaluation. A scheme like Mid-day Meal or PM Poshan can be one of the remedial actions to improve the academic and physical standards of students who belong to poor families in the state. The present design of MDMP is unable to reduce the menace of malnutrition and academic backwardness among students studying in classes I to VIII, as this scheme has many flaws. The partial reforms like rebranding, opening ‘Balvatikas’, social audit, setting up kitchen gardens, and ‘Tithi Bhojans’ are not capable of dealing with this century’s old, deep-rooted malnutrition. Providing one lunch during school time can’t provide sufficient nutrition to students.

The governments should take the problem of malnutrition seriously and should initiate urgent steps to curb the problem of malnutrition among students. Even the National Education Policy 2020 recommended that the government should make provision for breakfast to eradicate class- room hunger’ and enhance the nutrition level of our new citizens. Second, MDMP should be extended up to the senior secondary level, as a nutritious diet is mandatory at teenage for good health and a healthy mind. Most importantly, poverty is the mother of all ills, so the government should ensure that people come out of absolute poverty and become capable of providing their ward with a nutritious diet. Effective service delivery and utilization of government schemes rely on realistic planning with focused objectives to make execution practically possible at ground level, a strong implementation and monitoring system with the help of active community participation and using the public-private partnership model, and a reliable platform to take prompt action on grievances related to the scheme can improve the mid-day meal scheme.

So, the government should become liberal and open its coffers to eradicating the blot of malnutrition among the little champions. It should be kept in mind that nothing is more important than the investment in the health and education of its students.

5.6 Recommendations The scope of this study can be further expanded in detail. In fact, a much larger study could be conducted by including more districts in the context of MDMS, also including other welfare schemes. It can also widen the sample size of beneficiaries, and stakeholders to get a more representative picture of the State in the context of social accountability. A comparative study of health aspects of students of various states may be done for inter-state comparison of the impact of the scheme. A detailed study may be conducted to explore the execution and execution problems related to the scheme.

CHAPTER-I

Introduction

“School feeding programs can help prevent hunger, increase school enrolment, reduce absenteeism, and improve learning outcomes.”

-Food and Agriculture Organization of the UNO

A country's future prosperity hinges on the health and education of its children. Conversely, a nation faces a bleak future when its children suffer from malnutrition, stunting, and lack of education. Article 6 of the UN Convention on the Rights of the Child emphasizes every child's right to life, entailing access to clean water, medical care, and adequate nutritious meals (UNICEF, 1990). In September 2012, an expert committee advising the UN on World Food Security proposed measures to combat chronic childhood hunger, advocating for a "food security floor" encompassing nutrition, literacy, sanitation, primary healthcare, and access to clean drinking water.

In the 21st century, numerous countries have achieved significant progress in science and technology. However, hunger and poverty remain persistent challenges in the global community. Addressing these dual issues necessitates coordinated efforts from international agencies, governments, and society at large. The UN Millennium Development Goals (2000) recognized hunger and poverty as critical priorities under the first MDG, "Eradicate Extreme Poverty and Hunger." Therefore, true technological advancement cannot be claimed until malnutrition is eradicated alongside these enduring social issues.

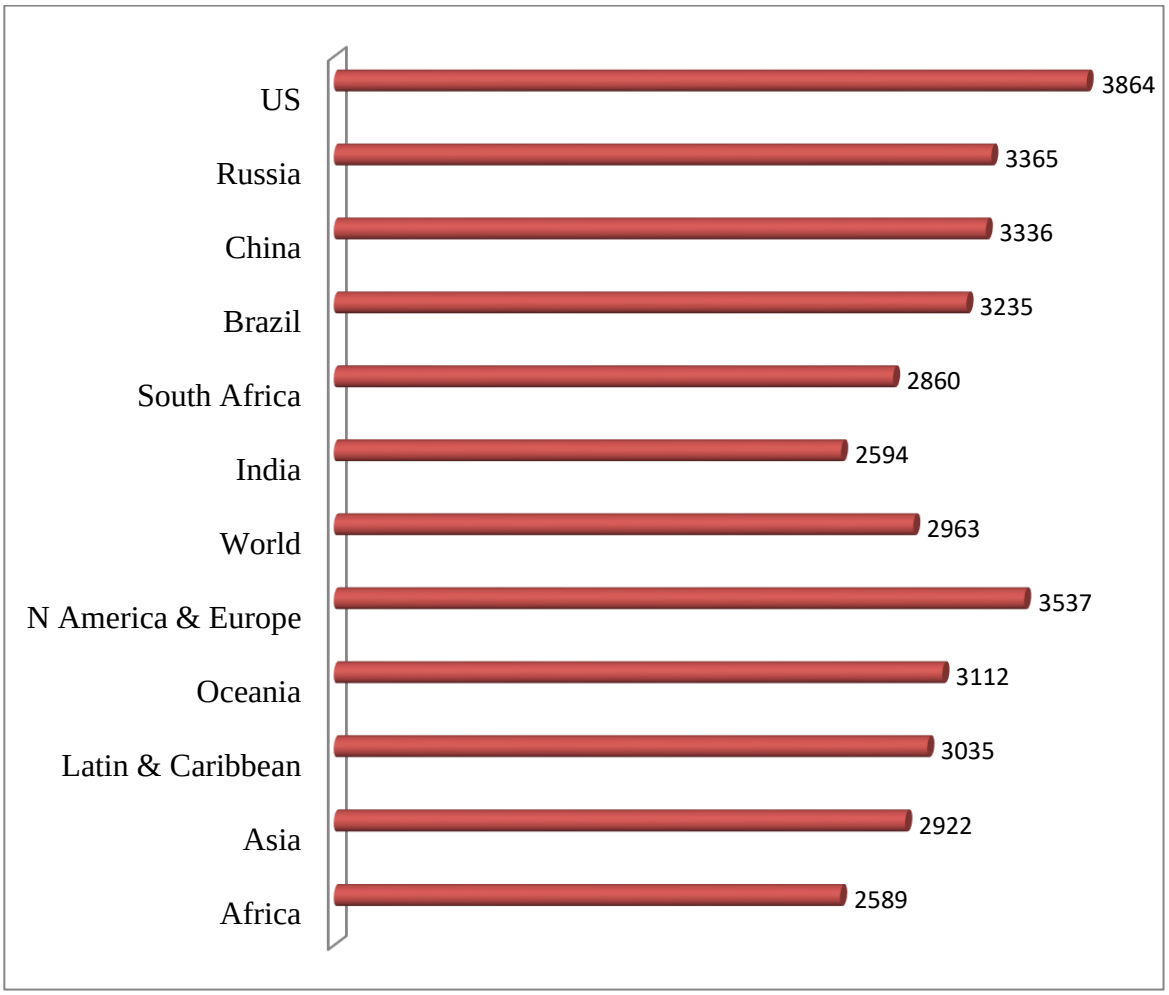
1.1 Malnutrition

Malnutrition is a nutritional deficiency; it occurs when a person gets too little or too much nutrition, which causes a health problem. It is an imbalance in dietary intake because of the shortage of nutritious material or surplus availability. Malnutrition is just like the

COVID-19 pandemic, as it causes diseases and increases mortality among children in poor countries. It is caused by poverty and chronic hunger. Malnutrition comprises two factors: (a) Raw hunger, which occurs when a child gets less food than the requirement for physical development. It is also called an endemic condition.

(b) Deficiency of micronutrients, fat, protein, etc. in meals, and the human body does not absorb it because of poor hygienic conditions or poor health (Tette, E.F. 2015). The following figure shows the availability of dietary energy supplies around the world.

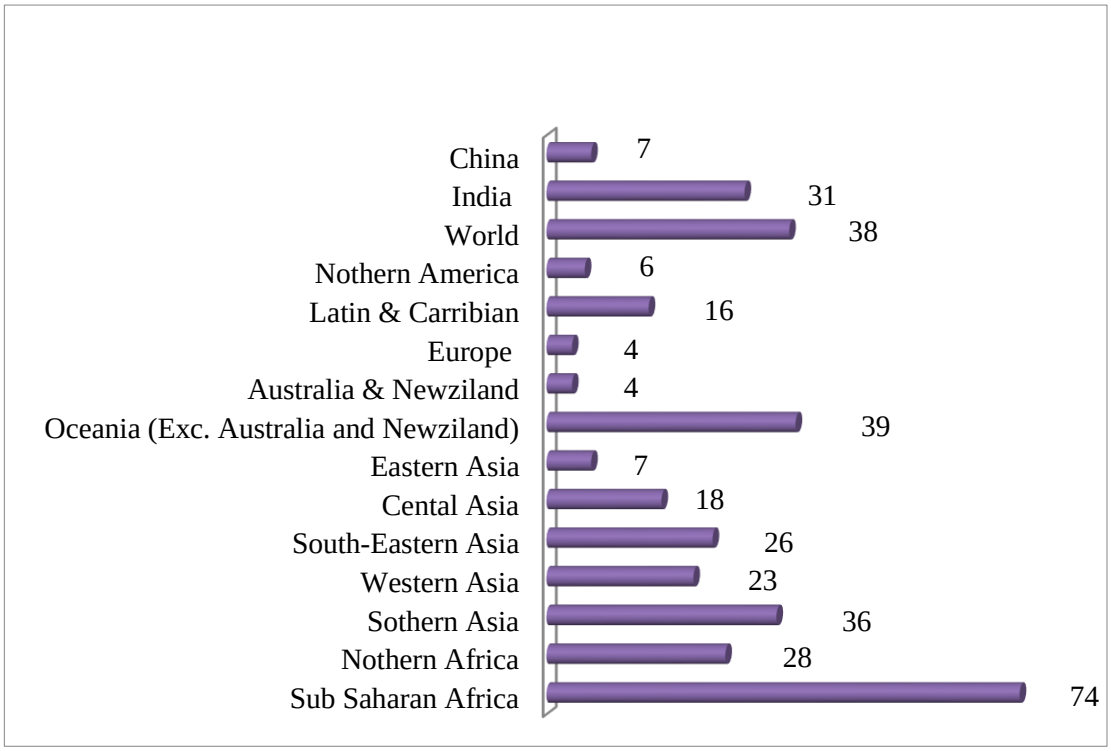
Figure 1.1: **Average Dietary Energy Supply (Kcal per Capita per Day): 2019-2021**



Source: FAO's Annual Statistics Report 2022

Since 2000, global per capita calorie intake has increased by an annual average of 9%, reaching 2963 calories worldwide. India's intake stands at 2594 calories, comparable to levels in many parts of Africa, despite the country's significant agricultural surplus in wheat, rice, sugarcane, and fruits. However, social and governmental disparities have exacerbated the situation, creating stark contradictions in food distribution. Many regions worldwide still struggle to provide an adequate calorie intake for children, highlighting the critical need for nutritious meals as a basic right, yet this need remains unmet for millions of children globally (UNICEF, 2022). In 2021 alone, UNICEF reported that approximately 13.6 million children suffered from severe malnutrition. It added, "One out of five deaths in children is because of severe wasting. The following figure states the mortality rate of children as per Sustainable Development Goals (SDG) regions in the world. The figure depicts the mortality rate of children who were less than 5 years of age.

Figure 1.2: Under 5 Children Mortality Rate, by SDG Region in 2021



Source: UN Inter-Agency Group for Child Mortality Estimation (UNIGME)

Now a child has a higher survival rate than in the 1990s, but within a country, inequity exists, which is a point of concern. Globally, the child mortality rate under 5 years of age was 38 per 1000 in 2021. It was mainly contributed by Sub-Saharan Africa, Oceania, and India. India's child mortality rate was 31 percent higher than that of its neighboring country, China (07). It is ironic that such a situation existed despite the availability of surplus food grains and medical facilities. India needs to do a lot to come into the performance range of Eastern Asian countries.

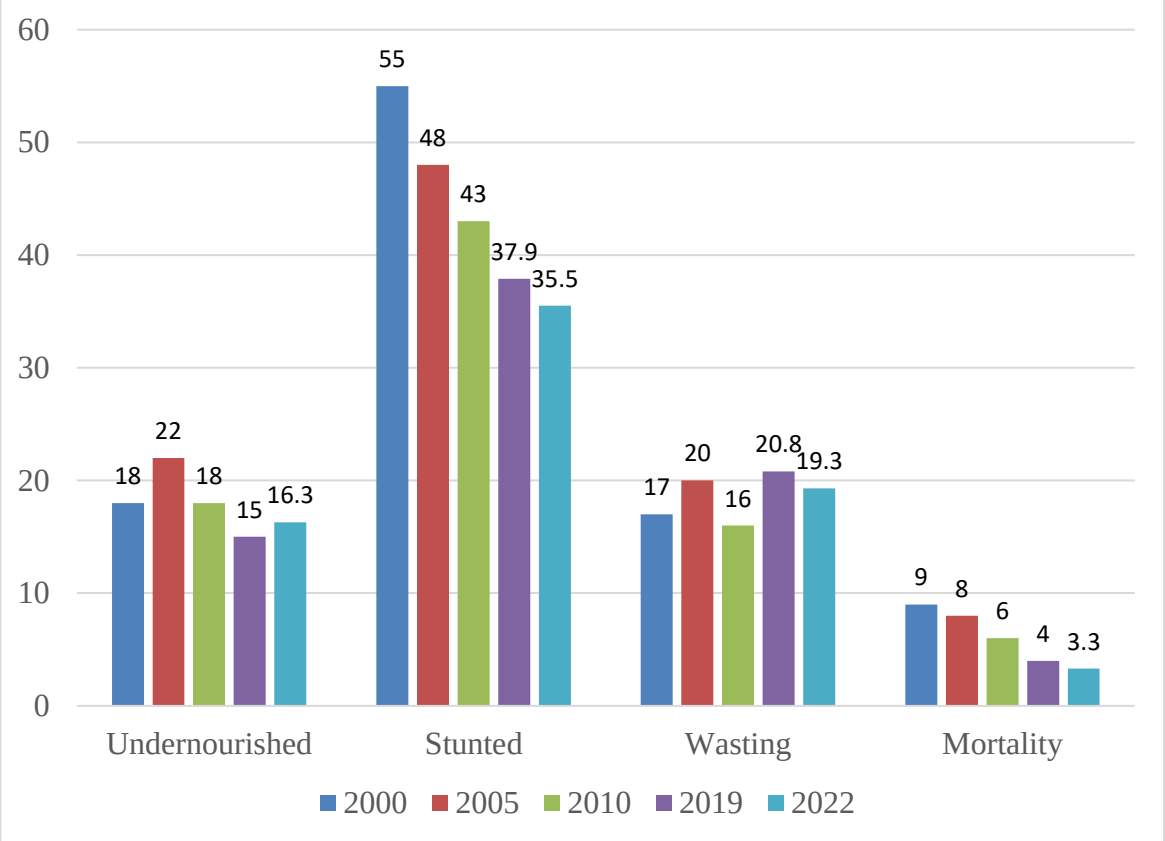
Many studies have shown that early malnutrition affects mental, physical, and cognitive development. Malnutrition is an impediment to the overall performance of a student, and it severely impairs intellectual and psychomotor development. Poor nutritious food not only hampers physical growth but also reduces brain development, intelligence, and overall health. It also affects a child's energy level, concentration power, recall ability, reflection power, and arithmetic ability. In fact, malnutrition is a second name for growth failure (Bagikar, V.V. & Savadata, B.B.2015).

A balanced and nutritious diet is essential for the optimal development of both mind and body. It supports physical growth and helps children achieve a healthy Body Mass Index (BMI). Adequate nutrition during childhood also prepares individuals for rapid growth during adolescence. Research indicates a clear link between nutrition intake and children's emotional well-being, affecting factors such as motivation, anxiety levels, and susceptibility to depression. Children who experience severe malnutrition are particularly vulnerable to various diseases due to weakened immunity against bacterial and viral infections (Upadhyaya, P. and Bisla, G. 2019).

To mitigate malnutrition, the United Nations Standing Committee (1977) on Nutrition began to promote research on malnutrition among students so that the malnourished students could be identified and "catch up" early for their timely recovery from malnutrition.

According to Nobel laureate in economics Angus Deaton, malnutrition in India is not solely attributable to calorie intake but is aggravated by the country's reliance on a diet high in carbohydrates and low in protein and fat. India's malnutrition challenges are reported to be more severe compared to Burkina Faso, Haiti, Bangladesh, and North Korea. As per the Global Hunger Index 2022, India holds a low ranking of 107th, indicating a significant hunger issue within the nation. This index underscores that "India faces a severe hunger problem." UNICEF's May 2022 alert classified the situation as a "Child Survival Emergency." India's case is unfortunately not unique in this regard. The following chart shows India's dismal health record.

Figure 1.3 Trend of Health Indicators' values in India



Source: Global Hunger Index 2022

Figure 1.3 shows that India did not perform very well in the fight against hunger. It scored 30.3 points, which keeps it in the 'Serious' category; it scored 35.5 points in the

"stunting" category, which keeps it in the "Alarming" category; and 19.3 points in the "wasting" category, which keeps it in the "Serious" category. The Global Hunger Index 2022 stated that India's struggle to alleviate hunger was not improving fast, despite expected record grain production of 330.5 MT in 2022–23. India is home to the world's most malnourished children, with 2/5 children being malnourished (GHI Report 2022).

1.2 History of the School Lunch in the World

The introduction of the school lunch shows the love, care, and concern for children by their respective governments and civil societies worldwide. The following countries take care of their future generations:

France: The credit for starting the Mid-Day Meal Program goes to Victor Hugo, a Frenchman in the year 1865. France started school lunch free of charge. It was enacted that all Communes would establish “School Fund Committees” to prepare meals for the poor and needy children of the school. After World War II, the school canteen increased from 8000 to 10900, and about 14% of students received school lunch. Family income was the criteria for the selection of these students. The menu for lunch consisted of meat, eggs, fish, a large bowl of vegetable soup, or a combination of these items, so that the total intake of animal protein may reach the range of 18 to 20 grams. Besides, they were getting fruits, milk, and cheese.

Japan started providing school lunches to its students in 1889. The aim of the program was to remove the weaknesses and malnutrition of students. Today, Japan’s school lunch program is recognized as the best program in aspects of coverage, outcome, concept, and philosophy.

In 1925, in **Norway**, “Oslo Breakfast” was provided, which consisted of whey cheese, raw carrot, apple or orange and milk with sandwiches. This meal was designed to provide the maximum level of nutrients. Elementary school students were getting this breakfast, irrespective of their socio-economic status, in 1972. Later on, the menu for this breakfast was reduced to 250 ml of milk due to a financial crunch.

Switzerland: School lunch was provided by private agencies in the early 19th century. In 1930, the soup was replaced by milk. It was available to students on both, a paid and free basis. This program was extended to 60% of students by 1945-46. The cost of lunch was borne by the government and the parents.

The school meal also started in **Italy, Greece, and Hungary** before World War II. After this war, UNICEF assisted with this program. The menu for school lunch consisted of cocoa, a cup of milk, and raisin milk bread. The aim of this lunch was to provide 550 units of calories. The beneficiaries of this lunch program were selected on the basis of 14 health and economic parameters. Local authorities were providing school lunches in Ireland. It started a free milk program for sickly pre-primary schools. The School Act of 1933 authorized the 'Country Councils' to provide meals in national schools in specific areas. The meal cost was divided between local authorities and state governments. In Dublin, students were provided with cheese, jam, sandwiches of meat, and 330 ml of milk.

In 1906, **England** introduced its inaugural 'School Meal Act', offering students a basic meal comprising bread, jam, porridge, and a small amount of milk. Subsequent updates to the menu occurred in 1940, expanding lunch options to include salads, boiled vegetables, pudding, and steak. By 1943, the government revamped the program, tying it to school attendance and providing grants to schools. In 1945, local authorities were mandated to ensure school lunches were provided. Since 1979, the government has continued to support local authorities by covering capital and cooking costs for these meals.

Before the Second World War, women's organizations and philanthropists in **Brazil** took on the responsibility of feeding malnourished children through school lunches. In the 1950s, UNICEF began supplying powdered milk to students. Post-World War II, Bulgaria's Social Welfare Ministry partnered with UNICEF to initiate a school lunch program tailored to students based on their health and economic needs.

In **China**, the school lunch program began in 1957 with a pilot project implemented in five mountain schools. This initiative was later expanded to include fishing, mining, salt, minerals, and rural areas. Initially (1957–64), China received donations of wheat flour and milk powder from welfare foundations in developed countries. Subsequently, through the United States Public Law 480 'AID' scheme and support from the World Food Program (WFP), China began receiving wheat flour, vegetable oil, and milk powder. Some schools also offered hot soup, while others provided a substantial hot lunch featuring meat, fish, eggs, bread, peanuts, and soybeans cooked with green vegetables.

Korea was dependent on outside help for providing MDM from 1953 to 1973, and this program failed as it could not fulfill the nutritional requirements of students.

In **Norway,** MDM started in the early parts of the 20th century when a hot meal was provided to needy students.

In the **USA**, Congress passed the "Public Law-the National School Lunch Act" to promote the well-being of its students and encourage the consumption of nutritious agricultural commodities. The school lunch consisted of French fries, two tacos, and milk. This lunch was served in a short period of time so that their studies would not be hampered.

Singapore started a school lunch program for malnourished students in primary school in 1975. The menu consisted of wheat and soy blends mixed with milk. It was served as a beverage at recess. It also supplied ration to 30,000 students consisting of 500 grams of sugar, 110 grams of Ovaltine, 500 grams of full cream milk powder, 10 eggs, and 500 grams of groundnut fortnightly.

The **Philippines** started a school lunch program in 1997, which has always been part of ancillary services. The school adopted a feeding scheme called snack feeding, which mainly consisted of nutria buns. It received a donation from Catholic Relief Services and cooperatives. In this program, priority was given to underweight students. This bun was highly nutritious, and it has 300 calories. The meal was served in mid-afternoon with

mango soup, donated food, noodles, leafy vegetables, dried shrimp, or a small quantity of meat. The other meal consisted of boiled carrots, boiled bananas, other root crops, and mixed vegetable dishes. This meal was served two or three times a week; later on, this frequency was increased, and the beneficiaries increased to all the students.

1.3 Welfare State and Goal of Inclusive Development

It is the fundamental duty of a welfare state like India to provide basic facilities to its citizens, e.g., health services, education, housing, etc. In the 21st century, "inclusive development" is the new mantra of development. In inclusive development, a welfare state ensures that no one is left behind in the journey of development, i.e., access to primary public health care, quality education, and other essential services to ensure a quality of life. By inclusive development, the Human Development Index of a country is increased. So, inclusive development is a basic objective of a welfare state.

In India, governments have habitually neglected the needs of downtrodden people. It has taken a half-hearted approach to meet the basic requirements of the people. There is an inadequacy in social services such as schooling, physical development, safe water, medical care, sanitation, and electrical energy. Development is underpinned by education and health. A productive labor force will enhance growth. A productive labor force is produced by the integration of good education and health (Dreze and Goyal, 2003). Equitable distributions of income will also enhance the purchasing power of the poor to buy qualitative education and health care.

Article 25 of our constitution guarantees qualitative education and healthcare services, alongside provisions for individuals' and families' health, welfare, food, clothing, shelter, and other essential needs. Article 26 further enshrines the right to education, making basic education compulsory and free for all children below 14 years of age. These dual objectives can be effectively realized through initiatives like the Mid-day Meal Program.

1.4 Background of Mid-Day Meal Program in India

The Mid-Day Meal or Nutrition Support Program for Primary Education has a long history in India. The Madras Presidency pioneered the introduction of the school lunch program, in which cooked meals were provided in Madras City Corporation Schools in 1925. In this scheme, meals were provided in the form of snacks to students attending school in rural areas. MDM was provided in the age group of 7 to 9 years. In Kolkata, Keshava Academy launched tiffin items for male students on a payment basis in 1928. Although it did not include girl students in this scheme, it covered a major segment of the boys. Kerala state started providing similar kinds of meals for school-going students in 1941. The Mid-Day Meal Program started in Mumbai in 1942, Bangalore in 1943, UP in 1953, and the Eastern state of Odisa in 1962. Later, K. Kamraj, the Chief Minister of Tamil Nadu, introduced it on a large scale in the 1960s. In fact, he was inspired by a boy who was a cowherd. When the CM asked him the reason for not attending school, the boy replied, “If I go to school, will you give me food? I can learn only when I eat.” This conversation pointed the way to MDMP for the Chief Minister of Tamil Nadu (Sachdeva, M 2017).

In this scheme, many international agencies like WHO, UNICEF, and FAO assisted the Indian states with the Mid-Day Meal Program. The organization supported many Indian states in implementing the MDM scheme from 1950 to 1980. India started Mid-Day Meal Program for students 6 to 11 years of age in 1962–63 with the help of international agencies. In this regimen, students were provided food for 200 days and, per day 300 calories with 8–12 grams of protein.

In the mid-1980s, three states, viz., Kerala, Rajasthan, and Gujarat, launched MDMPs in which boiled meals were provided. In 1990-91, nearly a dozen other states implemented self-funded MDMPs for children up to the primary grades. MG Ramachandran, then CM of Tamil Nadu in 1982, named the mid-day meal a Nutritious Food Program. The Government of India took major steps to launch the Mid-Day Meal Program on August

15, 1995, to protect students from malnutrition, encourage enrollment, and reduce dropouts in the 6-11 age group. Only a dry ration was issued to the students at that time. The Supreme Court of India gave a historic judgment on November 28, 2001, and issued orders to provide hot meals to all primary school students.

1.5 Mid-Day Meal Scheme in India

India is known as one of the oldest civilizations in the world (www.knowindia.gov.in). Now it is the largest democracy and the largest populated country in the world (UN DESA Brief No. 153, Page No. 02, 2023). It is one of the fastest-developing countries, and at present, it is ranked as the 5th largest economy in the world. It is a nuclear power country with the 4th largest military power. But it does not have everything rosy; its Human Development Index is 132, its Global Hunger Index is 111 in 2023, and it has the highest number of malnourished children in the world (GHI 2023).

In India, about 20% of the population is under the age of 14 (Census 2011). Government schools have become an asylum for the lower socio-economic strata of society, and these children suffer from malnutrition (Sachdeva, M. 2015). These poor parents were unable to meet the nutritional requirements of their wards. So, it is the constitutional and moral duty of the administration to ensure nutritious and healthy meals in government schools. To address the issue of education and health, the Government of India launched the world's largest school lunch program (MDMP) on August 15, 1995, to improve educational attainment and nutritious mid-day meals in 2408 blocks of the country.

The Mid-Day Meal Program was implemented across the country in 1997-98. It is a centrally funded scheme. It is a 100% centrally supported system for the union territory. The three-phase program involved all local bodies, and government primary schools in all union territories and states. In the first phase, it covered all such primary schools located in Low Female Literacy (LFL) Blocks, Employment Scheme Blocks (EAS), and Revised Public Distribution System (RPDS) Blocks in India. The second phase expanded in 1996-97 to cover all low female literacy blocks. Phase three included all primary schools in

1997-98. Under this scheme, 100 grams of food grains were provided per student every day. MDMP was converted to hot-cooked nutritious food in September 2004. Under the MDM regime, primary schools were provided with a total of 300 calories of food and 8-12 g of protein. This program was extended to middle school students on April 1, 2008.

At present, this scheme is renamed as the PM Poshan Scheme that is the largest school meal program in the world. In this scheme, 11.80 crore students were the beneficiaries in India, and 25.95 lakh were cooks and helpers from weaker sections of society. (www.mdm.nic.in, retrieved on March 31, 2022). The performance in implementing the Mid-Day Meal differs as per the efficiency and sensitivity of the state governments. Many states, like TN and Gujarat, were role models for the effective execution of this program (Grover and Kaur, 2012).

Table 1.1 Average Calories Required for Boys and Girls or Recommended Daily Allowance (RDA) for Children 07-09 Yea₹ of Age (2020)

ICMR RDA	Required	Minimum Expected from MDM
Protein	41	8-12
Fat	15	2.25
Calcium	400	60-90
Iron	25	3.70-4.20
Folic Acid	100	15
Iodine	120	18-25
Total Calories	1925	450

Source: Indian Council of Medical Research 2020

Table 1.1 showed that the Recommended Daily Allowance is almost five times more than the nutrition value provided by the MDMP. It means that MDM is the least nutrition provider, and more supplementary calories are required. It indicates that the plight of poor student is not bright in this form of Mid-day Meal Scheme. India should make effective plans and make judicious allocations of resources so that the disparities in

educational facilities can be mitigated as soon as possible. It is essential because the existing social structure is not conducive to equal social and educational rights in India. Here, rich strata of society capture the optimal benefit from development schemes. Indian society has hierarchical divisions based on socio-economic parameters (PROBE, 1999; Ramachandran and Naorem, 2013).

Logo of Mid-Day Meal Scheme:

Figure 1.4 Logo of Mid-Day Meal Scheme

Source: www.mdm.nic.in

The logo of the Mid-day Meal Scheme was designed beautifully. In this logo, eight students were sitting together in a circle for a Mid-day Meal. This group was comprised of both boys and girls with social harmony. The orange color of the plates depicts the hot meal. Generally, the orange color also represents heat, energy, and the sun. On the bottom

side, a book was opened, which showed a strong correlation between study and Mid-day Meal. This logo also represents the blossom of a flower, which is a symbol of happiness, childhood, progress, good health, and a bright future for a new generation.

1.6 National Food Security Act 2013

Table 1.2 Nutrition and Food Norms per Child per Day: NFSA 2013

Sl No	Items	Primary	Upper Primary
1	Calorie	450	700
2	Protein	12 grams	20 grams
3	Food Grains	100 grams	150 grams
4	Pulses	20 grams	30 grams
5	Vegetables	50 grams	75 grams
6	Oil & Fat	5 grams	7.5 grams
7	Salt & condiments	As per need	As per need

Source: National Food Security Act 2013

NFSA 2013 ensures entitlements to nutritional needs for students who were below 14 years of age. It makes provisions for one Mid-day Meal for up to 8th class or students below the age of 14 in government schools. It recommended the above-mentioned quantity of food items for its beneficiaries.

1.7 PM Poshan Scheme

The central government has renamed MDMP and approved ‘Pradhan Mantri Shakti Nirman’ (PM Poshan), a centrally sponsored scheme in all government schools from 2021–22 to 2025–26. In this scheme, the hot cooked meal is provided to all children studying in Bal-Vatika, primary and Upper Primary Schools from class 1st to 8th studying in 11.20 lakh schools in India. The two main objectives of this scheme were (a) eliminating classroom hunger and (b) providing education by improving the nutritional status of students belonging to disadvantaged groups in society. The budget estimate for

2021–22 was 11500 crores. This scheme has an outlay of ₹ 54061.73 crore for the five years up to 2025–26. Besides it, the central government will bear the cost of food grains worth ₹ 45000 crore, increasing to ₹ 130794.90 crore (dsel.education.gov.in). The scheme has the following unique features, which will improve effectiveness and efficiency of the scheme.

(a) The scheme is extended to the students studying in Bal-Vatika's, government, and government-aided schools.

(b) Tithi Bhojans is encouraged, which is a community-sponsored meal in school.

(c) Kitchen gardens are developed, which provides nutritious vegetables to the students in three lakh schools. It provides first-hand experience of nature and the kitchen garden.

(d) A social audit of the scheme is mandatory.

(e) ‘Supplementary Nutrition’ is provided to the ‘Aspirational District', which has a high prevalence of anemia in students.

(f) Cooking competitions are planned from the school to the national level.

(g) Items for school meals are procured from the Women Self-Help Group and Farmer Producers Organization (FPO) so that locally-grown traditional food can be encouraged.

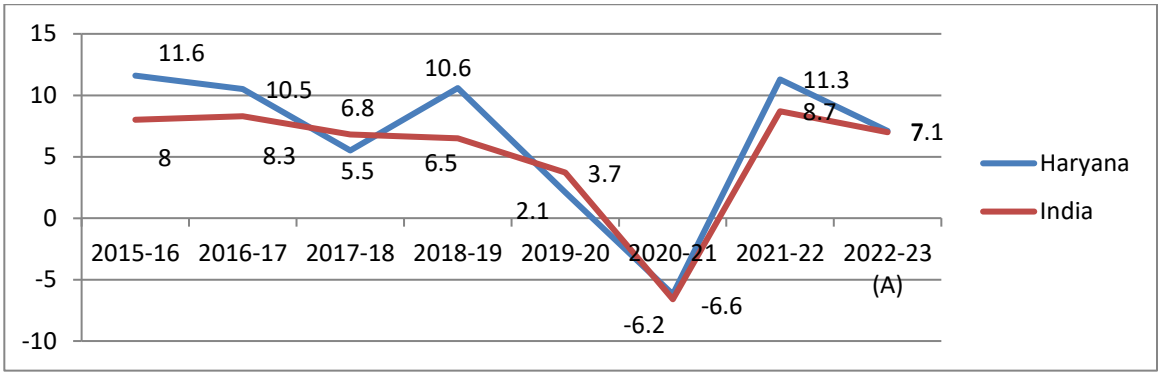
(h) Regional Institute of Education, eminent universities, and District Institute of Education and Training (DIET) representatives can inspect and monitor school meal progress.

1.8 Mid-day Meal Scheme in Haryana

Haryana was established on November 1, 1966. Its geographical area is 44212 km^2, which is 1.4% of India's land area, and its population is 2.54 crore (2011 census), which is 2.09% of India. Haryana is divided into six divisions and 22 districts. Although it is a

small and landlocked state, it is an economically developed state. Its estimated GDP for 2023–24 is $11.2 billion (Haryana Financial Statement 2023).

Figure 1.5 Growth Rate of GSDP of Haryana and India at Constant (2011-12) Price)



Source: Economic Survey Haryana 2022-23

Figure No. 1.5 showed that Haryana's GSDP has performed better than the country except in the financial year 2017-18. Its HDI ranking is 11th in 2022, and its Ease of Doing Business ranking was 1st in North India in 2022. Its contribution to defense forces was 10%, it had an amazing record in sports (1/3rd of India's medal tally), and it ranked 2nd in providing food grains in the central pool (Haryana Economic Survey 2022-23).

Table1.3 Health Indicators of Children in Haryana

Sl No	Term	NFHS-V Haryana	NFHS-V India	NFHS-IV Haryana
1	IMR	33.3	35.2	32.8
2	U5MR	38.7	41.9	41
3	Children under 5Years who were stunted	27.5	36	34.0
4	Children under 5Years who were wasted	15.9	19	30.2
5	Children under 5Years who were underweight	21.5	32	29.4
6	Children under 5Years who were Anaemic	70.4	67	71.7

Source: National Family Health Survey-V (2022)

Table 1.3 showed that Haryana has improved its health standards from NFHS-IV in U5MR, stunted, wasted, underweight, and anemic cases. However, its status deteriorated in IMR from NFHS-IV, and the state was lagging in anemic cases (70.4) from the national level (67). So, the state needs to do a lot for the improvement of the health of its children.

To solve this problem, in Haryana, MDMP was started in 44 educationally backward blocks of six districts (Bhiwani, Kaithal, Kaithal Mahendergarh, Hisar, Rewari, and Sirsa) at the primary level on August 15, 1995. Under this scheme, 3.0 kg (1.5 kg rice and 1.5 kg wheat) of dry rations were distributed to each student every month (Report of the 4th Joint Evaluation Mission on MDMP in Haryana, 2013). The MDMP was designed to provide a cooked meal to every public-school student in September 2004. A minimum of 450 calories with 8–12 g of protein was provided in this program. In the 2008–09 sessions, MDMP was expanded to include Upper Primary Schools. In Upper Primary Schools, 700 calories and 20 g of protein were provided (Dhankar, 2015).

In Haryana, 1448024 students from 11146 primary and secondary schools were using MDMP in the state. The details were:

Table1.4 MDMP Beneficiaries Strength of Students

Particulars	Govt. & Aided Schools		NCLP*		Local Body		Total	
			Gurugram & Faridabad		Ambala			
	School	Students	School	Students	School	Students	School	Students
Primary	8681	883125	57	2934	5	745	8743	886804
Upper Primary	2403	561220	0	0	0	0	2403	561220
Total	11084	1444345	57	2934	5	745	11146	1448024

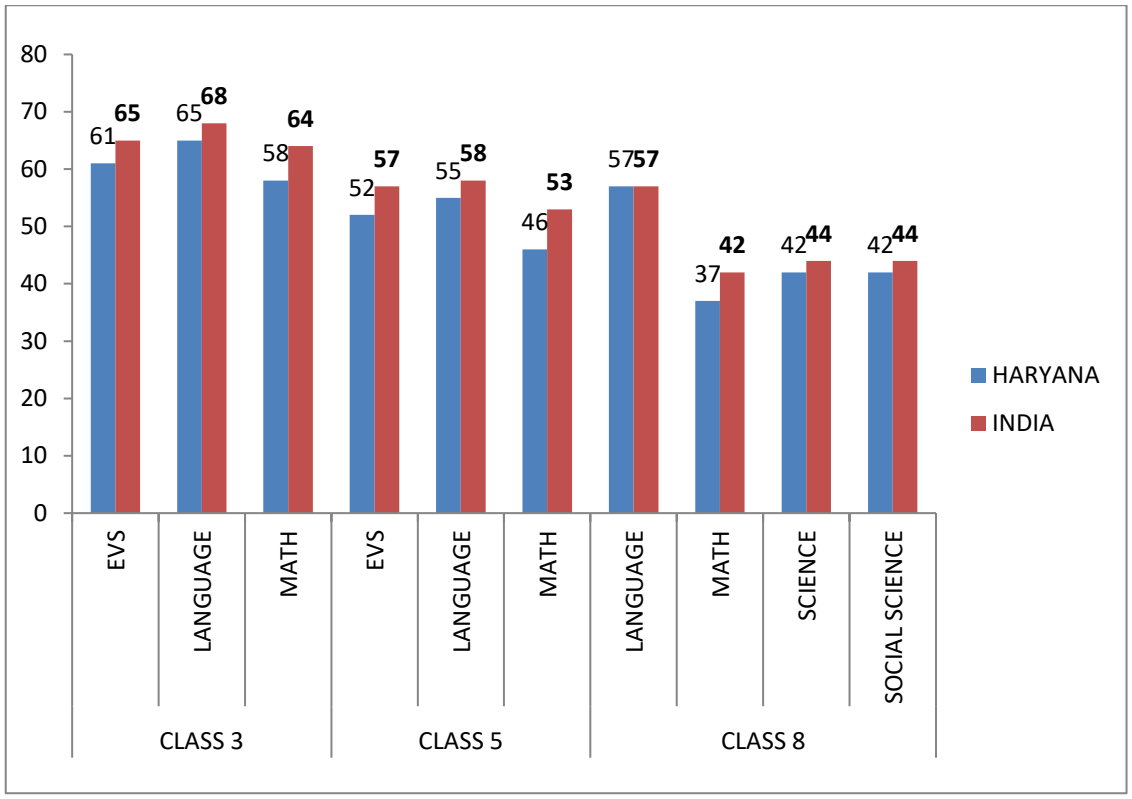
* National Child Labor Project Source: Economic Survey Haryana 2019-20

The Food Corporation of India provides free food grains to Primary and Upper Primary School students at 100 grams and 150 grams, respectively. The cooking cost per day for Mid-Day Meal (MDM) stands at ₹ 5.15 for Primary and ₹ 8.47 for Upper Primary School students, effective from October 1, 2022. This expenditure is shared between the Center and States in a 60:40 ratio. Cook Cum Helpers (CCH) receive an honorarium of ₹ 7000 per month, with ₹ 600 contributed by the Center and ₹ 6400 by the State. The budget allocation for Mid-Day Meal Program (MDMP) was ₹ 371.15 crore in 2022–23 and increased by 72% to ₹ 661 crore. In the financial year 2016–17, the MDMP budget was ₹ 293.74 crore, which rose to ₹ 661 crore in 2022–23, marking a 75% increase over the previous year's ₹ 430 crore budget (Economic Survey Haryana 2023).

The state government has directed school heads to choose the weekly menu from 20 given recipes. Besides that, the school provides 200 ml of milk in five flavors three times a week to all students (1-VIII). The state government provided milk on all school days (Haryana Economic Survey 2023–24).

1.8.1 Academic Achievements: The National Achievement Survey 2017 presented a gloomy picture of classes.

Figure 1. 6: Average Marks as per Classes and Subjects in Haryana



Source: National Achievement Survey 2017

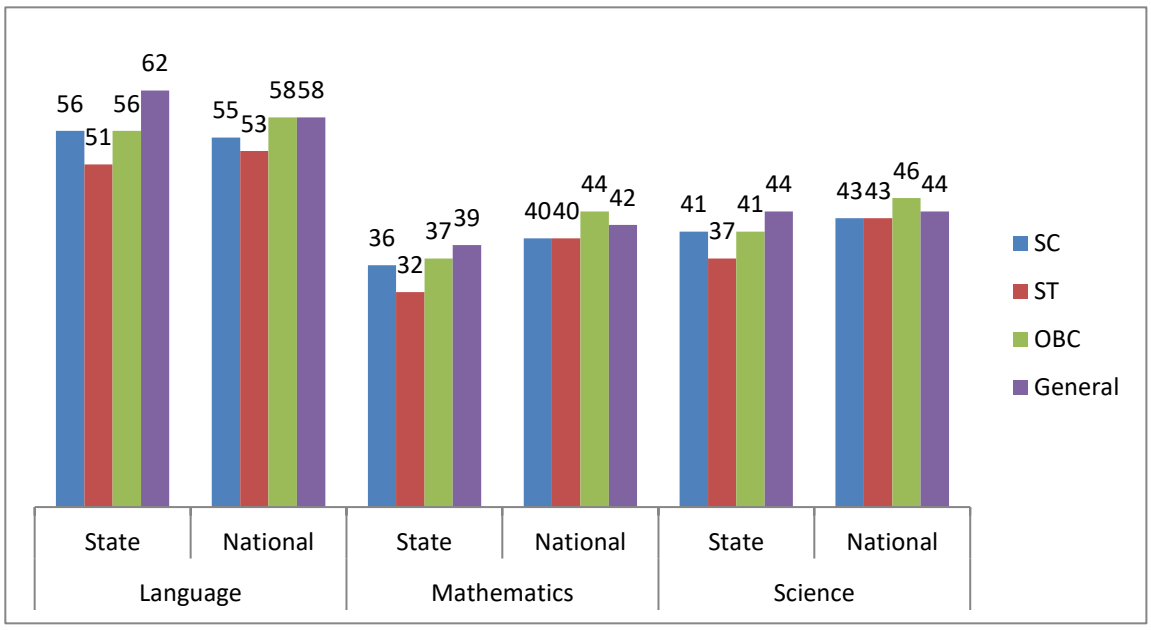
Figure 1.6 reflected that the students of Haryana were performing below the national average in all three subjects (EVS, Language, and Math) of 3rd and 5th classes, and four subjects of 8th classes.

1.8.2 Socio-Economic Status of Students in Haryana: Achieving a high quality of life hinges significantly on socio-economic conditions. In Haryana, there is pronounced structural inequality among various castes. Despite reservation policies and welfare schemes implemented by both state and central governments, the socio-economic status of Scheduled Castes (SC) and Backward Classes (BC) has shown improvement but still

trails that of upper-caste individuals in economic standing, living standards, educational achievements, and other key human development measures (Munshi, K. 2019).

Over the past four decades, Haryana has experienced rapid development, leading to shifts in socio-economic strata and evolving societal demands and expectations. The surge in employment opportunities, advancements in telecommunication, transportation, and information technology has enhanced mobility. However, the benefits of rapid development have predominantly accrued to the National Capital Region, exacerbating inter-district inequality within the state. The income disparity between the wealthiest three districts and the poorest three districts in Haryana stands at 4.38 times, highlighting a pressing concern (Ahmad, F. & Yadav, R. 2022).

