



Combating malnutrition in the community: A study of age-group disparities

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Abstract:

Malnutrition is a condition which is caused by the deficiency of nutrients and vitamins which may be caused due to improper consumption of a proper diet or maybe caused due to impaired absorption of nutrients and minerals in the body of the individual. This article presents a better understanding of the causes, risk factors, and conditions of diseases that might be linked with malnutrition and may play an important role of the or act as an aggravating factor in the spreading of the prevalence of malnutrition. It takes into account the demographic details and other variables in sample population such as age, dietary factors, access to healthcare etc. thus providing a detailed insight into the prevalence of malnutrition and how it is affected by these variables and factors such as socio-economic factors which affect the quality and standards of living conditions which in turn act as a deciding factor in the occurrence and tendency of malnutrition. The data collected from the sample is analyzed, studied and is used to draw a comparative inference between the different categories of the population like prevalence of malnutrition between different age groups, in between male and female groups, and also among the various disparities like Malnutrition, Overweight, obesity and healthy nature.

Key words: Malnutrition, prevalence, population factors, variables, BMI, diseased conditions.

INTRODUCTION:

Malnutrition is a major public health issue affecting millions of people worldwide, particularly in low- and middle-income countries. Malnutrition can take different forms, including undernutrition (e.g., stunting, wasting, and deficiencies of micronutrients), overweight, and obesity. The consequences of malnutrition can be far-reaching, affecting both physical and cognitive development, and increasing the risk of chronic diseases and premature death.

In sub-Saharan Africa and South Asia, undernutrition is prevalent among young children, and it is estimated that about 149 million children under five years of age are stunted globally. Wasting is also a significant concern, with an estimated 50 million children affected. Micronutrient deficiencies, such as iron, Vitamin A, and zinc, also pose a threat to child health and development[1].

In many high-income countries, the increasing burden of obesity and diet-related non-communicable diseases, such as cardiovascular disease, diabetes, and some cancers, are major public health challenges. In these countries, the prevalence of obesity is high, and it is estimated that over 1.9 billion adults are overweight or obese worldwide. So, malnutrition is a complex and multifaceted issue that affects people of all ages around the world, and it requires a comprehensive and coordinated response. The specific challenges and responses to malnutrition vary by country, but the need for action is universal[2].

In India, it is also affecting millions of people, particularly women and children. India has one of the highest burdens of malnutrition in the world, with high rates of stunting, wasting, and underweight among children, and high rates of anemia and obesity among women. According to the National Family Health Survey (NFHS-4), about 38% of children under five years of age in India are stunted, 21% are wasted, and 35% are underweight. Additionally, more than half of women of reproductive age are anemic, and over a quarter of the adult population is obese[3].

These high rates of malnutrition have a negative impact on the health and development of individuals, as well as on the economic and social development of the country as a whole. Malnutrition increases the risk of infectious diseases and chronic diseases, and it also impairs cognitive development and reduces educational and economic productivity. The government of India has implemented various programs and policies aimed at reducing malnutrition, including the Integrated Child Development Services (ICDS) program and the National Health Mission (NHM). These programs aim to improve maternal and child health and nutrition, but their implementation has been limited in many areas, and the impact has been mixed[4].

Malnutrition continues to be a major public health challenge in India, requiring sustained and comprehensive efforts from the government, health systems, communities, and other stakeholders to tackle its root causes and improve the health and nutrition of all citizens. Malnutrition remains a persistent public health issue in India, affecting millions of people across the country, but with regional disparities. Here is a table comparing the situation in North India and South India in table 1

Table 1. Comparison of the situations of malnutrition

Parameter	North India	South India
Stunting	High	Lower than North India
Wasting	High	Lower than North India
Underweight	High	Lower than North India
Anemia	High	High
Obesity	High	Increasing

It should be noted that the situation is complex and varies greatly within each region and state, and these are general trends based on available data. In both regions, there is a need for sustained and comprehensive efforts to improve maternal and child health and nutrition, address underlying socio-

economic and cultural factors, and increase access to health services and nutrition-specific interventions [5].

The purpose of the study is to understand the patterns, causes, and consequences of malnutrition in a specified community and examine disparities across different age groups. This study aims to achieve several specific objectives. Firstly, it seeks to assess the prevalence and forms of malnutrition, such as stunting, wasting, underweight, anemia, and obesity, among various age groups within the community. Secondly, it aims to examine the contributing factors to malnutrition, including dietary habits, access to health services and nutrition-specific interventions, as well as socioeconomic and cultural factors. Additionally, the study aims to explore the health and social consequences of malnutrition across different age groups, including its impact on physical and cognitive development, school performance, and economic productivity. Furthermore, it aims to identify disparities in malnutrition and its underlying causes across various age groups within the community. Ultimately, the study intends to generate evidence and recommendations for the development and implementation of community-based interventions that can enhance maternal and child health, improve nutrition, and reduce malnutrition disparities across different age groups. [6].