Figure 1.7 Average Marks of Class 3rd in three Subjects in Haryana by Social Groups

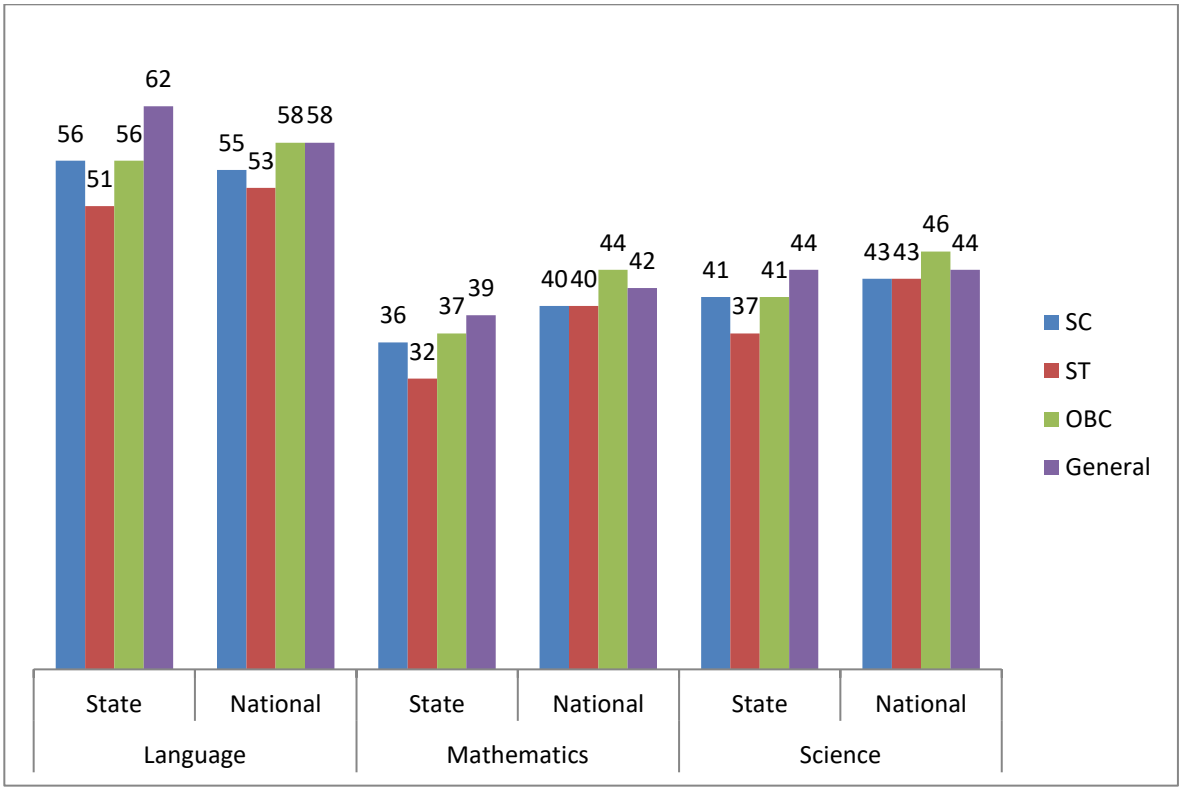


Source: National Achievement Survey 2017

Figure 1.7 indicated that students from OBC, SC, and ST categories showed low performance in language items at the 3rd-grade level, with ST and OBC students performing below the national average. In Mathematics, students from SC, ST, and OBC

categories demonstrated poor performance compared to their peers within the state, and all four categories performed below the national average. Similarly, in Science subject, students belonging to SC, ST, and OBC categories exhibited lower performance within the state, with all four categories performing below national averages.

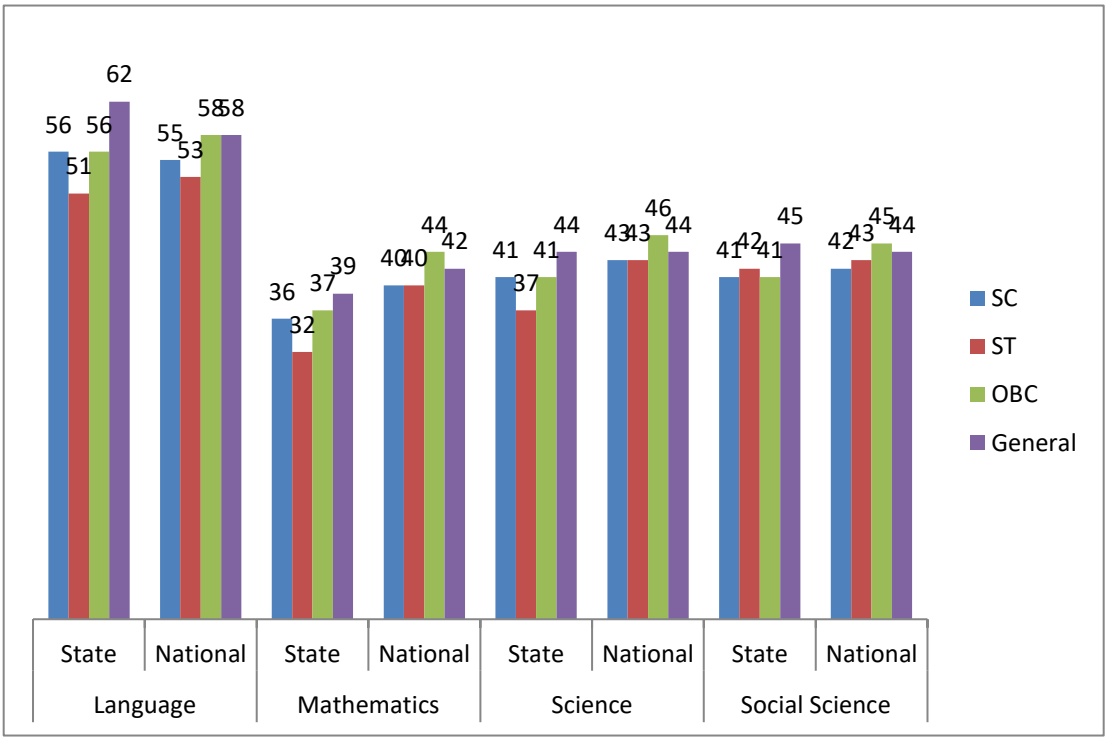
Figure 1.8: Average Marks of Class 5th in three Subjects by Social Groups



Source: National Achievement Survey 2017

Figure 1.8 showed that 5th-grade students from OBC, SC, and ST backgrounds in the state exhibit low performance in language subjects, with ST and OBC students performing below national averages. In Mathematics, students from SC, ST, and OBC categories also display poor performance compared to their peers within the state, with all groups performing below national averages. Similarly, in science subjects, students belonging to SC, ST, and OBC categories demonstrate weak performance within the state, with all three groups performing below national averages. These results highlight the substantial educational challenges facing 5th-grade students in the state across these subjects.

Figure 1.9 Average Marks of Class 8th in four Subjects by Social Groups



Source: National Achievement Survey 2017

Figure 1.9 indicated that 8th-grade students from OBC, SC, and ST backgrounds showed inadequate performance in language subjects within the state, with ST and OBC students performing below the national average. In Mathematics, students from SC, ST, and OBC categories exhibited substandard performance compared to their peers within the state, and all four groups performed below national averages. Similarly, in science subject, students belonging to SC, ST, and OBC categories demonstrated weak performance within the state, with all three groups performing below national averages. Additionally, in Social Science subject, students from SC, ST, and OBC backgrounds also performed poorly within the state, falling below the national average. Social group-wise data showed that the scheduled caste students were performing poorly at the inter-state and national levels in all three subjects and classes. MDMP is the panacea for enhancing the standards of students in health and educational achievements.

Table 1.5 Category-wise Nutrition Level in Haryana: 2019-21

Category	Weight for age/ Underweight		Height for Age/ Stunting		Weight for Height/ Wasting	
	Below - 3SD	Below - 2SD	Below - 3SD	Below - 2SD	Below - 3SD	Below - 2SD
SC	12.8	40.3	29.6	56.3	0.5	3.9
OBC	11.5	42.8	28.3	55.3	0.4	5.8
Others	8.2	28.0	19.9	44.6	1.1	5.7

Source: National Family Health Survey-V

Table No. 1.5 shown that children belonging to the SC category were more susceptible to stunting, wasting, and underweight in comparison with children belonging to other castes (upper castes). This shows a high magnitude of inequality in the medical standards of students.

Haryana lags behind in the health parameters and academic performance of its students. The situation worsens when compared to the national average. It lags behind almost all neighboring states. Students suffering from anemia get tired and are unable to concentrate on their studies. These students become underweight and wasted. In that case, these students will be a liability to society and the country. The IMR was higher in urban areas as compared to the national average in Haryana. Although the per capita availability of milk in Haryana is the second highest (1087 ml) after Punjab (1181 ml) in India (National Dairy Development Report 2019), despite this, Haryana is not able to improve the nutritional standards of its children.

1.9 Need of the Study

The issue of malnutrition and inadequate academic achievement becomes significantly concerning when intertwined with social stratification. An apparent paradox surfaces upon examining the Haryana State Profile, the National Family Health Survey-IV (2015-16), and the National Achievement Survey 2017. The dismal outcomes in health and academic metrics underscore that the Mid-Day Meal program is falling short of its objectives. Students from economically disadvantaged backgrounds performed even worse compared to their peers both within the state and nationwide. Therefore, there is an urgent requirement to evaluate the performance of the MDMP alongside a cost-effectiveness analysis.

In Haryana, numerous post-graduate studies have examined the 'nutrition' and 'satisfaction' levels of the Mid-day Meal Program, yet hardly any study have delved into a comprehensive socio-economic analysis of the scheme. Recognizing this gap, the researcher perceived the necessity to thoroughly investigate the MDMP and conduct a socio-economic analysis specific to Haryana to understand its operational dynamics. This study aims to provide a comprehensive overview of the MDMP's status in the region. Such an analysis would be instrumental in refining or reinforcing current practices and policies associated with the program. Since its revision in April 2004, the Mid-Day Meal Program has been in operation for 16 years, making it imperative to assess its efficacy at this stage. Given the heightened significance of the MDMP during the COVID-19 pandemic, a fresh survey is crucial to deeply analyze its status in Haryana, focusing on aspects like enrollment, attendance, retention, satisfaction levels, and the academic and physical achievements among beneficiaries from diverse socio-economic backgrounds.

1.10 Objectives of the Study

1. To ascertain the role of MDMP in increasing enrolment, attendance and retention among various socio-economic groups of students.
2. To analyze the contribution of MDMP in improving the educational attainment among various socio-economic groups of students.

3. To assess the satisfaction level of students, teachers, and parents about MDMP in government schools.
4 To examine the role of MDMP in improving the physical standards of students among various socio-economic groups of students.
5. To carry out comparative analysis of achievements of MDMP at Revenue Division level.
6. To suggest strategies for making the MDM efficient.

1.11 Definitions of Related Terms

Mid-day Meal Scheme: It is a school lunch program to improve the nutritional level, enrolment, retention, and attendance in government and aided schools for elementary school students in India.

Enrollment: It is the process of ensuring the attendance of students in a particular class at an educational institute in a given academic year.

Retention: The retention of students is holding them back in course work until completion.

Attendance: It is the marking of the presence of a student in a class.

Academic Achievement: It is the achievement of a long-term goal by a student in his given syllabus.

Socio-Economic Analysis: It is an analysis of students based on multi-dimensional parameters (like possession of assets, caste, education, per-capita income, etc.) for categorization in various classes.

Body Mass Index: It is a measure that shows the proportion between height and weight of a student's BMI measurement in children. It adjusts the children's stature and weight.

$$BMI = \frac{\text{Weight in Kg}}{(\text{Height in Meter})^2}$$

1.12 Delimitation of Study

The study was delimited as stated below:

1. The study was limited to elementary classes from 1st to 8th class in Haryana state. Cooked hot meal was provided since 2004, so data are analysed from 2004.
2. The study of views and perceptions expressed by students, teachers, and parents was restricted to only 12 out of 22 districts of Haryana.
3. The age of the children under study was 5 to 14 years.
4. Students, teachers' and parents' perceptions were taken from selected sample schools only.
5. The study was confined to the following variables: Enrolment, attendance, retention, scores in English; scores in Mathematics; scores in Science/EVS, Height, Weight, BMI, Body Mass Index and Academic Achievement Index.

1.13 Structure of Study

The present study is structured into five chapters. Chapter I provided a description of the Mid-Day Meal Scheme. Chapter II presented a comprehensive review of the literature on Mid-day Meal and their effects on students' enrolment, attendance, retention rate, and achievement in English, mathematics, EVS/science, satisfaction level of students' parents and teachers, physical standards of the students, and cost-effectiveness of Mid-day Meal. Chapter III highlighted research methodology, statistical tools for data analysis, and limitations. Chapter IV discussed the results and analysis of the data. The summary, conclusion, and implications of the study were discussed in Chapter V.

1.14 Conclusion

In a nutshell, the study touches on the many effects of the Mid-Day Meal Scheme on various socio-economic groups of students studying in Primary and Upper Primary Schools in Haryana. Despite Haryana's economic development, it has been a laggard state in child nutrition. It is the right time to evaluate the effect of the Mid-Day Meal Scheme, as it is the world's largest school lunch program and has passed the silver jubilee. The state needs to revive its Mid-Day Meal Program to boost child nutrition levels.

CHAPTER-II

Review of Literature

The literature review acts as a torch for work in the given area. It helps the researcher to identify the research gaps in the proposed research area. It also avoids duplication and replication of research. The available literature was reviewed in the context of this study under the following titles

2.1 Theoretical Framework

2.2 Empirical Studies

Empirical studies are reviewed under the following headings

2.2.1 Effects of MDM on Enrolment, Attendance and Retention

2.2.2 Effects of MDM on Academic Achievement.

2.2.3 Effects of MDM on Students, Teachers, and Parents Satisfaction.

2.2.4 Effects of MDM on Nutrition and Physical Development.

2.2.5 Effects of Mid-Day Meal on Various Socio-Economic Groups

2.2.6 Cost-Effectiveness Analysis of MDM

2.2.7 Research Gap

2.1 Theoretical Framework

A theoretical framework is comprised of related concepts, definitions, and limitations for a particular study. It describes the broader area of knowledge under study. Selection of any theory depends upon its ease of application, explanatory power and its appropriateness. A theoretical framework connects the researcher to existing theory that is used for particular study. It helps in validating or refuting the theoretical assumptions. It limits the scope of the relevant data for the particular study. Following theories are related to Mid-day Meal Scheme in India.

Becker (1960): Human Capital Theory

It was primarily developed by Gary Becker and Theodore Schultz. Becker is credited with formalizing human capital theory by his book' Human Capital' in 1964. His main emphasis was on the role of education and training in increasing productivity and improving the potential of individuals. He equated investment in human capital to physical capital. On the other hand, Theodore Schultz emphasized the importance of human capital in economic development and role of education in improving the economic productivity of a person. Together their work emphasized the role of investment in the education sector, training, and health for increasing the economic growth and higher productivity of an individual. The theory predicts a positive correlation between the level of education and individual income. Quality education leads to better employment prospectus and higher wages. Human Capital Theory also emphasizes the role of quality education in social and economic mobility. It helps an individual to improve their socio-economic status and reduce inequalities.

In a nutshell, the Human Capita theory emphasizes investing in human resources as a means to achieve economic prosperity and individual advancement.

MDMS very much align with Human Capital Theory in fulfilling the following objectives

1. Enhance school attendance and retention: poor families are lured by hot cooked meals served to their wards. It works as an incentive and students do not leave school because of hunger. It helps in improving school attendance and retention rates. So it is a direct investment in the educational attainment of the population.

2. Improving Nutritional Status: It is one of the important objectives of MDMS. It is crucial for the cognitive and physical development of students. A nourished will perform better physically and academically. Students are less prone to disease and other ailments.

3. Breaking the Cycle of Poverty: MDMS is a boon to poor families as it saves them time and money for preparing lunch. An educated person with good health prospectus has

a high chance of securing better employment opportunities. It will lead to improved economic prospectus not only for family but country as a whole.

4. Social equities and Inclusion: MDMS works for social equities and inclusion by enabling the poor to fight against poverty. It provides a level playing field for poor students to compete with their more affluent peers.

Thus, a Mid-day Meal scheme is grounded in Human Capital theory which emphasizes the long-term benefit of investing in education and the health of individuals to increase their productivity and overall economic growth. It is assumed that a child's formal education is a critical instrument for improving his productive capacity.

Sen, A (1999), Development Theory

According to Amartya Sen, in the context of this theory, development refers to promoting individual freedom and enhancing capabilities. Sen has raised concerns about using indicators such as GDP as development metrics, arguing that they fail to capture important aspects of quality of life and overall human well-being. Development is closely tied to the freedom and empowerment of individuals, as well as their capacity to acquire new skills and knowledge. This encompasses access to high-quality education, active participation in social, political, and economic spheres, and the availability of adequate healthcare services. Development necessitates a comprehensive approach that goes beyond purely economic considerations, taking into account political, social, and cultural dimensions. Sen's theory plays a crucial role in shaping global development policies such as the human development index (HDI), which assesses factors like education, life expectancy, and per capita income. The author suggests that education is central to the process of integrating growth and development and, thus, to the progress of people. The authors flag the very low standards of education in India, revealed both by student performance in international tests such as the program for international student assessment and also by independent audits of learning in our schools. They identify the

neglect of education by international standards in India, both in terms of coverage and quality.

In a nutshell, Sen's approach integrates social and ethical considerations into development, discourses, equities, justice, and human dignity. Mid-day Meal Scheme provides dignity to poor students and increases their capability by providing them good education and training. It is especially beneficial for the students belonging to low socio-economic groups in society.

2.2 Empirical Review

2.2.1 Effects of MDM on Enrolment, Attendance and Retention

Philip (2000) examined in a study titled 'Ending Malnutrition by 2020: An Agenda for Change in the Millennium' that healthier children live longer, live happier lives, and do better in school. The school breakfast program increased the daily intake of nutrients and brought about a significant improvement in academic results and the psychosocial functioning of students. Free lunch for students led to a drastic improvement in the USA and Japan as their literacy rates increased to 100 percent.

Darez and Goyal (2003) stated in the study 'Future of Mid-Day Meal' that a well-organized Mid-Day Meal program inculcated good habits (praying, hand washing, not wasting food, respecting classmates, cooks, and teachers), good hygiene, the importance of water conservation, the importance of a nutritious diet, learning to share, etc. An unhealthy lunch program can do more harm than good. The nutrition goals of the MDM were multifaceted, from eliminating hunger in the classroom to the healthy growth of schoolchildren. The students come by themselves every day and eat whatever they were provided. This allowed them to not only increased calorie and protein intake but also provided a nutritional supplement. There was another important way in which MDM contributed to the liberation of working women. Furthermore, when students received a lunch in school, mothers did not have to provide food at home. It is the responsibility of the welfare government to take constitutional measures to mitigate the menace of malnutrition. The right to food should be considered the right to nutritious food under

Article 47 of the Constitution of India. Provision of good food in schools increased the attendance and retention rate of students.

Kumar and Bhawani (2005) explored in their study 'Managing Child Malnutrition in a Drought-Affected District of Rajasthan: A Case Study' that childhood malnutrition is a very serious problem that can affect an individual for life; it could reduce his productivity and make him vulnerable to serious diseases that shorten his lifespan. Malnourished children have 3 to5 times higher mortality than well-nourished children. School meals were best designed at the center level to provide universal access to programs. These specific intervention programs can be combined with micronutrient meals. The reason for providing cooked food was to increase the nutritional level of the students. The lure of hot food makes the school environment friendly and supportive. It increased the enrolment, attendance and retention of students. Nutrition monitors used to check whether the students have washed their hands before lunch.

Sharma, S. & Passi S.J. (2006) stated in the study 'Study Supported by Municipal Corporation of Delhi' that mid-day meal was an old concept in India. It was started in the Madras Corporation area in 1925. Childhood is a crucial period for physical and mental growth. Nutritional food is essential for optimum growth. In the absence of nutritious food, many health-related issues take place like absenteeism and increment in drop out ratio. The MDMP was launched to provide nutritious food to poor students so that their physical and cognitive development could be ensured.

Suvarna (2007) explained in the study **'**Nutritional Status, Level of Intelligence, and Participation in Extracurricular Activities of School Children' that documented in India that $1/5^{th}$ of the population was children between 5 and 14 years; this age group included primary and secondary schools. It was also stated that children were the wealth of any nation because they formed one of the most important part of the population. MDMP has achieved its educational objective in Karnataka state by increasing the retention rate and

lowering the dropout rate. The MDMP could not meet the nutritional target. It was surprising that the retention rate of girls was higher than that of boys.

Kumar, A (2008) considered in the study 'Teacher's Perception towards the National Program of Nutritional Support to Primary Education (Mid-Day Meal Scheme)' that the enrollment of students in primary schools was not very encouraging. About 40% of teachers stated that the attendance of students increased. It was also found that valuable resources were wasted due to the dropout of students belonging to low socio-economic classes in government primary schools. These dropout students should be brought back to school.

Sarah (2009) explored this in a study titled 'How Effective Are Food-for-Education Programs?' That school feeding scheme could increase the level of health standards, nutrition level, and health through food availability. This nutrition level decreased if the family's income was reduced. Schools should increase their capacities so that they can deal with the overcrowding in schools and the learning environment. The school lunch was provided in primary schools in the UK. It provided energy from fat and sugar, minerals, and vitamins. Author Rare commended the idea that schools should provide fruits and vegetables to students. It should reduce saturated fat, which is injurious to their health. Due to the economic slowdown, the number of dependent students on the school lunch program increased.

Chauhan, SD (2011) examined in the study 'A Study of Mid-Day Meal Program in the Government Primary Schools of the Gwalior City of Madhya Pradesh' that 'Primary Education' satisfied the most basic needs of a person. Mid-day Meal Scheme, which was part of making the school environment more attractive so that they perceive it as their second home. The combination of hot-cooked food and packaged food could increase the contact time between the teacher and the students, which will further increase their academic performance. MDMP has achieved success in alleviating hunger, and most of the students enrolled in government schools belonged to the poorest families. For these

BPL children, it was sometimes not possible to eat one square meal a day. At least for some of them, lunch was the only meal they had in the day.

Kumar, B (2012) examined in their study, 'Responsiveness of Mid-Day Meal in Haryana: An Analysis,' that education was the cradle of civilization. Brain development requires nutritious meals. MDM was designed for the poorest children, especially girls. If this scheme is implemented with social responsibility, then government money can be utilized effectively, and it will become more participatory. Economically richer states like Punjab and Haryana have 40–42% of malnourished students, which was a matter of concern because students were affected by anemia. A mid-day meal has the potential to increase enrollment and decrease dropout. It will further improve educational attainment. Then the objectives of human resource development will be fulfilled.

Thakur, P (2013) examined in the study 'Assessment of Children Availing Mid-Day Meal Scheme' that school lunch programs provided a conducive environment for learning because attendance of students increased. It provided nutritious meals to the students. It was also found that the mid-day meal not only helps the child get a nutritious meal but also helps other family members who are left with more food to eat. The mid-day meal attempted to redistribute scarce resources towards the targeted beneficiaries.

Yadav, P (2013) examined in a study titled 'Impact of Mid-Day Meal Program on Nutritional Status and School Attendance of Girls in Allahabad.' that after the introduction of MDM, the attendance of students increased but not the enrollment of the students. The attendance of girl students increased more than that of boys. After the execution of MDM, school attendance has increased by 100%. About 52% of teachers stated that the concentration power of the students increased. About 70% of parents stated that attendance and the quality of education improved after the MDM launch. In about 75% of schools, enrollment and attendance have improved in the last 3 years. Contrary to eating, 92% of parents opined that they would send their children regularly to school even if there was no MDMP. Enrollment among girls was much lower than that of boys. These

girls were deprived of the benefits of MDMP in the country. The 100% enrolment could be ensured by the help of the government, private sector, and community.

Verma, R (2013) found in the study 'Mid-Day Meal not a Sufficient Deal' that enrollment in the 6 to 14 year old age group continued to be very high following the introduction of the MDMP. But the dropout rate among girls in the 11 to 14 year-old age group has increased. MDM has a positive effect on enrollment, attendance, and retention rates, which is a prerequisite for a higher level of academic performance for BPL families residing in rural areas. MDM mitigates the cost of schooling. It offers free nutritious meals that boost the enrolment and attendance of a child by addressing the twin factors, e.g., health and finance. The previous students reported that malnourished and sick students' attendance is very low. MDM is a vital means of increasing enrollment, attendance, and retention.

Sahoo, P (2013) stated in a study titled 'A Descriptive Study on Effectiveness of Mid-Day Meal Program in Selected Government Primary Schools of Bhubaneswar Odisha' that schools need to have a separate cooking place and a place for serving food. Student enrollment was not increasing due to private English-medium schools. MDM is the largest scheme to pull students into the education stream by giving them nutritious meals to make them worthy and healthy citizens of India.

Garg, M and Mandal, KS (2013) explored in their study 'Mid-Day Meal for the Poor, Privatized Education for the Non-Poor' that the enrolment of the child was the biggest criterion for ensuring universal education among the disadvantaged groups of society, which was dismal representation in education. Poor parents cited MDM as an important factor in the schooling of their wards. They considered MDM a subsidy for the cost of schooling. Hence, MDM has boosted the school participation of children belonging to marginalized sections of society. The other major advantage of MDMP is that it has lowered the age of enrollment from 8 to 10 years to 5 to 6 years. Besides, it has also contributed to an increase in the retention rate of students. The quality of academics in

government schools was going down; that's why parents from the general category were migrating their wards to private schools, ignoring the MDM benefits. That's why the enrollment ratio of students belonging to the general category was coming down.

Nambiar and Desai (2014) concluded in their book 'Mid-Day Meal Program, Past, Present, and Future' that MDMP is the biggest welfare scheme and was seen as a method of improving enrollment. At the same time, it could improve the physical standards and social integration of students. The students and parents concluded that MDM was very effective in reducing student dropouts.

Tarananum (2014) explored in the study 'Effective on Mid-Day Meal Scheme on Enrolment and Retention in Primary Schools of Western Uttar Pradesh' MDM has a tremendous effect on parents' aspirations to acquire quality education for their children. It is essential for the improvement of MDM that accountability and responsibility be fixed. Evidence from the last three decades (1983–2012) showed that childhood malnutrition was a very serious problem that affected an individual for life. It is also stated that it is the government's own responsibility to render social and food protection to its citizens. The main objective of the mid-day meal is to provide supplementary food, but it has become a substitute for lunch for poor students. The MDMP is designed to mitigate malnutrition and food insecurity among students. It could increase the attendance and retention of the students, and it could remove poverty from the masses by feeding their wards.

Singh, S and Gupta, N (2015) explored in a study titled 'Impact of mid-day meals on Enrollment, Attendance, and Retention of Primary School Children.' Recent economic research clearly documented the program's positive impact on enrollment, attendance, retention, and nutrition. Tamil Nadu is a state where we can learn the practices of quality and responsibility. MDM is more successful in terms of regularity and scale. It finds that there is a significant impact on the enrollment of children, especially children from disadvantaged groups. From a child's perspective, the lure of hot food makes the school

environment more child-friendly. MDM is a good instrument for encouraging students to attend school. As the food supply was linked to the attendance of the students, there was the possibility of inflating the data on attendance.

Kaur, M (2016) analyzed in the study 'Mid-Day Meal Scheme: An Analysis before and after' that when this scheme was launched, enrolment increased, but now again the rate of enrolment has come down. There is no significant fall in the dropout rate. The attendance of girls' students increased more than that of boys. MDMP is provided to only enroll students for 200 days of the year; this food is given only once every 24 hours, which is insufficient to provide an adequate nutritional level.

Roy, S and Roy, DR (2018) reported in the study 'Impact of Mid-Day Meal on Enrollment, Attendance, and Retention Rate of Primary School Children in Jalpaiguri District, West Bengal, India.' that the potential benefits of MDMP were primarily increased enrollment, attendance, and retention. Enrollment statistics increased, and dropouts decreased. The MDMP has served the important purpose of increasing enrollment and attendance because it is convenient for guardians to convince children to go to school, and, in turn, they are retained in school. The quality of MDM has declined because due attention is not paid to its preparation as teachers are involved in various other duties. Enrollment rates have improved, but the standard of academics has decreased.

Singh, N (2019) reported in the study 'Evaluation of Mid-Day Meal Program on Grass Root Level in India' that MDMP led to an increase in retention. It helped supplement the nutritious meal on the students' plates. MDMP was one of the best and most useful schemes. It became more successful as it increased student enrollment and attendance. This increased attendance enhanced the burden on the existing school system. If nutrition levels increase, enrollment will increase, dropouts will decrease, and test scores will improve.

Conclusion: It concluded that MDMS has significant impact on the enrollment, attendance and retention of students, in government run schools. From a child's perspective, the lure of hot food made the school environment more child-friendly. MDMS mitigates the classroom hunger and students do not leave school after the break for lunch at home.

2.2.2 Effects of MDM on Academic Achievement:

Dreze and Goyal (2003) found in a study titled 'Future of Mid-Day Meal' that school meal improved students' academic performance because "classroom hunger" reduced the concentration power of students. Mid-day meal inculcated intrinsic educational values in students apart from the routine learning process. It educated students about a balanced diet, good hygiene, hand washing, self-discipline, and social integration. Mid-day meal reduced the gender gap in enrollment and attendance. There was a greater attendance of girls than boys. The combination of a hot cooked meal and a pre-packed food meal could increase the contact time between teacher and student, which increased the student's academic performance.

Kumar, (2008) explored in his study 'Teacher's Perception towards the National Program of Nutritional Support to Primary Education (Mid-Day Meal Scheme)' that a hungry and ill child was not expected to learn. The majority of teachers felt that MDMS was helpful in ensuring universal education in the country. The majority of the teachers (91%) believed that students learned hygienic values in the schools. It was found that only 50% of students were able to write, 48% were able to read a passage, and 15% were not able to write.

Ghosh, M (2011) examined in the study 'Does the Mid-Day Meal Scheme Reduce the Incidence of Child Labor?' that **g**ood academics could remove the prevalence of child labor in the economy. As educational unemployment rose, the effectiveness of the Mid-day Meal Scheme (MDMS) and the educational achievement of students declined. The mid-day meal program could improve the academic performance of the students.

Thakur, P (2013) analyzed in the study ‘Assessment of Children Availing Mid-Day-Meal Scheme' that educational achievement was influenced by physical development, so school health programs should be strengthened. He found that 27.34% of students secured C2 grades in their first-term examinations. Students’ academic grades were significantly affected by two factors: the location of the school and the social and economic scale. This study found a direct relationship between scholastic achievement and the nutritional level of the students. Malnutrition has primarily impacted students from poor social and economic backgrounds, leading to lower academic achievement.

Verma (2013) stated in a study titled 'Mid-Day Meal not a Sufficient Deal’ that the state government should not concentrate only on the enrolment of students but also focus on quantitative and qualitative aspects of education. MDM has a long-term effect on the physical standards of the students and, in the short run, affected their memory, attention, and learning. A hungry student was not able to concentrate on her learning. So, Mid-day Meal was an important program to mitigate hunger and create a conducive environment for learning. Many students belonging to poor families come to school without breakfast, as it was not in practice in their homes. The Mid-day Meal Scheme (MDM) has the potential to foster comprehensive development within the school system. It could develop better teaching facilities, better infrastructure, community involvement, school health services, etc. There should be no compromise on the primary objective of education.

Sharma, R (2015) explored in the study ‘Government Initiative for Promoting Education Empowerment of Muslim Minorities’ that malnutrition has a much stronger effect on mortality. It causes long-term negative effects on mental, physical, and social development that prevented students from availing learning facilities in schools. There has also been an extension of the MDM program to Madrasas and Maqtabs for the educational advancement of minorities.

Arumugam (2015) examined in the study 'Mid-Day Meal Scheme in Chennai City, Tamil Nadu: A Study’ that the field philosophy of MDM was based on the fact that

hungry students cannot study satisfactorily. The MDMP has increased the level of hygiene and nutrition education. A hungry student is an academically poor student; unable to concentrate on his studies. School lunch was a panacea to fight classroom hunger and helped in better learning. Nutritious food positively affected learning. Mid-day meal triggered holistic development of the education system, such as better learning facilities, school health programs, and community participation.

Raman, R (2017) explored in book explored ‘School Shiksha Aur Mid-Day-Meal Yojna, Granth Academy, New Delhi’ that children got mental development from their immediate environment, i.e., these skills enabled them to face challenges in school and in future life. Most students in India reached school on empty stomachs. In this state, they could not concentrate on their studies, and those who came to school after breakfast were hungry at noon. So, it was essential to feed and keep them in school for better learning.

Lone, AQ (2017) explored in the study ‘Effect of Mid-Day Meal Program on the Development of Nutritional, Intellectual, and Social Parameters of Selected School-Going Children' that nutrient deficiencies were alleviated by the mid-day meal, and therefore non-mid-day meal recipients did not show significant differences in social and intellectual development. The study stated that all parameters, viz., intellectual, nutritional, and social development, were linked to the holistic development of the student. It was found that there were insignificant variations among students taking mid-day meals and students without MDM in all aspects of intellectual development except reasoning and memory. The reason for the poor academic performance could be irregular attendance, poor quality of meals, a smaller number of teachers, or other infrastructural deficiencies.

Kumar, D (2017) revealed in the study 'Mid-Day Meal Beneficiaries in Primary Schools of the Urban Area of Kurukshetra (Haryana): A Clinical Profile’ that clinical profiling of the students revealed that the incidence of anemia was very high, especially in the girls’ student in Kurukshetra district. The general well-being of the students was average. So, it

could be concluded that the Mid-Day Meal Scheme was a boon to students belonging to the lower strata of society. It brought these students into the mainstream of education. Although MDM was not sufficient to mitigate the problem of academics and malnutrition, the government must provide a nutritious diet to these students.

Conclusion: Malnutrition predominantly affected students from impoverished social and economic backgrounds, resulting in lowered academic achievements. Hungry students tended to struggle academically due to difficulties concentrating on their studies. The Mid-day Meal served as a solution to combat classroom hunger and assisted students in improving their learning outcomes. Nutritious food had a positive impact on learning. MDMS successfully integrated poor students into the mainstream educational system.

2.2.3. Effects of MDM on Students, Teachers and Parents Satisfaction

Afridi, F (2005) concluded in the study 'Mid-Day Meals in Two States: A Comparison of the Financial and Institutional Organization of the Program' that the new MDMP has a better standard, offers more variety, and is more popular with households. Most students and parents disliked Daliya. Parents reiterated the need to improve the level of Mid-day Meal, as it has a significant impact on the education and health of students. The teachers (87.14%) stated that MDM was providing a balanced and nutritious diet to students. It could protect students from malnutrition and diseases. About 58.57% of teachers were satisfied with the standard of meals provided. On the other hand, the majority of the teachers stated that a hot-cooked meal was liked by the majority of the students. Most teachers stated that they were not happy about the MDMS, as they considered it a burden and a waste of precious time for teachers and students. Students should be provided with fruits and vegetables at mid-day meal to make them more nutritious. The mid-day meal program is to eliminate classroom hunger.

Kumar (2008) examined in the study 'Teacher's Perception towards the National Program of Nutritional Support to Primary Education' that in India, 70% of teachers believed that MDMP was helping in the universalization of primary education, and

58.57% of primary school teachers were satisfied with the quality of meals provided under MDMP, and found that about 92% of students rated Mid-day Meal as average or above average. Only 25% of parents and 10% of students stated that MDM was insufficient for the growth of a child. The quality of MDM was not good. Students should be provided with seasonal fruits. The total calories required per child should be revised.

Narula (2008) examined in the study 'Best Practices Adopted in Mid-Day Meal Scheme: A Case Study of Haryana' that in Haryana state students were satisfied with the standard of MDM being served. This scheme has provided employment to underprivileged women in society. It was also found that only a few students took home prepared food to school, and some students in the neighborhood go home for lunch when something special is prepared at their home. The availability of water facilities was found in all schools. Approx. 74% of parents and 85% of pupils were satisfied with the infrastructure in schools; 91% of pupils were satisfied with the offer of a Mid-day Meal at the 2nd level of elementary school; and 100% of pupils were satisfied with the lunch and feeding program in primary schools. About 75% and 77% of parents were satisfied with the Mid-day Meal Scheme at primary and upper primary schools, respectively, and all 100% of teachers were satisfied with the arrangement of Mid-day Meals in both categories of schools. About 100% of students, parents, and teachers were satisfied with the amount served in both categories of schools. Based on the quality of the Mid-day Meals, only 74% of pupils were satisfied in primary schools. About 78% of parents and 74% of parents were satisfied with the quality of lunch in government schools. Based on the variety of the menu, 81% of primary school students and 73% of primary school students were satisfied. About 77% of parents were satisfied with the variety of the menu in both categories of schools, and 78% of students demanded changes in the menu.

Grover and Kaur (2010) examined in their study, 'Does the Mid-Day Meal Scheme Reduce the Incidence of Child Labor?' that the majority of students were satisfied with the Mid-day Meal Scheme. Most of the students (73%) said that the taste of the Mid-day Meal was good, and 76.6 percent of the students were satisfied with the flavor of the

Mid-day Meal. The majority of teachers (88%) were satisfied with the Mid-day Meal. There was insignificant variation between the levels of satisfaction of girls and boys; of course, other factors such as the job of parents, caste, source of income, family size, literacy level of parents, etc. were significantly related to satisfaction with the Mid-day Meal.

Chauhan (2011) contends in the study 'A Study of Mid-Day-Meal Program in the Government Primary School of the Gwalior City of Madhya Pradesh' that students in the range of 55% to 100% consumed Mid-day Meal regularly. The main cause of consuming less Mid-day Meal was the low quality of food, and parents did not permit their children to eat Mid-day Meal, etc. The majority of the teachers felt that packed food should be provided to students because they were not satisfied with the quality of the food being provided. Most of the parents, teachers, and students felt that the standard of MDM given by the school was better than that of the NGOs.

Thakur (2013) examined in the study 'Assessment of Children Availing Mid-day Meal Scheme' that 35.71% of students did not like the taste of Mid-day Meal. Only 3.53% of students took home-prepared meals. MDM was taken by 62.56% of students regularly in a week. It was found that 60.13% of the students took both MDM and home-prepared meals. Only 35.71% of students did not like Mid-Day Meal recipes. The present study found that 36.33% of students were dependent on Mid-day Meal and were not eating at other eateries. The majority of the students (52.35%) wanted that fruits should be included in their diets, but 17.5% of the students wanted to increase the quantity of MDM. Only 62.56% of students took MDM regularly. Researcher further found that 36.33% of students were only dependent on the MDM, and the majority of the students (52.35%) wanted that fruits should be included in the MDM.

Garg and Mandal (2013) explored in their study 'Mid-Day Meal for the Poor, Privatized Education for the Non-Poverty' that even SC girls got better food at home than Mid-day Meal in schools. The central government has allowed states to distribute dry rations by

home delivery and transfer the money for cooking costs to the accounts of students during the COVID period. Regarding the quality and menu of MDM, 72% of the surveyed students and 76% of the surveyed parents were satisfied.

Verma (2013) concluded in the study 'Mid-Day Meal Not a Sufficient Deal' that Mid-day Meal was not enough to feed the students, but the government should take effective steps to improve the standard of Mid-day Meal. Students came to school to get food, but many times unwanted incidents took place related to unhygienic conditions, adulteration, and finding pesticides in the meal. In some incidents, students died by consuming poisonous meals that were supposed to nourish them. The majority of the parents were unsatisfied with the standards of MDM provided by the schools. About 75% of headmasters admitted that the quality of the grains was not up to par.

Bhathal, P (2015) examined in the study 'A Critical Study of Mid-day Meal Scheme in India with Special Reference to Punjab' that food grains delivered for MDM were of bad quality. The quality of the Mid-day Meal has reduced because due attention was not paid to the preparation of the Mid-day Meal as teachers were involved in various other duties. Most parents and teachers felt that students got everything for free under the MDMS. So there was no reason to ask questions about its weaknesses and shortcomings. In most schools, the quality of Mid-day Meal was not regularly checked to ensure good food quality. Some teachers saw lunch as a distraction from learning and teaching.

Dhankar, WS (2015) concluded in the study 'Evaluating the National Mid-Day Meal Program with Social Reference to Haryana' that 73.3% of parents preferred to continue the Mid-day Meal Scheme with some modifications. On the other hand, 40% of students and their parents reported the poor quality of food served to them. About 68% of parents felt that the MDMP failed to provide the required vitamins and proteins. A study found that 73.33% of parents preferred to continue MDMP with some modifications. On the other hand, the majority of the students reported the poor standard of the meal served to them. About 68% of parents felt that the MDMP failed to provide the required vitamins

and proteins. About 63% of the teachers reported that the MDMP improved the nutritional status of poor students. Students have developed the habit of eating timely. Only 50% of parents were satisfied with the nutritional standards of the meal. In this, 26% of parents emphasized including milk, kheer, fruits, cheese, etc. in food.

Sharma, R (2015) examined in the study 'Mid-Day-Meal Scheme in India: The Road Ahead' that across the country, poor quality MDM was being served. Good quality food was not served according to the minimum standard prescribed by the court. Instances have been found where food was not served on time. The supply of food grains was irregular. The present study found that senior students were in the habit of skipping the Mid-day Meal, ignoring the fact that this meal was very important in respect of their overall nutrition.

Sachdeva, M (2017) examined in the study 'Nutritional Status of Mid-Day Meal Beneficiaries in Primary Schools' that MDM was provided by schools as per the norms set by the government but lacked important micronutrients. The study found that all teachers were satisfied with the standard of the MDM program. Students were also satisfied and appreciated MDMP in schools. Students called for the inclusion of sweets in the MDM menu. Teachers felt that MDM was beneficial for students. It has a positive effect on the physical growth and cognitive development of pupils. Health parameters have improved due to MDM in schools.

Singh, N (2019) stated in the study titled 'Evaluation of Mid-Day Meal Program on Grass Root Level in India' that the majority of the students and parents were happy about the standard of the Mid-day Meal being supplied, but some parents complained about the quality of the meal. The majority of the schools received poor-quality food grains, and even safe drinking water was not available in the schools. Cook cum helpers could be trained for better food handling and hygiene practices.

Gupta, G (2019) examined in the study 'Social Accountability in Service Delivery and Utilization of Mid-Day Meal Scheme in Rural and Urban Maharashtra' that all teachers

were satisfied with the standard of meal being provided to students. Besides, the parents were satisfied with the quantity and quality of the food being served to the students. They were also happy and appreciated the Mid-day Meal program in schools. They were urged to add sweets to the menu of Mid-day Meal. Rural area students have a positive opinion of the MDM compared to urban students.

Conclusion: All teachers expressed satisfaction with the quality of the MDM program. Likewise, students were content with and valued the Mid-Day Meal Program (MDMP) in schools. In Haryana, 73.33% of parents supported the continuation of the Mid-Day Meal Scheme, albeit with suggested modifications. Among them, 40% of both parents and students voiced concerns regarding the perceived 'poor quality' of the meals provided. The majority of parents noted no discernible improvements in the health and academic performance of their children. Approximately 73.3% of parents favored the continuation of the Mid-day Meal Scheme, albeit with some adjustments. Additionally, around 68% of parents felt that the MDMP fell short in delivering the necessary vitamins and proteins.

2.2.4 Effects of MDM on Nutrition and Physical Development

Salins, O (2005) suggested in the study 'Essence of Nutrition,' that in childhood, growth and development were faster and the body developed new tissues constantly. The study did not find any perceptible improvement in the weight-to-age ratio. The anthropometric analysis found that MDM did not affect the height of a child in the long run, but it has a marginal effect on weight. The percentage of students was divided into three groups as per the Waterloo classification. The wasted and stunted students were lower in numbers in comparison with the non-MDM students. In the Aksharea Dasona Scheme of Karnataka, 72% of students gained weight because of Mid-day Meal.

Chauhan (2011) examined in the study 'A Study of Mid-Day-Meal Program in the Government Primary Schools of the Gwalior City of Madhya Pradesh' that Mid-day Meal increased the nutritional status of students. The effect of school feeding programs on more than 1080 students aged 8 years who were provided with fortified biscuits and

milk for breakfast supplied 300 kcal for 17 months. In the anthropometric data, it was found that there was an increase in height and weight, i.e., 7.88 cm against 8.15 cm and 2.95 kg against 3.19 kg. It was found that 37% of students were stunted and 63% of students were underweight.

Sati, V and Dahiya, S (2012) observed in the study 'Nutritional Assessment of Rural School-Going Children (7-9) Years of Hisar District, Haryana.' that nutrition levels affected students in two villages in the Hisar district of Haryana. In this study, 100 students were selected as a sample, and a 24-hour dietary recall method was used for the last three consecutive days. It was found that the mean intake of fat, B-complex vitamins, energy, vitamin C, calcium, and iron was significantly lower than their respective RDAs. It was also observed that boys' nutrition intake was higher than that of girls, and their intake of protein and energy was 50–74.9 of the RDA. In conclusion, nutrients like fat, energy, B complex, vitamins, iron, vitamin C, and calcium were lacking, and it was significantly lower than the RDA of students. A balanced diet was urgently required, and food should be locally manufactured to improve their nutrition level for physical development.

Mehta (2013) explored in the study 'Nutritional Contribution of Mid-Day Meal to Dietary Intake of School Children in Ludhiana District of Punjab' that MDM targeted the requirement of nutritious meals for school children in both urban and rural areas. Researcher found that 80% of students were underweight. Students were likely to be infected due to their low immune strength. This would subsequently led to higher mortality. Girls' BMI was better than boys. The study found that the BMI of the Mid-day Meal recipients was lower than the standards. Even after 10 years since the initiation of MDM in the country, MDM beneficiary students were underweight. This raised a fundamental question about the quality of MDM. The quality of MDM needs to be controlled. I was found that students' diets were inadequate in all groups, resulting in low nutrient intake. MDM provided 20% of energy and 33% of daily protein needs. The overall contribution of MDM was negligible, ranging from 1/5 to 1/6 of the nutrition

level in Haryana state. There was an insignificant difference in nutritional consumption between rural and urban schools because there was no difference in the menu or cereals supplied.

Thakur (2013) explored in the study ‘Assessment of Children Availing Mid-Day Meal Scheme’ that about 25.9% of boys and 25% of girls were stunted. Among these students, 19.3% of girls and 25.7% of boys were suffering from thinness. The age factor significantly affected the BMI of the students. Stunting was prevalent among 42.9% of students belonging to lower socio-economic classes. Thinness prevailed among 24.4% of students belonging to the upper middle class, which was the highest in the groups. So there was a strong relationship between malnutrition and socio-economic variables.

Verma (2013) contended in the study 'Mid-Day Meal Not a Sufficient Deal’ that India was a labor-intensive country, so the unhealthy progress of children could be a hindrance in the path of development. Unhealthy children could negatively affect the HDI. If children were not fit, it was impossible to achieve a high growth rate in the country. Malnutrition reduces productivity, degrades human capital resources. It was suggested that one of the aims of the Mid-day Meal was to promote the health and well-being of pupils in primary schools. The Mid-day Meal lacks many important nutrients, such as riboflavin, carotene, and calcium. Therefore, the Mid-day Meal could be improved by including vegetables, fruits, and fortified foods. It was found that the average weight, height, and hemoglobin level of most of the students were below the required standard.

Nutan and Preja (2014) studied the “Nutritional Status of Mid-day Meals”. In this research work, 50 girl students from Kanya Gurukul Senior Secondary School were selected as a sample. Anthropometric measurements were used to assess nutritional levels. It was found that food intake and nutrition levels were lower than the recommended levels for all categories of students. The average weight, height, and TSF thickness of the girls were 24.12 kg, 130.96 cm, and 7.76 mm, respectively. About 94% of students were vegetarian, and 34% of students used to skip MDM. In the clinical

assessment, 8% of students were thin-built, 50% of students showed a normal appearance, and 42% of students were sickly-built. Most of the student's nutritional status was lower than the recommended Indian level, despite consumption of Mid-day Meal.

Sachdeva, M & Daver, (2014) examined in the study 'Clinical Profile of Mid-Day-Meal Beneficiaries of Primary Schools in Kurukshetra District' examined in the study 'Clinical Profile of Mid-Day-Meal Beneficiaries of Primary Schools in Kurukshetra District' that most subjects had pale skin (43.5) and light nails (55.1). Girls felt shortness of breath (38.0) and fatigue (55.3) very easily when compared to boys. Dizziness was also reported by 23.7 percent of the subjects. The prevalence of all these symptoms of iron deficiency could be related to anemia. Researcher found that about 28.7% of students had hair without luster. Only 24.3% of students had normal hair. The majority of the students (64%) did not have dry, lusterless, or rough skin. About 87% of students were having problems with their teeth, e.g., chalkiness, discoloration, and loss of enamel. About 21.8% of students were suffering from conjunctiva, and 12.9% of students were suffering from follicular. The majority of the students (55%) had pale skin and pale nails, showing signs of iron deficiency. About 55.3% of girls felt tiredness very easily in comparison with boys. On the other hand, 38% of girls felt breathlessness, which was a sign of anemia.

Bhathal (2015) explored in the study 'A Critical Study of Mid-Day Meal Scheme in India with Special Reference to Punjab' that the MDMP has brought an increment in the physical parameters of the students. It was found that the nutrition status of boys increased after the launch of MDM, and the proportion of stunting was reduced in all groups except in the age group of 6 years. The height of girls increased after the introduction of MDMP. The girl students were still undernourished after the MDMP. Researcher found that MDM has become an important source of calorie intake among poor students studying in government schools. The calorie value of MDM was higher (375.6 calories) in comparison to the personal lunch box (271.6 calories) of students. The total calorie value of a private school student was 1662.2 calories, whereas a student

studying in a government school consumed only 1413.3 calories in 24 hours' time. This has resulted in the students of government schools being thin, and on the other hand, non-beneficiaries of MDMP are suffering from obesity.

Ali, J & Akbar, M (2015) stated in the study on Pupil's Satisfaction with School's Mid-day Meal Program' on 1778 students in 6 divisions of Akshaya Patra, viz., Hubli (n = 366), Jaipur (n = 349), Bangalore (n = 375), Vrindavan (n = 346), and Baran (n = 342): in 68 schools, the anthropometric data shown that 45% of students were underweight, and this problem was more evident in the higher age group of students. About 42% of students were suffering from severe wasting. A total of 62.5% of students reported being in the severe malnutrition category because of their wait for a height z score of 3 SD.

Padma, Y and Anusha (2015) conducted a study on the adverse health effects at the school level when a Mid-day Meal was served to primary school students. It was a cross-sectional study in 28 government schools in Kurnool Municipal Corporation. Data were collected from principals through semi-structured interviews. Students were selected using systematic random sampling. Student data were collected by interview and BMI. LPG was used in 75% of schools. About 67.8% of schools used iodized salt. About 49.9% of the students had a normal BMI, and 19.1% of the students were underweight. It was concluded that LPG gas should be used for cooking and iodized salt should be used for the physical development of students.

Dhankar (2015) reported in the study of 'Mid-Day Meal Program with Social Reference to Haryana' that most parents observed that there was an insignificant increase in the health parameters of their wards. Mid-day Meal has become an important source of calorie intake among poor students studying in government schools. The calorie value of a Mid-day Meal was higher (375.6 kcal) in comparison with the personal lunch box (271.6 kcal) of students. But when the total calorie values of a private school student were counted, it was 1662. It was a study of 499 students, aged between 6 and 10 years,

studying in 25 government primary schools. It was found that stunting, wasting, and underweight problems were prevalent in 56%, 12.2%, and 60.9%, respectively.

Sharma, R (2015) examined in the study 'Government Initiative for Promoting Education Empowerment of Muslim Minority: A Case Study of MDM and SSA in Mewat District of Haryana' that the students who were not beneficiaries of MDM were doing better growth in MUAC and height. MDM also exerted very little effect on intellectual and social development. The main reason for this poor show of MDM was the low quality of food being served, and there was a nutrient gap in the diet. These samples were collected by applying cluster random sampling. The research work revealed that 26.7% of boys were malnourished. About 41.3% of students were most affected by stunting in non-MDM recipients, and 29.3% of girls were affected by stunting in non-MDM recipients. MDM has been calculated to have improved the level of nutrition, but the scheme needs to do more to improve the welfare of future citizens.

Prakash & Divya (2015) concluded the study 'MDMP on the nutritional status and dietary level of students in rural and urban schools. In this study, 274 and 279 students belonging to 10 schools were included in rural and urban areas respectively. In urban areas, 35.6% of girls and 30.4% of boys had a normal weight, and 20% of students were in the underweight category. In rural areas, students suffer from underweight more than in urban areas. It was found that most of the urban girls were of normal height. Rural students' intake of fiber was higher than that of urban children. About 41.6% to 45.06% of students confirmed that they were not getting pulses in their diet. Mid-day Meal contributed 40% of calories and 43.8% of fat intake to students' diet intake. Students got vitamin C from Mid-day Meal in the range of 59.2% to 69.2%. Most of the vitamins were received through the vegetables used in the Mid-day Meal Program.

Patel, P & Patel, P et al. (2016) examined in a study the 'Effects of MDMP on Nutrition', A grand total of 400 students, with an equal split between those from private schools and government-run schools, were selected at random. In this study, an

anthropometric measurement and the t-test, was used to find out the difference in the nutritional status of students. It was revealed that 24% of boys and 19% of girls were suffering from higher stunting in comparison with the non-Mid-day Meal beneficiaries. In terms of waste, 17% of boys and 18% of girls were significantly suffering in government schools. Mid-day meal beneficiaries were consuming less quantity of nutrients while comparing the RDA recommended 24-hour dietary recall. It was found that Mid-day Meal beneficiaries' boys received 78% protein, 53% micronutrients, 60% energy, and 50% calcium. Girls' students faced a more severe situation as they received only 67% of the recommended protein, 48% of the necessary micronutrients, 59% of the required energy, and 44% of the essential calcium, all of which were lower compared to boys. It was appreciated in the study that the MDM scheme has been helpful in restricting the percentage of stunting to some extent but not in case of wasting. In a nutshell, MDM beneficiaries were receiving less protein, micronutrients, energy, and calcium.

Nazni, P & Lone AQ (2017) concluded in their study 'Effect of Mid-Day Meal Program on the Development of Nutritional', Intellectual, and Social Parameters of Selected School-Going Children' a comparative study of anthropometric measurement, social development, and intellectual development among mid-day meal and non-mid-day meal recipients in Baramulla District, Jammu and Kashmir State. In this study, 52 students from each group of MDM and non-MDM groups in the school were included. Outcomes of physical measurements like weight, height, and circumference of the upper arm were measured. It revealed significant differences among various groups of students. Childhood is crucial for physical and mental growth. Nutritional food was essential for optimum growth. In the absence of nutritious food, many health-related issues took place. The MDMP was launched to provide nutritious food to poor students, stating that growth of students become faster at this age, and the children develop their new tissues constantly and replace the old ones during this period.

Prabhat, A. (2018) explored in the study 'Effect of Mid-Day Meal Program on the Nutritional Status of School Children' that there was an insignificant difference between

the average height and weight of non-MDM recipients and MDM recipients in six districts of the Kashmir region. NMDMP recipients improved in physical development in terms of MUAC and height. MDM was provided as per the standards set by the government but lacks micronutrients. The average height and weight of the examined students were lower than NCHS, CDC, and ICMR standards. The study found that the level of malnutrition was very high. This is demonstrated by the hemoglobin, clinical, and anthropometric measurements of students. The efficiency of MDMP was low in India. Primary school MDM beneficiary students were taken as a sample. It was a cross-sectional study in which 322 students studied in 12 primary schools in a single block of Kashmir. Students' background information was collected, and indicators of malnutrition (underweight, wasting, and stunting) were estimated. Through logistic regression, it was found that 42.6% of students were suffering from wasting.

Sachdeva (2017) examined in the study 'Nutritional Status of Mid-Day Meal Beneficiaries in Primary Schools' that the mean height and weight of the screened students were less than the NCHS, CDS, and ICMR standards. The study found that the level of malnutrition was very high. It was proven by the level of hemoglobin and anthropometric measurements of the students. The concept of malnutrition originated in the 1950s. It was stated that children residing in developing countries were not getting adequate-quality protein. It was a serious state of the body when it does not get the right amount of nutrients that were essential for body development. The MDMP provided 33% of their nutritional requirements.

Banerjee, A and Chattopadhyay, N (2019) concluded in a study titled 'Impact of Malnutrition on Neuro-development in Children from a Marginalized Rural Community in India.' that multiple micronutrients and the use of fortified rice affected the physical development of students. The use of multiple micronutrients and fortified rice could be an effective strategy to combat micronutrient deficiencies in a country like India. In this study, the investigation was carried out on students' cognitive and physical development in the school age group. A sample of 258 students was selected in a randomized,

controlled, and double-blind manner. In one intervention group, students were provided a rice-based lunch meal that was fortified with micronutrients and low iron (6.25 mg). This diet was provided six days per week for six months. After 6 months, biochemical, anthropometric, and cognitive assessments were carried out. It was revealed that 61% of students were suffering from anemia, but physical standard of students improved. It was recommended that fortified rice could be a panacea for improving the vitamin deficiency and physical development of students in India.

Gupta, G (2019) concluded in the study 'Social Accountability in Service Delivery and Utilization of Mid-Day Meal Scheme in Rural and Urban Maharashtra' Teachers felt Mid-day Meal benefited students. It has a positive effect on the physical growth and cognitive development of pupils. Health parameters have improved due to Mid-day Meals at school. To resolve the problem of anemia in the large population, innovative efforts have been started. In 22 villages in the bordering district, villagers were being trained and motivated to grow organic vegetables in playhouses. It led to awareness about health and the removal of anemia in children and women.

Kumar, MV (2020) explored in his study 'Improving the Iron Status of School Children through a Mid-Day Meal Program with Meals Prepared Using Multiple Micronutrient-Fortified Salts in Tamil Nadu the iron status of students with IDA and its association with retardation'. It also investigated the effect of iron supplement on growth velocity in one year. It was a controlled study of diabetes endocrine metabolism in collaboration with the children's hospital at Cairo University. This study was conducted on 40 healthy, non-anemic children in the age group of 7 to 11 years. The study found that iron status was crucial for normal weight, height, and growth velocity. So, iron supplements should be given to augment the physical growth of children.

Conclusion: In the anthropometric data, it was discovered that as a result of Mid-day Meal Scheme, there had been an augmentation in the height and weight of students, although it fell short of the required standards. The findings indicated that 24% of boys

and 19% of girls exhibited heightened levels of stunting compared to ICMR standards. Within government schools, 17% of boys and 18% of girls encountered notable difficulties associated with wastage. Around 49.9% of students maintained a normal BMI, whereas 19.1% were classified as underweight.

2.2.5 Effects of Mid-Day Meal on Various Socio-Economic Groups

Dreze and Goyal (2003) examined in the study ‘Future of Mid-Day Meal' that Mid-day Meal also contributed to achieving social justice. All students enjoyed their school lunch without any caste prejudices. It also alleviates gender differences and provides employment opportunities for women from weaker sections of society. It also freed working women from having to prepare lunch for their children. Most students enrolled in public schools come from poor socio-economic backgrounds. So MDMS was a boon for the poor sections of society. It motivated these students to come to school and improve their lives because lack of education was the biggest obstacle to the social upliftment of the disadvantaged sections of society. Thus, the Mid-day Meal was a great challenge to the prevailing social inequalities. Some students were so poor that they were unable to feed their bellies in their homes. The MDMS provided them protection from hunger. It was a boon to poor households, such as widows, landless laborers, etc. Mid-day Meal played a crucial role in drought-prone and tribal areas where they provided nutritious food to these students. The Mid-day Meal socialized students with other students at the school. When students sat together at lunch, it would surely alleviate the prevailing social inequalities. There was a strong indication that earlier resistance by the upper castes to the distribution of Mid-day Meal has now weakened rather rapidly.

Muktha (2004) concluded in the study ‘Public Expenditure on Social Sector in India.’ That the apex court of India stated that India was facing a situation of plenty of food and scarcity. The biased distribution of food among the poor and the destitute led to starvation and malnourishment. Thus, the Mid-Day Meal Scheme was declared a right for poor students. The court dismissed the negative argument against the Mid-day Meal Scheme

by stating that financial incapacity could not be an excuse to deny the fundamental rights of poor students. Mid-day meals have alleviated classroom hunger and helped in the socialization of the students, particularly with those of other castes. The Mid-day Meal has been able to mitigate classroom hunger, social discrimination, and the formation of good habits among students.

Kumar (2008) explored in the study 'Teacher's Perception towards the National Program of Nutritional Support to Primary Education' that the majority of the teachers (97.14%) stated that there was no discrimination based on caste and creed. The MDMP should be able to fill the nutrient ion gap in the diet of students belonging to low socio-economic groups in society. In the present study, Mid-day Meals only provided 300 kcal instead of the targeted 330 calories. The NNMB survey (1) (1991–92) revealed that there was a 767-calorie per-day gap in the diet of these poor students. So, still, a considerable energy deficit of 45% existed in the diet of these students. Mid-Day Meal showed effective improvement in the enrollment of girls.

Chauhan (2011) explored in the study 'A Study of Mid-Day Meal Program in the Government Primary Schools of the Gwalior City of Madhya Pradesh.' that the study found there was no social discrimination among students, and neither had it been observed by the parents. The Indian government was spending its scarce and limited resources for providing universal elementary education, but this objective looked difficult due to the inherent discrimination in Indian society. The majority of the students from poor families suffered from malnutrition, and eventually, this situation led to dropping out of school at an early age. It adversely affected their low enrollment, retention in school and personality development. These children were forced to become child laborers and become victims of the vicious circle of poverty.

Avinash, M (2013) examined in a study titled 'A Study of Mid-Day Meal Scheme under Food Security with Special References to Upper Primary Schools of Rural Bhadravthi Taluk' that many poor parents were unable to send their wards to schools because it

would lead to incur extra financial burden. Without feeding them, it was difficult to send them to school. The poor students have low nutritional status. Hence, a nutritious supplement in the Mid-day Meal was a must. MDM provided 33% of the total nutrients in a hot cooked meal. The MDM has become a substitute for a hot homemade meal for poor students. Students of all castes and communities eat together, so the Mid-day Meal was instrumental in bringing about better social integration. It has promoted the enrolment of girls to bring equality of gender. Parents were able to convince their wards to attend classes in their schools. Mid-day Meal fostered sound social behavior among students. It removed feelings of gender bias and differences between castes in Meghalaya. It was found that there was a prevalence of poor enrolment and a high rate of dropout among students belonging to poor socio-economic backgrounds.

Garg and Mandal (2013) concluded in their study 'Mid-Day Meal for the Poor, Privatized Education for the Non-Poor' that the Mid-Day Meal program was launched to eradicate social inequalities that were inherited through the discriminatory division of society, i.e.,' resilience of social structures'. The study found that midday meals were a policy intervention that benefited students belonging to low socio-economic groups in society. Social development programs were used to benefit the privileged segment of society, and they perpetuated poverty, malnutrition, and a low level of education among the poor people of the society.

MDM has been helpful in increasing the enrolment of girls. Thus, it challenged the prevailing social structure. Before the Mid-day Meal, the parents stated that they were unable to send their daughters to school because they could not afford the economic cost. So, they considered schooling the girl child as economically futile. They considered an investment in their son's education more fruitful, as a better-educated son was a guarantee of their financial security in old age. The scenario for the girl child changed after the launch of the Mid-day Meal Scheme as the participation of the girl child increased. They found the MDM as a subsidy for schooling costs. The vulnerable groups of society were engulfed in a vicious cycle of malnutrition, disease, and poverty. So Mid-

day Meal fulfilled this gap and taken care of the nutritional aspects of its multipronged program. It improved the multi-national status of such students. Gender discrimination was also found clearly in the average consumption of calories, as girls consume fewer calories than boys. It was also noticed that female students consume 'habitually' fewer meal than boys. Children belonging to poor socio-economic criteria did not get good-quality food in their homes. Mid-day Meal was better than their home-prepared meal. The rich families practiced equality in serving food to their wards, but poor families provided better meals to their sons. The students from poor backgrounds were lagging behind due to structural differences.

Jawahar and Sunder (2015) examined in the study 'Principles of Economics of Education' that no country in the world has achieved economic growth without making a huge investment in the education sector. Unequal distribution of education in society led to a negative impact on per capita income and disharmony in society. The low per capita income forced the lower strata of society to acquire substandard education. A good quality education imparted skills in a person and enhanced his productivity. The skilled person would be able to increase his income and enable him to lead a quality life. Education could be the best instrument for mitigating social discrimination and poverty. The country's economic growth alone could not reduce the burden of malnutrition among India's low socio-economic population.

Sharma, R (2015) explored in the study 'Mid-Day Meal Scheme in India: The Road Ahead' that in slum areas, families were headed by women. Poverty forced them to stop their wards from attending school and force them to work. The second benefit of Mid-day Meal in a slum area was that it reduced domestic violence because of food insecurity. High food prices make slum people poorer, and the Mid-day Meal was very helpful for such people. Due to the high prices of fat and protein, the slum residents removed such items from their diet, but their wards got a balanced diet with Mid-day Meal. This healthy diet ensured physical and psychological growth. It also enhanced the learning capability of students.

Arumugam (2015) concluded in the study 'Mid-Day Meal Scheme in Chennai City, Tamil Nadu: A Case Study' that classroom hunger was prevalent in India due to poverty, and 1/3 of households were struggling to get one square meal a day. MDMP was designed to motivate students for regular attendance in school and feed them during their stay in school. The MDMP provided employment opportunities to the needy, destitute, or widowed women of the village. The MDMP was launched for needy students who were BPL, as it was the largest nutrition intervention with a unique feature in the world. The social implications of the MDMP were very positive. It urged students of all castes and creeds to have lunch together, prepared by a woman who belonged to a marginalized caste. They learn to mingle, learn, and eat together, which brought cohesiveness to society. These students will become true citizens of India. In this way, the transformation of low-income people was taking place. The Mid-day Meal was the harbinger of the new social order. Due to poverty and ignorance on the part of poor parents, more than 75% of children were suffering from poor health, malnutrition, retarded growth, vitamin deficiency disorder, iron and iodine deficiency, etc. For taking the Mid-day Meal, students belonging to different castes sit together for dining, which has helped in breaking the caste taboo? Mid-day meal programs led to a silent revolution in bringing social reforms as they accepted the meals prepared by the downtrodden community. These students mingle, move, share food, and learn together during their lunch break. In this way, they became the true citizens of the country; they transcended all divisions and differences, which led to a socio-economic transformation in society.

Singh, A (2015) explored in the study 'Trends Inequality in Food Consumption and Calories Intake in India: Evidence from the Last Three Decades 1983–2012' that Mid-day Meal Program was started to compensate for mineral and vitamin deficiency for poor students. Across country inequality in calorie consumption increased after economic reforms in 1991. Thus, Mid-day Meal Program found to be helpful in mitigating this disparity in caloric intake. Physical health increased the chances of employability and productivity. It would increase social inequality; yet another inequality in calorie

consumption has decreased. The government should increase the efficiency of the PDS, Mid-day Meal, and the National Food Security Program Act 2013.

Bhathal (2016) examined in the study 'A Critical Study of Mid-Day Meal Scheme in India with Special Reference to Punjab' that the majority of the teachers praised the Mid-day Meal Scheme because this scheme was successful in inculcating values related to hygiene, discipline, and gender discrimination. The MDM program has mitigated social evils like gender and caste inequalities. It has also provided employment to poor and destitute women as cooks in schools. Students belonging to higher socio-economic class were suffering from obesity, and a balanced diet required equal attention from the authorities. This was the era of nutritional transition in India. The students belonging to rural areas accepted the Mid-day Meal Program with the right attitude in comparison to urban students due to various reasons.

Gautam (2017) concluded in 'Study on the Socio-Economic Status of Students Who Are Getting Mid-Day Meals' that the Mid-day Meal Program was very successful in increasing the enrollment of students from low socio-economic backgrounds. The effect of this program was more pronounced with the lowest rating of the economic condition. The number of lunch recipients has increased since 1995. About 60% of beneficiaries belonged to families with low per capita income. Researcher found that Mid-day Meal increased the socialization of students and provided employment opportunities for women who were oppressed.

Raman (2017) evaluated in the study 'School Shiksha Aur Mid-Day Meal Yojana, Granth Academy' that the Mid-Day Meal was 'Socialist' in nature; it helped students to sit together for a meal irrespective of different classes, castes, or creeds. It helped in mitigating the gender, caste, and creed feelings of the students. It motivated the students of weaker sections of society, especially girls, to go to school to acquire a basic education. Due to MDM, the poor and hungry students have started to acquire education and the social and gender distance has been reduced.

Sachdeva (2017) explored in the study 'Nutritional Status of Mid-Day Meal Beneficiaries in Primary Schools' that the low level of nutrition in the majority of students was caused by poor economic conditions of the students. Mid-day Meal helpful in fulfilling the requirement for nutrients and energy. **T**he state government was distributing iron tablets in schools so that the deficiency of iron could be mitigated. A deficiency of iron leads to the problem of anemia. Poor people do not have nutritional value on their plates.

National Achievement Survey (2017): Students of Haryana were performing below the national average in all three subjects (EVS, Language, and Math) of classes, 3rd and 5th, and four subjects of 8th classes. Students belonging to the OBC, SC, and ST categories were performing poorly in class 3rd in language items, and ST and OBC students were performing below national averages. In Mathematics, the students belonging to the SC, ST, and OBC categories were performing poorly within the state, and the students from all four categories were performing below national averages. In Science subjects, the students belonging to the SC, ST, and OBC categories were performing poorly within the state, and the students from all four categories were performing below national averages. In Social Science subjects, students belonging to SC, ST, and OBC were performing poorly within the state, and these three categories of students were performing below the national average. Social group-wise data shows that the scheduled caste students were performing poorly at the inter-state and national levels in all three subjects and classes. MDMP is the panacea for enhancing the standards of students in health and educational achievements.

UNICEF Global Nutrition Report (2018) stated that about 14% of people were malnourished and 37.4% of students were suffering from stunting in India. About 69 crore people were malnourished in the world. There was an improvement in child mortality to 3.7%, but this rate was higher than in other countries. India's grain production increased by five times in the last 74 years; still, the problem of malnourishment was critical in India. The problem of malnutrition was not due to a lack

of food grains. But it was due to a lack of purchasing power for grains, which led to a reduction in the productivity of people. They become poor and get infected with goiter, resulting in a rise in infant mortality.

Arya and Mehta (2019) concluded a study titled 'A Qualitative Study of the Mid-day Meal Program was Regarding Social Discrimination in Selected Government Primary Schools in Varanasi District in Uttar Pradesh.' Social development programs always benefited the elite sections of society because structural discrimination denied equal status to poor people. It increased the extent of poverty, malnutrition, and the level of education among the poor sections of society. To alleviate this social problem, the Mid-day Meal Program was in place. The reason for the positive relationship between malnutrition and income was inequality in the distribution of income. All the students, parents, and teachers were satisfied that there was social equity in serving the MDM in primary and elementary schools.

Singh (2019) examined in the study 'Evaluation of Mid-Day Meal Program on Root Level in India' that MDMP was specially targeted for the benefit of students belonging to marginalized sections of society. Despite such a scheme, the educational gap between rich and poor sections of society was increasing with time. Most of the social schemes benefited the richer sections of society, but the MDM was a scheme that helped the disadvantaged groups of society. Spatial inequality was found in terms of students availing of MDM across India, but there was no sign of discrimination against female students. Castes have a smaller role to play in this centrally sponsored scheme. There was a low probability for richer people to avail themselves of MDM facilities in comparison with poor people. Rural people avail more of MDM facilities than urban people. MDM has increased the acceptance of Dalits in society. MDM was launched with the aim of covering the maximum number of students belonging to economically weaker sections of society. It has fulfilled its aims, as 70% of students belonging to the low-income group were availing of MDM facilities. The Mid-day Meal Program was empowering young girls aged 05–18 who were once barred from leaving home because their parents were not

confident about their daughters' security and now wholeheartedly support them in their effort to improve the nutritional level of girls and send them to school. So, MDMP played a major role in helping poor students.

National Family Health Survey-V (2021): Children belonging to the SC category were more susceptible to stunting, wasting, and underweight in comparison with children belonging to other castes (upper castes) in Haryana. This showed a high magnitude of inequality in the medical standards of students.

Prakash and Singh, P (2022) examined in a study titled 'Efficacy of Mid-Day Meal Scheme in India: Challenges and Policy Concerns.' that education played a crucial role in boosting economic growth, which in turn improved the overall standard of living. Access to primary education was vital for the development of people belonging to the lowest socio-economic strata of society. Mid-day Meal ensured the democratization of primary education. There was a correlation between educational attainment and poverty, parental education, gender of the student, caste, wealth, and motivational effects of the student and her parents. If the mother was educated, then there was no probability of gender discrimination. Education declined the incidence of child labor. So, a Mid-day Meal was the panacea for all problems related to a child. Her future was brightened with the launch of a Mid-day Meal Program in schools.

Conclusion: Mid-day Meal Scheme played a major role in helping poor students. It has increased the acceptance of Dalits in society. The Mid-day Meal was launched with the aim of covering the maximum number of students belonging to economically weaker sections of society. It has fully fulfilled its aim, as 70% of students belonging to the low-income group were availing of the Mid-day Meal facility.

2.2.6 Cost-Effectiveness Analysis of MDM

Garber, AM & Phelps, CE (1997) found in their study "Economics of Cost-effectiveness Analysis", that cost effectiveness analysis is mainly used as a powerful tool

for making decision related to resource allocation. CEA is often sought for making broad public policies so that the social welfare of people can be improved. CE analysis is used to improve efficiency and equity. It is particularly congenial to social insurance in health sector. The goal of cost-effective analysis is to promote economic efficiency in allocation of resources in health sector although, CEA should be applied by considering its limitations.

Murray JL, Evan DB, et.al (2000) in "Development of WHO Guidelines on Generalized Cost-Effectiveness Analysis concluded that cost-effectiveness analysis is employed to assess specific interventions. The cost-effectiveness of a new intervention was either compared to a predetermined price threshold or a set of interventions derived from a literature review.

The primary objective of policy framing was to ensure that resources within the health sector were distributed across population groups in order to achieve the highest overall level of population health. Enhancing the allocation efficiency of the health sector could be achieved by reallocating resources from less cost-effective interventions to more cost-effective ones. Cost-effectiveness analysis proves highly beneficial in achieving modest goals.

Weintranb WS, Cohin DJ (2009) concluded that Cost-effectiveness analysis (CEA) assesses the cost-effectiveness relationship within healthcare. CEA has taken an incremental approach and mainly focused on comparing alternative treatments. It is a valuable tool for Health Economists as it addressed various questions related to cost and effectiveness. Moreover, CEA provided managers with the necessary information to make informed decisions. By using CEA, one can expand their understanding of efficacy data through analysis. CEA was also referred to as cost minimization studies, emphasizing the equivalence of efficacy.

Jawahar and Sunder (2010) stated in their book titled 'Principles of Economics of Education,' that cost-effectiveness was a relationship between related output and the

inputs. It is used to identify the work efficiency of an institution and its low-cost production. It is the endeavor of all firms or institutions to cover the cost of input to survive in competition. The data collected from the field supported that the Mid-day Meal does work, and it redistributed resources from haves to have not. Such programs boost the educational advancement of children. The decision to send a child for education was an investment decision that was comprised of the cost of schooling (textbooks, fees, and transportation) and the opportunity cost of schooling. This opportunity cost was composed of labor market income and household work. Education empowers a person to get access to a job and higher wages. MDMP required strengthening in its operational planning and supervision so that it could be made more cost-effective.

Cellini, S & Kee, J (2015) found that cost-effectiveness analysis and cost-benefit analysis were valuable tools for evaluating programs. Cost-effectiveness analysis (CEA) was a technique that assesses both the cost and the outcomes/benefits of a program. This technique could be applied at various stages of a program, including before, after, or during its implementation. By providing insights into program costs and assessing efficiency, CEA played a crucial role in decision-making and program evaluation.

CEA focused on quantifying the cost of a program and linking it to specific measures of program effectiveness. This helped to determine the program's cost-effectiveness, which was calculated using specific formulae:

Cost Effectiveness Ratio= Total Cost/ units of effectiveness

Using this formula, it can calculate the cost-effectiveness ratio, which can then be compared with that of other states or countries. Additionally, it can compare the cost-effectiveness ratio with other policy ratios to determine which policy costs less per unit of outcome. A Social Cost Effectiveness Analysis considered both the costs and benefits, whether monetary or non-monetary, that is experienced by everyone in society.

Tattwamsi and Bhue (2022) the efficacy of MDM can be increased by including local foods and millet, which are cost-effective. Millets are rich in multivitamins and minerals. India is a developing country that is facing resource constraints. The cost-effectiveness of MDMP was a major concern for such a course. Policy formulation reforms should be internalized based on ground realities and need-based assessment. The roadmap for the implementation of MDMP must increase the cost-effectiveness of the program. The main challenge of MDMP was to curtail expenditures and improve efficiency. A social audit could be an effective instrument for it. The social audit team can monitor MDMP in schools periodically. This team should be empowered to audit, monitor, and suggest ways to make MDMP more cost-effective. Multigrain soy-enriched noodles are very nutritious. It has the potential to improve the cost-effectiveness of MDM.

Deluca, EK & Gebremariam, A (2023) et al. Concluded that the cost-effectiveness of influenza vaccination varied depending on the age and specific risk factors of each individual patient. The study found that the effectiveness of vaccination was influenced by the likelihood of contracting influenza, and it was shown to be favorable for preventing the disease. The study adopted a healthcare and social sector perspective over a one-year period. The primary measure of success was the incremental cost-effectiveness ratio (ICER), expressed in dollars. Cost effectiveness analysis helped in cost cutting and resource reallocation.

Conclusion: Cost-Effectiveness Analysis could be applied at various stages of a program, including before, after, or during its implementation. By providing insights into program costs and assessing efficiency, CEA played a crucial role in decision-making and program evaluation. Cost-effectiveness was utilized to identify the work efficiency of an institution and its low-cost production. Social Cost Effectiveness Analysis considered both the costs and benefits, whether monetary or non-monetary, experienced by everyone in society. It was highly applicable in the field of social benefit schemes, such as the Mid-day Meal Scheme; it could help in the reduction of its cost and improve the effective implementation of the program.

2.7 Research Gap

The Mid-day Meal Scheme has been pivotal in enhancing student enrollment, attendance, and retention rates in government schools. By providing hot meals, it has transformed school environments into more welcoming spaces for children, effectively addressing classroom hunger and improving learning outcomes. However, persistent issues such as malnutrition, particularly among economically disadvantaged students, continue to hinder academic achievements due to reduced concentration and learning capabilities in hungry students.

While the program enjoys broad support from teachers and students, concerns linger regarding the perceived quality of meals, as evidenced by feedback from parents and students, especially in state like Haryana. Anthropometric data analysis indicated that while the scheme has contributed to improvements in height and weight among students, these gains often fall short of established standards, with many students still experiencing stunted growth.

Moreover, the correlation between socio-economic status and academic performance underscores the necessity for nuanced approaches to address nutritional deficiencies and enhance learning outcomes among disadvantaged students. Disparities in health and academic indicators between socio-economic groups within Haryana and nationally highlight the urgency for improved strategies to ensure nutritious diets for all students.

In addition to Cost-Effectiveness Analysis (CEA), there is a critical need for a comprehensive utility analysis of the Mid-Day Meal Program (MDMP) in Haryana. This would help identify areas for enhancement and optimize resource allocation, ultimately enabling stakeholders to devise targeted interventions that tackle the complex challenges posed by malnutrition and poor academic performance, low physical standards and bad quality of Mid-day Meal.

Despite efforts to evaluate the program's nutritional impact, particularly in Haryana, comprehensive studies examining the socio-economic dynamics surrounding the Mid-day Meal Scheme remain insufficient. Addressing this gap through detailed research can provide valuable insights into the program's effectiveness and socio-economic implications within the state, informing evidence-based policy decisions and refining implementation practices to better serve beneficiaries.

Given its operational history since 2004 and increased significance during the COVID-19 pandemic, there is an urgent call for updated surveys to assess the current state of the MDMP in Haryana comprehensively. Such assessments would illuminate various aspects including enrollment, attendance, retention rates, satisfaction levels, and academic achievements across different socio-economic groups, thereby guiding interventions aimed at optimizing program outcomes and ensuring equitable access to education and nutrition for all students.

The health and academic performance of students in Haryana lag behind national averages and neighboring states, exacerbated by issues such as anemia leading to fatigue and decreased concentration among students. Despite favorable indicators like high per capita milk availability, Haryana struggles to improve the nutritional standards of its children, posing long-term challenges to societal and national development.

CHAPTER-III

Research Methodology

Research methodology clarifies the plan and procedure to carry out research work and analyze the results. A comprehensive understanding of the research method and data analysis is a prerequisite for research design. Therefore, research design provides the framework for the collection and analysis of the data. This research work is designed to analyze the impact of Mid-day Meal on enrolment, attendance, retention, academic performance, and the physical level of primary and upper primary students of different socio-economic groups in Haryana. So, this chapter explained the research methodology used to provide a detailed description of the population, sample design, sample size, and statistical tools for data analysis. This chapter is divided into the following three sections:
Section I: It highlighted the research design and research topic, objectives, hypothesis, sample design, and sample size estimation.

Section II: Research instrument, validity, and reliability

Section III: Provided a detailed description of statistical tools for data analysis.

Section I

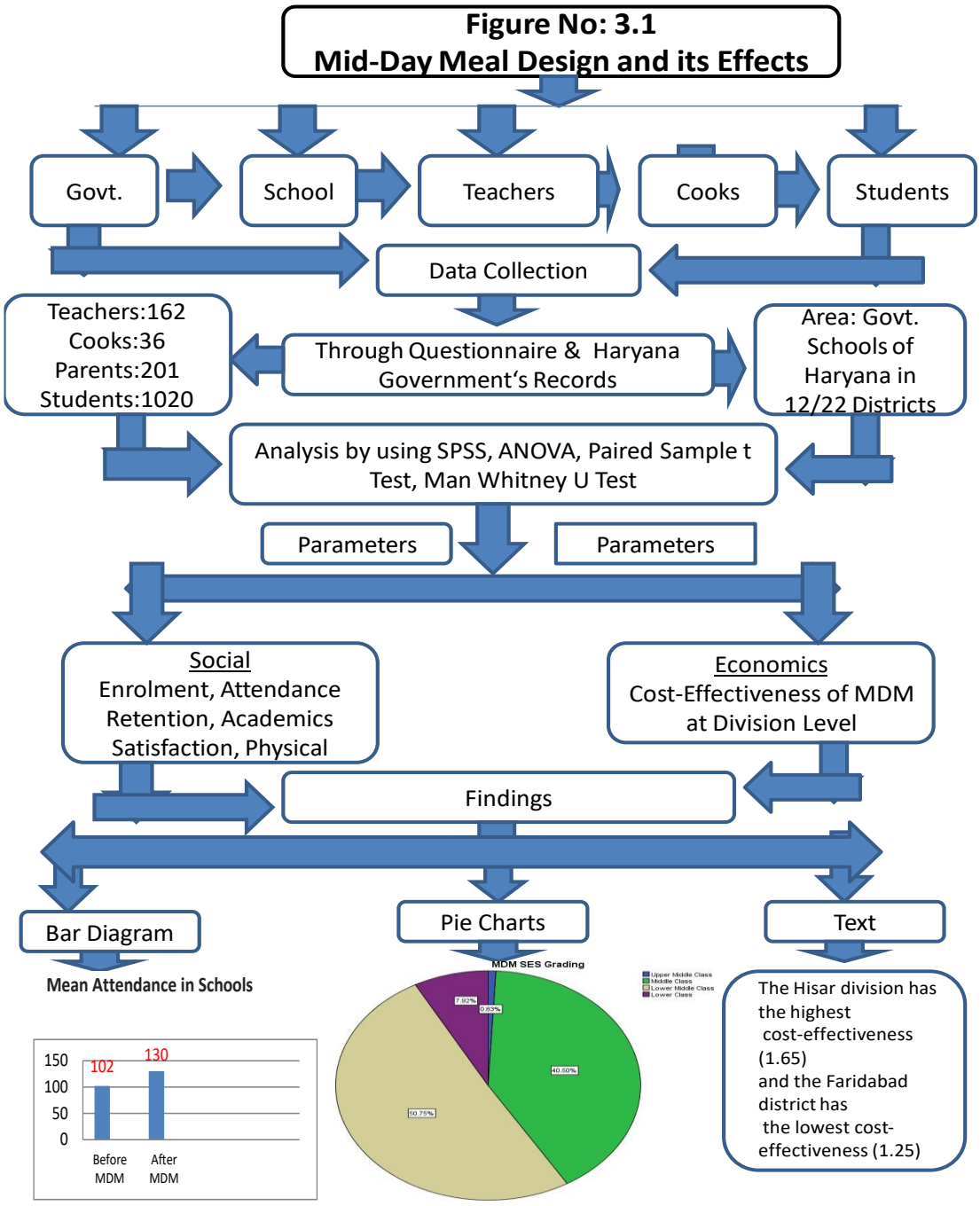
3.1 Research Design: It was a cross-sectional study conducted in the North Indian state Haryana. It has six divisions and twenty-two districts. This study was carried out in 12 out of 22 districts in Haryana. The data were collected from Mid-Day Meal stakeholders in both rural and urban areas through Pareek Socio-economic Scale, a self-structured questionnaire, Anthropic measurements, a semi-structured interview, and a self-structured achievement test for classes 5 and 8 of government schools.

3.1.1 Research Topic

“A Socio-Economic Analysis of the Mid-Day Meal Scheme in Haryana"

3.1.2 Design of Mid-Day Meal in Haryana

Figure No: 3.1
Mid-Day Meal Design and its Effects



3.1.3 Objectives of the Study

1. To ascertain the role of MDMP in increasing enrolment, attendance and retention among various socio-economic groups of students.
2. To analyze the contribution of MDMP in improving the educational attainment among various socio-economic groups of students.
3. To assess the satisfaction level of students, teachers, and parents about MDMP in government schools.
4 To examine the role of MDMP in improving the physical standards of students among various socio-economic groups of students.
5. To carry out a comparative analysis of achievements of MDMP at the Revenue Division level.
6. To suggest strategies for making the MDM efficient.

3.1.4 Hypothesis

A hypothesis is typically a statement that can be tested through research and experimentation. A researcher should formulate hypotheses that propose potential explanations or relationships between variables. Researcher should ensure that hypotheses are specific, testable, based on logical reasoning and directly address the research gaps. (Dayanand, AK 2018). Hypotheses were framed based on observations, existing knowledge, identified research gaps and questions about Mid-day Meal Scheme.

Sources of hypothesis: Researcher is a government school teacher and has observed the functioning of Mid-day Meal Scheme closely, feedbacks were taken from students, parents and peer teachers, principals and BEEOs. Second, these hypotheses were mainly based on the review of following theses: Kaur, R (2010), Tarananum (2014), Bhathal, P (2015), Sachdeva, M (2017), Sagar, R (2019), Banu, A (2019), Solanki, JC (2020), Arya, NK (2020), Boriwal, S (2020).

First Objective: To Ascertain the Role of MDMP in Increasing Enrolment, Attendance, and Retention among Various Socio-Economic Groups of Students.

The Mid-day Meal Scheme (MDMS) has been recognized as a pivotal factor in enhancing students' enrollment, attendance, and retention rates within government-operated schools, as evidenced by numerous studies. However, the focus of these studies has primarily been on the positive impact of MDMS on enrollment, attendance, and retention, hardly any study was conducted on the socio-economic dimensions of MDMS affecting students. Consequently, this study aimed to investigate the effects of MDMS on the enrollment, attendance, and retention rates among various socio-economic groups of students in both Primary and Upper Primary Schools. By analyzing these factors, the study seeks to uncover patterns in enrollment, attendance, and retention across various socio-economic groups in Haryana. Such insights are crucial for policymakers to refine the effectiveness of MDMS, ensuring targeted improvements that effectively boost enrollment, attendance, and retention rates for specific student groups. These hypotheses are formulated to resolve the unanswered questions of research gap and aimed at evaluating the enrolment, attendance and retention rate of students from various socio-economic groups in selected schools.

H0: There is no significant difference in increasing enrolment among students of various socio-economic groups of students in Primary Schools.

H0: There is no significant difference in increasing enrolment among students of various socio-economic groups of students in Upper Primary Schools.

H0: There is no significant difference in increasing attendance among students of various socio-economic groups of Primary Schools.

H0: There is no significant difference in increasing attendance among students of various socio-economic groups of students in Upper Primary Schools.

H0: There is no significant difference in increasing retention among students of various

socio-economic groups in Primary Schools.

H0: There is no significant difference in increasing retention among students of various socio-economic groups Upper Primary Schools.

Second Objective: To Analyze the Contribution of MDMP in Improving the Educational Attainment among Various Socio-Economic Groups of Students in Government Schools.

The prevalent issue of malnutrition, particularly among students hailing from economically disadvantaged backgrounds, persisted as a barrier to academic success. The impediments posed by hunger on concentration and learning are well-documented in research works. The Mid-day Meal Scheme emerged as a pivotal intervention in fostering comprehensive student development and ensuring equitable access to quality education, especially for those from impoverished socio-economic backgrounds. Despite numerous studies highlighting the positive impact of MDMS on educational outcomes, hardly there was research examining its effects on academic attainment among various socio-economic groups within Primary and Upper Primary Schools in Haryana. This study is specifically structured to assess the educational performance of various socio-economic groups. Its findings are poised to inform policymakers on strategies to enhance the efficacy of MDMS, thereby elevating the academic performance of underperforming student groups. These hypotheses were formulated to resolve the unanswered questions of research gap and aimed at evaluating the academic achievements of students from various socio-economic groups in selected districts.

H0: There is no significant difference in scoring of marks in English subject among students of various socio-economic groups in **P**rimary Schools**.**

H0: There is no significant difference in scoring of marks in English subject among students of various socio-economic groups in Upper Primary Schools.

H0: There is no significant difference in scoring of marks in Mathematics subject among

students of various socio-economic groups in Primary Schools.

H0: There is no significant difference in scoring of marks in Mathematics subject among students of various socio-economic groups in Upper Primary Schools.

H0: There is no significant difference in scoring of marks in EVS subject among students of various socio-economic groups in Primary Schools.

H0: There is no significant difference in scoring of marks in Science subject among students of various socio-economic groups in Upper Primary Schools.

Third Objective: To Assess the Satisfaction Level of Students, Teachers and Parents about MDMP among Various Socio-Economic Groups of Students.

Despite garnering widespread support from both teachers, parents and students, the Mid-day Meal Program faces persistent concerns regarding the perceived quality of meals provided, particularly evident in feedback from parents, teachers, and students, notably in Haryana. While Haryana has seen numerous post-graduate-level studies assessing the satisfaction level concerning the various aspect of the Mid-day Meal Scheme, there was hardly any study did comprehensive investigations into the socio-economic dynamics underpinning the scheme. This study aimed to assess the satisfaction levels of students, teachers, and parents among various socio-economic categories. By leveraging this feedback, policymakers can tailor improvements to the Mid-day Meal Scheme, thereby enhancing satisfaction levels among students, parents, and teachers across different socio-economic groups. Following hypotheses were formulated to assess the various aspects of satisfaction among students, teachers and parents belonging to various socio-economic categories.

H0: There is no significant difference in regularity of students due to tasty meal of MDMP among various socio-economic groups of students.

H0: There is no significant difference that they were getting change in meal on daily basis among various socio-economic groups of students.

H0: There is no significant difference in liking MDM menu among various socio-

economic groups of students.

H0: There is no significant difference in perception of MDM is cooked hygienically among various socio-economic groups of students.

H0: There is no significant difference in perception of garnishing of MDM among all the students of various socio-economic groups of students.

H0: There is no significant difference in perception of demanding more meal among students of various socio-economic groups of students.

H0: There is no significant difference in perception of getting equal and desired quantity of MDM among students of various socio-economic groups of students.

H0: There is no significant difference in perception of eating all served meal among students of various socio-economic groups of students.

H0: There is no significant difference in perception of getting full meal of MDM among students of various socio-economic groups of students.

H0: There is no significant difference in getting satisfaction in MDM among various socio-economic groups of students.

H0: There is no significant difference in perception of getting positive impact on their study among students of various socio-economic groups of students.

H0: There is no significant difference in perception of continuance of MDM among students of various socio-economic groups of students.

H0: There is no significant difference in perception that MDM is prepared as per the menu table among teachers of Primary and Upper Primary Schools.

H0: There is no significant difference in perception of teachers that MDM is prepared timely among teachers of Primary and Upper Primary Schools.

H0: There is no significant difference in perception of teachers that hygienic conditions were observed while preparing MDM among teachers of Primary and Upper Primary Schools.

H0: There is no significant difference in perception of teachers of Primary and Upper Primary Schools that nutritious meal was provided in Mid- day Meal.

H0: There is no significant difference in perception of teachers of Primary and Upper Primary Schools that they were satisfied with the quality of mid- day meal.

H0: There is no significant difference in perception of among teachers of Primary and Upper Primary Schools that they Students' interests in study have increased after implementing the MDMP.

H0: There is no significant difference in perception of teachers of Primary and Upper Primary Schools that the teaching time decreased due to MDMP.

H0: There is no significant difference in perception of teachers of Primary and Upper Primary Schools that MDMP was not beneficial for social cohesiveness.

H0: There is no significant difference in perception of teachers of Primary and Upper Primary Schools that MDM menu should be changed.

H0 There is no significant difference in perception of parents of Primary and Upper Primary Schools that your child likes MDM that's why they go to school regularly.

H0 There is no significant difference in perception of parents of Primary and Upper Primary Schools that your children get Mid-day Meal regularly.

H0 There is no significant difference in perception of parents of Primary and Upper Primary Schools that hygienic conditions were specially observed in Mid-day Meal.

H0: There is no significant difference in perception of Primary and Upper Primary Schools that they have observed improvement in the health of your child due to Mid-day Meal.

H0: There is no significant difference in perception of parents of Primary and Upper Primary Schools their children have faced health related problems after taking Mid-day Meal.

H0: There is no significant difference in the in perception of parents of Primary and Upper Primary Schools that they have observed caste discrimination while taking the

Mid-day Meal by their wards.

H0: There is no significant difference in perception of parents of Primary and Upper Primary Schools that MDM should be continue.

Fourth Objective: To Examine the Role of MDMP in Improving the Physical Standards of Students among Various Socio-Economic Groups of Students.

Anthropometric data analysis revealed that although the Mid-day Meal Scheme has yielded enhancements in students' height, weight, and BMI, these improvements still fell below the established standards set by the Indian Council of Medical Research (ICMR), with a notable proportion of students continuing to experience stunted growth and being underweight. While numerous studies have demonstrated a positive correlation between the Mid-day Meal Program and the enhancement of physical standards among students in Haryana, there was hardly any research investigating the program's impact on the physical well-being of students among various socio-economic groups. This study was designed to provide insights into the role of the Mid-day Meal Program in augmenting the physical standards of students within various socio-economic groups. Its findings will furnish policymakers with valuable data to refine the Mid-day Meal Program, aiming to bolster the physical well-being of students, particularly those from disadvantaged backgrounds. To this end, the study has formulated hypotheses aimed at scrutinizing the effects of the Mid-day Meal Scheme on improving the physical standards of students among various socio-economic groups.

H0: There is no significant difference in measurement of weight among students of various socio-economic groups of students.

H0: There is no significant difference in measurement of height among students of various socio-economic groups of students.

H0: There is no significant difference in measurement of BMI among students of various socio-economic groups of students.

Fifth Objective: To Carry Out Cost Effectiveness Analysis of MDMP at Revenue Division Level.

In conjunction with Cost-Effectiveness Analysis (CEA), there arisen a critical necessity for a comprehensive utility analysis of the prevailing Mid-Day Meal Program (MDMP) in Haryana state, aimed at pinpointing areas necessitating improvement and optimizing resource allocation. The Cost-Effectiveness Analysis has shed light on the performance of all six divisions within the state of Haryana. This analytical approach served as a valuable tool for policymakers to scrutinize data and improve the Mid-day Meal Scheme in laggard divisions. Such analysis came out as one of the most effective methods for refining resource allocation strategies and attaining optimal outcomes. To this end, the study has formulated hypotheses geared towards evaluating the per capita cost-effectiveness concerning Body Mass Index and Academic Achievement Index for both boys and girls across all six divisions.

H0: There is no significant difference exist in per capita cost effectiveness of Body Mass Index of boys at division level.

H0 There is no significant difference exist in per capita cost effectiveness of academics Index of boys at division level

H0: There is no significant difference exist in per capita cost effectiveness of academic achievement of girls at division level.

H0: There is no significant difference exist in per capita cost effectiveness of Body Mass Index of girl students at division level.

3.1.5 Selection of Variables

As per feasibility following variables were selected for this study:

1. **Admission-Related Components**

Enrollment Rate: Students taking admission in a given year in a particular class

Attendance Rate: Students come to school for the purpose of their studies.

Retention Rate: Students remaining in the school for the given academic year.

2. Health-related fitness components

Height: The height of the students was measured in meters.

Weight: It was measured in kilograms by using the weighing machine.

BMI: It is a calculation using a person's height and weight; BMI = kg/m^2.

3. Educational achievement components

Marks in English: An achievement test of 10 questions with 10 marks was given to students in classes V and VIII.

Marks in Mathematics: An achievement test of 10 questions with 10 marks was given to students in classes V and VIII.

Marks in EVS/Science: An achievement test of 10 questions with 10 marks was given to students in classes V and VIII.

4. Satisfaction Level Components:

Student's satisfaction level: A questionnaire of 23 statements was given to students for expressing their opinion.

Teachers' satisfaction level: A questionnaire of 18 statements was given to the teachers to express their opinions about MDM.

Parent's satisfaction level: A questionnaire of 14 statements was given to parents to opine about MDM.

3.1.6 Sources of Database

The present study is confined to the demography of Haryana.

Primary Data

* The academic achievement test was conducted on 5^{th} and 8^{th} grade students in Math, English, and EVS/Science subjects among various socio-economic groups of students, and primary data were collected.

* Primary data related to Mid-day Meal satisfaction perception was collected from students, parents, and teachers belonging to various categories.

* In the same way, the researcher collected data related to the height, weight, and BMI of students categorized into various socio-economic groups.

Secondary Data

* Data related to enrolment, attendance, and retention rate were collected from school records and the Directorate of Elementary Education, Haryana, for the time period of 2003–2021.

* Data related to the academic achievement of students was collected from the National Achievement Survey to compare the performance of students before and after the execution of MDMP in the time period 2003–2021.

* Physical standard data were collected from the Community Health Center of the concerned school from 2003 to 2021 to analyze the role of MDMP in improving the physical standards of the students. The data were divided into two categories: before MDMP and after MDMP.

* Data related to the cost of a Mid-day Meal was collected from the Directorate of Elementary Education, Haryana.

3.1.7 Sample Design

The present study used a multi-stage sampling technique. In the 1st to 3rd stages geographical, in the 4th stage of educational, and in the 5th stage of gender sampling, technique of clustering of sampling was exercised in Haryana. It is divided into six administrative divisions. In the second stage, from each division, two districts were selected based on the minimum and maximum marks scored in the National Achievement Survey 2017. In the third stage, government-run schools were divided into two categories, viz., rural and urban. In the fourth stage, Primary and Upper Primary Schools were taken from rural and urban areas randomly. In the fifth stage, boys and girls from each school were selected randomly for the collection of data.

Source: Constructed by Author

3.1.8 Estimation of Sample Size

The sample size was calculated proportionally from both Primary and Upper Primary School students and parents. A sample size of 613 was derived for primary schools, and a sample size of 364 was derived proportionally for upper primary schools, which was adequate to provide state-wide results. In the same way, an equal number of parents were chosen as the sample for the present study. From each district, primary and upper primary schools were chosen from rural and urban areas by a simple random method. It is explained in the following figure:

Figure 3.3 Contribution of Each District in Sample Population: Primary School

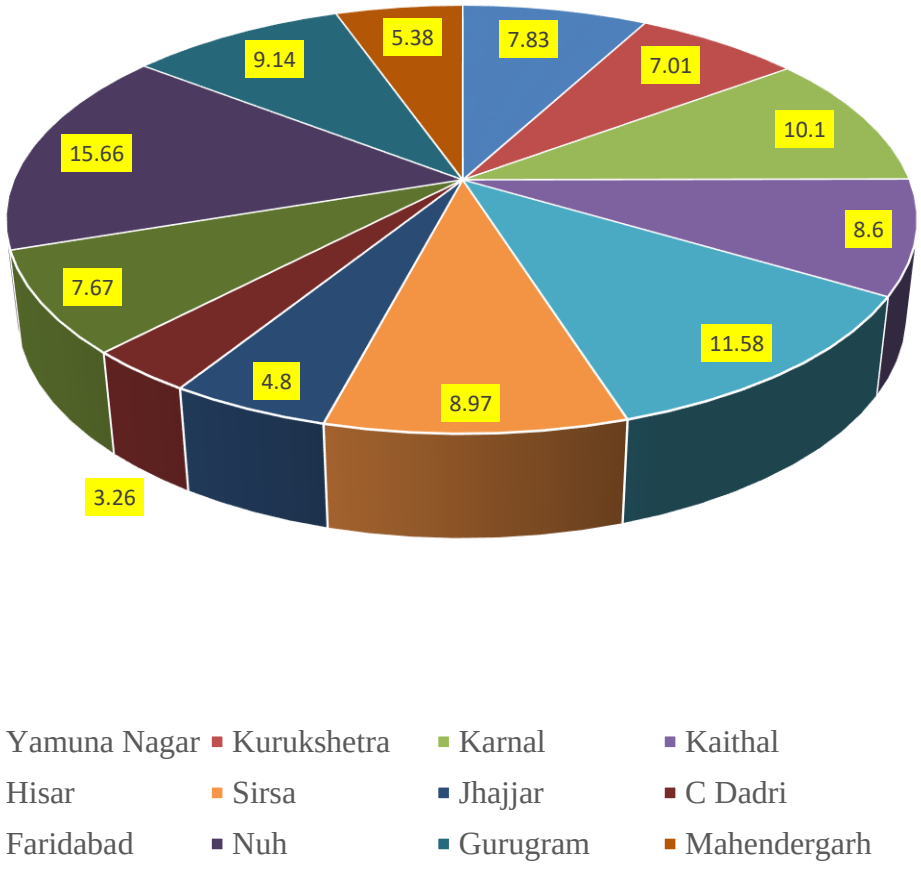


Fig. 3.3 showed the contribution of each district to the sample population. It was determined as per the strength of students studying in primary classes in particular

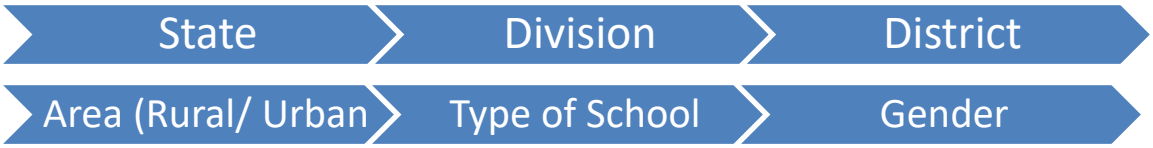
districts. The sample contribution was determined by 0.10% of its students' strengths. The strength of students was not only related to the geographical area of that district but also socio-economic condition of that district

Table No 3.1 Sample Selection: Primary School Students (September 2021)

Divisions	Districts	No of students in Primary Classes	No. of Students in Rural Area	Girls	0.10 % of total Population in round figure	No. of students in Urban Area	Boys	0.10 % of total Population in round figure	Girls	0.10 % of total Population in round figure
Ambala	Yamuna Nagar	50974	31145	15515	16	19829	9960	10	9869	10
	Kurukshetra	44370	31547	16720	17	12823	6433	6	6390	6
Karnal	Karnal	66150	46173	23008	23	19977	10174	10	9803	10
	Kaithal	57221	44632	22231	22	12589	6315	6	6274	6
Hisar	Hisar	74955	51195	25511	26	23760	11940	12	11820	12
	Sirsa	57114	44035	21567	22	13079	6581	7	6498	6
Rohtak	Jhajjar	30700	22903	11301	11	7797	4022	4	3775	4
	C Dadri	20042	16094	7820	8	3948	2180	2	1768	2
Faridabad	Faridabad	56071	11495	5728	6	44576	22364	22	22212	22
	Nuh	97777	86630	43727	44	11147	5182	5	5965	6
Gurugram	Gurugram	66038	20604	10267	10	45434	22994	23	22440	22
	Mahendergarh	33944	29056	14879	15	4888	2152	2	2736	3
		655356	435509	218274	220	219847	110297	109	109550	109

Source: Directorate of Elementary School Education Haryana

Students were selected as per sample design



The highest sample size was taken from the Nuh district as its student strength was 97777 and the lowest sample data were collected from the Charkhi Dadri district as its primary school strength was only 20042 students.

Figure 3.4 Contribution of each District in Sample Population: Upper Primary School

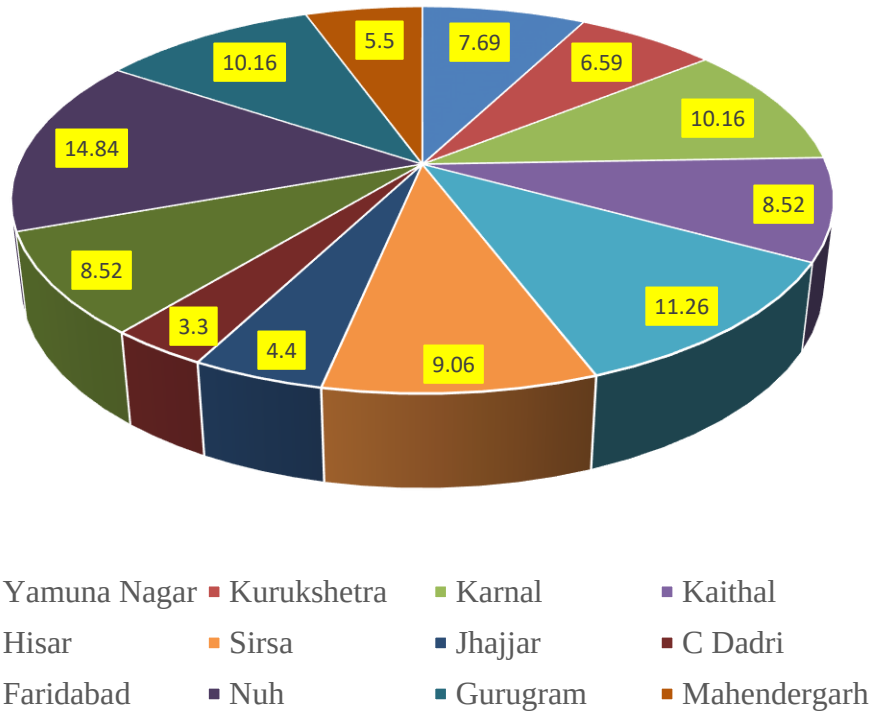


Figure no 3.4 shown the contribution of each district in the sample population was determined as per the strength of students studying in Upper Primary Schools in particular districts. Sample contribution was determined by 0.10% of its student's strength. The strength of students was not only related to the geographical area of that district but also socio-economic condition of that district.

Table No 3.2 Sample Selection: Upper Primary School Students Septemeber 2021

Divisions	Districts	No of students in UpperPrimary Classes	Rural Area	Girls	0.10 % of total Population in round figure	Urban Area	Boys	0.10 % of total Population in round figure	Girls	0.10 % of total Population in round figure
Ambala	Yamuna Nagar	28126	17185	8715	9	10941	5356	5	5585	6
	Kurukshetra	24483	17407	8926	9	7076	3428	3	3648	4
Kamal	Karnal	36500	25477	12772	13	11023	5497	5	5526	6
	Kaithal	31642	24701	12783	13	6941	3461	3	3480	3
Hisar	Hisar	41358	28248	14261	14	13110	6538	7	6572	7
	Sirsa	31514	24298	12181	13	7216	3598	4	3618	4
Rohtak	Jhajjar	16940	12637	6285	6	4303	2146	2	2157	2
	C Dadri	11058	8860	4442	4	2178	1586	2	1692	2
Faridabad	Faridabad	30939	6343	3180	3	24596	12066	12	12530	13
	Nuh	53952	47801	24963	25	6151	2467	2	3684	4
Gurugram	Gurugram	36437	11368	5699	6	25069	12401	12	12668	13
	Mahendergarh	18729	16033	8538	9	2696	1644	2	1552	2
Total		361678	240358	122745	124	121300	60188	59	62712	66

Source: Directorate Elementary School Education Haryana

Table 3.2 shown that the highest sample size was taken from the Nuh district as its students' strength was 53952 and the lowest sample data were collected from the Charkhi Dadri district as its primary school strength was only 11058 students.

Table No 3.3 Sample Selection: Teachers of Primary and Upper Schools (Septemeber 2021)

Divisions	Districts	No of teachers in Primary Classes	0.40 % of total Population	Sample size	No of teachers in Upper Primary Classes	0.40 % of total Population	Sample size
Ambala	Yamuna Nagar	1727	6.9	7	1021	4.08	4
	Kurukshetra	1759	7.03	7	985	3.94	4
Karnal	Karnal	2420	9.68	10	1527	6.1	6
	Kaithal	2525	10.1	10	1585	6.34	6
Hisar	Jind	2689	10.75	11	1612	6.44	6
	Sirsa	2739	10.95	11	1715	6.86	7
Rohtak	Jhajjar	1109	4.43	4	711	2.84	3
	C Dadri	982	3.92	4	619	2.47	2
Faridabad	Faridabad	1875	7.5	8	1214	4.85	5
	Nuh	3923	15.69	16	2319	9.27	9
Gurugram	Gurugram	1950	7.8	8	1224	4.89	5
	Mahendergarh	1255	5.02	5	916	3.66	4

Source: Directorate of Elementary School Education Haryana

Table 3.3, showed the sample size of teachers of primary and upper primary divisions. The highest sample size was taken from Nuh district as its teachers' strength was 3923 and 2319 for primary and upper primary divisions respectively. The lowest sample size was collected from the Charkhi Dadri district as its primary school strength was 982 and 619 teachers from primary and upper primary divisions respectively.

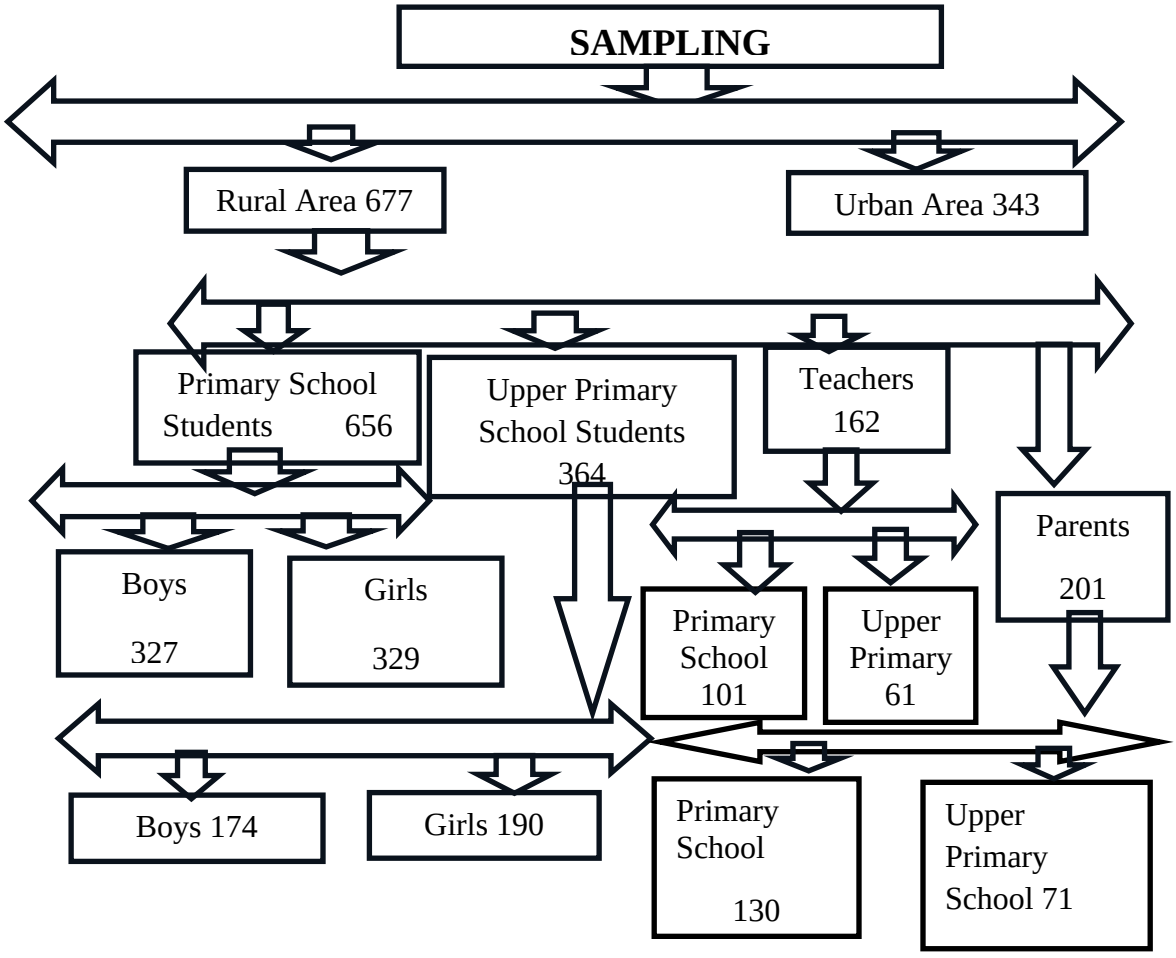
Table No 3.4 Sample Selection: Parents of Primary and Upper Schools (Septemeber 2021)

Divisions	Districts	No. of Parents in Primary Classes	0.02 % of total Population	Sample size	No. of Parents in Upper Primary Classes	0.02 % of total Population	Sample size
Ambala	Yamuna Nagar	50974	10.19	10	28126	5.62	6
	Kurukshetra	44370	8.87	9	24483	4.89	5
Karnal	Karnal	66150	13.23	13	36500	7.3	7
	Kaithal	57221	11.44	11	31642	6.32	6
Hisar	Jind	74955	14.99	15	41358	8.27	8
	Sirsa	57114	11.42	11	31514	6.3	6
Rohtak	Jhajjar	30700	6.14	6	16940	3.38	3
	C Dadri	20042	4	4	11058	2.21	2
Faridabad	Faridabad	56071	11.21	11	30939	6.18	6
	Nuh	97777	19.55	20	53952	10.79	11
Gurugram	Gurugram	66038	13.2	13	36437	7.28	7
	Mahendergarh	33944	6.78	7	18729	3.74	4

Directorate of Elementary School Education, Haryana

In table 3.4, it was assumed that the strength of parents was equal to the number of students. The highest sample size of the primary school division was taken from the Nuh district as its parents' strength was 97777 and the lowest sample data were collected from Charkhi Dadri district as its primary school strength was only 20042 parents. In the same way, for the upper primary school division, highest sample size was taken from Nuh district as its parents' strength was 53952 and the lowest sample data were collected from Charkhi Dadri district as its primary school strength was only 11058 parents.

Figure No 3.5 Sample Sizes of Primary and Upper Primary Schools



Source: Calculated by Author

Section II

3.2 Research Instruments

In a research study, tool is used to collect measure and analyze related data. These tools should be reliable and valid. It should be based upon conceptual framework. Data should be competent to test the hypothesis.

3.2.1 Framing of Questionnaire

To measure the impact of the Mid-Day Meal Scheme on various socio-economic groups of students studying in the primary and upper primary classes of government-run schools

in Haryana, a well-structured questionnaire has been used. The questionnaire was divided into four sections. Section I highlighted the identification of students. Mid-Day Meal's administration tendencies were discussed in Section II. Further, Section III focused on the satisfaction level of students. Section IV sought suggestions for improvement of MDMP, for which the five-point Likert scale was used.

Achievement Test (self-prepared)

This test was prepared in consultation with the subject teachers. Achievement tests were prepared for Primary and Upper Primary Schools in three subjects: English, Math, and EVS/Science. These three subjects were chosen for the achievement test because the National Achievement Survey also used these three subjects for the nationwide survey. Each subject contained 10 objective-type questions of one mark each. It was comprised of low, medium, and high difficulty levels. These questions were based on knowledge, understanding, and application domains. The questions were taken from the syllabus of 5th and 8th standards. These tests were prepared for class 5^{th} and 8^{th} students. It was prepared in Hindi and English. No negative marking was applied.

Pareek's Scale: It was used for calculating the socio-economic scale of a family. It has nine components, viz., caste, occupation, education, level of social participation, landholding, type of house, number of animals, type of family, and material possessions. Students were categorized as per scoring and analysed for performance. Based on the scores of Revised Udai Pareek Socio-Economic Status, students were classified as per following classes.

Socio-Economic Status Class	Total Scale
Upper Class (UC):	> 43
Upper Middle Class (UMC):	33-42
Middle Class (MC):	24-32
Lower Middle Class (LMC):	13-23
Lower Class (LC):	<13

Scoring of five-point Likert Scale: The collected data was scored by extracting the responses from the questionnaire. Subjects' responses were weighted differently according to the following response categories:

Category	Marks
'SA: Strongly Agree	5
'A'-Agree	4
'N'-Neutral	3
'D'-Disagree	2
'SD: Strongly Disagree	1

3.2.2 Content Validity

"Content validity refers to the extent to which a questionnaire on a measure shown by some content or how well the content material was sampled in the measures." (Rubio et al., 2003). In a similar study, it was found that content validity is very helpful in framing the items to operationalize the content and measure the content of interest (Kimberlin and

Winterstein, 2008). The validity of the content area cannot be verified with the help of mathematical and statistical tools, so it is validated with the help of the judgment of professionals in the field. So, content validity is a judgment procedure to ascertain whether a question covers a relevant domain (Dar, IA, Garg, K and Mishra, M 2018).

Content validity was assessed by trusting in the proficiency of the experts who have thorough knowledge about the domain or construct under study. These subject experts were requested to provide valuable feedback related to content, language, and ambiguity. The majority of experts suggested that the language of questions should be simple and understandable; no technical terms should be used. A few items were either corrected or deleted after getting insightful suggestions from experts.

3.2.3 Pilot Testing

"Pilot testing is done to check the internal consistency of the statement by analysing the Cronbach's alpha" (Bashir & Akbar 2021). A pilot test was conducted on 150 students of the same age groups in one Primary and Upper Primary Schools in three districts of Haryana. It was ensured that students belonged to various socio-economic groups in society. Students did not report any difficulty in understanding and answering the questionnaires. It took around 40–45 minutes for each respondent to register their response and 5 minutes to measure their height and weight.

3.2.4 Reliability

It is defined as the property by which steady and consistent results are accomplished when the measurements of items are repeated. "Reliability is explained as the uniformity in the results when the measurement is repeated time after time. In simple terms, when a questionnaire is put to use on a similar population, the results are said to be reliable" (Nargundkar, 2008).

According to Farooq (2017), “the most widely used method to measure reliability is Cronbach’s alpha, which ranges from 0 to 1 and can be used to measure the reliability of dichotomous scales, Likert scales, nominal scales, and ordinal scales." In a study by Nunnally (1978), the threshold value of ‘Cronbach’s Alpha for validating a question should not be less than 0.70. There is higher the value of Alpha, the higher the reliability of the item, and vice versa.

The value of ‘Cronbach’s alpha’ for ‘Management of Mid-day Meal’ Construct, ‘Satisfaction of Mid-day Meal’, and ‘Impact of Mid-day Meal’ was above 0.70, as presented in table 3.2.2, thereby certifying the reliability of all the constructs. The Cronbach’s alpha value of ‘Management of Mid-Day Meals’ was 0.722, which improved to 0.743 after deleting three questions. The Cronbach’s alpha of ‘Satisfaction for the Mid-Day Meal’ construct was 0.710, which improved to 0.741 after deleting five questions. The Cronbach’s alpha of the ‘Impact of the Mid-Day Meal’ construct was 0.705, which improved to 0.749 after deleting six questions. Therefore, all the scales were established to be reliable.

Table No 3.5 Reliability of Mid-Day Meal Scheme Satisfaction level of Students

Construct	Item Code	Corrected Items Correlation	Alpha Values if Item Deleted	Cronbach's Alpha	Item Label
Management of Mid-Day Meal	MM1	0.516	0.756	0.743	You come to school daily.
	MM2	0.384	0.741		You come to school after taking meal.
	MM3	0.545	0.723		You get change in meal daily.
	MM4	0.236	0.714		You take Mid-Day Meal daily.
	MM5	0.412	0.749		Mid-Day Meal cooked hygienically.
	MM6	0.258	0.742		While preparing menu of MDM, students' interest should be acknowledged.
	MM7	0.574	0.74		Fruits should be included in MDM.
	MM8	0.349	0.784		Green vegetables are used in MDM.
Satisfaction of Mid-Day Meal	SM1	0.241	0.70	0.741	MDM is garnished.
	SM2	0.583	0.745		You demand more meal.
	SM3	0.159	0.781		All the students get meal in equal quantity and as per their desire.
	SM4	0.543	0.725		You eat all served meal.
	SM5	0.357	0.732		You get full meal.
	SM6	0.456	0.729		You get satisfaction after taking MDM.
	SM7	0.541	0.736		MDM should be continue.
	SM8	0.258	0.784		Flavour of MDM is good.
	SM9	0.346	0.752		I like to come to school regularly because I get tasty meal here.
	SM10	0.124	0.748		You like menu table daily.
Impact of Mid-Day Meal	IM1	0.542	0.721	0.749	You get positive impact of MDM on your study.
	IM2	0.536	0.756		MDM intevenes in my study.
	IM3	0.259	0.735		The students of other castes do discrimination with you during meal
	IM4	0.423	0.749		You have faced problems related to health after taking MDM.
	IM5	0.427	0.785		You got positive impact of MDM on your body.

Source: Calculation of Author

Table No 3.6 : Reliability of Mid-Day Meal Scheme Satisfaction Level of Parents

Construct	Item Code	Corrected Items Correlation	Alpha Values if Item Deleted	Cronbach's Alpha	Item Label
Management of Mid-Day Meal	MM1	0.526	0.716	0.725	Children go to school after having a meal.
	MM2	0.484	0.721		Children go to school with meals.
	MM3	0.525	0.723		Children bring meals from school.
	MM4	0.541	0.728		Parents contribute to bring improvement in the arrangments of MDM.
	MM5	0.231	0.734		You go to school to observe MDM arrangements.
	MM6	0.212	0.729		There should be a change in the menu of MDM.
Satisfaction of Mid-Day Meal	SM1	0.341	0.723	0.746	Hygienic conditions are especially observed in MDM.
	SM2	0.483	0.753		Your child likes MDM that's why they go to school regularly.
	SM3	0.259	0.784		You want that MDM should be continue.
	SM4	0.359	0.726		Your children get MDM regularly.
Impact of Mid-Day Meal	IM1	0.342	0.736	0.738	Your children have faced caste discrimination while taking the MDM.
	IM2	0.526	0.741		Your children have faced health-related problems after taking the MDM.
	IM3	0.359	0.726		You have observed improvement in the study of your child after the implementation of MDM.
	IM4	0.323	0.748		You have observed improvement in the health of your child after the implementation of MDM.

Source: Calculation of Author

The value of Cronbach's alpha for 'Management of Mid-Day Meal' construct, 'Satisfaction of Mid-Day Meal', and 'Impact of Mid-Day Meal' was above 0.70, as presented in table 3.6, thereby certifying the reliability of all the constructs. The Cronbach's alpha value of 'Management of Mid-Day Meals' was 0.713, which improved to 0.725 after deleting two questions. The Cronbach's alpha of 'Satisfaction for the Mid-Day Meal' construct was 0.714, which improved to 0.746 after deleting four questions. The Cronbach's alpha of the 'Impact of the Mid-Day Meal' construct was 0.721, which improved to 0.738 after deleting two questions. Therefore, all the scales were established to be reliable.

Table No 3.7 Reliability of Mid-Day Meal Scheme Satisfaction level of Teachers

Construct	Item Code	Corrected Items Correlation	Alpha Values if Item Deleted	Cronbach's Alpha	Item Label
Management of Mid-Day Meal	MM1	0.416	0.766	0.740	MDM is prepared as per the menu table.
	MM2	0.484	0.742		MDM is prepared timely.
	MM3	0.545	0.720		Hygenic conditions are observed in kitchen.
	MM4	0.336	0.704		MDM is tasted for its taste.
	MM5	0.422	0.744		Parents contribution should be taken for improving the MDMP.
	MM6	0.258	0.748		MDM sample is kept for test.
	MM7	0.564	0.760		Teachers' point of view should be considered while preparing MDM menu.
Satisfaction of Mid-Day Meal	SM1	0.247	0.707	0.722	Nutritious meal is given to students in MDM.
	SM2	0.523	0.728		You are satisfied with the quality of MDM.
	SM3	0.459	0.724		MDM Menu is good.
	SM4	0.243	0.729		MDM should be continue.
Impact of Mid-Day Meal	IM1	0.442	0.736	0.742	MDMP is not beneficial for social cohesiveness.
	IM2	0.336	0.755		Students' interest in study have increased after implementing the MDMP.
	IM3	0.249	0.734		Students' concentration increased after implementing MDMP.
	IM4	0.413	0.729		Your teaching time decreased after implementing the MDMP.
	IM5	0.417	0.755		Admissions have increased after implementing the MDMP.
	IM6	0.422	0.744		Students' attendances have increased after implementing MDMP.
	IM7	0.358	0.741		Students' drop out rate reduced after implementing the MDMP.

Source: Calculated by Author

The value of Cronbach's Alpha for 'Management of Mid-Day Meal' construct, 'Satisfaction of Mid-Day Meal' and 'Impact of Mid-Day Meal' was above 0.70, as presented in table 3.7, thereby certifying the reliability of all the constructs. The Cronbach's alpha value of 'Management of Mid-Day Meal' was 0.719 which improved to 0.740 after deleting 03 questions. Cronbach's alpha value of 'Satisfaction of Mid-Day Meal' construct was 0.712 which improved to 0.722 after deleting 02 questions. Cronbach's alpha of 'Impact of Mid-Day Meal' construct was 0.725 which improved to 0.742 after deleting 03 questions. Therefore, all the scales were established to be reliable.

Section III

3.3 Statistical Tools for Data Analysis

3.1 Mean

The mean is a basic concept in Mathematics and Statistics. In Statistics, it is a measure of the central tendency of a probability distribution. To calculate the mean, all the values are added to the given data and then divided by the number of subjects. So, mean is estimated by taking the sum of all observations in a data set divided by the total number of observations in a given data set.

$$\bar{x}=\sum x/n$$

Where,

$\sum x$: sum of all observations

n: Number of observations

3.3.2 Paired Sample t test

A paired sample t test compares the mean of two measurements taken from the same individual unit. The continuous dependent variable is measured at two different times. The purpose of a paired sample t test is to determine statistical evidence that the mean

difference between two paired observations is significantly different from zero. A paired sample t- test requires the following main assumptions:

1. Data are normally distributed.
2. Random sampling of data.
3. The dependent variable should be continuous.
4. Subjects should be the same in both groups.

Hypothesis: Ho: There is no significant difference between the two groups.

H1: There is a significant difference between the two groups.

$$t=\sum d\sqrt{n(\sum d2)-(\sum d)2n-1}$$

Where,

d = difference

n = number of samples

For calculating 't' value, the critical 't' value is compared with df (n-1) in the t distribution table for a chosen confidence level. If the calculated t value is higher than the critical t value, then Ho is accepted, or vice versa.

3.3.3 One-way ANOVA (Analysis of Variance Test)

Before using any statistical tool, it is mandatory to check the normality of the data. The parametric test requires normal distribution of data for small sample size. It has bell shaped curve. Normality can be described by mean and standard deviation parameters. A perfect normality has same mean and standard deviation. ANOVA test assumes normality of data. The Central Limit Theorem states that when the size of a sample is ≥ 100, a violation of the normality assumption is not a big issue (Moivre, 1733; Atman DG; Bland JM Statistics Notes: The Normal Distribution, BMJ 1995; 310:298), it was further cited

by Kumara, P and Kumar, P. 2021. In this study, one-way ANOVA was chosen as a sophisticated tool because it is considered robust. “ANOVA is a relatively robust procedure with respect to the violation of the normality assumption” (Kirk, 1995). Andy Field (2000), in his book, Discovering Statistics, Exploring Data: The Beast of Bias stated that for large sample sizes, violations of normality are considered normal. The ANOVA procedure is reasonably robust for non-normality” (Miller, 1997).

“One way ANOVA test is a statistical method used to compare the mean value of samples to check whether they are significantly different. Also, the method uses one independent variable" Verma and Sharma, (2005). It is a useful research tool in linear modeling that minimizes the sum of squares, which is used in F-statistic. It assumes a Gaussain distribution of the residuals, and this model is robust to the non-normality assumption (Knife and Forstmeier, 2021). Therefore, in the present study, data is collected from 656 students and parents in the primary division and 364 students and parents in the upper primary division, so it is assumed that the data is normally distributed. Analysis of Variance (ANOVA) performs the comparison between three or more dependent variables. It has one independent variable, which is categorical. Its main assumptions are:

1. Normal distribution of the population.
2. Independent of the sample.
3. Homogeneity of variance
4. The dependent variable should be continuous.

While calculating ANOVA, it involves the comparison of means from an independent group using the F-distribution i.e., a comparison between the group and the within-group variance.

Formula

$$\text{Coefficient of ANOVA(F)} = \frac{\text{Mean Sum of Squares between Groups}}{\text{Mean Sum of Squares within Groups}}$$

In hypothesis testing,

Ho: There is no significant difference between means of groups.

H1: There is a significant difference between the means of groups.

Result of F is called significant if f statistics are greater than the F value. A significant result shows the existence of a difference in means.

3.3.4 One Sample t-test

One sample t test measure whether the mean population is statistically different from a calculated or hypothetical mean. In other words, it compares the test variable mean with a known mean in the population. It is a parametric test. When framing the underlying assumptions of a t-test, it's crucial to consider the nature of your data and the specific type of t-test you're conducting (e.g., independent samples t-test, paired samples t-test). Here's a general outline of the assumptions for a two-sample independent t-test:

1. **Independence**: The observations within each group must be independent of each other. This means that the data points in one group should not be related to or affects the data points in the other group. If the data is not independent, it can lead to biased results.
2. **Normality**: The data in each group should follow a normal distribution. This means that when you plot the data in each group on a histogram, it should resemble a bell-shaped curve. While the t-test is robust to violations of normality, especially with large sample sizes, severe deviations from normality can affect the validity of the results.

3. **Homogeneity of variances**: The variances of the two groups should be equal. This means that the spread or dispersion of scores in one group should be roughly similar to the spread in the other group. Violations of this assumption can lead to inaccurate results, particularly if the sample sizes are unequal. However, if the sample sizes are equal, the t-test is relatively robust to violations of this assumption.

While framing these assumptions following steps were ensured by the researcher in analysis:

- Independence of data was checked by ensuring that the data points were collected independently or through random sampling.
- Normality of data was visually checked by using histograms, Q-Q plots, statistical tests the Shapiro-Wilk test.
- Test for homogeneity of variances was carried out by using statistical test, Levene's test.

Hypothesis

Ho: **T**here is no significant difference between the population mean and the constant mean value.

H1: There is a significant difference between the population mean and the constant mean value.

Formula:

$$t = \frac{(\bar{x} - \mu)}{\sigma/\sqrt{n}}$$

where,

$\bar{x}$= Sample Mean

μ = Assumed Population Mean

σ = Standard Deviation

n= Number of observations

The calculated t value is compared with the assumed mean from the t distribution table with a given degree of freedom (DF). If the calculated t mean is greater than the critical value, accept the Ho, or vice versa.

3.3.5 Mann-Whitney U Test

It is commonly called the “Wilcoxon Rank Sum Test” or "Mann-Whitney-Wilcoxon Test”. It determines whether the two independent samples are from the same population. According to Mac Farland and Yeats (2016), “the Mann-Whitney U test is quite powerful, and by no means should it be considered anything but equivalent to the student's t-test for independent samples in terms of utility.” It is used when the data are ordinal and the assumptions of the t test are not fulfilled.

$$\mathrm{U} = n1n2 + \frac{n2\ (n2+1)}{2} - \sum_{i=n1+1}^{n2} Ri$$

where,

n1: Sample size one

n2: Sample size two

U: Mann Whitney U Test

R: Rank of sample size

Cost-Effectiveness Analysis: Cost-effectiveness analysis (CEA) is a method used in economics and healthcare to compare the relative costs and health outcomes (or other outcomes of interest) of programs. It is a systematic approach that helps decision-makers to allocate resources efficiently by assessing whether the benefits of a program justify its costs. CEA provides a structured framework for evaluating the trade-offs between costs and benefits and helps ensure that limited resources are used in ways that maximize social or organizational goals. For cost effectiveness analysis of MDMP at the Revenue Division level, the following methodology was used:

Computation of Unit Cost

In this analysis, per capita, students' recurring expenditure on MDM was calculated during 2021 as unit cost. This unit cost was obtained by dividing the total recurring expenditure incurred by the sampled school's total enrolment attributable.

Computation of Cost-effectiveness

To compute the cost-effectiveness of sampled schools, first, the unit costs of MDM were computed, and then students' achievement test performance in academics and physical standards in classes V and VIII were calculated. The achievement index was computed with the help of the following formula:

$$\text{Achievement Index, A} = \frac{\text{Mean of total marks secured}}{\text{Total marks of a student}} \text{x } 100$$

$$\text{Cost} - \text{Effectiveness per Capita} = \frac{\text{Per Capita MDM Mean Cost}}{\text{Mean Academic Marks Secured}}$$

The database was analyzed with the help of many statistical methods using graphs, percentage, pie chart etc.

CHAPTER - IV

Result and Discussions

The data becomes meaningful after proper analysis and interpretation. After the collection of data, the next step usually involves analysis. Analysis of data means extracting inherent facts from the tabulated data, which is done by turning complex factors into simple segments and then projecting it into new, visible arrangements. The analysis of data has two main aims:

1. It reduces the data into an interpretable and intelligible form so that the relationship between variables can be studied and tested.
2. It aims to extract maximum information.

After analysis, interpretation of the outcome takes place. Pertinent inferences are made about the relationship between various variables, and conclusions are drawn. In the present study, the data are analysed through various statistical techniques like the paired sample t-test, ANOVA, the Mann-Whitney U test, the one-sample test, and tabular and graphical devices. Since the present research study was proposed to study "A Socio-Economic Analysis of the MDM Scheme in Haryana". Its data analysis and findings are presented objective wise in this chapter.

4.1 To Ascertain the Role of MDMP in Increasing Enrolment, Attendance, and Retention among Various Socio-Economic Groups of Students.

In this objective, the role of MDMP was analyzed in increasing the enrolment, attendance, and retention of students belonging to various socio-economic groups. Secondary data were collected from the Directorate of Elementary Education, Government of Haryana, for the period of 2003 to 2021. It was analyzed whether the MDM scheme has made any difference in enrolment, attendance, and retention of students in primary and upper primary schools of government.

4.1.1 H0: There is No Significant Difference in Increasing Enrolment among Students of Various Socio-Economic Groups of Students in Primary Schools.

Table 4.1.1: One Way ANOVA Test: Enrolment of Primary Schools

Enrolment	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.354	0	-	-	-	-	-
UMC		08	1.21	0.26	32.1	3	0.000 Significant At.05 level. H0 Rejected
MC		209	31.86	3.9			
LMC		377	57.46	4.1			
LC		62	9.47	3.4			

Source: Author's calculation

The P value (0.354) of the Levene test was greater than the critical value (.05), so it has homogeneity of data. The outcome showed a p-value of 0.000, which was significant at the 0.05 significance level. The outcome implied that there was a significant difference in the enrolment of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 1.21, 31.86, 57.46, and 9.47, respectively, which shown that the maximum number of students studying in government schools belonged to LMC and LC. MDMS has the least role in increasing the enrollment of the students in Upper class and Upper Middle class. This outcome is supported by other studies, e.g., Sahoo; P. (2013) found that enrolment does not increase among rich students due to private English-medium schools. Kaur, M (2016) concluded that after the introduction of MDM, the enrolment of students has decreased by 38 percent, but the enrolment of the poorest segment of society is high in government-run schools. Secondary data in Table 4.1.1 showed that the mean enrolment of students declined after the introduction of the Mid-day Meal Scheme, but it did not reduce MC and LMC students' strength in primary schools.

Table No 4.1.2 Mean Enrolment of Primary Schools District-wise (2003-21)

Districts	Mean of Enrolment before MDM	Mean of Enrolment After MDM
Kurukshetra	58215	44103
Yamunanagar	54238	48042
Kaithal	83124	56929
Karnal	85460	73578
Sirsa	94631	77594
Jind	95781	71112
Jhajjar	35295	33848
Charkhi Dadri	15924	13827
Faridabad	86544	65937
Nuh	95493	125554
Mahendergarh	69560	40198
Gurugram	88921	67241
Total	863186	717963
Mean	71992	59830

Sources: Directorate of Elementary Education Haryana

Table no. 4.1.2 clearly shown that enrolment in all the districts has reduced even after the execution of MDMP except in Nuh district where the enrolment has increased. Enrolment decreased because of better infrastructure and availability of English medium schools in all districts under study except Nuh. Sahoo, P. (2013) found that enrolment does not increase among rich students due to private English-medium schools. Per capita income in the Nuh district is the least in Haryana. Due to poverty, parents were unable to afford expensive education in private schools (Bhardwaj, KJ 2008).

The Role of MDM Program is to Increase Enrollment in Primary School Classes

Paired Sample T Test

	Levene' Test	Mean	N	SD	t	Sig (2tailed)
Mean of Enrolment before MDM	0.457	71992	12	29312.9	2.11	0.001
Mean of Enrolment after MDM		59830	12	27985.6		Significant a t .05 level

A paired sample t-test was performed to determine the effect of MDM on the enrollment of pupils in primary schools. The outcome showed a p-value of 0.001, which was significant at the 0.05 significance level (for both pre-MDM and post-MDM groups). The outcome implied that the MDMP has a significant role in the enrolment of pupils in primary school classes. The mean difference showed that enrolment has declined in primary schools in Haryana after the introduction of the MDM scheme.

4.1.2 H0: There is no Significant Difference in Increasing Enrolment among Students of Various Socio-Economic Groups of Students in Upper Primary School.

Table 4.1.3: One Way ANOVA Test: Enrolment of Upper Primary School

Enrolment	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.554	0	-	-	32.1	3	-
UMC		04	1.11	3.0			0.000 Significant At.05 level. H0 Rejected
MC		163	44.78	3.9			
LMC		174	47.80	4.1			
LC		23	6.31	3.4			

Source: Author's calculation

The P value (.554) of the Levene test was greater than the critical value (.05), so it has homogeneity of data. The outcome showed a p-value of 0.000, which was significant at the 0.05 significance level. The outcome implied that there was a significant difference in the enrolment of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 1.11, 44.78, 47.80, and 6.31, respectively, which showed that the maximum number of students studying in government schools belonged to LMC and LC. Table 4.1.2 showed that MDM has a significant role in increasing the enrollment of lower Middle Class- and Upper-Class students. It has the least role in increasing the enrollment of the Upper Class and Upper Middle Class. This outcome was supported by other studies, e.g., Sahoo P. (2013) found that enrolment did not increase among rich students due to private English-medium schools. Kaur, M (2016) concluded that after the introduction of MDM, the enrolment of students has decreased by 38 percent, but the enrolment of the poorest segment of society was high in government-run schools. Secondary data in Table 4.1.3 showed that the mean enrolment of students declined after the introduction of the Mid-day Meal Scheme, but it did not affect the strength of students belonging to the Middle Class and Lower Middle Class categories.

Table No 4.1.4: Mean Enrolment of Upper Primary Schools (2003-21)

Districts	Mean of Enrolment before MDM	Mean of Enrolment after MDM
Kurukshetra	21669	28119
Yamunanagar	30641	23475
Kaithal	35643	37581
Karnal	47794	34231
Sirsa	45880	38457
Jind	39513	31807
Jhajjar	33898	23287
Charkhi Dadri	11263	9864
Faridabad	46389	39374

Nuh	25471	48008
Mahendergarh	30102	23306
Gurugram	33048	24251
Total	390048	361760
Mean	33442	30146

Sources: Directorate of Elementary Education Haryana

Table 4.1.4 clearly shown that enrolment in Karnal, Jhajjar, Faridabad, and Mahendergarh districts has reduced even after the implementation of MDMP, but in Nuh and Kurukshetra districts, enrolment has increased. Enrolment decreased because of better infrastructure and availability of English medium schools in all districts under study except Nuh. Sahoo; P. (2013) found that enrolment does not increase among rich students due to private English-medium schools. Per capita income in the Nuh district is the least in Haryana. Due to poverty, parents were unable to afford expensive education in private schools (Bhardwaj KJ 2008).

Paired Sample T Test

	Levene's Test	Mean	N	SD	t	Sig (2tailed)
Mean Enrolment before MDM	0.562	33442	12	13140.2	0.712	0.482 Not Significant At .05 level
Mean Enrolment after MDM		30146	12	11512.75		

Source: Author's calculation

A paired sample t-test was conducted to determine the effect of MDM on the enrollment of students in Upper Primary schools. The outcome showed the P-value of 0.482, which was insignificant at the 0.05 significance level. The outcome implied that there was no significant role of the MDMP in decreasing the enrollment of students in Upper Primary Classes. The mean difference showed that enrolment of students marginally decreased

after the execution of the MDMP in Upper Primary Schools in Haryana.

4.1.3 H0: There is no Significant Difference in Increasing Attendance among Students of Primary Schools of various Socio-Economic Groups of Students.

4.1.5: One Way ANOVA Test: Attendance among Students of Primary Schools

Enrolment	Levene's Test	N	Mean	SD	F	df	Sig.
UC	-	0	-	-	-	-	-
UMC	0.620	08	191.6	22.06	41.4	3	.036 Significant At .05 level. H0 Rejected
MC		209	172.3	21.9			
LMC		377	143.8	26.1			
LC		62	111.9	23.0			

Sources: Author's calculation

The P value (0.620) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed the P-value of 0.036, which was significant at the 0.05 level of significance. The outcome implied that there was a significant difference in students' attendance among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 191.6, 172.3, 143.8, and 111.9, respectively, indicating that lower socio-economic group students have lower attendance compared to higher strata of students. Lower-class pupils have the lowest school attendance. This outcome is also supported by other studies, e.g., Nambiar & Desai (2014) stated that MDMP was considered a means of promoting improved enrolment and school attendance. Singh, S & Gupta, N (2015) found that MDM was a critical vehicle for increasing enrollment, attendance, and retention. Paul, PK and Mondal, NK (2012) concluded that MDM has a positive effect on enrollment, attendance, and retention rates. The secondary data in Table 4.1.5 reflected that the attendance of students increased

significantly in primary schools, but it could not increase the attendance of LC and LMC category students equal to MC and UMC category.

Role of MDM program in Increasing the Attendance in Primary School

Paired Sample T- Test

	Mean	N	SD	t	Sig (2-tailed)
Mean Attendance before MDM	102.5	12	21.6	3.7	0.003 Significant At .05 level
Mean Attendance after MDM	130.2	12	6.8		

Source: Author's calculation

A paired sample t-test was conducted to determine the effect of MDM on the attendance of students in primary schools. The outcome showed a p-value of 0.003, which was significant at the.05 significance level. The outcome of the paired sample t-test implied that the MDMP played a significant role in increasing the attendance of students in primary classes. The mean difference showed that the attendance of students increased after the implementation of the MDMP in primary schools in Haryana.

Table: 4.1.6: Attendance of Primary Schools in Haryana (2004-2020)

Districts	Mean Attendance Before MDM	Mean Attendance After MDM
Kurukshetra	105.3	130.2
Yamunanagar	98.6	118.3
Kaithal	101.8	119.6
Karnal	108.6	138.1
Sirsa	106.5	132.3
Jind	109.2	131.2
Jhajjar	111.7	149.6
Charkhi Dadri	110.6	145.1
Faridabad	103.4	132.6
Nuh	62.5	102.3
Mahendergarh	104.6	128.5
Gurugram	101.7	132.4
Total	1224.5	1560
Mean	102.5	130.2

Sources: Directorate of Elementary Education Haryana

Table 4.1.6 showed that the attendance of Primary School students increased from 102.5 to 130.2 which was a significant increase in attendance after the execution of MDMP. Students got lunch which enabled them to stay in school full time. It increased their attendance. Paul and Mondal (2012) concluded that MDM has a positive effect on enrollment, attendance, and retention rates.

4.1.4 H0: There is no Significant Difference in Increasing Attendance among Students of Upper Primary Schools of Various Socio-Economic Groups of Students.

4.1.7: One Way ANOVA Test: Attendance of Students of Upper Primary Schools

Enrolment	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	-	0	-	-	-	-	-
UMC	0.420	04	198.6	20.06	38.1	3	.031 Significant At 0.05 level. H0 Rejected
MC		163	192.3	19.9			
LMC		174	151.8	16.1			
LC		23	121.4	21.0			

Sources: Author's Calculations

The P value (0.420) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a P-value of 0.031, which was significant at the 0.05 level of significance. The outcome implied that there was a significant difference in student's attendance among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 198.6, 192.3, 151.8, and 121.4, respectively, indicating that lower socio-economic group students have lower attendance compared to higher strata groups. Lower-class pupils have the lowest school attendance. This outcome is also supported by other studies, e.g., Nambiar & Desai (2014) stated that MDMP is considered a mean of promoting improved enrolment and school attendance. Singh (2010) found that MDMP was a critical vehicle for increasing enrollment, attendance, and retention. Paul and Mondal (2012) concluded that MDMP has a positive effect on enrollment, attendance, and retention rates. The secondary data in Table 4.1.7 reflected that the attendance of students increased significantly in primary schools, but it could not increase the attendance of LC and LMC category students equal to MC and UMC category.

Analysis of data of Upper Primary Classes: Attendance: Paired Samples T Test

Paired Sample T- Test

	Mean	N	SD	t	Sig (2-tailed)
Mean Attendance before MDM	109.5	12	22.1	-3.842	.005 Significant
Mean Attendance after MDM	132.5	12	7.9		

Source: Author's calculation

A paired sample t-test was performed to determine the effect of MDM on the attendance of pupils in upper primary schools. The outcome showed a p-value of 0.005, which was significant at the 0.05 level of significance. The outcome of the paired sample t-test showed that the MDMP played a significant role in increasing student attendance in the upper middle classes. The mean difference showed that student attendance has increased after the introduction of the MDMP in the Upper Primary Classes of Haryana.

Table 4.1.8: Mean Attendance of Upper Primary Schools in Haryana (2003-21)

Districts	Mean Attendance before MDM	Mean Attendance after MDM
Kurukshetra	110.65	134.1
Yamunanagar	102.85	130.6
Kaithal	112.6	129.55
Karnal	113.6	137.1
Sirsa	113.22	127.15
Jind	111.5	138.15
Jhajjar	116.85	142.3
Charkhi Dadri	114.28	134.35
Faridabad	115.3	137.85
Nuh	80.65	116.55

Mahendergarh	121.5	135.05
Gurugram	101.0	127.25
Total	1314	1590
Mean	109.5	132.5

Sources: Directorate of Elementary Education Haryana

Attendance in all the districts improved after implementation of MDMP. Nambiar & Desai (2014) stated that MDMP was considered a means of promoting improved enrolment and school attendance.

4.1.5 H0: There is no Significant Difference in Increasing Retention among Students of Primary Schools of various Socio-Economic Groups.

Table 4.1.9: One Way ANOVA: Retention among Students of Primary Schools

Enrolment	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.324		-	-	-	-	-
UMC			95.65	5.0	41.4	3	0.035 Significant At.05 level. H0 accepted
MC			96.19	5.9			
LMC			85.38	7.1			
LC			74.29	7.3			

Sources: Author's calculation

The P value (0.324) of the Levene test was greater than the critical value (.05), so there was homogeneity of data. The outcome showed a p-value of 0.35, which was not significant at the 0.05 significance level. The outcome implied that there was no significant difference in the retention rate of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 95.65, 96.19, 85.38, and 74.29, respectively, which showed that lower socio-economic group students have a lower retention rate in comparison with the higher strata groups. Lower-class students have the lowest retention rate in schools. This outcome was also supported by

other studies, e.g., Singh, M. (2010), which concluded that MDM was a vital means of increasing enrollment, attendance, and retention. Sharma, R. (2015) stated that students and parents believed that MDMP was very effective in reducing dropout rates. It was found that valuable resources were wasted due to the dropout of students belonging to low socio-economic classes in government primary schools. After the execution of the MDMP, the dropout rate was reduced by 65%. Table 4.1.9 reflected that retention of students increased after implementing MDMP, but it could not increase retention of students who belonged to lower-class students.

Role of MDM Program in Increasing Retention Rate in Primary School Classes

Paired Samples t Test

	Mean	N	SD	t	Sig (2-tailed)
Mean Retention before MDM	62.36	12	21.13	-5.583	0.000 Significant at .05 level
Mean Retention after MDM	93.30	12	6.24		

Source: Author's calculation

A paired sample t-test was conducted to determine the effect of MDMP on the retention of students in primary schools. The outcome showed the P-value of 0.000, which was significant at the 0.05 significance level. The outcome implied that the MDMP played a significant role in increasing the retention of students in primary classes. The mean difference showed that retention of students increased after the execution of the MDMP in primary schools in Haryana.

Table 4.1.10: Mean Retention Rate of Primary Schools in Haryana (2003-2021)

Districts	Mean Retention before MDM	Mean Retention after MDM
Kurukshetra	63	97.8
Yamunanagar	66	97.5
Kaithal	67.03	97.3
Karnal	65.08	94.3
Sirsa	64.04	95.7
Jindal	67.74	96.3
Jhajjar	64.58	88.1
Charkhi Dadri	60.57	88.3
Faridabad	60.4	96.1
Nuh	52.88	76.45
Mahendergarh	62.76	95
Gurugram	54.24	96.8
Total	748.32	1119.65
Mean	62.36	93.3.

Sources: Directorate of Elementary Education Haryana

Table 4.1.10 showed that the mean retention of students studying in primary schools increased from 62.36 to 93.3 after the execution of the MDM Scheme in Primary Schools. Students' retention rate increased in all the under-study districts of Haryana. MDMS has improved the school environment. It was so congenial that students wanted to keep continue their studies. Sharma, R. (2015) stated that students and parents believed that MDMP was very effective in reducing dropout rates.

4.1.6 H0: There is No Significant Difference in Increasing Retention among Students of Various Socio-Economic Groups in Upper Primary Schools

Table 4.1.11: One Way ANOVA: Retention among Students of Upper Primary Schools

	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.214	0	-	-	-	-	-
UMC		04	98.65	4.9	29.4	3	0.075 Not Significant At 0.05 level. H0 accepted
MC		163	92.21	5.2			
LMC		174	72.38	6.1			
LC		23	54.29	6.3			

Sources: Directorate of Elementary Education Haryana

The P value (.214) of the Levene test was greater than the critical value of.05, so it has homogeneity of data. The outcome showed the p-value of 0.75, which was not significant at the 0.05 significance level. The outcome implied that there was no significant difference in the retention rate of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 98.65, 92.21, 72.38, and 54.29, respectively, which showed that lower socio-economic groups have a lower retention rate in comparison with the higher strata groups. This outcome is supported by other studies, e.g., Singh, S and Gupta, N (2015) concluded that MDM was a vital means of increasing enrolment, attendance, and retention. Sharma, R. (2015) explored that students and parents believed that MDMP was very effective in reducing student dropouts. Table 4.1.11 shows that MDM has a significant role in increasing the retention rate of UMC and MC students. It has the least role in increasing the retention of the lower class.

Role of MDM Program in Increasing the Retention in Upper Primary School Classes: Paired Samples t test

	Mean	N	SD	t	Sig (2-tailed)
Mean of retention before MDM	66.1	12	21.97	-4.799	.001 Significant at 0.05 level
Mean of retention after MDM	95.3	12	4.16		

Source: Author's calculation

A paired sample t-test was performed to determine the effect of MDMP on the retention of pupils in primary schools. The outcome showed a p-value of 0.001, which was significant at the 0.05 level of significance. The outcome suggested that the Mid-Day Meal Program has played a significant role in increasing student's retention in Upper Primary School Classes. The mean difference showed that the students' retention has increased significantly after the introduction of the MDM scheme in Upper Primary Schools in Haryana.

Table No 4.1.12: Mean Retention of Upper Primary School in Haryana (2003-21)

Districts	Retention Rate before MDM	Retention Rate after MDM
Kurukshetra	68.1	96.2
Yamunanagar	60.01	98.2
Kaithal	68.1	97.8
Karnal	75.4	96.9
Sirsa	70.4	95.5
Jindal	68.2	97.5
Jhajjar	61.8	90.9
Charkhi Dadri	65.3	92

Faridabad	68.5	96.5
Nuh	53.4	84.2
Mahendergarh	66.59	96.4
Gurugram	67.4	96.7
Total	793.6	1143.6
Mean	66.1	95.3

Sources: Directorate of Elementary Education Haryana

Table 4.1.12 showed that the mean retention of Upper Primary Schools increased from 66.1 to 95.3 after the implementation of MDM Scheme. Students' retention rate increased in all the under study districts of Haryana. MDMS has improved the school environment. It was so congenial that students wanted to keep continue their studies. Sharma, R. (2015) stated that students and parents believed that MDMP was very effective in reducing dropout rates.

4.1.7 Reasons of Dropout

Figure No: 4.1.1: Reasons of Dropout

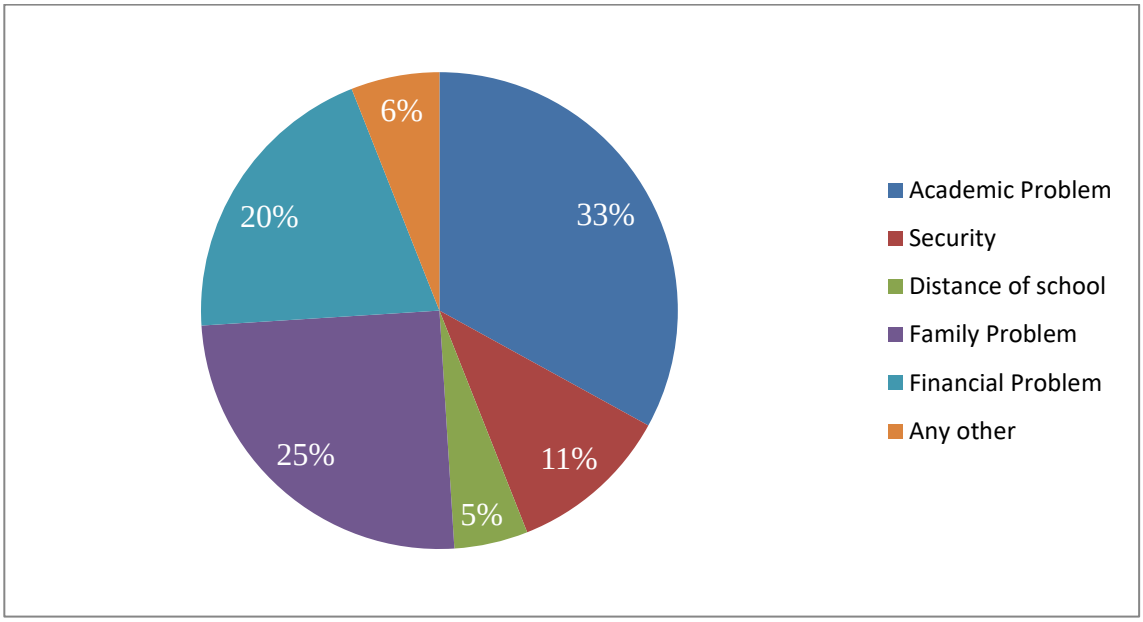


Figure no 4.1.1 reflected that the main reason for dropout in Haryana was academic problem of a student. Students were unable to cop up with the academic activities in the schools. Other important problems were family and financial problem of student's family. Although there was provision of free and universal education up to upper primary level but still some students were unable to continue their education.

4.2 To Analyze the Contribution of MDMP in Improving the Educational Attainment among Various Socio-Economic Groups of Students in Government Schools.

The academic achievement test was conducted on 5^{th}, and 8^{th} class students in Math, English, and EVS/ Science subjects. Nutritious meal has a positive correlation with academic achievements. "Skipping breakfast has negative impact on academic achievement by adversely affecting cognition and absenteeism and effective practices are available for schools to address this problem" Basch (2011). "High Academic achievement was shown among adolescents having a regular meal pattern, particularly breakfast and lunch" Stea, TH & Torstveit MK (2014). "Evidence suggested that breakfast consumption may improve cognitive function related to memory, test grades and school attendance" Ram Persaud and Pareria et al. (2005). Beside it, many other studies e.g., Burkhalter and Hillman (2011), Adolphus and Lawton et al. (2013) examined the role of nutritious meal and its effects on academic scores of students. So, it can be inferred that nutritious meal is very helpful for energy, concentration and development of a healthy mind.

4.2.1 H0: There is No Significant Difference in Scoring of Marks in English Subject among Students of Various Socio-Economic Groups of Primary Schools.

Table 4.2.1: One Way ANOVA Test: Marks in English Subject among Students of Primary Schools

Scores in English.	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.654	0	-	-	-	-	-
UMC		08	6.65	2.0	32.1	3	.000 Significant At.05 level. H0 Rejected
MC		209	6.17	1.9			
LMC		377	5.32	2.1			
LC		62	4.29	2.0			

Source: Author's calculation

The P value (0.654) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a p-value of 0.000, which was significant at 0.05 levels. The outcome implied that there was a significant difference in English subject score among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 6.65, 6.17, 5.32, and 4.29, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools. This outcome was supported by many previous research studies. Kumar, A. (2008) stated that a child who was hungry and sick was not expected to learn well. About 70% of teachers believed that MDMP helped to achieve the goal of universal education in the country. The majority of teachers (91%) believed that pupils learned better after the implementation of MDM in schools. Table 4.2.1 showed that marks in English have increased after implementing MDMP, but LMC and LC students were still lagging behind from higher class students.

Contribution of MDMP on Improvement of Marks in English Subject among Students of Primary School: Paired Samples t Test

Scores in English	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks in English subject before MDM	0.068	32.21	5	28.05	36.43	0.968 Not Significant At .05 level
Marks in English subject after MDM		37.35	5	22.17		

A paired sample t-test was conducted to determine the effect of MDMP on the English subjects of primary school students. The outcome showed a p-value of 0.968, which was not significant at the 0.05 level of significance. It means that the Mid-day Meal Program had no significant effect on increasing the number of English subjects in the primary class. The mean difference showed that English subject scores has marginally increased after the introduction of the MDM scheme in primary schools in Haryana.

Table: 4.2.2 Mean Average English subject of Students among Primary School Students in Haryana (2003-2021)

Districts	Mean marks in English subject before MDM out of 80 marks	Mean marks in English subject after MDM out of 80 marks
Kurukshetra	36.57	40.71
Yamunanagar	33.24	38.31
Kaithal	34.23	38.26
Karnal	31.67	37.78
Sirsa	33.22	37.21
Jind	30.28	38.21
Jhajjar	35.23	38.23
Charkhi Dadri	32.53	37.24
Faridabad	31.07	37.86
Nuh	25.23	31.02
Mahendergarh	33.13	37.19
Gurugram	30.12	36.18
Total	386.52	448.2
Mean	32.21	37.35

Sources: National Achievement Survey 2021

Table 4.2.2 showed that the mean average English subject increased from 32.21 to 37.35 in primary school students after implementation of the MDM Scheme. Mean score in English subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Kumar, A. (2008) stated that a child who was hungry and sick was not expected to learn well. About 70% of teachers believed that MDMP helped to achieve the goal of universal education in the country. The majority of teachers (91%) believed that pupils learned better after the implementation of MDM in schools.

4.2.2 H0: There is no Significant Difference in Scoring of Marks in English Subject among Students of Upper Primary Schools of Various Socio-Economic Groups.

4.2.3: One Way ANOVA Test: English Subject Marks among Students of Upper Primary Schools

Scores in English.	Levene's Test	N	Mean	SD	F	df	Sig.
UC	0.664	0	-	-	-	-	-
UMC		04	6.46	2.1	31.1	3	0.001 Significant At.05 level. H0 Rejected
MC		163	6.17	1.8			
LMC		174	5.12	2.2			
LC		23	4.22	1.9			

Source: Author's calculation

The P value (0.664) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a p-value of 0.001, which was significant at 0.05 levels. The outcome implied that there was a significant difference in English subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 6.46, 6.17, 5.12, and 4.22, respectively, indicating that students from the lower socio-economic group achieved low marks compared to the higher strata group students. Paul, PK, and Mandal, NK (2012) found a correlation between MDMP and students' academic achievement. The Mid-Day Meal Program improved the academic performance of the students. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved.

Table 4.2.3 showed that the marks of students have increased after implementing MDMP,

but lower middle- and lower-class students were still lagging behind higher-strata students. Table No 4.2.4 showed that marks in English subject has increased after implementation of MDMP.

Contribution of MDMP on Improvement of Marks in English Subject among Upper Primary School Students: Paired Sample t Test

Scores in English	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks of English subject before MDM	0.051	32.69	3	4.7	40.2	0.012 Significant
Marks of English subject after MDM		38.49	3	5.0		At .05 level

Source: Author's calculation

A paired sample t-test was conducted to determine the effect of MDMP on the English subjects of upper primary school students. The p-value was 0.012, which was significant at the 0.05 level of significance. The outcome reflected that the Mid-Day Meal Program played a significant role in increasing the marks of English subjects in students in upper primary schools. The mean difference showed that English subject scores has increased after the execution of the MDM scheme in upper primary schools in Haryana.

Table no 4.2.4: Mean Average English subject among Upper Primary School Students in Haryana (2003-2021)

Districts	Mean marks in English subject before MDM out of 80 marks	Mean marks in English subject after MDM out of 80 marks
Kurukshetra	35.53	40.72
Yamunanagar	34.23	38.31
Kaithal	35.28	40.21
Karnal	32.60	37.78
Sirsa	30.23	39.31
Jind	31.27	38.21
Jhajjar	34.28	40.29
Charkhi Dadri	33.13	38.26
Faridabad	32.27	38.46
Nuh	27.20	31.02
Mahendergarh	34.28	41.13
Gurugram	32.02	38.18
Total	392.32	461.88
Mean	32.69	38.49

Source: National Achievement Survey 2021

Table 4.2.4 showed that the mean average English subject increased from 32.69 to 38.49 in upper primary school students after the execution of the MDM Scheme. Mean score in English subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Kumar, A. (2008) stated that a child who was hungry and sick was not expected to learn well. About 70% of teachers believed that MDMP helped to achieve the goal of universal education in the country. The majority of teachers (91%) believed that pupils learned better after the implementation of MDM in schools.

4.2.3 H0: There is no Significant Difference in Scoring of Marks in Mathematics Subject among Students of Primary Schools of Various Socio-Economic Groups.

Table 4.2.5: One Way ANOVA Test: Marks in Mathematics Subject among Students of Primary Schools

Scores in Mathematics.	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.803	0	-	-	-	-	-
UMC		08	5.70	1.72	29.24	3	0.000 Significant At.05 level. H0 Rejected
MC		209	5.75	1.91			
LMC		377	4.80	1.99			
Lower Class		62	4.22	1.85			

Source: Author's calculation

The P value (0.803) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a P-value of 0.000, which was significant at the 0.05 level. The outcome implied that there was a significant difference in marks in mathematics subjects among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 5.70, 5.75, 4.80, and 4.22, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools. This outcome is supported by many previous studies, e.g., Paul, PK, and Mandal, NK (2012), which found a correlation between MDM programs and student academic achievement. The Mid-Day Meal Program improved the academic performance of the students. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved. Table 4.2.5 showed that marks in Mathematics has increased after implementing MDMP, but lower-middle-

class and lower-class students were still lagging behind from higher class students. Table No 4.2.6 showed that marks in mathematics have increased in all the districts of Haryana after implementation of MDMP.

Contribution of MDMP on Improvement of Marks in Mathematics Subject among Primary School Students: Paired Samples t Test

Scores in Mathematics	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks in Mathematics subject before MDM	0.078	27.56	5	22.89	3.115	0.063 Not Significant at .05 significance level
Marks in Mathematics subject after MDM		32.98	5	26.64		

Source: Author's calculation

To determine the effect of MDMP on the mathematics subjects of primary school students, a paired sample t-test was performed. The outcome showed a p-value of 0.063, which was insignificant at the 0.05 level of significance. The outcome showed that the Mid-Day Meal Program had no significant effect on increasing the marks of mathematics subjects in the Primary Schools.

Table 4.2.6: Mean Mathematics subject among Primary School Students (2003-21)

Districts	Mean marks in Mathematics subject before MDM out of 80 marks	Mean marks in Mathematics subject after MDM out of 80 marks
Kurukshetra	28.04	34.54
Yamunanagar	26.13	31.55
Kaithal	29.21	33.27
Karnal	26.26	32.42

Sirsa	29.14	35.18
Jind	26.29	32.29
Jhajjar	30.87	34.81
Charkhi Dadri	26.56	32.36
Faridabad	30.54	34.84
Nuh	20.84	27.89
Mahendergarh	29.26	34.23
Gurugram	27.34	32.38
Total	330.72	395.76
Mean	27.56	32.98

Source: National Achievement Survey 2021

Table 4.2.6 showed that the mean mathematics subject of primary school students was 27.56 which increased to 32.98 marks after the execution of MDMP in Haryana. Mean score in Mathematics subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved.

4.2.4 H0: There is No Significant Difference in Scoring of Marks in Mathematics Subject among Students of Upper Primary Schools of Various Socio-Economic Groups.

4.2.7: One Way ANOVA Test: Marks in Mathematics Subject among Students of Upper Primary Schools

Scores in Mathematics	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.621	0	-	-	-	-	-
UMC		04	6.65	2.0	32.1	3	0.000 Significant At.05 level. H0 Rejected
MC		163	6.17	1.9			
LMC		174	5.32	2.1			
LC		23	4.29	2.0			

Source: Author's calculation

The P value (0.621) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a p-value of 0.000, which was significant at 0.05 levels. The outcome implied that there was a significant difference in mathematics subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 6.65, 6.17, 5.32, and 4.29, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools. This outcome is supported by many previous studies, e.g., Paul, PK, and Mandal, NK (2012) found a correlation between MDMP and students' academic achievement. The Mid-Day Meal Program improved the academic performance of the students. Sachdeva (2017) concluded that after the introduction of MDMP, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved. Table 4.2.7 showed that marks in mathematics have improved after implementing MDMP, but Lower Middle-Class and Lower-Class students were still lagging behind higher-strata students.

Contribution of MDMP on the Improvement of Marks in Mathematics Subject among Upper Primary School Students: Paired Samples t Test

Scores in Mathematics	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks of Mathematics subject before MDM	0.074	33.58	3	5.3	28.1	0.001 Significant At.05 level.
Marks of Mathematics subject after MDM		41.63	3	6.4		

Source: Author's calculation

A paired sample t-test was executed to determine the effect of MDM on the mathematics subjects of Upper Primary School students after the execution of the MDM scheme. The outcome showed a p-value of 0.001, which was significant at the 0.05 level of significance. The outcome showed that the MDMP had a significant effect on increasing the mathematics subjects of students in Upper Primary School classes. The mean difference showed that marks in mathematics have increased after the execution of the MDM scheme in Upper Primary Schools in Haryana. Table no 4.2.8 showed that students' marks in Mathematics have increased after implementation of MDMP in all the districts of Haryana.

Table 4.2.8: Mean of Mathematics Subject among Upper Primary School in Haryana (2003-2021)

Districts	Mean marks in Mathematics subject before MDM out of 80 marks	Mean marks in Mathematics subject after MDM out of 80 marks
Kurukshetra	36.98	45.48
Yamunanagar	35.72	41.76
Kaithal	35.28	41.69
Karnal	32.27	40.36
Sirsa	34.26	41.52
Jind	33.76	42.84
Jhajjar	36.47	44.57
Charkhi Dadri	35.26	43.86
Faridabad	31.48	42.98
Nuh	25.65	30.65
Mahendergarh	33.69	44.60
Gurugram	32.14	39.25
Total	402.96	499.56
Mean	33.58	41.63

Source: National Achievement Survey 2021

Table 4.2.8 showed that the mean Mathematics subject of upper primary school students increased from 33.58 to 41.63 marks after the execution of the MDM Scheme in Haryana. Mean score in Mathematics subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved.

4.2.5 H0: There is No Significant Difference in Scoring of Marks in EVS Subject among Students of Various Socio-Economic Groups in Primary Schools.

Table 4.2.9: One Way ANOVA Test: Marks in EVS Subject among Students of Primary Schools

Scores in EVS.	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	.615	0	-	-	-	-	-
UMC		08	6.05	2.0	31.1	3	0.002 Significant At.05 level. H0 Rejected
MC		209	6.27	1.9			
LMC		377	5.12	2.1			
LC		62	4.21	2.0			

Source: Author's calculation

The P value (0.615) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a p-value of 0.002, which was significant at 0.05 levels. The outcome implied that there was a significant difference in EVS subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 6.05, 6.27, 5.12, and 4.21, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools. This outcome is supported by many previous studies e.g., Paul, PK, and Mandal, NK (2012) found a correlation between MDM programs and student academic achievement. The Mid-Day Meal Program improved the academic performance of the students. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved. Table 4.2.10 showed that marks have increased after

implementing MDMP, but lower middle- and lower-class students were still lagging behind higher-strategy students.

Contribution of MDMP on Improvement of Marks in EVS Subject among Students of Primary School: Paired Samples t Test

Scores in EVS	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks of EVS before MDM	0.081	31.56	5	0.268	53.514	0.000 Significant
Marks of EVS before MDM		38.45	5	0.353		At.05 level.

Source: Author's calculation

A paired sample t-test was executed to determine the effect of MDMP on the EVS subject of primary school students after implementation of the MDM scheme. The outcome showed a p-value of 0.000, which was significant at the 0.05 level of significance. The outcome showed that the MDMP had a significant effect on increasing the marks for EVS subjects in primary school classes. The mean difference showed that the score of EVS has increased after the execution of the MDM scheme in primary schools in Haryana.

Table 4.2.10: Mean of EVS Subject Marks among Primary Schools (2003-2021)

Districts	Mean marks in EVS subject before MDM out of 80 marks	Mean marks in EVS subject after MDM out of 80 marks
Kurukshetra	34.15	41.15
Yamunanagar	30.81	37.41
Kaithal	33.27	40.25
Karnal	29.21	38.26
Sirsa	34.56	38.66
Jind	31.87	37.85
Jhajjar	35.43	41.36
Charkhi Dadri	30.59	37.63

Faridabad	32.47	38.62
Nuh	21.21	28.31
Mahendergarh	33.26	42.41
Gurugram	31.89	39.49
Total	378.72	461.40
Mean	31.56	38.45

Source: National Achievement Survey 2021

Figure 4.2.10 showed that the mean strength of beneficiaries of primary school students was 31.56 which were increased to 38.45 after the execution of MDM Scheme in Haryana. Mean score in EVS subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved.

4.2.6 H0: There is No Significant Difference in Scoring of Marks in Science Subject among Students Various Socio-Economic Groups in Upper Primary School.

4.2.11: One Way ANOVA Test: Marks in Science Subject among Students of Upper Primary School

Scores in Science	Levene's Test	N	Mean	SD	F	DF	Sig.
UC	0.201	0	-	-	26.3	3	-
UMC		04	5.82	2.00			0.056 Insignificant At.05 level. H0 Rejected
MC		163	5.94	1.59			
LMC		174	5.21	1.64			
LC		23	4.65	1.61			

Source: Author's calculation

The P value (0.201) of Levene's test was higher than the critical value of 0.05, so it has homogeneity of data. The outcome showed a p-value of 0.056, which was insignificant at the 0.05 level of significance. The outcome implied that there was a significant difference in science subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 5.82, 5.94, 5.21, and 4.65, respectively, which showed that students in lower socio-economic groups scored lower marks compared to students in higher strata. Lower-class students have the lowest average marks in schools. This outcome is supported by many previous studies. Paul, PK, and Mandal, NK (2012) found a correlation between MDM programs and students' academic achievement. The Mid-Day Meal Program improved the academic performance of the students. Sachdeva (2017) concluded that after the introduction of MDMP, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved. Table 4.2.11 showed that marks increased after implementing MDMP, but lower-middle- and lower-class students were still lagging behind higher-strata students. Table No 4.2.12 showed that students' marks have improved after implementation of MDMP in all the districts of Haryana.

Contribution of MDMP on the Improvement of Marks in Science Subject among Upper Primary School Students: Paired Samples t Test

Science Subject	Levene Test	Mean	N	SD	t	Sig (2-tailed)
Marks in Science subject before MDM	0.086	32.58	3	0.6807	41.0	0.001 Significant at.05 level.
Marks in Science subject after MDM		39.46	3	0.3608		

Source: Author's calculation

A paired sample t-test was conducted to determine the effect of MDM on the science subjects of Upper Primary School students after the implementation of the MDM scheme. The outcome showed a p-value of 0.001, which was significant at the 0.05 level of significance. The outcome showed that the MDMP had a significant effect on increasing the marks of science subjects among students in Upper Primary School classes. The mean difference showed that the science score has increased after implementation of the MDM scheme in Upper Primary Schools in Haryana. Table no. 4.2.12 showed that marks in science subject have increased after implementation of MDMP in all the districts in Haryana.

Table 4.2.12: Mean of Science Subject Marks among Upper Primary Schools (2003-2021)

Districts	Mean marks in EVS subject before MDM out of 80 marks	Mean marks in EVS subject after MDM out of 80 marks
Kurukshetra	35.23	41.32
Yamunanagar	32.87	36.17
Kaithal	34.21	41.24
Karnal	32.64	41.54
Sirsa	34.21	40.31
Jind	31.69	38.61
Jhajjar	35.61	42.24
Charkhi Dadri	32.58	40.48
Faridabad	33.58	39.52
Nuh	25.62	31.63
Mahendergarh	32.46	42.24
Gurugram	30.26	38.22
Total	390.96	473.52
Mean	32.58	39.46

Source: National Achievement Survey 2021

Figure 4.2.12 showed that the mean strength of beneficiaries of Upper Primary School students was 32.58 which were increased to 39.46 after the execution of MDM Scheme in Haryana. Mean score in science subject increased in all the districts because now students were able to attend more classes and concentrated on their studies because their stomach was full. Sachdeva (2017) concluded that after the introduction of MDM, the school's academic environment improved. Earlier, hungry students were not able to concentrate on their studies, but now their nutrition requirements have been fulfilled to a large extent and their learning abilities have improved.

4.3 Third Objective: To Assess the Satisfaction Level of Students, Teachers and Parents about MDMP among various Groups.

The present study required a fairly large variety of data. The content of the questionnaire was developed in such a way as to elicit maximum information from respondents.

4.3.1 Observation Schedule of Schools: Observation schedule was noted and prepared by the researcher to find out facilities available in the selected schools of 12 districts of Haryana.

Table 4.3.1 Summary of Observation Schedule of Schools

Sr No	Parameters	Observation	
		Yes	**No**
1.	Store Room available	Yes	
2.	Separate kitchen shade available	Yes	
3.	Safe grain storage facility available	-Yes	
4.	Adequate utensils (cooking and serving) available	Yes	
5.	Display of cyclic Menu available	Yes	
6.	General Hygiene of cook house maintained		No
7.	General hygiene of Cook cum Helper conducted	Yes	
8.	Provision of washing hands available		No
9.	Provision of proper disposal of waste material available		No

10.	Safe drinking water available	Yes	
11.	Separate serving area is available	Yes	
12	LPG gas connection is available	Yes	
13	Meal is prepared by using LPG	Yes	
14	Presence of MDM in- charge while serving the meal	Yes	
15	Gunny bags of ration are kept on platform	Yes	
16	Spices are kept in air tight containers		No
17	Grains are cleaned before use	Yes	
18	Vegetables are cleaned before use.	Yes	
19	Waste is disposed of in dustbin		No
20	Different set of clothe is used by cooking staff in kitchen		No
21	Kitchen is well lit and ventilated	Yes	
22	Cook cum helper trimmed their nails	Yes	
23	Cook cum helper worn tidy clothes	Yes	
24	Utensils are washed before use		No
25	Plates are provided to the students	Yes	
26	Plates are washed before use.		No
27	Kitchen floor is washed on working days.		No
28	MDM is served at stipulated time.	Yes	
29	Same food is served to all students		No
30	Students take meal with the help of spoon.	Yes	
31	Proper arrangement for dinning is available		No
32	Student leave the meal uneaten	Yes	
33	MDM record is maintained daily.	Yes	
34	MDM committee is set up		No
35	Previous day food sample is kept for food poisoning test	Yes	

36	Appearance of meal is good.	Yes	
37	Taste and smell of meal is good.	Yes	

Source: Author's calculations

4.3.2 Semi-structured Interview of Elementary Head Teacher/ Head Teacher: The majority of the Elementary Head Teachers opined that MDMP's objectives were very pious. If it was implemented in an effective way, then it could be a game changer for the country. It has reduced malnutrition and increased the retention rate of students. This scheme should be monitored periodically to make it more effective. The honorarium of cooks and cum helpers should be raised so that they work more sincerely. Management of MDM should be given to the NGO so that teachers and staff can concentrate on students' education. The main constraints of MDM were the shortage of teaching staff and meager cooking costs. The menu for MDM should be revised to incorporate more nutritious meals and fruits.

4.3.3 Semi-structured Interview of Mid-day Meal in-charges: The majority of the MDM in charges opined that the main objective of MDM was to protect the students from classroom hunger, and MDM has been able to achieve its objectives. In most of the schools, MDM was maintained by MDM in-charges, and it was inspected by the higher authorities. The most favorable dishes for students were Puri and Sabji. Students did not like Daliya. The MDM in charges complained that they were not getting cooperation from their colleague. Positive aspects of MDM were that students came to school regularly, promoted social integration, had higher retention rates, and decreased dropout rates. Students were getting at least one good meal a day, and their academic achievement increased.

4.3.4 Semi-structured Interview of Cook cum Helpers: Although Haryana state was paying the highest honorarium (Rs 6500) per month in the country (Economic Survey of Haryana 2023), these Cooks cum Helpers were demanding a hike in their honorarium and status of government employees; for it, they even ended a month's long agitation. The

majority of the cooks were not satisfied with their job profiles. They made a complaint that they were working more than Aanganwadi cooks. But neither was they permanent government employees nor did they get a regular salary like them. It was very difficult to run houses in such a situation, as they were poor widows. They were quite satisfied with the working conditions in the schools but worried about their future after 60 years of age as they would not get retirement benefits.

4.3.5 Satisfaction Level of Students: A five-point Likert Scale was used to assess the satisfaction level. Attempts were made to keep the questions precise, unambiguous, and clear. Result of primary survey is not categorized as per school but result is categorized as per Socio-economic status of students.

4.3.6 H0: There is No Significant Difference in the Regularity of Students Due to Tasty Meals of MDMP among Various Socio-Economic Groups of Students.

Descriptive

I like to come in school regularly because I get tasty meal here	Levene's Test	N	Mean	SD	Standard Error
UC	-	0	-	-	-
UMC	0.532	12	2.17	.88	.2141
MC		372	2.66	1.12	.0519
LMC		551	2.76	1.15	.0465
LC		85	3.02	1.14	.1181

Source: Author's calculation

The P value (0.532) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. The mean values of UMC, MC, LMC, and LC were 2.57, 2.66, 2.76, 2.76, and 3.02, respectively.

Higher-strata students did not consider that they come to school regularly because they got a tasty meal here in comparison to lower-class students.

Table 4.3.2: One Way ANOVA Test: Regularity of Students due to a Tasty MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	15.843	3	5.281	4.058	0.007 Significant at .05 level
Within Groups	1321.816	1016	1.301		
Total	1337.659	1019			

Source: Author's calculation

Table 4.3.2 provided one-way ANOVA outcomes for getting the perceptions of students. The statement was, "I like to come to school regularly because I get a tasty meal here**."** The P value was 0.007, which was statistically significant at the 5-percent significance level. It can be inferred that different socio-economic groups have significant mean differences related to this perception. It was evident that students belonging to lower-class strata were allured by MDM. Boriwal & Mittal (2019) found that mid-day meals were more liked by poor students, and it worked as an allurement to attract these students to schools. Chauhan, SD (2011) explored that MDM was a big relief for downtrodden students, and at least they got a one-time full and hot meal, so it made schools attractive.

4.3.7 H0: There is no Significant Difference that they were Getting Change in Meal on Daily Basis among various Socio-Economic Groups of Students.

Descriptive

You Get Change in Menu Daily.	Levene's Test	N	Mean	SD	Standard Error
UC	0.672	0	-	-	-
UMC		12	3.41	1.12	.2720
MC		372	3.23	1.13	.0523
LMC		551	3.26	1.09	.0441
LC		85	3.06	1.2	.1282

Source: Author's calculation

The P value (0.672) of the Levene test was greater than the critical value of 0.05, so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which was a parametric test. The mean values of UMC, MC, LMC, and LC were 3.41, 3.23, 3.26, and 3.06, respectively. It showed that students belonging to higher strata of society did not come to school for the sake of a tasty meal. All category students observed that they were getting changes in the MDM on a daily basis.

Table 4.3.3: One Way ANOVA Test for Getting Change in Meal on Daily Basis

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	3.883	3	1.294	1.024	0.0381 Significant At.05 level. H0 Rejected
Within Groups	1284.224	1016	1.264		
Total	1288.107	1019			

Source: Author's calculation

Table 4.3.3 provided one-way ANOVA outcomes for getting the perceptions of students. The statement was, **'**You get a change on the menu daily'. The P value was 0.0381, which was statistically significant at the 0.5 significance level. It can be inferred that different socio-economic groups have significant mean differences related to this perception. It was

evident that MDM was prepared as per the menu. Tarananum (2014) stated that MDM was given regularly and its menu was changed regularly as per the menu chart.

4.3.8 There is no Significant Difference in Perception of Taking MDM Daily among various Socio-Economic Groups of Students.

Descriptive

You Take MDM Daily	Levene's Test	N	Mean	SD	Standard Error
UC	0.586	0	-	-	-
UMC		12	3.043	0.8745	0.2121
MC		372	3.294	1.1107	0.0513
LMC		551	3.311	1.0702	0.0430
LC		85	3.471	1.0925	0.1200

Source: Author's calculation

The P value (0.586) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which was a parametric test. The mean values of UMC, MC, LMC, and LC were 3.043, 3.294, 3.311, and 3.471, respectively. It shows that students belonging to higher strata of society take MDM daily in school. Students belonging to poor strata were taking MDM more regularly than students belonging to higher strata.

Table 4.3.4: One Way ANOVA Test for taking MDM daily

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	6.579	3	2.193	1.841	0.138 Insignificant At.05 level. H0 Accepted
Within Groups	1210.056	1016	1.191		
Total	1216.635	1019			

Source: Author's calculation

Table No. 4.3.4 provided a one-way ANOVA outcome for getting the perceptions of students among various socio-economic groups. The statement was, “You take MDM daily." The P value was 0.138, which was not statistically significant at the 0.05 significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. Lower-class students take MDM more regularly, as their score was 3.5 on a five-point Likert scale. Arumugam (2015) stated that poor students were keenly interested in taking the mid-day meal.

4.3.9 H0: There is no Significant Difference in Liking the MDM Menu among Various Socio-Economic Groups of Students.

Descriptive

You Like Menu of MDM	Levene’s Test	N	Mean	SD	Standard Error
UC	0.323	0	-	-	-
UMC		12	2.706	0.8489	0.2059
MC		372	2.746	1.0770	0.0497
LMC		551	2.831	1.0537	0.0423
LC		85	2.989	1.1868	0.1224

Source: Author’s calculation

The P value (0.323) of the Levene test was greater than the critical value (0.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which was a parametric test. The mean values of UMC, MC, LMC, and LC were 2.706, 2.746, 2.831, and 2.989, respectively. It showed that students belonging to higher strata of society like the MDM menu less. Students belonging to all strata did not like the MDM menu because their scoring was below 3 on the five-point Likert scale.

Table 4.3.5: One Way ANOVA Test for liking MDM menu

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	5.374	3	1.791	1.561	0.197 Insignificant At.05 level. H0 Accepted
Within Groups	1166.368	1016	1.148		
Total	1171.742	1019			

Source: Author's calculation

Table 4.3.5 provided a one-way ANOVA outcome for determining the perceptions of students among various socio-economic groups. The statement was, "You like the menu of MDM." The P value was 0.197, which was not statistically significant at the 0.05 significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. It was also revealed that higher-strata students liked less than lower-strategy students. Boriwal & Mittal (2019) explored that poor students did not care about choice of menu and their hunger made all MDM menus tasty.

4.3.10 H0: There is No Significant Difference in Perception of MDM is Cooked Hygienically among various Socio-Economic Groups of Students.

Descriptive

MDM is Cooked Hygienically	Levene's Test	N	Mean	SD	Standard Error
UC	0.227	0	-	-	-
UMC		12	2.979	0.9315	0.2259
MC		372	3.275	1.1280	0.0521
LMC		551	3.235	1.0842	0.0435
LC		85	3.353	1.2180	0.1256

Source: Author's calculation

The P value (.227) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. The mean values of UMC, MC, LMC, and LC were 2.979, 3.275, 3.235, and 3.353, respectively. It was shown that students belonging to higher strata of society opined that MDM was prepared hygienically. Students belonging to the higher strata of society perceived that MDM was not cooked hygienically, and they were not satisfied as they scored less than 3 point on rating scale, in comparison with the students belonging to the lower class. Students belonging to MC, LMC, and LC perceived that MDM was cooked hygienically.

Table 4.3.6: One Way ANOVA Test for MDM is Cooked Hygienically

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	7.155	3	2.385	1.934	0.122 Insignificant At.05 level. H0 Accepted
Within Groups	1252.728	1016	1.233		
Total	1259.883	1019			

Source: Author's calculation

Table 4.3.6 provided the one-way ANOVA outcome for getting the perception of students. The statement was, "MDM is cooked hygienically." The P value was 122, which was not statistically significant at the 5 percent significance level. It was inferred that different socio-economic groups have no significant mean difference related to hygienic cooking. Chauhan (2011) stated that the school administration was paying more attention to the hygienic condition of hygiene and sanitation in the MDM cooking house and its surroundings.

4.3.11 H0: There is no Significant Difference in Perception of Garnishing of MDM among all the Students of Various Socio-Economic Groups of Students.

Descriptive

MDM is Garnished.	Levene's Test	N	Mean	SD	Standard Error
UC	0.203	0	-	-	-
UMC		12	2.529	0.9315	0.2259
MC		372	2.793	1.1280	0.0521
LMC		551	2.771	1.0842	0.0435
LC		85	2.813	1.2180	0.1256

Source: Author's calculation

The P value (0.203) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test is used, which is a parametric test. The mean values of UMC, MC, LMC, and LC are 2.529, 2.793, 2.771, and 2.813, respectively. It showed that students belonging to all strata of society opine that MDM was not garnished satisfactorily. Students belonging to the upper middle class felt that MDM was not garnished satisfactorily, whereas students belonging to the lower strata of society found that MDM was comparatively garnished. Lower-class students feel that MDM was more garnished.

Table 4.3.7: One Way ANOVA Test for Garnishing of MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	1.541	3	0.514	0.420	0.739 Insignificant At.05 level. H0 Accepted
Within Groups	1243.584	1016	1.224		
Total	1245.125	1019			

Source: Author's calculation

Table 4.3.7 provided one-way ANOVA outcomes for getting the perceptions of students. The statement was, "MDM is garnished**."** The P value was 0.739, which was statistically insignificant at the 5 percent significance level. It can be inferred that different socio-

economic groups have insignificant mean differences related to this perception. Arumugum (2015) found that MDM was not garnished due to a lack of funds and expertise.

4.3.12 H0: There is no Significant Difference in Perception of Demanding More Meals among Students of Various Socio-Economic Groups of Students.

Descriptive

You Demand More Meal.	Levene's Test	N	Mean	SD	Standard Error
UC	0.194	0	-	-	-
UMC		12	2.706	0.7717	0.1872
MC		372	2.789	1.0440	0.0482
LMC		551	2.863	1.0289	0.0413
LC		85	3.021	1.1730	0.1210

Source: Author's calculation

The P value (0.194) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which is a parametric test. The mean values of UMC, MC, LMC, and LC are 2.706, 2.789, 2.863, and 3.021, respectively. It shown that students belonging to the higher strata of society demand fewer meals in comparison with lower-status students. Students belonging to the UMC demanded less MDM in comparison with the students belonging to the LC. Except for the LC, none of the higher strata students demanded more meals because their score was less than 3 on the Likert scale.

Table 4.3.8: One Way ANOVA Test for Demanding More Meal

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	4.923	3	1.641	1.506	0.211 Insignificant At.05 level. H0 Accepted
Within Groups	1106.424	1016	1.089		
Total	1111.347	1019			

Source: Author's calculation

This table provided one-way ANOVA outcomes for getting the perception of students. The statement was, **"**You demand more meals." The P value was .211 which was not statistically significant at 5 percent significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. Boriwal & Mittal (2019) stated that poor strata students consume more meals because their hunger was bigger than that of higher strata students.

4.3.13 H0: There is no Significant Difference in Perception of Getting Equal and Desired Quantity of MDM among Students of Various Socio-Economic Groups of Students.

Descriptive

All the students get meal in equal quantity and as per their desire.	Levene's Test	N	Mean	SD	Standard Error
UC	0.542	0	-	-	-
UMC		12	3.529	0.9432	0.2288
MC		372	3.333	1.1248	0.0519
LMC		551	3.329	1.0940	0.0439
LC		85	3.086	1.1973	0.1235

Source: Author's calculation

The P value (0.542) of the Levene test was greater than the critical value (0.05), so the variances were not significantly different or there was homogeneity of data. The mean values of UMC, MC, LMC, and LC are 3.529, 3.333, 3.329, and 3.086, respectively. It showed that students belonging to higher strata of society opined that they were getting a meal in equal quantity. All students were satisfied that they were getting an equal and desired quantity of mid-day meal. In comparison, students belonging to the lower class were less satisfied than students belonging to the upper middle class in terms of an equal and desired quantity of mid-day meal.

Table 4.3.9: One Way ANOVA Test for Getting Equal and Desired Quantity of MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	6.016	3	2.005	1.620	0.183 Insignificant At.05 level. H0 Accepted
Within Groups	1252.728	1016	1.233		
Total	1258.744	1019			

Source: Author's calculation

Table 4.3.9 provided one-way ANOVA outcomes for getting the perceptions of students. The statement was, "All the students get meals in equal quantity and as per their desire." The P value was 0.183, which was not statistically significant at the 5 percent significance level. It was inferred that different socio-economic groups have no significant mean difference related to this perception. Chauhan (2011) explored that students did not face discrimination in the distribution of MDM, and it promoted social harmony.

4.3.14 H0: There is no Significant Difference in Perception of Eating all Served Meal Among Students of Various Socio-Economic Groups of Students.

Descriptive

You Eat all Served Meal.	Levene's Test	N	Mean	SD	Standard Error
UC	0.106	0	-	-	-
UMC		12	3.235	0.8314	.2016
MC		372	3.275	1.1166	.0516
LMC		551	3.248	1.0753	.0432
LC		85	2.968	1.2133	.1251

Source: Author's calculation

The P value (0.106) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which was a parametric test. The mean values of UMC, MC, LMC, and LC are 3.235, 3.275, 3.248, and 2.968, respectively. It showed that students belonging to the higher strata of society eat all-served meals in comparison with lower-strategy students. Students belonging to the lower class did not eat all the MDM in comparison with the students belonging to the higher classes. Students belonging to UMC, MC, and LMC were satisfied that they consumed all served MDM.

Table 4.3.10: One Way ANOVA Test for eating all served meal

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	7.557	3	2.519	2.082	0.101 Insignificant At.05 level. H0 Accepted
Within Groups	1229.36	1016	1.210		
Total	1236.917	1019			

Source: Author's calculation

Table 4.3.10 provided a one-way ANOVA outcome for determining the perceptions of

students among various socio-economic groups. The statement was, “You eat all served meals." The P value was 0.101, which was not statistically significant at the 5 percent significance level. It was inferred that different socio-economic groups have no significant mean difference related to this perception. Arumugum (2015) stated that poor students get more meals and later on could not take all the meals served.

4.3.15 H0: There is no Significant Difference in Perception of Getting a Full Meal of MDM among Students of Various Socio-Economic Groups of Students.

Descriptive

You Get Full Meal.	Levene’s Test	N	Mean	SD	Standard Error
UC	0.572	0	-	-	-
UMC		12	3.706	1.0467	0.253
MC		372	3.299	1.1268	0.052
LMC		551	3.36	1.1061	0.044
LC		85	3.160	1.2470	0.128

The P value (0.572) of the Levene test was greater than the critical value (0.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which is a parametric test. The mean values of UMC, MC, LMC, and LC are 3.706, 3.299, 3.363, and 3.160, respectively. It showed that students belonging to the higher strata of society opined that they get a full meal in comparison with lower-strategy students. Students belonging to UMC were more satisfied while getting a full meal of MDM in comparison with other classes. All the socio-economic classes were satisfied that they were getting a full meal, but comparatively, students belonging to the lower class were less satisfied.

Table 4.3.11: One Way ANOVA Test for Getting a Full Meal of MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	6.255	3	2.085	1.647	.177 Insignificant At.05 level. H0 Accepted
Within Groups	1286.256	1016	1.266		
Total	1292.511	1019			

Source: Author's calculation

Table no 4.3.11 provided a one-way ANOVA outcome for getting the perception of students. The statement was, "You get a full meal**."** The P value was 0.177 which was not statistically significant at 5 percent significance level. It inferred that different socio-economic groups have no significant mean difference related to this perception. Boriwal (2020) stated that all students got full meal and there was no shortage of meals.

4.3.16 H0: There is no significant difference in getting satisfaction in MDM among various socio-economic groups of students.

Descriptive

You Get Satisfaction after Taking MDM.	Levene's Test	N	Mean	SD	Standard Error
UC	0.267	0	-	-	-
UMC		12	3.471	0.624	0.1514
MC		372	3.530	0.945	0.0437
LMC		551	3.535	0.953	0.0383
LC		85	3.548	0.980	0.1012

Source: Author's calculation

The P value (0.267) of Levene's test was greater than the critical value of 0.05, so the variances were not significantly different or had homogeneity of data. The average values

of UMC, MC, LMC, and LC are 3.471, 3.530, 3.535, and 3.548, respectively. It showed that students from higher strata of society do not like mid-day meals compared to students from lower strata.

Table 4.3.12: One Way ANOVA Test for Getting Satisfaction in MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	1.001	3	0.334	0.371	0.774 Insignificant At.05 level. H0 Accepted
Within Groups	914.491	1016	0.900		
Total	915.492	1019			

Source: Author's calculation

Table 4.3.12 provided one-way ANOVA outcomes for getting the perceptions of students. The statement was, **'**You get satisfaction after taking MDM'. The P value was 0.774, which was not statistically significant at the 5 percent significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. Ghose, M. (2011) stated that the maximum number of students was satisfied with the MDM scheme. Most of the students (73%) said that the taste of the mid-day meal was good, and 76.6 percent of the students were satisfied with the smell of the mid-day meal. The majority of teachers (88%) were satisfied with the mid-day meal. There was an insignificant difference between the levels of satisfaction of boys and girls; of course, other factors such as the job of parents, caste, income, family size, literacy level of parents, etc. were significantly related to satisfaction with the mid-day meal. Students belonging to all categories were almost satisfied with the mid-day meal. In comparison, students belonging to the lower class were more satisfied with the MDM than the other higher classes.

4.3.17 H0: There is no Significant Difference in Perception of Getting a Positive Impact on their Study among of Various Socio-Economic Groups of Students.

Descriptive

You Get Positive Impact of MDM on your Study.	Levene's Test	N	Mean	SD	Standard Error
UC	0.064	0	-	-	-
UMC		12	3.059	0.9475	0.1114
MC		372	3.203	1.0936	0.0505
LMC		551	3.194	1.0670	0.0429
LC		85	2.904	1.0829	0.1220

Source: Author's calculation

The P value (0.064) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which is a parametric test. The mean values of UMC, MC, LMC, and LC are 3.059, 3.203, 3.194, and 2.904, respectively. It was shown that students belonging to UMC opined that they got a more positive impact from MDM on their studies in comparison with lower-strata students. Students belonging to the middle class perceived a more positive impact of MDM on their studies in comparison with the other socio-economic classes. Students belonging to the lower class did not perceive that they were getting a positive impact from MDM on their studies.

Table 4.3.13: One Way ANOVA Test for Getting Positive Impact on their Study

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	7.682	3	2.561	2.182	.088 Insignificant At.05 level. H0 Accepted
Within Groups	1192.784	1016	1.174		
Total	1200.466	1019			

Source: Author's calculation

Table 4.3.143 provided one-way ANOVA outcomes for getting the perception of students. The statement was, "You get a positive impact of MDM on your study." The P value was 0.088, which was not statistically significant at the 5 percent significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. Tarananum (2014) explored that mid-day meals removed classroom hunger, and students were able to concentrate on their studies. It improved the academic achievement of students.

4.3.18 H0: There is no Significant Difference in Perception of Continuance of MDM among Students of various Socio-Economic Groups of Students.

Descriptive

MDM should be Continue	Levene's Test	N	Mean	SD	Standard Error
UC	0.270	0	-	-	-
UMC		12	2.989	1.2225	0.1261
MC		372	3.253	1.0794	0.0434
LMC		551	3.258	1.1073	0.0511
LC		85	3.294	.9196	0.2230

Source: Author's calculation

The P value (0.270) of Levene's test was greater than the critical value of 0.05, so the variances were not significantly different or it has homogeneity of data. The average

values of UMC, MC, LMC, and LC are 2.989, 3.253, 3.258, and 3.294, respectively. Students belonging to all categories wanted MDM to be continued except UMC as it scored 2.99, which was lower than 3. Students belonging to the lower class were more in support of the continuation of MDM in comparison with other classes.

Table 4.3.14: One Way ANOVA Test for Continuance of MDM

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	6.185	3	2.062	1.703	0.165 Insignificant At .05 level. H0 Accepted
Within Groups	1229.36	1016	1.210		
Total	1235.545	1019			

Source: Author's calculation

Table 4.3.14 provided a one-way ANOVA outcome for getting the perceptions of students among various socio-economic groups. The statement was, **"**MDM should be continued." The P value was 0.165, which was statistically insignificant at a 5 percent significance level. It can be inferred that different socio-economic groups have no significant mean difference related to this perception. Malyadri (2010) says that about 92% of students' rate midday meals as average or above average. Only 25% of parents and 10% of students said that the Mid-day Meal was insufficient for the child's growth. The quality of the lunch food was not good. Students should be given seasonal fruits. The total number of calories required per child should be revised. Dhankar, WS (2015) found that in Haryana, 73.33% of parents are in favor of continuing the MDM scheme. They wanted some modifications to this program. In their responses, 40% of parents and students complained that students were provided with "poor quality" food. Most parents do not notice any improvement in the health indicators of their wards.

Table 4.3.16 Summary of Students' opinions about Mid-day Meal Program						N
	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagre
Management of Mid-day Meal	You come to school daily.	102, 10	398, 39	122, 12	214, 21	184, 18
	You come to school after having a meal.	245, 24	224, 22	184, 18	163, 16	204, 20
	You get change in meal daily.	286, 28	347, 34	153, 15	122, 12	112, 11
	You take mid-day meal daily.	245, 24	388, 38	112, 11	173, 17	102, 10
	Mid-day meal cooked hygenically.	134, 13	326, 32	296, 29	185, 18	81, 8
	While preparing a menu of MDM, students' interest should	245, 24	326, 32	143, 14	194, 19	112, 11
	acknowledged.					
	Fruits should be included in MDM.	173, 17	428, 42	214, 21	122, 12	81, 8
	Green vegetables are used in MDM.	184, 18	398, 39	122, 12	163, 16	153, 15
Satisfaction of Mid-day Meal	MDM is garninished.	143, 14	184, 18	296, 29	286 ,28	112, 11
	You demand more meal.	153, 15	255 ,25	102, 10	326, 32	184, 18
	All the students get meals in equal quantity and as per	194, 19	347, 34	122, 12	214, 21	143, 14
	their desire.					
	You eat all the served meal.	173, 17	194, 19	112, 11	357, 35	184, 18
	You get full meal.	204, 20	377, 37	82, 8	214, 21	143, 14
	You get satisfaction after taking Mid-day Meal.	235, 23	428, 42	92, 9	163, 16	102, 10
	MDM should be continue.	255, 25	265, 46	41, 4	143, 14	112, 11
	The Flavor of the Mid-day Meal is good.	194, 19	286, 28	265, 26	184, 18	92, 9
	I like to come to school because I get tasty meals here.	82, 8	184, 18	296, 29	326, 32	133, 13
	You like menu table.	112, 11	245, 24	41, 4	428, 42	194, 19
Impact of Mid-day M	You get positive impact of Mid-day meal on your body.	184, 18	345, 34	122, 12	224, 22	143, 14
	Mid-day Meal intervenes in my study.	153, 15	173, 17	133, 13	326, 32	235, 23
	The students of other castes do discrimination while taking M	82, 8	112, 11	204, 20	439, 43	184, 18
	You have faced problems related to health after taking MDM	112, 11	163, 16	265, 26	286, 28	194, 19
	You got a positive impact of Mid-day Meal on your study.	154, 15	378, 37	102, 10	201, 20	184, 18

Source: Author's calculation

Teachers Satisfaction

4.3.19 H0: There is no Significant Difference in Perception that MDM is Prepared as Per the Menu Table among Teachers of Primary and Upper Primary Schools.

Table 4.3.16: Mann Whitney U Test for MDM Prepared as Per the Menu Table

MDM is Prepared as per the Menu Table.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.5	0.041	0.743	1520.0	323.0	-.329	0.742 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.39	0.023					

Source: Author's calculation

The majority of the primary and upper primary school teachers perceived that MDM was prepared as per the menu table, as their mean value was 3.5 and 3.39. The p-value was 0.742, which is more than the critical value of.05, so it is insignificant. In other words, there is an insignificant difference between teachers of primary and upper primary classes. Both primary and upper primary school teachers agreed that MDM was prepared according to the menu. In comparison, primary school teachers scored more than upper primary school teachers, which showed that MDM was prepared more as per the menu in primary schools than for upper primary school students. Malyadri (2010) stated that MDM was prepared as per the given menu charts in school. The MDM menu is fixed, so advance preparation is not difficult.

4.3.20 H0: There is no Significant Difference in Perception of Teachers that MDM is Prepared Timely among Teachers of Primary and Upper Primary Schools.

Table 4.3.17: Mann Whitney U Test for MDM Prepared Timely

MDM is Prepared Timely.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.33	0.023	1.000	162.0	333.0	0	0.75 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.46	0.01					

Source: Author's calculation

The majority of the primary and upper primary school teachers perceived that MDM was prepared timely, as their mean is 3.33 and 3.46 respectively. The P-value was 0.750, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between 5th and 8th-class teachers. Figure 4.37 showed that both primary and upper primary school teachers agreed that MDM was prepared on time. In comparison, upper primary school teachers scored more than primary school teachers, which showed that MDM was prepared more on time in upper primary schools than the primary school students. Chauhan (2011) explored that MDM was served timely because its timing was fixed; only in some cases it got late.

4.3.21 H0: There is no Significant Difference in Perception of Teachers that Hygienic Conditions were Observed while Preparing MDM among Teachers of Primary and Upper Primary Schools.

Table 4.3.18: Mann Whitney U Test for Hygienic Conditions was Observed While Preparing MDM

Hygienic Conditions were Observed in the Kitchen.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.50	0.02	0.929	148.0	319.0	-.49	0.646 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.33	0.01					

Source: Author's calculation

The majority of the primary and upper primary school teachers perceived that hygienic conditions were observed in the kitchen, as their mean was 3.50 and 3.33 respectively. P value was 0.646, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between teachers in the primary and upper primary classes. Both primary and upper primary school teachers agreed that MDM was prepared hygienically. In comparison, primary school teachers scored higher than upper primary school teachers, which showed that MDM was prepared more hygienically

in Primary Schools than Upper Primary School students. Boriwal & Mittal (2020) stated that special attention was paid to maintaining hygienic conditions in the kitchen and its surroundings.

4.3.22 H0: There is no Significant Difference in the Perception of Teachers of Primary and Upper Primary Schools that Nutritious Meal was Provided in Mid-Day Meal.

Table 4.3.19: Mann Whitney U Test for Getting a Nutritious Meal

Nutritious Meal is Given to Students in MDM.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	2.83	0.015	0.808	150.0	321.0	-.392	0.695 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	2.67	0.016					

Source: Author's calculation

The majority of the primary and upper primary school teachers did not perceive that nutritious meals were given to students, as their mean was 2.83 and 2.67. P value was 0.695, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary-class teachers. Teachers of primary schools more believed that their students were getting a nutritious meal in MDM than the teachers of upper primary schools. Although none of the categories were satisfied that MDM was providing a nutritious meal to students.

Tarananum (2014) explored that the menu of MDM was prepared to enhance the level of nutrition of students.

4.3.23 H0: There is no Significant Difference in the Perception of Teachers of Primary and Upper Primary Schools that Teachers were Satisfied with the Quality of Mid-Day Meal.

Table 4.3.20: Mann Whitney U Test for Getting Satisfaction from MDM

You were Satisfied with the Quality of MDM.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	2.50	0.021	0.891	132.5	303.5	0.966	0.334 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	2.89	0.011					

Source: Author's calculation

The majority of the primary and upper primary school teachers were not satisfied with the quality of MDM, as their mean was 2.50 and 2.89. The P-value was 0.334, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary-class teachers. Upper Primary School teachers comparatively believed that students were getting a qualitative meal in MDMP than the teachers of primary schools. However, none of the categories were satisfied with the quality of the meal served because their scoring was less than 3. Boriwal & Mittal (2020), Chauhan (2011), and Tarananum (2014) concluded that

teachers wanted MDMP to be continued but students were not getting nutritious meal.

4.3.24 H0: There is no Significant Difference in Perception among Teachers of Primary and Upper Primary Schools that they Students' Interests in Study have Increased after Implementing the MDMP.

Table 4.3.21: Mann Whitney U Test for Students' Interests in Study has Increased

Students' Interest in Study have Increased after Implementing the MDMP	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.50	0.011	1.000	16.20	333.0	0.000	0.850 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.67	0.012					

Source: Author's calculation

The majority of the Primary and Upper Primary School teachers opined that students' interest in the study has increased after implementing the MDMP, as their mean was 3.50 and 3.67. The P value was 0.850, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary-class teachers. Upper Primary School teachers comparatively believed that students' interest in studies increased after the execution of MDMP than the teachers of primary school. Although both categories were satisfied with the perception that students; interest in studies increased after implementation of Mid-day Meal Program because they scored more than 3. Arumugam (2015) explored that MDM eliminates classroom hunger and enables students to focus more on their studies. MDMP helped

students get higher scores in academics.

4.3.25 H0: There is no Significant Difference in Perception of Teachers of Primary and Upper Primary Schools that the Teaching Time Decreased Due to MDMP.

Table 4.3.22: Mann Whitney U Test for Decreased Teaching Time

Your Teaching Time Decreased due to MDMP.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	2.50	0.012	0.929	1480.0	319.0	0.000	0.646 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	2.67	0.010					

The majority of the Primary and Upper Primary School teachers felt that their teaching time has not decreased after implementing MDMP, as their mean was between 2.50 and 2.67. The P value was 0.646, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary teachers. Upper primary school teachers comparatively believed that their teaching time decreased after the execution of MDMP than the teachers of primary school. Although none of the categories believed that their teaching time had been reduced because their scoring was less than 3. Chauhan (2011) stated that teachers' teaching time did not decrease due to MDMP because only one MDM in charge took care

of all the management aspects of MDM, and MDM was served during break time at noon.

4.3.26 Ho: There is no Significant Difference in Perception of Teachers of Primary and Upper PrimarySchools that MDMP was not Beneficial for Social Cohesiveness.

Table 4.3.23: Mann Whitney U Test

MDMP is not Beneficial for Social Cohesiveness.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	2.67	0.011	1.000	162.0	333.0	0.000	0.860 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	2.72	0.013					

Source: Author's calculation

The majority of the Primary and Upper Primary School teachers felt that MDMP was beneficial for social cohesiveness, as their mean was 2.67 and 2.72. The P value was 0.860, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary teachers. Upper primary school teachers comparatively believed that MDMP was more beneficial for social cohesiveness than the teachers of primary school. Both of the categories were satisfied that MDMP was beneficial for social cohesiveness. Sachdeva, M (2017) found that MDMP was very conducive to the development of social harmony in schools. Students dine together, irrespective of their caste or creed. Even students take lunch prepared by other caste-poor women without any hesitation.

4.3.27 H0: There is no Significant Difference in the Perception of Teachers of Primary and Upper Primary Schools that the MDM Menu should be Changed.

Table 4.3.24: Mann Whitney U Test for Change of MDM Menu

MDM Menu should be Changed.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.33	0.020	0.929	1.840	319.0	-.459	0.646 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.52	0.031					

Source: Author's calculation

The majority of the Primary and Upper Primary School teachers felt that the MDM menu should be changed, as their mean was 3.33 and 3.52. The P-value was 0.646, which is more than the critical value of.05, so it is insignificant. In other words, there was an insignificant difference between primary and upper-primary teachers. Upper Primary School teachers comparatively believed that the MDM menu should be changed than the teachers of Primary School, although both categories wanted to change the menu of MDM. Boriwal & Mittal (2020) explored that student did not like the menu of MDM as it was not so tasty.

4.3.28 HO: There is no Significant Difference in the Perception of Teachers of Primary and Upper Primary Schools that MDM should be Continue.

Table 4.3.25: Mann Whitney U Test for Continuance of MDM

MDM should be Continue.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Teacher	3.50	0.01	1.000	620.0	333.0	0.000	0.752 Insignificant At .05 level H0 Accepted
Upper Primary School Teacher	3.61	0.02					

Source: Author's calculation

The majority of the Primary and Upper Primary School teachers felt that MDMP should be continued, as their mean was 3.50 and 3.61. The P-value was 0.752, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between primary and upper-primary teachers. Upper primary school teachers comparatively believed that MDM should be continued than the teachers of primary school. Although both categories wanted MDM to be continued. Tarananum (2014) found that teachers wanted MDMP to be continued despite its lacunae.

Table 4.3.27 Summary of Teachers' Opinions about the Mid-day Meal Program										N	%
	Statements	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
Management of Mid-day Meal	MDM is prepared as per menu table.	**37,**	23	**68,**	42	**15,**	9	**26,**	16	**16,**	10
	MDM is prepared timely.	**45,**	28	**55,**	34	**24,**	15	**20,**	12	**18,**	11
	Hygiene conditions are observed in kitchen.	**39,**	24	**62,**	38	**18,**	11	**27,**	17	**16,**	10
	MDM is tested for its taste.	**32,**	20	**60,**	37	**13,**	8	**34,**	21	**23,**	14
	Parents' contribution should be taken to improve the MDMP.	**29,**	18	**63,**	39	**19,**	12	**27,**	16	**24,**	15
	MDMP sample is kept for test.	**24,**	15	**27,**	17	**21,**	13	**52,**	32	**38,**	23
	Teachers' point of view should be considered while preparing MDM menu.	**44,**	27	**57,**	35	**24,**	15	**21,**	13	**16,**	10
Satisfaction of Mid-day Meal	A Nutritious meal is given to students in MDM.	**13,**	8	**29,**	18	**47,**	29	**52,**	32	**21,**	13
	You are satisfied with the quality of MDM.	**15,**	9	**16,**	10	**31,**	19	**71,**	44	**29,**	18
	MDM menu is good.	**23,**	14	**29,**	18	**21,**	13	**53,**	33	**36,**	22
	MDM should be continue.	**47,**	29	**53,**	33	**24,**	15	**23,**	14	**15,**	9
Impact of Mid-day Meal	MDMP is not beneficial for social cohesiveness.	**16,**	10	**26,**	16	**41,**	25	**60,**	37	**19,**	12
	Students' interests in study have increased after implementation of MDMP.	**31,**	19	**55,**	34	**19,**	12	**34,**	21	**23,**	14
	Students' concentration has increased after implementing MDMP.	**45,**	28	**58,**	36	**21,**	13	**25,**	15	**13,**	8
	Your teaching time decreased after implementing MDMP.	**24,**	15	**27,**	17	**47,**	29	**47,**	29	**17,**	10
	Admissions have increased after implementing MDMP.	**31,**	19	**55,**	34	**19,**	12	**34,**	21	**23,**	14
	Students' dropouts have decreased after implementing MDMP.	**38,**	24	**61,**	38	**19,**	11	**29,**	18	**15,**	9
	Students' attendance has increased after implementing MDMP	**37,**	23	**68,**	42	**15,**	9	**26,**	16	**16,**	10

Source: Author's Calculation

Parents' Satisfaction

4.3.29 H0: There is no Significant Difference in the Perception of Parents of Primary and Upper Primary Schools that Your Child Likes MDM that's why they Go to School Regularly.

Table 4.3.27: Mann Whitney U Test for Children Going to School for Taking MDM

Your child likes MDM thats why they Go to School Regularly.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Asmp. Sig (2 tailed)
Primary School Parents	3.23	.001	0.407	1792.0	3622.0	0.965 Insignificant At .05 level H0 Accepted
Upper Primary School Parents	3.78	.001				

Source: Author's calculation

The majority of primary and upper primary school parents felt that children like MDM that's why they come to school as their mean was 3.23 and 3.78, respectively. The sig. P-value was 0.965, which was more than the critical value of.05, so it was insignificant. In other words, there was an insignificant difference between parents of primary and upper-primary schools. Parents of Upper Primary School comparatively more perceived that their ward came to school due to MDM than the parents of Primary School. Although both categories perceived that their children came to school regularly because their wards liked MDM, Chauhan (2011) explored that MDM played a crucial role in the attendance and enrollment of students in a classroom.

4.3.30 H0 There is no Significant Difference in the Perception of Parents of Primary and Upper Primary Schools that your Children Get MDM Regularly.

Table 4.3.28: Mann Whitney U Test for Children Getting MDM Regularly

Your children get MDM regularly.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Asmp. Sig (2 tailed)
Primary School Parents	3.41	0.001	1.000	1763.0	3593.0	0.840 Insignificant At .05 level H0 Accepted
Upper Primary School Parents	3.52	0.001				

Source: Author's calculation

The majority of the primary and upper primary school parents observed that their children got MDM regularly, as their mean was 3.41 and 3.52. The P-value was 0.840, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between the parents of primary and upper primary schools. Parents of upper primary schools comparatively perceived that their wards got MDM more regularly than the parents of primary schools. Although both categories perceived that their children got MDM regularly because their score was more than 3. Kumar, D (2017) study found that 95.24% of parents observed that their ward was getting MDM regularly.

4.3.31 H0 There is no Significant Difference in Perception of Parents of Primary and Upper Primary Schools that Hygienic Conditions were Specially Observed in Mid-Day Meal.

Table 4.3.29: Mann Whitney U Test for Hygienic Conditions was specially Observed in Mid- day Meal.

Hygienic Conditions were Specially Observed in MDM.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Asmp. Sig (2 tailed)
Primary School Parents	3.48	0.001	0.358	1721.0	3551.1	0.666 Insignificant At .05 level H0 accepted
Upper Primary School Parents	3.55	0.001				

Source: Author's calculation

Hygienic conditions were especially observed in MDM, as their mean was between 3.48 and 3.55. The P-value was 0.666, which was more than the critical value of.05, so it was insignificant. In other words, there was an insignificant difference between the parents of primary and upper primary schools. The majority of the primary and upper primary school parents felt that hygienic conditions were observed. Kumar, S & Bhawani, L (2005) study found that 93.33% of parents perceived that hygiene was given importance; on the other hand, 40% of parents reported the low standard of the food served to them. About 68% of parents felt that the MDMP failed to provide the required vitamins and

other nutrients.

4.3.32 H0: There is no Significant Difference in Perception that they have Observed Improvement in the Health of Your Child due to MDM

Table 4.3.30: Mann Whitney U Test for improvement in the health of your child due to MDM

You have observed improvement in the health of your child due to MDM.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Parents	2.73	0.001	0.090	1638.5	3468.0	-.879	0.379 Insignificant At .05 level H0 Accepted
Upper Primary School Parents	2.93	0.001					

Source: Author's calculation

The majority of primary and upper primary school parents have not observed improvement in the health of their child due to MDM, as their mean was 2.73 and 2.93. The P-value was 0.379, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between teachers of primary and upper-primary parents. Parents of upper primary schools comparatively perceived that they have not observed improvement in the health of their ward after the implementation of MDMP compared to the parents of primary schools. Although both categories perceived that they had not observed improvement in the health of their wards

after the implementation of MDMP because their score was less than 3. Malyadri (2010) stated that only 25% of parents and 10% of students stated that MDM was insufficient for the growth of a child. The quality of MDM was not good. Students should be provided with seasonal fruits. The total calories required per child should be revised.

4.3.33 H0: There is no Significant Difference in the Perception of Parents of Primary and Upper Primary Schools that their Children have Faced Health-Related Problems after Taking Mid-day Meal.

Table 4.3.31: Mann Whitney U Test for Children have Faced Health Related Problems after Taking Mid-day Meal.

Your children have faced health related problems after taking Mid Day Meal.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Z	Asmp. Sig (2 tailed)
Primary School Parents	2.63	0.001	0.610	1670.5	3500.5	-0.075	0.481 Insignificant At .05 level H0 Accepted
Upper Primary School Parents	2.78	0.001					

Source: Author's calculation

The majority of the primary and upper primary school parents observed that their children

had not faced health-related problems after taking MDM, as their mean was 2.63 and 2.78. The P-value was 0.481, which was more than the critical value of 0.05, so it was insignificant. In other words, there was an insignificant difference between the parents of primary and upper primary parents. Parents of upper primary school comparatively perceived that their children have not faced health-related problems after taking MDM than the parents of primary school. Although both categories perceived that their children had not faced health-related problems after taking MDM because their score was less than 3, Dhankar, WS (2015) study stated that 93.3% of parents found that their wards did not face any health-related problems after taking the MDM.

4.3.34 H0: There is no Significant Difference in the Observation about Caste Discrimination while Taking the MDM.

Table 4.3.32: Mann Whitney U Test for caste discrimination while taking the MDM

Your children have faced caste discrimination while taking the MDM.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcoxon W Test	Asymp. Sig (2 tailed)
Primary School Parents	2.63	0.001	0.610	1670.5	3500.5	0.481 Insignificant At .05 level H0 Accepted
Upper Primary School Parents	2.78	0.001				

Source: Author's calculation

The majority of the primary and upper primary school parents observed that their children had not faced caste discrimination while taking MDM, as their mean was 2.63 and 2.78, respectively. The P-value was 0.481, which was more than the critical value of 0.05, so it

was insignificant. In other words, there was an insignificant difference between the parents of primary and upper primary parents. Parents of Upper Primary School comparatively perceived that their children have not faced more caste discrimination than Primary Schools. Although both categories perceived that their children had not faced caste discrimination while taking MDM because their score was less than 3, the Dhankar, WS (2015) study stated that 95.3% of parents found that their wards did not face any discrimination while taking the MDM.

4.3.35 H0: There is no Significant Difference in Perception of Parents of Primary and Upper Primary Schools that MDM should be Continued.

Table 4.3.33: Mann Whitney U Test for MDM should be continued

MDM should be continue.	Mean	Spiro Wilk Test	Levene test	Mann Whitney U Test	Wilcox on W Test	Asymp. Sig (2 tailed)
Primary Class Parents	3.40	0.001	0.774	1741.0	3571.0	0.747 Insignificant At .05 level H0 Accepted
Upper primary Class Parents	3.50	0.001				

Source: Author's calculation

Most primary and upper primary school parents believed that MDMP should be continued because their average score was 3.40 and 3.50 respectively. The P-value was 0.747, which was more than the critical value of 0.05, making it insignificant. In other words, there was a negligible difference between the primary and upper primary parents. Parents of upper primary school comparatively more perceived that MDM should be

continued than the parents of primary school. Although both categories perceived that MDM should continue because their score was more than 3, Kumar, S (2005) study found that 73.33% of parents prefer to continue MDMP with some modifications. On the other hand, 40% of parents reported the low standard of the food served to them. About 68% of parents felt that the MDMP failed to provide the required vitamins and other nutrients.

Table 4.3.35 Summary of Parents' opinions about the Mid-day Meal Program						**N**	%
	Statements	Strongly Agree		Agree	Neutral	Disagree	Strongly Disagree
Management of Mid-day Meal	Children go to school after taking meal.	**46**, 23		**85**, 42	**18**, 9	**32**, 16	**20**, 10
	Children go to school with meal.	**30**, 15		**34**, 17	**26**, 13	**65**, 32	**46**, 23
	Children bring meal from school	**20**, 10		**32**, 16	**59**, 29	**62**, 31	**28**, 14
	Parents contributes to bring improvement in the	**30**, 15		**34**, 17	**27**, 13	**64**, 32	**46**, 23
	management of Mid-day Meal.	**26**, 13		**54**, 27	**20**, 10	**64**, 32	**37**, 18
	You go to school to observe the management of MDM.	**18**, 9		**20**, 10	**38**, 19	**89**, 44	**36**, 18
	There should be a change in the menu of MDM.	**56**, 28		**69**, 34	**30**, 15	**24**, 12	**22**, 11
Satisfaction of Mid-day Meal	Hygienic conditions are especially observed in Mid-day Meal.	**40**, 20		**75**, 37	**16**, 8	**42**, 21	**28**, 14
	Your child likes MDM that's why they go to school regularly.	**28**, 14		**36**, 18	**59**, 29	**56**, 28	**22**, 11
	You want that MDM should be continued.	**48**, 24		**77**, 38	**22**, 11	**34**, 17	**20**, 10
	Your children get MDM regularly.	**36**, 18		**79**, 39	**24**, 12	**32**, 16	**30**, 15
Impact of Mid-day Meal	Your children have faced caste discrimination while taking Mid-day Meal.	**16**, 8		**36**, 18	**58**, 29	**65**, 32	**26**, 13
	Your children have faced health-related problems after taking Mid-day Meal.	**20**, 10		**32**, 16	**50**, 25	**75**, 37	**24**, 12
	You have observed improvement in the study of your child after the implementation of MDM	**38**, 19		**69**, 34	**24**, 12	**42**, 21	**28**, 14
	You have observed improvement in the health of your child after the implementation of MDM.	**30**, 15		**34**, 17	**26**, 13	**65**, 32	**46**, 23

Source: Authors' calculation

4.4 Fourth Objective: To Examine the Role of MDMP in Improving the Physical Standards of Students among Various Socio-Economic Groups of Students.

4.4.1 H0: There is no Significant Difference in the Measurement of Weight among Students of Various Socio-Economic Groups of Students.

Descriptive

Measurement of Weight	Levene's Test	N	Mean	SD	Standard Error
UC	0.332	0	-	-	-
UMC		12	36.223	7.38745	1.79172
MC		372	33.869	6.82898	0.31533
LMC		551	33.018	6.86549	0.27572
LC		85	32.497	6.23435	0.64302

Source: Author's calculation

The P-value (0.332) of the Levene test was greater than the critical value of 0.05, so the variances were not significantly different or there was homogeneity of data. The mean value of the weight of UMC, MC, LMC, and LC students was 36.223, 33.869, 33.018, and 32.497 kg, respectively. It has been shown that students belonging to the higher strata of society have a higher weight than students from the lower strata of various socio-economic groups. Students belonging to higher classes have more weight than those belonging to lower classes. There was a direct relationship between the socio-economic status of a student and their weight. Students belonging to UMC have the highest weight (36.223 kg), and LC students have the lowest weight (32.497 kg).

Table 4.4.1: One Way ANOVA Test Difference in Measurement of Weight

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	403.09	3	134.364	2.896	0.034 Significant At.05 level. H0 Rejected
Within Groups	47138.33	1016	46.396		
Total	47542.26	1019			

Source: Author's calculation

Table No. 4.4.1 provided one-way ANOVA outcomes for determining the difference in measurement of weight among various socio-economic groups of students. The P value was 0.034, which was statistically significant at a 5 percent significance level. It can be inferred that different socio-economic groups have significant mean differences related to their measurement of weights. According to Minj, Goud, et al. (2014), the nutrition status of boys increased after the launching of MDM, and the proportion of stunting has reduced in all groups, except in the age group of 6 years. Sachdeva (2017) stated that MDMP has improved the height and weight of students. Table 4.4.2 supported this finding that the mean weight of students increased after implementing MDMP, but it could not bring students of the LC and LMC categories on par with students of higher strata.

Paired Samples t Test

	Levene Test	Mean	N	Std. Deviation	t	Sig (2-tailed)
Students' weight before MDM	0.322	32.04	1020	6.77	33.568	0.000 Significant At .05 level H0 rejected
Students' weight after MDM		33.49	1020	7.021		

Source: Author's calculation

The table showed that the Levene test P value of 0.322 was higher than the critical value of 0.05, so the variance was not significantly different or had homogeneity of data.

Therefore, the paired sample t-test, which is a parametric test, was used. The mean of the two groups was 32.04 and 33.49, showing that there was a significant difference in the weight of the students. The outcome of the paired sample t-test stated that the MDM program played a significant role in improving the weight of students, as the 2-tailed value was 0.000, which was significant at the 0.05 level. The MDM program has a significant role in improving the weight of students in Haryana government schools. Table No 4.4.2 supported that Mean weight of students improved from32.035 kg to 33.488 kg after implementation of MDMP.

Table 4.4.2: Mean Weight of Students

Districts	Mean weight before MDM	Mean weight after MDM
Kurukshetra	32.52	33.62
Yamunanagar	32.86	34.02
Kaithal	30.36	32.48
Karnal	33.38	34.85
Sirsa	33.42	34.89
Jind	31.28	32.48
Jhajjar	32.56	33.05
Charkhi Dadri	31.64	33.18
Faridabad	32.78	33.96
Nuh	29.39	31.63
Gurugram	31.67	33.87
Mahendergarh	32.56	33.81
Total	384.42	401.84
Mean	32.035	33.488

Source: Health Department of Haryana

Table no 4.4.2 showed that female students' weight increased from 32.035 kg to 33.488 kg after the execution of MDMP. Mean weight of students increased in all the given districts as now student is getting nutritious full plate. It increased their nutrition level.

According to Minj, Goud, et al. (2014), the nutrition status of boys increased after the launching of MDM, and the proportion of stunting has reduced in all groups.

4.4.2 H0: There is no Significant Difference in the Measurement of Height among Students of Various Socio-Economic Groups of Students.

Descriptive

Description	Levene's Test	N	Mean	SD	Standard Error
UC	0.0532	0	-	-	-
UMC		12	1.423	0.124	0.008
MC		372	1.418	0.133	0.006
LMC		551	1.415	0.117	0.004
LC		85	1.402	0.144	0.014

Source: Author's calculation

The P-value (.0532) of the Levene test was greater than the critical value (.05), so the variances were not significantly different or there was homogeneity of data. The mean values of UMC, MC, LMC, and LC were 1.423, 1.418, 1.415, and 1.402, respectively. It showed that students belonging to the higher strata of society have a higher height in comparison with students from the lower strata.

Table 4.4.3: One Way ANOVA Test for Measurement of Height

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	.059	3	.020	1.247	0.291 Insignificant At.05 level. H0 Accepted
Within Groups	16.256	1016	.016		
Total	16.315	1019			

Source: Author's calculation

Table 4.4.3 provides a one-way ANOVA outcome for determining the difference in measurement of height among various socio-economic groups of students. The P value was 0.291, which was not statistically significant at a 5 percent significance level. It can

be inferred that different socio-economic groups have no significant mean difference related to their measurement of heights. Prakash, J (2010) examined mid-day meals regarding the nutritional status and dietary levels of 274 and 279 students in rural and urban areas' 10 schools and found that MDM has improved the nutrition level of students, which led to an increase in their height. According to Minj, C & et al. (2014), the nutrition status of boys increased after the launching of MDM, and the proportion of stunting has reduced in all groups except in the age group of 6 years. The height of girls increased after the introduction of MDMP. Sachdeva (2017) stated that MDMP has improved the height and weight of students. Table 4.4.4 also showed that the height of students has increased after implementing MDMP.

Paired Samples t -Test

Students' Height	**Levene Test**	**Mean**	**N**	**SD**	**t**	**Sig (2-tailed)**
Students' Height before MDM	0.626	1.394	1020	0.119	9.766	0.087 Insignificant At .05 level
Students' Height after MDM		1.398	1020	0.124		H0 rejected

Source: Author's calculation

Table reflects that the Levene test P value of 0.626 was higher than the critical value of 0.05, so the variance was not significantly different or had homogeneity of data. The mean of the two groups was 1.394 and 1.398, which showed that there was a significant difference in the height of the students. The Paired Sample t-test outcome implied that the MDM program played a significant role in improving the height of students, as the 2-tailed value was 0.087, which was significant at the 0.05 level.

Table 4.4.4: Mean Height of Students

Districts	Mean height before MDM	Mean height after MDM
Kurukshetra	1.398	1.401
Yamunanagar	1.401	1.405
Kaithal	1.386	1.389
Karnal	1.389	1.393
Sirsa	1.399	1.405
Jind	1.405	1.409
Jhajjar	1.402	1.406
Charkhi Dadri	1.392	1.396
Faridabad	1.387	1.391
Nuh	1.382	1.386
Gurugram	1.391	1.395
Mahendergarh	1.396	1.4
Total	16.728	16.776
Mean	1.394	1.398

Source: Health Department of Haryana

Table no. 4.4.4 showed that students' height increased from 1.394 m to 1.398 m after the implementation of MDMP. Mean height of students increased in all the given districts as now student are getting nutritious full plate. It increased their nutrition level. The height of girls increased after the introduction of MDMP. Sachdeva (2017) stated that MDMP has improved the height and weight of students.

4.4.3 H0: There is no Significant Difference in the Measurement of BMI among Students of Various Socio-Economic Groups of Students.

Descriptive

BMI of Students	Levene's Test	N	Mean	SD	Standard Error
UC	0.180	0	-	-	-
UMC		12	18.84	4.7751	1.1581
MC		372	17.44	3.4192	.1578
LMC		551	16.66	3.5057	.1407
LC		85	16.49	3.9083	.4031

Author's calculation

The P-value (0.180) of the Levene test was greater than the critical value of 0.05, so the variances were not significantly different or there was homogeneity of data. Hence, an ANOVA test was used, which is a parametric test. The mean values of UMC, MC, LMC, and LC were 18.84, 17.44, 16.66, and 16.49, respectively. It showed that students belonging to the higher strata of society have a higher BMI (18.84) than those belonging to the lower class (16.49).

Table 4.4.5: One Way ANOVA Test for Measurement of BMI among Students

	Sum of Squares	DF	Mean Square	F	Sig
Between Groups	243.567	3	81.189	6.532	.000 Significant At.05 level. H0 Rejected
Within Groups	12627.864	1016	12.429		
Total	12871.431	1019			

Source: Author's calculation

Table 4.4.5 provided one-way ANOVA outcomes for determining the difference in measurement of BMI among various socio-economic groups of students. The P value was 0.000, which was statistically significant at a 5 percent significance level. It can be inferred that different socio-economic groups have significant mean differences related to

their measurement of BMI. Awasthi (2014) mentioned that MDMP provided nutritious meals to students, which helped correct their BMI. Table 4.4.6 showed that MDMP has improved the BMI of students.

Paired Samples t Test

Students' BMI	Levene Test	Mean	N	SD	T	Sig (2-tailed)
BMI before MDM	0.147	16.02	1020	3.45	13.317	0.000 Significant
BMI after MDM		17.01	1020	3.58		At .05 level H0 rejected

Source: Author's calculation

The table shown that the P-value of the Levene test (.147) was greater than the critical value (.05), so the variance was not significantly different or there was homogeneity of data. Hence, a paired sample t-test, which is a parametric test, was used. The mean of the two groups was 16.02 and 17.01, showing that there was a significant difference in the BMI of boys. The outcome of the paired t-test states that there was a significant role of the MDM program in improving the BMI of boy students, as the value of the 2-tailed was 0.000, which was significant at the 0.05 level. The MDM program has a significant role in improving the BMI of boy students in government schools in Haryana.

Table 4.4.6: Mean BMI of Students

Districts	Mean BMI before MDM	Mean BMI after MDM
Kurukshetra	16.63	16.79
Yamunanagar	16.24	16.59
Kaithal	15.8	16.06
Karnal	17.3	17.38
Sirsa	16.97	17.01
Jind	15.01	16.08
Jhajjar	16.01	16.25
Charkhi Dadri	16.32	16.43
Faridabad	16.03	17.03
Nuh	13.36	14.7
Gurugram	16.37	16.75
Mahendergarh	16.3	16.48
Total	192.34	197.55
Mean	16.02	17.01

Source: Health Department of Haryana

Table no. 4.4.6 showed that boy students' BMI increased from 16.02 to 17.01 after the execution of MDMP. BMI in all the given districts increased after implementation of the MDMS. Awasthi (2014) mentioned that MDMP provided nutritious meals to students, which helped correct their BMI.

4.5 Fifth Objective: To Carry out Cost Effectiveness Analysis of MDMP at Revenue Division Level.

A cost-effectiveness analysis was carried out based on the performance of students in a division. Students' performance was compared against the Achievement Index of Physical Standards and Academic Excellence. An inter-division cost-effectiveness analysis reflected the status of MDMP in the division, and the sum of the performance of these divisions reflected the performance of the state. The analysis was reflected through tables,

bar diagrams, and t-tests.

4.5.1 H0: There is no Significant Difference Exist in Per Capita Cost Effectiveness of Body Mass Index at Division Level of Boys.

Table 4.5.1: Boys' Division-wise Cost Effectiveness of Body Mass Index

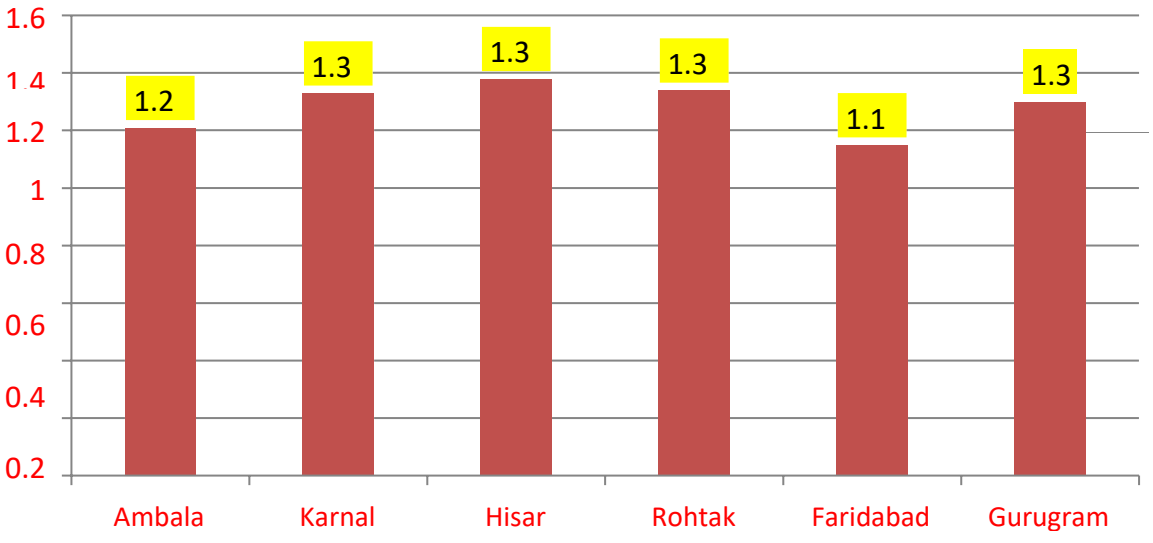
Divisions	BMI Boys VIII	BMI Boys V	Total	Mean BMI Boys	Per Capita MDM Cost VIII	Per Capita MDM Cost V	Per Capita MDM Mean Cost	Cost Effectiveness per capita Boys
Ambala	14.82	16.08	30.9	15.45	13.07	12.72	12.72	1.21
Karnal	14.84	16.86	31.7	15.85	11.72	12.09	11.91	1.33
Hisar	16.12	16.48	32.6	16.3	12.03	11.52	11.78	1.38
Rohtak	15.56	16.26	31.82	15.91	11.92	11.71	11.82	1.34
Faridabad	14.38	13.36	27.74	13.87	11.74	12.34	12.04	1.15
Gurugram	16.58	16.88	33.46	16.73	12.24	13.35	12.8	1.3

Source: Author's calculation

The BMI of boys was calculated by adding 1st to 8th class and it was then divided by the per capita MDM mean cost to find out the per capita cost-effectiveness of boys for the Body Mass Index. The best per capita cost-effectiveness of boys for BMI belonged to district Hisar, and the minimum cost-effectiveness was found in the Faridabad division.

Figure No 4.5.1

Division wise Cost Effectiveness of Bodv Mass Index: Bovs



Source: Primary Survey

Figure 4.5.1 showed that insignificant differences exist between divisions in respect of the BMI of boys. The Hisar division has the highest cost-effectiveness (1.38), and the Faridabad district has the lowest cost-effectiveness (1.15) in Haryana. The cost-effectiveness diagram shown that by spending one extra rupee, the Hisar division can increase BMI by 1.38 points and the Faridabad division by 1.1 points.

Table 4.5.2: One-Sample t Test for Existence of Difference in Per Capita Cost Effectiveness of Body Mass Index of Boys at Division Level

	Spiro-Wilk Test	Levene's Test	N	Mean	SD	t	Sig. (2-tailed)
Per capita cost effectiveness forBMI Boys	0.069	0.102	6	15.68	1.8	0.25	0.981 Insignificant at 05 level H0 accepted

Source: Author's calculation

The outcome of Table 4.5.2 showed that an insignificant difference existed for the per capita cost-effectiveness of the body mass index of boys at the division level, as the 2-tailed value was 0.981, which was insignificant at the 0.05 significance level. Rani and Singh (2020) found that multigrain-enriched noodles were very nutritious. It has improved the cost-effectiveness of MDM. Mishra, A & et al. (2022) found that millet was rich in multiple vitamins and minerals. India is a developing country that is facing resource constraints. The cost-effectiveness of MDMP should be a major concern in such a course. The main challenge of MDMP was to curtail expenditures and improve efficiency. The use of millets has improved the cost-effectiveness of MDMP in Burla, Orissa State.

4.5.2 H0: There is no Significant Difference Exist in the Per Capita Cost Effectiveness of the Academics Index at Division Level of Boys.

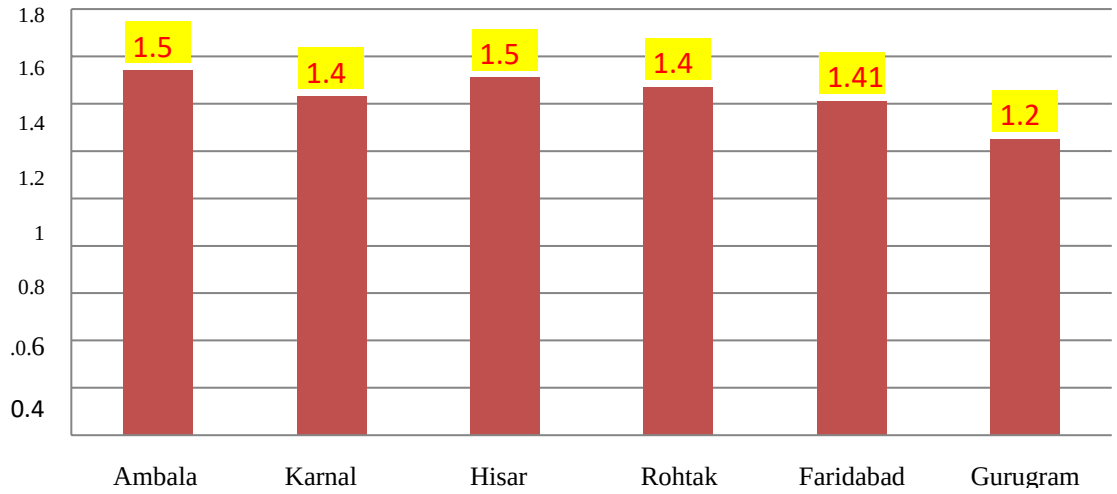
Table 4.5.3: Boys' Division-wise Cost Effectiveness of Academic Achievements

Divisions	Academic Achievement Boys VIII	Academic Achievement Boys V	Total Marks Total	Mean of Academics Boys	Per capita MDM Cost VIII	Per capita MDM Cost V	Mean of per capita MDM Cost	Cost-effectiveness per capita Boys
Ambala	18.41	20.9	39.41	19.66	13.07	12.72	12.72	1.54
Karnal	16.61	17.46	34.07	17.04	11.72	12.09	11.91	1.43
Hisar	15.76	19.74	35.5	17.75	12.03	11.52	11.78	1.51
Rohtak	18.01	16.68	34.69	17.35	11.92	11.71	11.82	1.47
Faridabad	18.78	15.12	33.9	16.95	11.74	12.34	12.04	1.41
Gurugram	16.12	15.78	31.9	15.95	12.24	13.35	12.8	1.25

Source: Author's calculation

Table 4.5.3 reflected that the academic achievement of boys was calculated by adding 1st to 8th class and it was then divided by the per capita MDM mean cost to find out the per capita cost-effectiveness of boys for academic achievements. The best per capita cost-effectiveness of boys for academic achievements was found in district Ambala, and the minimum cost-effectiveness was found in Gurugram.

Figure 4.5.2: Boys' Division-wise Cost Effectiveness of Academic Achievements



Source: Primary Survey

Figure 4.5.2 showed that an insignificant difference existed in cost-effectiveness between divisions with respect to the academic achievement of boys. The Ambala division has the highest cost-effectiveness (1.54 marks), and the Gurugram division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram shown that by spending one extra rupee, the Ambala division can increase academic achievement by 1.54 marks and the Hisar division by 1.51 points.

Table 4.5.4: One-sample t Test for Existence of Difference in Per Capita Cost Effectiveness of Academics Index at Division Level of Boys.

Academic Achievement	Spiro-Wilk Test	Levene's Test	N	Mean	SD	t	Sig. (2-tailed)
Boys' Per Capita Cost Effectiveness for Academic Achievement	0.097	0.120	6	17.45	1.521	-.140	0.894 Insignificant at .05 level H0 accepted

Source: Author's calculation

The outcome of one sample t-test showed that an insignificant difference existed for the per capita cost-effectiveness of academic achievement of boys at the division level, as the 2-tailed value is 0.894, which was insignificant at a.05 significance level. It inferred that there was an insignificant difference existed between divisions related to per capita cost-effectiveness for the academic achievements of boys. Rani, Singh & Kumble et al. (2020) found that multigrain soy-enriched noodles were very nutritious. It has improved the cost-effectiveness of MDM in improving the academic achievement of students.

4.5.3 H0: There is no Significant Difference Exist in Per Capita Cost Effectiveness of Academic Achievement of Girls at the Division Level.

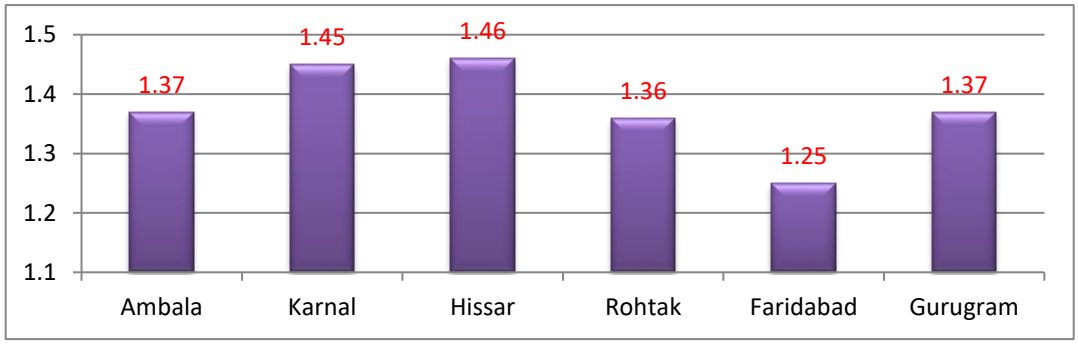
Table 4.5.5: Division wise Girls' Cost Effectiveness of Academics

Divisions	Academic Girls VIII	Academic Girls V	Total Marks Total	Mean of Academics Girls	Per capita MDM Cost VIII	Per capita MDM Cost V	Mean of per capita MDM Cost	Cost-effectiveness per capita Girls
Ambala	18.14	16.76	34.9	17.45	13.07	12.72	12.72	1.37
Karnal	17.74	16.92	34.66	17.33	11.72	12.09	11.91	1.45
Hisar	17.02	17.32	34.34	17.17	12.03	11.52	11.78	1.46
Rohtak	16.92	15.34	32.26	16.13	11.92	11.71	11.82	1.36
Faridabad	16.07	13.9	29.97	14.99	11.74	12.34	12.04	1.25
Gurugram	18.3	16.8	35.1	17.55	12.24	13.35	12.8	1.37

Source: Author's calculation

Table no. 4.5.5 reflected that the academic achievement of girls was calculated by adding 1st to 8th class and it was then divided by the per capita MDM mean cost to find out the per capita cost-effectiveness of girls for academic achievements. The best per capita cost-effectiveness of girls for academic achievements was found in the Hisar division, and the minimum cost-effectiveness was found in the Faridabad division.

Figure 4.5.3: Girls' Division-wise Cost Effectiveness of Academic Achievements



Source: Primary Survey

Figure 4.5.3 show that insignificant differences existed in cost-effectiveness between divisions with respect to the academic achievement of girls. The Hisar division has the highest cost-effectiveness (1.46 marks), and the Faridabad division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the Hisar division can increase academic achievement by 1.46 marks and the Ambala division by 1.45 marks by spending one rupee extra on the mid-day meal.

Table 4.5.6: One-Sample T Test for Girls' Division-wise Cost Effectiveness of Academic Achievements

Academic Achievement	Spiro-Wilk Test	Levene's Test	N	Mean	SD	t	Sig. (2-tailed)
Per Capita Cost Effectiveness for Academic Achievement (Girls)	0.095	0.114	6	1.37	.076	0.107	0.910 Insignificant at 0.05 level

Source: Author's calculation

The outcome of table no 4.5.6 showed that there was an insignificant difference existed for the per capita cost-effectiveness of academic achievement of girls at the division level, as the 2-tailed significance value was 0.910, which was insignificant at the 0.05 significance level. So, the H0 was retained. It inferred that there was an insignificant difference existed between divisions related to per capita cost-effectiveness for the academic achievements of girls. Sarita & Singh, E (2016) found that millets were rich in multivitamins and minerals. The use of millets has improved the cost-effectiveness of MDMP in Burla, Orissa State.

4.5.4 H0: There is no Significant Difference Exist in the Per Capita Cost-Effectiveness of the Body Mass Index of Girls at the Division Level.

Table 4.5.7: Girls' Per Capita Cost Effectiveness of BMI

Divisions	BMI Girls VIII	BMI Girls V	Total	Mean BMI Girls	Per Capita MDM Cost VIII	Per Capita MDM Cost V	Per Capita MDM Mean Cost	Per Capita Cost Effective-ness
Ambala	17.67	17.2	34.92	17.4	13.07	12.37	12.72	1.37
Karnal	16.9	16.6	33.52	16.7	11.72	12.09	11.91	1.41
Hisar	18.1	20.6	38.76	19.3	12.03	11.52	11.78	1.65
Rohtak	17.1	18.1	35.22	17.6	11.92	11.71	11.82	1.49
Faridabad	15.42	14.8	30.22	15.1	11.74	12.34	12.04	1.25
Gurugram	16.52	18.8	35.35	17.6	12.24	13.35	12.8	1.38

Source: Author's calculation

Table No. 4.5.7 showed that the mean BMI of the Hisar division stands at the highest position, and the Faridabad division stood at the lowest ranking. In terms of per capita cost effectiveness, again, the Hisar division stood at the first rank followed by the Rohtak division. The cost-effectiveness of the Faridabad division was the lowest. It showed that the Faridabad division was unable to improve BMI at a low cost, so it needed to improve the functioning of MDMS in its schools.

Figure 4.5.4: Girls' Per Capita Cost Effectiveness of Source: Primary Survey

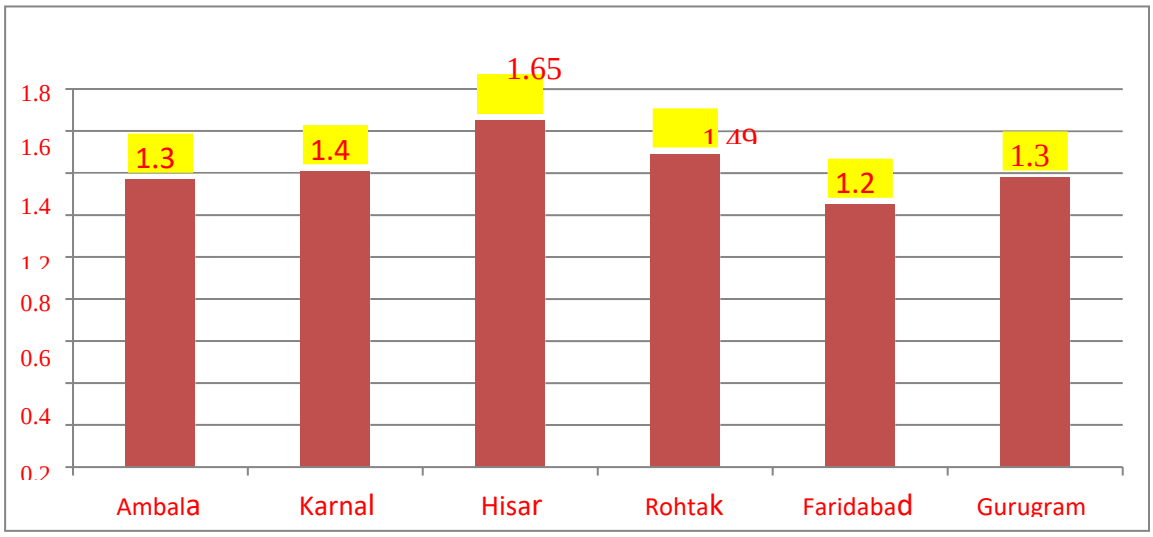


Figure No 4.5.4 showed that insignificant differences existed between divisions in respect of the BMI of girls. The Hisar division has the highest cost-effectiveness (1.65) and the Faridabad district has the lowest cost-effectiveness (1.25) in the Haryana state. The cost-effectiveness diagram showed that by spending one extra rupee Hisar division could increase BMI by 1.65 points and the Rohtak division by 1.49 points.

Table 4.5.8: One-Sample t-Test for Girls' Per Capita Cost Effectiveness of BMI

BMI	Spiro-Wilk Test	Levene's Test	N	Mean	SD	t	Sig. (2-tailed)
Per Capita Cost Effectiveness BMI Girls	0.084	0.110	6	1.42	.13472	0.091	0 .931 Insignificant at .05 level H0 accepted

Source: Author's calculation

The outcome of Table 4.5.8 showed that an insignificant difference existed for the per capita cost-effectiveness of the body mass index of girls at the division level, as the 2-tailed value was 0.931, which is insignificant at the 0.05 significance level. It inferred

that an insignificant difference existed between divisions related to per capita cost-effectiveness for the BMI of girls. Singh and Gupta (2015) found that MDM was very helpful in promoting the nutritional status of students. The cost-effectiveness of MDMP improved when it strengthened its operational planning and supervision. There was an insignificant difference in BMI between various blocks of Lucknow districts.

4.5.5 Policy Analysis: The Mid-Day Meal Program's cost-effectiveness is evaluated through the efficient management of human and material resources. This evaluation seeks to ascertain whether these resources are optimally utilized to achieve the greatest value for money. The allocation of available resources across health services is scrutinized to maximize the program's health outcomes (Thomas and Chalkidou, 2016). Cost-effectiveness analysis (CEA) serves as a vital economic evaluation tool, particularly in policy formulation. Developed to aid decision-makers coping with limited resources, CEA facilitates comparisons among programs that yield varied outcomes, aiming to identify the most effective combinations (Thomas and Chalkidou, 2016).

The Mid-Day Meal Program aims to provide nutritious meals to students, fostering a conducive academic environment and promoting physical growth. This study employed cost-effectiveness analysis to gauge the program's expenditure against its outcomes, recommending strategies for optimizing scarce resources to achieve maximal results. The overarching objective is to deliver maximum benefits with minimal costs, crucial in a developing country like India, constrained by financial limitations for the Mid-Day Meal Program's expansion. The findings underscore its overall success, although it reveals shortcomings in enhancing academic and physical standards among beneficiaries from lower middle and lower classes.

Specific divisions within the program exhibit varying levels of cost-effectiveness: Hisar excels in achieving Body Mass Index (BMI) outcomes, while Ambala demonstrates superior academic outcomes relative to budgetary allocations. These divisions serve as examples of efficient resource utilization within defined financial constraints. Addressing

current needs, innovations such as local processing of food could enhance the program's nutritional quality and affordability. Simultaneously, reducing per capita meal costs is crucial for enhancing overall cost-effectiveness.

Achieving cost-effectiveness necessitates enhancing internal stakeholder efficiency through rigorous monitoring, effective supervision, and the minimization of food wastage. Maintaining meal quality remains paramount, alongside initiatives to guide students in improving both academics and BMI. Implementing remedial classes and encouraging regular physical exercise were proposed strategies to achieve these educational and health goals effectively.

Chapter -V

Summary, Conclusion and Policy Implications

This chapter briefly summarizes the research work to date. It begins with an introduction to the results and discussions. The chapter is presented into the following nine sections;

5.1 Introduction: Students of a country make their future bright, but their future is badly affected by malnourished, stunted, and uneducated students. Moreover, Article 6 of the UN Convention on Children states, “Every child has the right to life.” i.e., there should be the provision of clean water, medical care, and sufficient nutritious meals (UNICEF, 1990). An expert committee to the UN on World Food Security issued recommendations for eradicating chronic childhood hunger in September 2012. It recommended the concept of a “Food Security Floor”. It was defined as the minimum steps required for the eradication of hunger. It comprised of nutrition literacy, sanitation, primary health, and clean drinking water.

The launch of MDMP at school shows the love, care, and concern for children by their respective governments and civil societies around the world. Victor Hugo, a Frenchman, is credited with starting the school lunch program in 1865. In France, meals were provided as free or paid meals. It was enacted that all municipalities would establish "School Fund Committees" to prepare food for the poor and needy children of the school. The basic duty of a welfare state like India is to provide basic facilities to its citizens, e.g., health services, education, housing, etc. In the 21st century, "Inclusive Development" is the new "mantra" of development. In inclusive development, the welfare state ensures that no one is left behind on the path of development, i.e., access to primary public health care, quality education, and other necessary services to ensure a quality life. A productive workforce will drive growth. A productive workforce is created by integrating good education and health. An equitable distribution of income will also increase the purchasing power of the poor to buy quality education and health care. To ensure these two services, Article 25 of our constitution makes provisions for the fitness and well-

being, food, clothing, housing, and other imperative services of individuals and families. Article 26 provides the ‘Right to Education’. Elementary education shall be compulsory and free for all students up to 14 years of age.

To address the issue of education and health, the Government of India launched the world's largest school lunch program (MDMP) on August 15, 1995, to improve educational attainment and nutritious meals in 2408 blocks of the country. The Government of India issued letter number F-6-2/95 containing guidelines for the National Nutrition Support Program for School Education. The Mid-day Meal Program was implemented across the country in 1997–98. It is a 100% centrally supported scheme for the States and Union Territory. The three-phase program involved all governments, local bodies, and government primary schools in all union territories and states. In the first phase, it covered all such primary schools located in Low Female Literacy (LFL) Blocks, Employment Scheme Blocks (EAS), and Revised Public Distribution System (RPDS) Blocks in India. In the second phase, it was expanded in 1996–97 to cover all Community Development blocks with low female literacy blocks. Phase-III included all primary schools in 1997–98. Under this scheme, 100 g of food grains were provided per student every day. MDMP was converted to hot-cooked, nutritious food in September 2004. Under the MDM regime, primary schools were provided with a total of 300 calories of food and 8–12 g of protein, thanks to the Supreme Court's intervention. This program was extended to upper primary school students on April 1, 2008.

MDMP is known as the PM Poshan Scheme, which is the largest school meal program in the world. In this scheme, 11.59 crore students were beneficiaries in India, and 25.95 lakh cooks are helpers from weaker sections of society. (mdm.nic.in, retrieved on March 31, 2022). The performance in implementing the Mid-Day Meal differs as per the efficiency and sensitivity of the state governments. Many states, like Tamil Nadu and Gujarat, are role models for the effective execution of this program (Grover and Kaur, 2012).

Haryana society has a high degree of structural inequality between different castes. The socio-economic conditions of people in the SC and BC categories have improved due to the implementation of the reservation policy and various welfare programs run by the state and central governments. But still, this category of people lags behind from the upper caste people in terms of economic status, living standards, educational status, and other parameters of human beings.

A socio-economic analysis of the MDMP would be very useful in strengthening or modifying the current practices and policies related to this system. Since its inception in April 2004, the Mid-day Meal in its current form and services has already passed 16 years; therefore, it was highly desirable to evaluate the effectiveness of the program at this stage. In the period of COVID-19, when MDMP has become more important, a new survey was needed to deeply analyze the state of the system in the state to find out the enrollment, attendance, retention, satisfaction level, and physical and academic achievement level among the beneficiaries of different socio-economic groups in society. A cost-effectiveness analysis will highlight the effective use of MDMP for the improvement of plight of students belonging to lower strata in Haryana. Thus, there is a need for a socio-economic analysis of MDM in the state with the following objectives:

Objectives of the Study

1. To ascertain the role of MDMP in increasing enrolment, attendance and retention among various socio-economic groups of students.
2. To analyze the contribution of MDMP in improving the educational attainment among various socio-economic groups of students.
3. To assess the satisfaction level of students, teachers, and parents about MDMP in government schools.
4 To examine the role of MDMP in improving the physical standards of students among various socio-economic groups of students.

5 To carry out comparative analysis of achievements of MDMP at Revenue Division level.

6 To suggest strategies for making the MDM efficient.

5.2 Methodology

Methodology means the description and justification of the research method. A method consists of a technique and tool to collect data by using empirical observations and reasoning. Methodology clarifies the plan and procedure to carry out research work and analyze the results. So, methodology is a philosophy on which research is based.

To collect the necessary data, it was necessary to work as per the laid-out procedure that was helpful in attaining the objectives of the research work. This research work was designed to analyze the impact of Mid-day Meal on enrolment, attendance, retention, academic performance, and the physical level of primary and upper primary students of different socio-economic groups in Haryana. The method of investigation used was a descriptive and cross-sectional study. Stratified random sampling was used for the selection of schools.

A 5% margin of error was adopted in the study, and a confidence level of 95% was chosen. A total of 1,020 subjects were studied, of which 519 were girls and 501 were boys from primary and upper primary state schools in the same ratio in the age group of 6–14 years. Students were categorized according to Pareek's socio-economic scale score. The criterion for inclusion in the sample was chronological age at the time of sampling. The age at the last birthday (i.e., age in the whole year) was used to calculate the data. In addition, 162 teachers and 301 parents were taken as samples.

The researcher used several options to collect the required data from the subjects. It included a semi-structured interview, a questionnaire, and anthropometric measurements. The questionnaire was developed in order to obtain the necessary information. The questionnaire was prepared with the help of an English expert, three principals, two Block Education officers, one professor from the Central University of Haryana, and two

professors from Lovely Professional University. Each item was analyzed for relevance and objectivity before completion. A pilot test was conducted on 150 students of the same age groups in one primary and upper primary school in three districts of Haryana. It was ensured that students belonged to various socio-economic groups in society. Students did not report any difficulty in understanding and answering the questionnaires. It took around 40–45 minutes for each respondent to register their response and 5 minutes to measure their height and weight.

This was done to determine the reliability of the test. The reliability of the test was constructed by the researcher using pre-test and post-test methods on students, and pre-reliability was determined using Cronbach's alpha scale from SPSS. Test items were modified because reliability was less than 0.70 on Cronbach's alpha scale via SPSS. The investigator resolved the ambiguity and difficulty of the instrument items and brought improved items.

A separately prepared five-point questionnaire and achievement test were prepared in Hindi and English, respectively. Pupils V and VIII received 10 items worth 10 points each.

Primary and secondary data were used to analyze the impact of the MDMP. Secondary data revealed school enrollment, attendance, retention, and the number of students. Secondary data was collected from the Directorate of Elementary Education, Haryana, Chandigarh, and a comparison was made between the attendances of two time periods (before and after the introduction of MDMP) in different districts.

Anthropometric measures, paired t-test technique, Mann Whitney U test, ANOVA, and one-sample t-test for classes, parents, and teachers were used to analyze data before and after mid-day meal implementation.

5.3 Result and Discussion

5.3.1 Demographic Profile of Students

1. In this study 656 students were taken from Primary Schools and 364 students were taken from Upper Primary Schools in 12 districts of Haryana.
2. Students' data were analyzed from 12 districts of Haryana. In percentage terms, it was 8.3% of the total data analyzed from each district.
3. In the collected data 41.42% of students were from the SC category, 25.7% of students belonged to the BC B category, and 13.17% of students were from the BC A category which was the lowest
4. For Most of the students' fathers, 34.3% engaged in labor work 17.3% engaged in farming activities and very fewer students (4.5%) of students' fathers did nothing.
5. Maximum (369) students' fathers were matriculate and 53 students' fathers could not even read. About 95.4% of students' fathers were matriculated or below it.
6. A maximum (609) students fall in the category of Lower Middle Class a few students (10) belonged to the Upper Middle Class and nil students belonged to the Upper Class as per the Pareek Socio-Economic scale.

5.3.2 Role of MDMP in Increasing Enrolment, Attendance, and Retention of Students:

1. The outcome implied that there was a significant difference in the enrolment of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 1.21, 31.86, 57.46, and 9.47, respectively, which showed that the maximum number of students studying in government schools belonged to LMC and LC. It has the least role in increasing the enrolment of the upper and upper middle classes.

2. The outcome implied that there was a significant difference existed in the enrolment of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 1.11, 44.78, 47.80, and 6.31, respectively,

which showed that the maximum number of students studying in government upper primary schools belong to LMC and LC.

3. The outcome showed a P-value of 0.036, which was significant at the 0.05 level of significance. The outcome implied that there was a significant difference in students' attendance among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 191.6, 172.3, 143.8, and 111.9, respectively, indicating that lower socio-economic group students have lower attendance compared to higher strata of students. Lower-class pupils have the lowest school attendance.
4. The outcome implied that there was a significant difference in student attendance among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 198.6, 192.3, 151.8, and 121.4, respectively, indicating that lower socioeconomic group students have lower attendance compared to higher strata groups in upper primary schools. Lower-class pupils have the lowest school attendance.
5. The outcome implied that there was no significant difference in the retention rate of students among various socio-economic groups in Haryana. The mean values of UMC, MC, LMC, and LC were 95.65, 96.19, 85.38, and 74.29, respectively, which showed that lower socio-economic group students in primary schools have a lower retention rate in comparison with the higher strata groups. Lower-class students have the lowest retention rate in schools.
6. The outcome implied that there was no significant difference in the retention rate of students among various socio-economic groups of students in upper primary schools in Haryana. The mean values of UMC, MC, LMC, and LC were 98.65, 92.21, 72.38, and 54.29, respectively, which showed that lower socio-economic groups have a lower retention rate in comparison with the higher strata groups. Lower-class students have the lowest retention rate in schools.

5.3.3 Contribution of MDMP in Improving Educational Attainment

1. The outcome implied that there was a significant difference in English subject scores among different socio-economic groups of students in primary schools in Haryana. The mean values of UMC, MC, LMC, and LC were 6.65, 6.17, 5.32, and 4.29, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools.

2. The outcome implied that there was a significant difference in English subject scores among different socio-economic groups of students in upper primary schools in Haryana. The mean values of UMC, MC, LMC, and LC were 6.46, 6.17, 5.12, and 4.22, respectively, indicating that students from the lower socio-economic group achieved low marks compared to the higher strata group students.
3. The outcome implied that there was a significant difference in marks in mathematics subjects among different socio-economic groups of students in primary schools in Haryana. The mean values of UMC, MC, LMC, and LC were 5.70, 5.75, 4.80, and 4.22, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools.
4. The outcome implied that there was a significant difference in English subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 6.65, 6.17, 5.32, and 4.29, respectively, indicating that students from the lower socio-economic groups achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools.
5. The outcome implied that there was a significant difference in EVS subject scores among different socio-economic groups of students in primary schools in Haryana. The mean values of UMC, MC, LMC, and LC were 6.05, 6.27, 5.12, and 4.21, respectively, indicating that students from the lower socio-economic groups

achieved low marks compared to the higher strata groups. Lower-class students have the lowest average marks in schools.

6. The outcome implied that there was a significant difference in science subject scores among different socio-economic groups of students in Haryana. The mean values of UMC, MC, LMC, and LC were 5.82, 5.94, 5.21, and 4.65, respectively, which showed that students in lower socio-economic groups scored lower marks compared to students in higher strata. Lower-class students have the lowest average marks in schools.

5.3.4 Satisfaction level of students, teachers and parents about MDMP

A Students' satisfaction

1. Higher-status students did not consider that they come to school regularly because they got a tasty meal here in comparison to lower-class students. It was evident that students belonging to lower class strata were allured by mid-day meal.

2. Almost all category students observed that they were getting changed menu in the MDM on a daily basis, so their scores ranged from 3.41 to 3.06. It was evident that MDM was prepared as per the menu.
3. Students belonging to the poor strata were taking MDM more regularly than students belonging to the higher strata.
4. Students belonging to all strata did not like the MDM menu because their scoring was below 3 on a five-point Likert scale. It was also revealed that higher-strata students like less MDM than lower-strategy students.
5. Students belonging to the UMC of society perceived that MDM was not cooked hygienically, and students belonging to lower strata perceived that MDM was cooked hygienically.
6. Students belonging to the upper middle class felt that the flavour of MDM was not satisfactory, whereas students belonging to the MC and LMC found that the flavour

of MDM was satisfactory. Students belonging to Lower Class found that the flavour of MDM was very satisfactory.

7. Students belonging to the upper middle class felt that MDM was not garnished satisfactorily, whereas students belonging to the MC and LMC of society found that MDM was garnished satisfactorily. Lower-class students felt that MDM was garnished quite satisfactorily.
8. Students belonging to the upper middle school class demanded less MDM in comparison with the students belonging to the lower class. Except for the Lower Class, none of the higher strata students demanded more meals as their score was less than 3.
9. All students were satisfied that they were getting the same and desired quantity of mid-day meals. In comparison, students belonging to the lower class were less satisfied than students belonging to the upper middle class in terms of an equal and desired quantity of mid-day meals.
10. Students belonging to the lower class did not eat all served MDM in comparison with the students belonging to the higher strata. Students belonging to UMC, MC, and LMC were satisfied that they consumed MDM.
11. Students belonging to UMC were more satisfied while getting a full meal of MDM in comparison with other socio-economic classes. All the socio-economic classes were satisfied that they were getting a full meal, but comparatively, students belonging to the lower class were more satisfied.
12. Students belonging to all categories were almost satisfied with the mid-day meal. In comparison, students belonging to the lower class were more satisfied with the MDM than the other higher classes.
13. Students belonging to Middle Class perceived a more positive impact of MDM on their studies in comparison with the other socio-economic classes. Students belonging to the lower class did not perceive that they were getting a positive impact from MDM on their studies. Students belonging to all categories wanted that MDM to be continue except UMC because its score was 2.99, which was lower

than 3. Students belonging to the lower class were more in support of the continuation of MDM in comparison with other classes.

B. Teachers Satisfaction

1. Both primary and upper primary school teachers agreed that MDM was prepared according to the menu. In comparison, primary school teachers scored more than upper primary schools, which showed that MDM was prepared more as per the menu in primary schools than in upper primary schools.

2. Both primary and upper primary school teachers agreed that MDM was prepared on time. In comparison, upper primary school teachers scored more than primary school teachers, which showed that MDM was prepared more timely in upper primary schools than for primary school students.
3. Both primary and upper primary school teachers agreed that MDM was prepared hygienically. In comparison, primary school teachers scored higher than upper primary school, which showed that MDM was prepared more hygienically in primary schools than upper primary school students.
4. Teachers of primary schools believed that their students were getting a more nutritious meal in MDM than the upper primary school teachers. Although none of the categories were satisfied that MDM was providing a nutritious meal to students,

5 Upper primary school teachers comparatively believed that students were getting a qualitative meal in MDMP than the teachers of primary schools. Although none of the categories were satisfied with the quality of the meal served because their scoring was less than 3,

6. Upper Primary School teachers comparatively believed that students' interest in studies increased after the execution of MDMP than the teachers of primary school. Although both categories were satisfied with the quality of the meal served because they were scoring less than 3, Upper primary school teachers comparatively believed that their teaching time decreased after the execution of MDMP than the

teachers of primary schools. Although none of the categories believed that their teaching time had been reduced because their scoring was less than 3.

7. Upper primary school teachers comparatively believed that MDMP was more beneficial for social cohesiveness than the teachers of primary school. Both categories of teachers were satisfied that MDMP was beneficial for social cohesiveness.

8. Upper primary school teachers comparatively believed that the MDM menu should be changed. While both groups aimed to alter the MDM menu.

9. Upper primary school teachers comparatively believed that MDM should be continued than the teachers of primary school. Although both categories wanted that MDM should be continuing.

C) Parents' Satisfaction

1. Parents of upper primary schools comparatively more perceived that their ward came to school due to MDM than the parents of primary schools. Although both categories perceived that their children came to school regularly because their ward liked MDM,

2. Parents of upper primary schools comparatively perceived that their wards got MDM more regularly than the parents of primary schools. Although both categories perceived that their children get MDM regularly because their score was more than 3.
3. Parents of upper primary schools comparatively perceive that hygienic conditions were especially observed while preparing MDM than the parents of primary schools. Although both categories perceived that hygienic conditions were especially observed while preparing MDM as their score was more than 3.
4. Parents of upper primary schools comparatively perceived that they have not observed improvement in the health of their ward after the implementation of MDMP than the parents of primary schools. Although both categories perceived

that they had not observed improvement in the health of their ward after the implementation of MDMP as their score was less than 3.

5. Parents of Upper Primary School comparatively perceived that their children have not faced health-related problems after taking MDM than the parents of Primary School. Although both categories perceived that their children had not faced health-related problems after taking MDM as their score was less than 3,
6. Parents of Upper Primary School comparatively perceived that their children have not faced any caste discrimination compared to the parents of Primary School. Although both categories perceived that their children had not faced caste discrimination after taking MDM as their score was less than 3.
7. Parents of upper primary schools were comparatively more persuaded that MDM should be continued than the parents of primary schools. Although both categories perceived that MDM should be continued as their score was more than 3.

5.3.5 Role of MDMP in Improving the Physical Standards of Students

1. The mean value of the weight of UMC, MC, LMC, and LC students was 36.223, 33.869, 33.018, and 32.497 kg, respectively. It has been shown that students belonging to the higher strata of society have a higher weight than students from the lower strata of various socio-economic groups. Students belonging to higher classes have more weight than those belonging to lower classes. There was a direct relationship between the socio-economic status of a student and their weight. Students belonging to UMC have the highest weight (36.223 kg), and LC students have the lowest weight (32.497 kg).

2. The mean values of UMC, MC, LMC, and LC were 1.423, 1.418, 1.415, and 1.402, respectively. It showed that students belonging to the higher strata of society have a higher height in comparison with students from the lower strata.

3. The mean values of UMC, MC, LMC, and LC are 18.84, 17.44, 16.66, and 16.49, respectively. It showed that students belonging to the higher strata of society have a higher BMI (18.84) than those belonging to the lower class (16.49).

5.3.6. Cost-effectiveness Analysis of MDMP at the Revenue Division Level

1. Insignificant differences existed between divisions in respect of the BMI of boys. The Hisar division has the highest cost-effectiveness (1.38), and the Faridabad district has the lowest cost-effectiveness (1.15) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the Hisar division can increase BMI by 1.38 points.

2. Insignificant differences existed in cost-effectiveness between divisions with respect to the academic achievement of boys. The Ambala division has the highest cost-effectiveness (1.54 marks), and the Gurugram division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the Ambala division can increase academic achievement by 1.54 marks and the Hisar division by 1.51 points.
3. Insignificant differences existed in cost-effectiveness between divisions with respect to the academic achievement of girls. The Hisar division has the highest cost-effectiveness (1.46 marks), and the Faridabad division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the Hisar division could increase academic achievement by 1.46 marks and the Ambala division by 1.45 marks by spending one rupee extra on Mid-Day Meal.
4. Insignificant differences existed between divisions in respect to the BMI of girls. The Hisar division has the highest cost-effectiveness (1.65) and the Faridabad district has the lowest cost-effectiveness (1.25) in Haryana state. The cost-effectiveness diagram showed that by spending one extra rupee, the Hisar division could increase BMI by 1.65 points and the Rohtak division by 1.49 points.

5.4 Implications of the Study

The main purpose of the present study was to critically analyze "A Socio-Economic Analysis of the Mid-Day Meal Program in Haryana". The results of the study reflected that the scheme has had a positive impact on attendance, retention rate, academic achievement, and physical growth of the students in the age group of 6 to 14 years of age. It was also appraised in the conclusion that the Mid-day Meal Scheme is a central government scheme. It was an initiative of the government of India to foster social and gender equity in the country. However, the scheme of such a huge magnitude is facing lacunae that need to be urgently addressed so that it can realize its full potential. The investigator has proposed the following implications for the research study:

5.4.1 Implications for the Government

It is the central government's sponsored welfare scheme. The officials of this scheme can take advantage of the findings of the study and improve the planning, expansion, and execution of the plan. The outcome of the study reflected the poor performance of students belonging to low socio-economic groups in all aspects, e.g., attendance, academics, and physical growth. The implications of the Mid-day Meal Program for the government encompass various aspects, ranging from educational outcomes to socio-economic development. Here are some key implications:

1. **Enhanced Educational Outcomes**: The Mid-day Meal Program has the potential to significantly improve educational outcomes by addressing malnutrition and hunger among school children. Government investment in this program can lead to better attendance, increased concentration levels, and improved academic performance among students. The state government could plan a special diet for students who have these low physical parameters, so that these students could come on par with a high socio-economic group of students.
2. **Increased Enrollment Rates**: By providing free meals to students, especially those from disadvantaged backgrounds, the Mid-day Meal Program serves as an incentive

for parents to send their children to school. This can contribute to higher enrollment rates, particularly in rural and economically disadvantaged groups of population.

3. **Nutritional Support for Vulnerable Populations**: The program plays a crucial role in addressing the nutritional needs of vulnerable populations, such as children from low-income families or marginalized communities. Ensuring access to nutritious meals can mitigate the long-term effects of malnutrition and contribute to overall health and well-being.
4. **Poverty Alleviation and Social Welfare**: Investing in the Mid-day Meal Program aligns with broader poverty alleviation and social welfare objectives. By reducing the financial burden on families and improving the nutritional status of children, the government can contribute to poverty reduction efforts and promote social equity.
5. **Healthcare Cost Reduction**: Addressing malnutrition at an early age through the Mid-day Meal Program can lead to long-term health benefits, potentially reducing healthcare costs associated with malnutrition-related illnesses and diseases later in life. This can result in cost savings for the government in terms of healthcare expenditures.
6. **Investment in Human Capital**: By prioritizing initiatives like the Mid-day Meal Program, the government invests in the development of human capital, which is crucial for sustainable economic growth and development. Well-nourished and educated individuals are better equipped to contribute to the workforce and drive economic progress.
7. **Policy Effectiveness and Monitoring**: The Mid-day Meal Program also highlights the importance of effective policy implementation and monitoring mechanisms. The government needs to ensure that the program is efficiently managed, resources are allocated effectively, and quality standards are maintained to achieve its intended objectives. The local governments, viz., panchayats and municipal corporations, can monitor the implementation of the schemes in schools and at the district administration level. The collective efforts of all three levels of government can improve the outcome of MDMP in the country.

8. **Partnerships and Collaboration**: Collaboration with other stakeholders, including non-governmental organizations, community groups, and private sector entities, can enhance the reach and impact of the Mid-day Meal Program. Government efforts to foster partnerships and leverage resources can strengthen the program's effectiveness and sustainability.
9. **Use of Cost-Effectiveness Analysis:** Government can concentrate on improving the cost-effectiveness of MDMP for a better outcome. The state government could plan effective execution of the plan. It can focus on these low-performing students and release special grants to improve the plight of these poverty-ridden students.

In conclusion, the implications of the Mid-day Meal Program for the government extend beyond education and nutrition to encompass broader socio-economic and public health objectives. By prioritizing investment in this program, governments can make significant strides towards achieving inclusive growth, poverty reduction, and improved well-being for all citizens.

5.4.2 Implications for Schools: The school is the execution place of the scheme. The findings of the study reveal the plight of poor students. This scheme, in its present form, is not competent to help students belonging to low socio-economic groups. The school can learn from this study and pay special attention to these poor students, who are not performing at par with the students of the higher strata. MDMP makes the school an attractive place for lower-class students. The Mid-day Meal Program has several implications for schools, influencing various aspects of their operations, environment, and outcomes:

1. **Attendance and Enrollment**: One of the primary implications of the Mid-day Meal Program for schools is increased attendance and enrollment rates. By providing a nutritious meal during the school day, the program acts as an incentive for students to attend school regularly, leading to higher enrollment rates and improved attendance records.

2. **Health and Nutrition**: The program contributes to the overall health and nutrition of students by ensuring they receive at least one nutritious meal each day. Schools play a crucial role in implementing the program effectively, ensuring that meals are prepared, served, and consumed in a hygienic and safe environment.
3. **Academic Performance**: Access to nutritious meals through the Mid-day Meal Program can positively impact students' academic performance. Schools may observe improvements in students' concentration levels, cognitive abilities, and learning outcomes as a result of better nutrition and reduced hunger-related distractions.
4. **Socialization and Community Engagement**: Meals provided through the program offer opportunities for socialization and community engagement within the school environment. Shared meals foster a sense of camaraderie among students and provide a platform for interaction and bonding, contributing to a positive school culture.
5. **Infrastructure and Facilities**: Implementing the Mid-day Meal Program may require schools to upgrade their infrastructure and facilities to accommodate meal preparation, storage, and dining areas. Schools need adequate kitchen facilities, dining halls, and sanitation amenities to ensure the program's smooth functioning.
6. **Administrative Responsibilities**: Schools bear administrative responsibilities related to the implementation and management of the Mid-day Meal Program. This includes coordinating with food suppliers, managing budgets and resources, maintaining records, and ensuring compliance with program guidelines and regulations.
7. **Community Participation and Support**: Successful implementation of the Mid-day Meal Program often requires collaboration and support from the local community, including parents, volunteers, and community leaders. Schools may engage community members in various aspects of the program, such as meal preparation, monitoring, and evaluation.

8. **Resource Allocation**: Schools must allocate resources effectively to support the Mid-day Meal Program while ensuring that other educational priorities are not neglected. This may involve balancing budgets, prioritizing spending, and seeking additional funding or support from government agencies, NGOs, or donors. Schools can work on the cost-effectiveness of the MDMP at ground level to improve the outcome.

In summary, the Mid-day Meal Program has significant implications for schools, impacting areas such as attendance, health, academic performance, infrastructure, administration, cost-effectiveness analysis and community engagement. Schools play a pivotal role in implementing the program and ensuring that students benefit from nutritious meals while receiving quality education in a supportive environment.

5.4.3 Implications for Parents

This study will raise awareness among parents about the outcome of MDMP. Parents are the partners of the school for the holistic development of students. The school should assess the performance of students not only in academics but also in the physical and behavioral impacts of taking mid-day meal. The Mid-day Meal Program has several implications for parents, influencing various aspects of their lives and roles in their children's education:

1. **Economic Relief**: For parents from low-income households, the provision of free meals through the Mid-day Meal Program can alleviate financial strain associated with providing daily meals for their children. This can free up resources that can be allocated to other essential needs, such as healthcare or education-related expenses.
2. **Increased School Attendance**: The availability of nutritious meals at school serves as an incentive for parents to send their children to school regularly. Knowing that their children will receive a free meal during the school day encourages parents to prioritize education and ensure consistent attendance, leading to better learning outcomes.

3. **Health and Nutrition**: Parents benefit from the program's focus on improving the nutritional status of their children. Access to nutritious meals at school contributes to better overall health and well-being for children, reducing the risk of malnutrition-related illnesses and promoting growth and development.
4. **Educational Support**: The Mid-day Meal Program reinforces parents' confidence in the educational system by providing tangible support for their children's education. Knowing that their children are receiving a nutritious meal at school can strengthen parents' trust in the school's ability to provide a conducive learning environment.
5. **Time Management**: For parents with busy schedules or multiple responsibilities, the Mid-day Meal Program can help alleviate the burden of preparing and packing meals for their children to take to school. This saves parents time and effort, allowing them to focus on other tasks or commitments.
6. **Community Engagement**: The program may foster a sense of community engagement among parents, as they may volunteer or participate in activities related to the program, such as meal planning, monitoring, or fund raising. This involvement can strengthen ties within the school community and promote a sense of shared responsibility for children's well-being.
7. **Empowerment and Advocacy**: Parents may feel empowered to advocate for their children's rights to access nutritious meals and quality education. The existence of the Mid-day Meal Program highlights the importance of government support for children's welfare and encourages parents to engage in advocacy efforts to ensure continued program funding and support.
8. **Social Equity**: The Mid-day Meal Program promotes social equity by ensuring that all children, regardless of their socio-economic background, have access to nutritious meals at school. This helps reduce disparities in educational opportunities and supports the principle of equal access to education for all children.

In summary, the Mid-day Meal Program has significant implications for parents, providing economic relief, promoting school attendance, supporting children's health and

nutrition, and fostering community engagement. After knowing the physical and academic performance of their ward, they can report the matter to local hospitals and school administration. Parents can ensure the regular attendance of students and counsel their children about eating habits. By supporting their children's education and well-being, parents play a crucial role in ensuring the success and effectiveness of the program.

5.4.4 Implications for Students

Students are the main focal point of this welfare scheme. This study reveals the satisfaction level of students and their academic and physical performance. Students can be counseled to wash their hands and have a full meal so that malnutrition can be eradicated. The Mid-day Meal Program carries several implications for students, impacting their health, education, and overall well-being:

1. **Nutritional Support**: The program ensures that students receive at least one nutritious meal during the school day, addressing hunger and malnutrition issues. This has significant implications for their physical health and development, reducing the risk of nutritional deficiencies and related health problems. A quality meal nourishes them to become competent and productive citizens.
2. **Improved Concentration and Learning**: Access to nutritious meals through the Mid-day Meal Program can enhance students' concentration levels and cognitive abilities. By eating healthy and nutritious meal, students' enthusiasm for the study increases. Proper nutrition is linked to improved academic performance, as students are better able to focus on their studies and engage in learning activities. MDMP removes classroom hunger and helps to improve concentration, learning abilities
3. **Increased School Attendance**: The provision of free meals serves as an incentive for students to attend school regularly, especially those from socio-economically disadvantaged backgrounds. They do not leave school early for the sake of food. By

reducing absenteeism, the program helps ensure that students have consistent access to education, leading to better learning outcomes.

4. **Socio-economic Equity**: The Mid-day Meal Program promotes socio-economic equity by ensuring that all students, regardless of their family's financial status, have access to nutritious meals. This helps level the playing field and reduces disparities in educational opportunities among students from different backgrounds.
5. **Health and Well-being**: Regular access to nutritious meals contributes to students' overall health and well-being, improving their immune function and reducing the risk of illnesses. This, in turn, can lead to fewer missed school days due to sickness and better overall academic performance.
6. **Long-term Development**: Adequate nutrition during childhood is essential for long-term physical and cognitive development. The Mid-day Meal Program lays the foundation for students' future well-being, potentially impacting their future educational attainment, earning potential and overall quality of life.
7. **Socialization and Community Engagement**: Meals provided through the program also serve as a platform for socialization and community engagement among students. Sharing meals together fosters a sense of camaraderie and belonging, contributing to a positive school environment. Students enjoy social harmony and become agents of positive social change.
8. **Empowerment and Dignity**: Access to nutritious meals at school empowers students and their families, alleviating the financial burden associated with providing meals. It also promotes dignity and respect for students, ensuring that they are not stigmatized or excluded based on their socio-economic status.

In essence, the Mid-day Meal Program has far-reaching implications for students, not only in terms of their immediate nutritional needs but also in shaping their educational opportunities, health outcomes, and overall development. By prioritizing the well-being of students through initiatives like this program, societies can invest in a healthier, more educated future generation.

5.4.5 Educational Implications of the Study

The findings of this study will immensely contribute to the existing stock of knowledge in the fields of welfare schemes and education. Besides, this study will provide empirical data analysis and fill the research gap in the international literature. This study is helpful to carry out research on other welfare schemes and can be extended to other states.

5.5 Policy Recommendations

The study presents the following recommendations for better implementation of the mid-day meal scheme:

5.5.1 Suggestions for Governments

1. The government should increase the budget for MDMP and release it timely to state governments. So that MDMP can be improved.
2. The government should supply good-quality food grains through FCI so that nutrition levels can be maintained. It will check the wastage of food grains.
3. To meet budget constraints, the government should focus on the cost-effectiveness of MDMP.
4. The cooking cost hike should be linked to the inflation rate. Every six months, it should be revised accordingly. The government should release funds timely and as per requirements.
5. There should be provisions for breakfast because a lunch on school days alone is not enough to mitigate the malnutrition of generations.
6. Headmasters, Mid-Day Meals in Charges, and cooks should be trained in various aspects of MDMP so that the outcome may be improved.
7. MDM menus should be changed by taking the advice of nutritionists, students' tastes, and seasons.
8. The menu for MDMP should be improved by the state. Ready-to-eat meals (fruits, fruit cake, juice, nutritious biscuits, etc.) should be provided in adverse weather and

other constraints. It should be given as a supplement to malnourished and low-BMI students. Seasonal fruits, green vegetables, and milk should be provided to improve the nutrition level of MDM.

9. Night chowkidars should be appointed to stop the theft cases related to MDMP items in schools.
10. State and local administrations should ensure the delivery of nutritious and healthy meals.
11. A drinkable water supply should be ensured.
12. The state should ensure effective monitoring of MDMP with IT support and fix accountability for improving the transparency and quality of MDMP. The government should send a third party to check the efficiency of the Mid-day Meal Program. Steering and monitoring committees should be set up at the district level for the smooth functioning of MDMP. Frequent visits by higher authorities will ensure improvement in the quality of MDM.
13. A campaign should be launched to spread awareness about MDMP. More people will know the scheme better, and they will ensure the quality of MDMP.
14. MDMP managers should be appointed for the implementation of MDMP.
15. The government should ensure the delivery of quality education and improve infrastructure facilities so that student enrolment can increase.
16. Medical health check-up should be carried out quarterly, and low-BMI students' cases should be monitored.
17. Cooks should be trained, and their salaries should be raised so that they feel motivated. They should be given insurance coverage, uniforms, and cashless medical facilities.
18. NGOs, self-help groups, eminent personalities, industrialists, local government representatives, and cooperative societies should be encouraged to improve and monitor MDMP.
19. Print and visual media should publish articles related to MDMP to raise awareness in society. Parents should be counselled about the importance of a nutritious diet

and the role of MDMP. Mid-Day Meal is only a supplementary diet, and parents should be encouraged to monitor the dietary intake of their children. Members of the PTA should visit the schools to monitor and contribute to MDMP.

5.5.2 Suggestions for Schools

1. The school should ensure proper seating arrangements for the Mid-day Meal.
2. Fire extinguishers should be placed to meet any type of fire breakout.
3. Samples of MDM should be kept until the next day to avoid any type of food poisoning.
4. Teachers should be deployed to check the hygiene conditions of the kitchen and surroundings, test the Mid-day Meal, and ensure that no student is left out of taking MDM.
5. Proper health cards should be maintained with the help of local hospitals, and the class in charge should be instructed to monitor the academic and physical development of each student in his class.
6. Mid-day meal in-charges should be provided training for cost-effective management and maintenance of proper records of documents.
7. Cooperation and feedback should be sought from school management committees.
8. Teachers and Cooks should be rewarded and recognized at annual functions for their good contribution to improving MDM.
9. The school should work on the cost-effectiveness of MDMP without compromising on nutrition.
10. Provision should be made for fearless feedback from parents and students. Schools should make an effort to work on this feedback.
11. Students' hand washing should be monitored, and they should be taught about taking MDM hygienically.
12. The kitchen garden should be maintained by eco-clubs in schools, and its vegetables should be used in MDM. A first-aid box should be placed in the kitchen.
13. The school should ensure timely preparation of MDM.

14. Medical fitness and the hygienic conditions of cooks should be ensured. Cooks should wear aprons and tie knots in their hair.
15. There is a strong correlation between health and academic achievement. So, physical exercise and sports activities should be carried out in schools.
16. Drinkable water should be provided to students, and if possible, water purifiers should be set up.

5.6 Limitations of the Study

1. The present study is restricted to government schools located in 12 districts of all the 06 divisions in Haryana state; therefore, the cultural, socio-economic, and geographical differences may be different for other states. Therefore, caution should be exercised when extrapolating these results to other populations or settings.
2. Due to constraints in resources and time, the sample size for this study was limited (Students-1020, Parents-162 Teachers-201), potentially impacting the representativeness of the findings.
3. While efforts were made to conduct rigorous statistical analyses, the complexity of the dataset may have precluded a more nuanced examination of certain relationships.
4. Future research could benefit from longitudinal studies with larger sample sizes to confirm and extend the findings of this study.

5.7 Conclusion

MDMP is one of the centrally sponsored welfare schemes implemented in all states of India. Government schools have become an asylum for students belonging to lower sections of society. This research was mainly focused on the effects of MDMP on students belonging to various socio-economic groups in Haryana. The findings clearly indicated that MDMP is a boon to students, especially those belonging to the LMC and LC of society. The study found that MDMS was able to improve the attendance and

retention of students in primary schools, but it could not improve the enrolment of students. Enrolment of students decreased, which may be due to the trend of English-medium private schools. The study found that the educational achievement of students increased after the implementation of MDMP, but it was again less beneficial for the lower sections of society comparatively. Analysis of the data further reveals that both girl and boy students' physical standards improved after the execution of MDMP, but girl students got more benefits from MDMP than boys.

Students were satisfied with the hygiene, and timing of MDMP, but they were not satisfied with the menu or its quality. Students want to get a change in the menu, and interestingly, they want to get food articles like fruits, ghee, Halwa, Puri, Kheer, Rasgulla, Maggi, etc. All the students were in favour of continuing MDMP. In the same way, teachers of primary and upper primary wings were not satisfied with the quality and nutrition level of students. Both categories of teachers agreed that the attendance and retention rate of students increased after the implementation of MDMP. The majority of teachers wanted MDMP to be continued. In the same way, parents were satisfied that their wards were getting MDM regularly, food was prepared hygienically, and their wards had not faced any health problems after taking MDM. Parents were also satisfied that their wards did not face any caste discrimination while taking MDM; it ensured that our societies were accepting change. Students have not observed any improvement in their health standards. Parents wanted that MDMP be continued.

The cost-effectiveness showed that by spending one extra rupee, the Hisar division can increase BMI by 1.38 points and the Rohtak division by 1.32 points. By spending one extra rupee, the Ambala division can increase academic achievement by 1.54 marks and the Hisar division by 1.51 points. The Hisar division has the highest cost-effectiveness (1.46 marks), and the Faridabad division has the lowest cost-effectiveness (1.25 marks) in Haryana. The cost-effectiveness diagram showed that by spending one extra rupee, the Hisar division can increase academic achievement by 1.46 marks and the Ambala division by 1.45 marks by spending one rupee extra on the mid-day meal.

In the nutshell, India is a country of diversity, so it requires ‘Inclusive Development’ for the upliftment of downtrodden people. Second, delivery of any government scheme depends upon design execution, structures for delivery mechanisms, and monitoring and evaluation. A scheme like Mid-day Meal or PM Poshan can be one of the remedial actions to improve the academic and physical standards of students who belong to poor families in the state. The present design of MDMP is unable to reduce the menace of malnutrition and academic backwardness among students studying in classes I to VIII, as this scheme has many flaws. The partial reforms like rebranding, opening ‘Balvatikas’, social audit, setting up kitchen gardens, and ‘Tithi Bhojans’ are not capable of dealing with this century’s old, deep-rooted malnutrition. Providing one lunch during school time can’t provide sufficient nutrition to students.

The governments should take the problem of malnutrition seriously and should initiate urgent steps to curb the problem of malnutrition among students. Even the National Education Policy 2020 recommended that the government should make provision for breakfast to eradicate class- room hunger’ and enhance the nutrition level of our new citizens. Second, MDMP should be extended up to the senior secondary level, as a nutritious diet is mandatory at teenage for good health and a healthy mind. Most importantly, poverty is the mother of all ills, so the government should ensure that people come out of absolute poverty and become capable of providing their ward with a nutritious diet. Effective service delivery and utilization of government schemes rely on realistic planning with focused objectives to make execution practically possible at ground level, a strong implementation and monitoring system with the help of active community participation and using the public-private partnership model, and a reliable platform to take prompt action on grievances related to the scheme can improve the mid-day meal scheme.

So, the government should become liberal and open its coffers to eradicating the blot of malnutrition among the little champions. It should be kept in mind that nothing is more important than the investment in the health and education of its students.

5.8 Scope of Future Research

Future research can be carried out to cover the following research areas:

* The scope of this study can be further expanded for other welfare schemes in Haryana.

* A much larger study could be conducted by including all districts of Haryana.

* It can also widen the sample size of beneficiaries and stakeholders to get a more representative picture of the state.

* A comparative study of the health aspects of students from various states may be done for an inter-state comparison of the impact of the scheme.

* A detailed study may be conducted to explore the execution and related problems of the scheme.

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Appendices No-01

Observation Schedule of Schools

Name of School: Type of School: Date:

Block: District:

Name of Elementary Head: No of Teachers:

No. of student enrolled: No. of student present:

Sr No	Parameters	Observation	
		Yes	No
1.	Store Room available		
2.	Separate kitchen shade available		
3.	Safe food storage facility available		
4.	Adequate utensils (cooking and serving) available		
5.	Display of cyclic Menu available		
6.	General Hygiene of cook house maintained		
7.	General hygiene of Cook cum Helper conducted		
8.	Provision of washing hands available		
9.	Provision of proper disposal of waste material available		
10.	Safe drinking water available		
11.	Separate serving area is available		
12	LPG gas connection is available		
13	Meal is prepared by using LPG		
14	Presence of MDM Incharge while serving the meal		
15	Gunny bags of ration are kept on platform		

16	Spices are kept in air tight containers		
17	Grains are cleaned before use		
18	Vegetables are cleaned before use.		
19	Waste is disposed of in dustbin		
20	Different set of clothe is used by cooking staff in kitchen		
21	Kitchen is well lit and ventilated		
22	Cook cum helper trimmed their nails		
23	Cook cum helper worn tidy clothes		
24	Utensils are washed before use		
25	Plates are provided to the students		
26	Plates are washed before use.		
27	Kitchen floor is washed on working days.		
28	MDM is served at stipulated time.		
29	Same food is served to all students		
30	Students take meal with the help of spoon.		
31	Proper arrangement for dinning is available		
32	Student leave the meal uneaten		
33	MDM record is maintained daily.		
34	MDM committee is set up		
35	Previous day food sample is kept for food poisoning test		
36	Appearance of meal is good.		

Appendices No-02

Semi- Structured Interview of Mid-Day Meal in charges

Name and Code of School: Type of School: Primary/ Middle

Block: District: Date:

Sr No	Questions	Response	Remarks
1.	What are the objectives of MDMP?	1. Protecting students from class room hunger. 2. Increasing enrolment and attendance. 3. Decreasing the dropout rate. 4. Improving socialization among all the castes. 5. Addressing the issue of malnutrition. 6. Social empowerment of poor pupil.	
2.	Has MDM fulfilled its objectives?	Yes/ No	
3.	Are you facing any difficulty in procurement of cooked meal.	Yes/ No	
4.	Who maintains the MDM records?	1. MDM in charge 2.Cook 3.Clerk 4. Principal	
5.	In case of shortfall of meal, what is done?	1. Meal is served only to few students. 2. Quantity of meal served, is reduced. 3. Meal is served only until the stock	

		lasts. 4. New stock is bought or borrowed 5. People donate meal.	
6.	Is MDM inspected by the authorities?	Yes? No	
7.	Which menu students like most?		
8.	Mention the problems that you face in MDMP	1. Inadequate infrastructure. 2. Poor finance allocation. 3. Shortage of supplied meal. 4. Non-co-operation from the teachers. 5. Meal is not supplied timely.	
9.	Some positive aspects of MDM that you have experienced.	1. Students come in school regularly. 2. Promotes social integration. 3. Higher retention rates and decreased dropout rates. 4. Students getting at least one good meal in a day. 5. Academic achievement of students increased.	
10	Please give suggestion to improve MDM:		

Appendices No-03

Semi- Structured Interview of Head Teacher/ Principal

(a) Implementation of the scheme

(b) Organizational aspects of MDM

(c) Procurement of food meal

(d) Liaison with Meal supplier agency.

(e) Monitoring aspects of MDM

(h) Management problems related with MDM

(i) Suggestions and opinions about various aspects of MDM

(j) Problems faced

(k) Visits to schools

(l) Suggestions to run the MDM smoothly

(m) Menu

(n) Preparation of food with respect to cooking devices, kitchen garden in school, cooking time, distribution of food in schools, etc.

Appendices No-04

Semi- Structured Interview of Cook cum Helper

(a) Difficulties faced during cooking.

(b) Satisfaction of job

(c) Honorium and other perks

(d) Quality of MDM preparation

(e) Suggestions for improving MDMP.

Appendices-V

Profile of Students

(Parikh SES)

1 Name of School:_____Block:_____District: _____ .
4 Name of Student:_____Father's Name: _____ Class: ___

7. Age:_____ 8. Gender: Boy/ Girl 9.Caste: _____

10. Type of family: Single/ Joint 11 No. of members in family: _____

12. Father's educational qualification: (a) Illiterate (b) cannot read (c) can read & write (d) Primary (e) Middle (f) Matriculate (g) Graduation and more

13. Father's profession: (a) Nothing (b) Labour (c) Family business (d) trade

(e) Self employment (f) Agriculture (g) Service

14. Family's land holding: (a) No land (b) < 1 Acre (c) 1 to 5 Acre.

d) 5 to 10 Acre e) 15 to 20 Acre f) More than 20 Acre

15. Family's social participation: (a) Nothing (b) Member of one organization

(c) Member of more than one organization (d) Official of one organization

(e) Leader/ Punch/ Sarpunch

16. No. of members in the family: (a) Up to 5 (b) More than 5

17. Status of House: (a) No House (b) Katcha House (c) Mixed House (d) Pakka House (e) Haveli

18. No. of Animals: (a) No Animal (b) 1 to 2 Animal (c) 3 to 4 Animals (d) 5 to 6 Animals

19. Domestic property: (a) Bullock Cart (b) Cycle (c) Radio (d) Chairs

(e) Tractor (f) Nothing

20. Annual Family Income:

21. Profession of Mother:

22. Income of other family members:

Appendices-VI

Students Satisfaction Questionnaire

Name of School:_____Block:_____District:_____

Name of Student :_____(Class):_____(Date) _____

Dear Students,

This questionnaire is related to Mid Day Meal. You are requested to read these questions and (√) mark your answers in the box. I assure you that your answers will be kept confidential. These answers will be used only for research work.

Thank you.

Yours sincerely,

Ram Gopal

Sl No	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	You come to school daily.					
2	You come to school after taking meal.					
3	I like to come to school regularly because I get tasty meal here.					
4	You get change in meal daily.					
5	You take Mid-Day Meal daily.					
6	You like menu table daily.					
7	Mid-Day Meal cooked hygienically.					
8	Flavour of MDM is good.					
9	MDM is garnished.					
10	You demand more meal.					
11	All the students get meal in equal					

	quantity and as per their desire.					
12	You eat all served meal.					
13	You get full meal.					
14	You get satisfaction after taking MDM.					
15	You get positive impact of MDM on your study.					
16	MDM intevenes in my study.					
17	You have faced problems related to health after taking MDM.					
18	You got positive impact of MDM on your body.					
19	While preparing menu of MDM, students' interest should be acknowledged.					
20	Fruits should be included in MDM.					
21	The students of other castes do discrimination with you during meal					
22	Green vegetables are used in MDM.					
23	MDM should be continue.					
24	Which recipe you like most:					
25	Which recipe you like least:					

26	To make MDM better, give your suggestions:

Appendices-VII

Achievement Test

(For Middle Schools)

All questions are compulsory.

Science

Fill in the blanks with the given words.

Milk, sugarcane, plants, vitamin B, rickets, non- vegetarian

Q.1 We get sugar from_____.

Q.2 Parrot eats_____only.

Q.3 Deficiency of vitamin D causes_____.

Q.4 Beriberi is caused by the deficiency of _____.

Q. 5. How many poles a magnet has?

(a) 1 (b) 2 (c) 3 (d) 4.

Q. 6 Protein food is generally called_____.

(a) Weight booster (b) Age enhancer (c) Energy booster (d) Knowledge booster

Q. 7. Fill in the blank.

A device that is used to break the electric circuit is called?

(a) Switch (b) Insulator (c) Conductor (d) None

Q. 8. In which form food is processed in photosynthesis process?

(a) Starch (b) Protein (c) Fat (d) Vitamin

Q.9. How many chambers are there in human heart?

(a) 1 (b) 2 (c) 3 (d) 4

Q. 10. Fill in the blank.

A power cell has _____terminals.

(a) 1 (b) 2 (c) 3 (d) 4

Mathematics

Q. 1 Write in Roman: 69

(a) LXIX (b) LXXI (c) XLXI (d) ILXX

Q. 2 One runner makes a round of rectangular which has 50 meter length and 30 meter breadth. Find out the distance travelled by him?

(a) 160 meter (b) 140 meter (c) 150meter (d) 180 meter

Q.3 Write following numbers in increasing order.

500, 750, 840, 771, 521

Q. 4 Add $2\frac{4}{5}$ & $3\frac{5}{6}$

(a) $6\frac{11}{30}$ (b) $6\frac{19}{30}$ (c) $6\frac{13}{30}$ (d) $6\frac{17}{30}$

Q. 5 One lac is = _____thousands.

(a) 10 (b) 100 (c) 1000 (d) 10000

Q. 6 One crore is = _____ 10 lac.

(a) 1 (b) 10 (c) 100 (d) 1000

Q. 7 1 Meter is = _____ millimeter.

(a) 1 (b) 10 (c) 100 (d) 1000

Q. 8 Find out 8 x 179 x 12

(a) 17200 (b) 17184 (c) 17194 (d) 17864

Q. 9. One dozen pen cost Rs. 180 and 8 ball pen cost Rs 56. Find out the ratio of cost between pen and ball pen.

(a) 15 : 7 (b) 15 : 8 (c) 15 : 11 (d) 15 : 4

Q. 10. Find out the factors of 68

(a) 1, 2, 4, 17 (b) 1, 2. 4, 16 (c) 1, 2, 5, 17 (d) 1, 2, 3, 16

Subject: English

Q. 1. Write plural of word: Fish

a) Fisher b) Fishs c) Fishes d) Fished

Q. 2. Write superlative (3rd) degree of word: Long

a) Longer b) Longerer c) Longing d) Longest

Q. 3. What is birth place of Kalpna Chawla?

a) Kurukshetra b) Karnal c) Kaithal d) Ambala

Q. 4. Write plural of following word: Flower

a) Flowers b) Flowered c) Flowerish d) Flower

Q. 5 Write superlative (3rd) degree of word: Cold

a) Colder b) Colded c) Coldest d) Coldiest

Q. 6 He has _____(help) me a lot.

a) helper b) helped c) help d) helping

Q7 Find out the correct spelling: a) DERWONFUL b) FULWONDER

c) WONFULDER d) WONDERFUL

Q. 8. Write plural of following word: Thief

a) Thiefs b) Thieves c) Thieft d)Thefts

Q.9 Complete following phrase with a suitable word:

A_____of ships.

a) pack b) flock c) fleet d) bundle

Q. 10 Write plural of following word: Thief

a): Theifs b) Thieves c) Thifes d) Many Thief

Appendices-VIII

Achievement Test: EVS

(For Primary Schools)

Total Marks: 30 Time: 30 Minutes

All questions are compulsory

Q. 1. Inventor of Braille script is_____.

a) Heilen-Keiler b) Willium Braille c) John Braille d) Loius Braille

Q. 2. Soyabin seeds belongs to which country?

a) India b) China c) Europe d) Austraila

Q. 3. In the following which bird cannot fly?

a) Peacock b) Black Francolin c) Ostrich d) Vulture

Q. 4 Which is the state bird of Haryana?

a) Black Francolin b) Peacock c) Parrot d) Cuckoo

Q. 5 Why International Forest Day is celebrated?

a) For cutting the forest b) For the entertainment of the people

c) For increasing brotherhood d) To bring awareness about forest protection

Q. 6. Which tree was saved by Chipko Movement?

a) Khejri b) Babool c) Neem d) Pipal

Q. 7. In which district Nahar wildlife sanctuary is situated?

a) Jhajjar b) Kaithal c) Rewari d) Mahendergarh

Q. 8. Which vitamin is essential for the normal vision of eyes?

a) Vitamin A b) Vitamin B c) Vitamin C d) Vitamin E

Q. 9 Which creature in the following is a reptile?

a) Hippopotamus b) lizard c) Tortoise d) Snake

Q. 10. Where heaviest rain fall takes place in the world?

a) Nagaland b) Assam c) Goa d) Meghalaya

Mathematics

Q. 1. 5045 gram is =

(a) 50 kg, 45gms (b) 5 kg 45gms (c) 5 kg 45g (d) 50 kg, 45g

Q. 2 How to write 3 hrs and 5 minutes of afternoon time?

a) 5:30 A.M. b) 5:30 P.M. c) 3:50 A.M. d) 3:05 P.M.

Q. 3 . Wages of one labour for one day is ₹450 then the wages of 12 days will be?

) 4400 b) 5000 c) 5400 d) 6000

Q. 4. When we divide 76076 by 13 then what will be the quotient?

a) 5652 b) 5852 c) 5762 d) 5662

Q. 5. Addition of 7.7 + 7.77 + 7.777+ 7.7777=

a) 28.2828 b) 28.2847 c) 30.0247 d) 31.0247

Q.6. What will be the product of first two indivisible numbers?

) 2 b) 6 c) 10 d) 12

Q. 7. What will be the product of 4 X 10000

a) 4000 b) 40000 c) 400000 d) 4000000

Q. 8. If I want to buy 6 dozen and 4 extra bananas then how many banana shopkeeper will give to me?

a) 77 b) 76 c) 84 d) 67

Q. 9. Write 37504 to nearest hundred numbers.

a) 37500 b) 40000 c) 37000 d) 45000

Q. 10. How to write five lakh nine thousand four hundred and eight in numbers?

a) 509408 b) 509048 c) 5094008 d) 50940800

English

Q.1. What is the young one of Dog?

a) Calf b) Kitten c) Puppy d) Cub

Q.2. Which is our national animal?

a) Lion b) Tiger c) Cow d) Cat

Q.3. I have_____bicycle.

a) A b) An c) The d) None of these

Q.4. Lotus is very beautiful _____.

a) Leaf b) Fruit c) Flower d) Vegetable

Q.5. Make meaningful word from the jumbled letters' Ynoug'.

a) gnoug b) nougy c) young d) ougny

Q.6. Pick out 'Adverb' in the following sentence

'He always reaches school on time'

a) Always b) Reaches c) School d) Time

Q.7. Make a meaningful word from the letters- h, t, w, e, a?

a) Watch b) Thewa c) Wheat d) Teawh

Q.8. Use correct preposition in the following sentence.

'The teacher is writing ----------the black board.'

a) in b) on c) under d) near

Q.9. Which is rhyming word of 'grows'?

a) Cow b) Mow c) Knows d) Green

Q.10. Use correct form of the verb.

The Sun _____(rise) in the East.

a) rise b) rose c) rising d) rises

Appendices-IX

Parents Satisfaction Questionnaire

Name of School:_____Block:_____District:_____

Name of Parents:_____ Class_____Date:_____

Dear Parents,

This questionnaire is related to Mid Day Meal. You are requested to read these questions and tick (√) mark your answer in the box. I assure you that your answers will be kept confidential. These answers will be used only for research work.

Yours sincerely,

Ram Gopal

Sl No	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Your child likes MDM thats why they go to school regularly.					
2	Children go to school after taking meal.					
3	Children go to school with meal.					
4	Children bring meal from school.					
5	Your children get MDM regularly.					
6	Hygienic conditions are specially observed in MDM.					
7	You have observed improvement in the health of your child after					

	implementation of MDM.					
8	Your children have faced health related problems after taking the MDM.					
9	You have observed improvement in the study of your child after implementation of MDM.					
10	You go to school for observing MDM arrangements.					
11	Your children have faced caste discrimination while taking the MDM.					
12	There should be change in the menu of MDM.					
13	Parents should contribute to bring improvement in the arrangments of MDM.					
14	You want that MDM should be continue.					
15	DMP					

Appendices-X

Teachers' Satisfaction Questionnaire

Name of School_____Block_____District:_____

Name of Teacher:_____Post:_____Date:_____

Dear Teachers,

This questionnaire is related to Mid Day Meal. You are requested to read these questions and (√) mark your answer in the box. I assure you that your answers will be kept confidential. These answers will be used only for research work.

Yours sincerely,

Ram Gopal

Sl No	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	MDM is prepared as per the menu table.					
2	MDM is prepared timely.					
3	Hygenic conditions are observed in kitchen.					
4	MDM is tasted for its taste.					
5	Nutritious meal is given to students in MDM.					
6	You are satisfied with the quality of MDM.					
7	MDM sample is kept for test.					
8	Teachers' point of view should be considered while preparing MDM menu.					
9	Students' interest in study have increased after implementing the					

	MDMP.					
10	Students' concentration increased after implementing MDMP.					
11	Your teaching time decreased after implementing the MDMP.					
12	Admissions have increased after implementing the MDMP.					
13	Students' attendances have increased after implementing MDMP.					
14	Students' drop out rate reduced after implementing the MDMP.					
15	MDMP is not beneficial for social cohesiveness.					
16	Parents contribution should be taken for improving the MDMP.					
17	MDM Menu should be changed.					
18	MDM should be continue.					
19	What suggestions you will give to improve MDMP?					

Appendices-XIV

Schedule: Drop out Students

Name of student: _____ Father's Name: _____

Class: _____ Year of drop out: _____

Gender: _____ Age: _____

Name of school: _____District: _____

Q 1. What were the reasons for drop out?

_____

_____

Q. 2 Does the teacher came to re-admission of your ward?

_____

_____

Q. 3 Was the school administration being responsible for the drop out?

_____

Q. 4 Was the student interested in the schooling?

Q.5 Did the security of your ward concern you?

_____

Q. 6 Did the distance of school mattered?

Q. 7 Did your ward like Mid-day Meal in school?

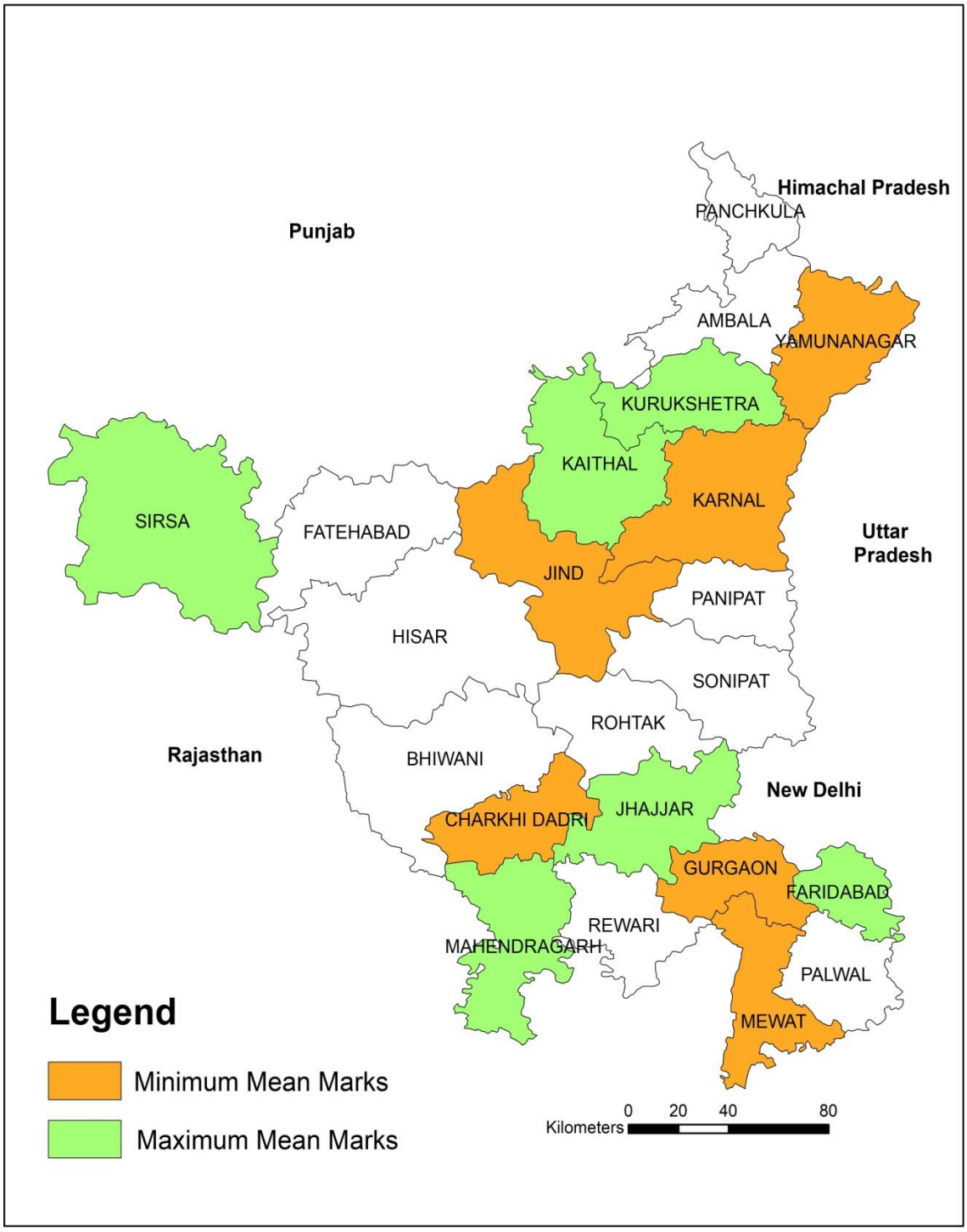
Q. 8 What was your opinion about Mid-day Meal?

_____

Q. 9 What your ward is doing now?

Appendices-XV

Haryana's Map Depicting Districts, Selected for Sample Collection



List of Publications

S No	Title of the paper with author Name	Name of Journal	Published Date	Issue No/ Vol no, Issue no	Indexed in Scopus/ UGC Care list
1	Lacunae of Mid-Day Meal Scheme in Haryana Ram Gopal & Dr Rajender Singh	Shodhsamhita	15 Oct 2022	ISSN 2277-7067 Vol IX Issue II (IV)	UGC CARE Group-I Journal
2	Status of Mid-Day Meal Scheme in India Ram Gopal & Dr Rajender Singh	Mathematical Statistician and Engineering Applications	22 Oct 2022	ISSN 2094-0343 Vol: 32 Issue: 03	Scopus

List of Conferences

S No	Title of the paper with author Name	Name of Conference	Date of Conference	Organized by
1	Cost Effectiveness of Mid-Day Meal Scheme in Haryana (India) Ram Gopal & Dr Rajender Singh	International Conference on Global Issue in Multidisciplinary Academic Research	31 Oct 2021	IARA & Rajabhat Maha Sarakham University, Thailand
2	Covid-19 and Mid-Day Meal in Haryana Ram Gopal & Dr Rajender Singh	Indian Economy during Pandemic: New Challenges and Opportunities	28-29 April 2022	Chaudhary Ranbir Singh University, Jind (Haryana)

List of Workshops

S No	Title of the Workshop	Date of workshop	Organized by
1	Econometrics-Time Series & Panel Data Analysis	10-16 Jun 2019	Mittal School of Business & HRDC LPU, Punjab
2	Refresher Course on Research Methodology and Data analysis	24-05 to 12-06-2021	HRDC, LPU, Punjab
3	Complete Guide for Review Paper Publications	20-06-2021	Research Graduate Institute, New Delhi
3	Basic Statistical Data Analysis using SPSS	10-13-01 2022	Meerashpa Learning Solutions, Channai
4	Industry 5.0: Human Touch, Innovation and Efficiency	28-01-2022	Mittal School of Business, LPU, Punjab
5	The Complete Roadmap for Thesis Writing	12-02-2022	Research Graduate Institute, New Delhi