Prevalence and form of malnutrition:

To determine the prevalence and forms of malnutrition across different age groups in the community, various assessment methods can be employed. Anthropometric assessments involve measuring height, weight, and mid-upper arm circumference to evaluate stunting, wasting, and underweight respectively. Biochemical assessments involve measuring blood hemoglobin levels to assess anemia and calculating body mass index (BMI) to identify overweight and obesity. Dietary assessments can be conducted through dietary recalls, food frequency questionnaires, and food security assessments to understand dietary habits and nutrient intake. Clinical assessments involve examining morbidities and identifying micronutrient deficiencies associated with malnutrition, such as iron-deficiency anemia, vitamin A deficiency, and iodine deficiency disorders. By utilizing these diverse assessment methods, a comprehensive understanding of the prevalence and types of malnutrition among different age groups within the community can be obtained. [7].

Factors contributing to malnutrition in the community: To explore the factors contributing to malnutrition in the community and understand their variations across different age groups, various assessment methods can be utilized. Socio-demographic assessments involve gathering information on education, income, household structure, and occupation to examine their relationship with malnutrition among different age groups. Environmental assessments focus on evaluating access to safe drinking water, sanitation, and hygiene practices and their impact on malnutrition among different age groups. Assessing the utilization of health services and nutrition-specific interventions, such as prenatal care, vaccination, and complementary feeding, can be done through health services assessments. Dietary assessments, including dietary recalls, food frequency questionnaires, and food security assessments, can shed light on dietary habits and nutrient intake in relation to malnutrition across different age groups. Additionally, cultural and behavioral assessments involve understanding

cultural beliefs and practices, such as child feeding practices, and their influence on malnutrition among different age groups. By analyzing the results of these assessments, key factors contributing to malnutrition among different age groups can be identified, enabling the design of targeted interventions to address specific needs and challenges. Ultimately, these efforts aim to reduce disparities in malnutrition across different age groups within the community. [8].

Health and social consequences of malnutrition:

The health and social consequences of malnutrition among different age groups in the community can be explored through various methods, such as:

- **Clinical assessments:** This includes measurement of morbidities and micronutrient deficiencies associated with malnutrition, such as iron-deficiency anemia, vitamin A deficiency, and iodine deficiency disorders, and how they relate to malnutrition among different age groups.
- **Cognitive and educational assessments:** This includes measurement of cognitive development and educational outcomes, such as school attendance and academic performance, and how they relate to malnutrition among different age groups.
- **Economic assessments:** This includes measurement of economic productivity and household income, and how they relate to malnutrition among different age groups.
- **Social assessments:** This includes measurement of social and emotional well-being, such as social participation, resilience, and mental health, and how they relate to malnutrition among different age groups.

The results can be analyzed to identify the specific health and social consequences of malnutrition among different age groups, also in different genders and how they vary across different age groups. This information can inform the design of effective interventions to address the specific needs and challenges of different age groups and reduce disparities in malnutrition across different population groups. Additionally, the information can also highlight the long-term consequences of malnutrition and the importance of early and effective interventions to prevent malnutrition and its consequences [9].

The following approaches can be used to understand how disparities in malnutrition and its underlying causes vary across different community:

- ✓ **Demographic and socioeconomic analysis:** This includes assessment of demographic and socioeconomic factors, such as household income, education level, occupation, and living conditions, and how they relate to malnutrition and its underlying causes among different age groups.
- ✓ **Nutritional assessments:** This includes measurement of dietary intake and nutrient status, such as dietary diversity, energy and protein intake, and micronutrient deficiencies, and how they relate to malnutrition among different age groups.

- ✓ **Anthropometric measurements:** This includes measurement of body composition and size, such as height, weight, body mass index (BMI), and waist circumference, and how they relate to malnutrition among different age groups.
- ✓ **Health behavior assessments:** This includes measurement of health behaviors, such as physical activity, hygiene practices, and smoking, and how they relate to malnutrition among different age groups.

This information can inform the design of interventions that are tailored to the specific needs and challenges and reduce disparities in malnutrition. Additionally, this information can also highlight the need for multi-sectoral approaches to address the underlying causes of malnutrition and reduce disparities in malnutrition [10].

It is well documented that the prevalence of malnutrition is higher among children and women compared to other age groups in India. This is due to a combination of biological and socio-economic factors. Children, especially those under five years of age, are at a higher risk of malnutrition as they have greater nutritional requirements for growth and development. Women, especially pregnant and lactating women, also have increased nutritional needs, and often face gender-based barriers that limit their access to adequate nutrition [11].

The burden of malnutrition in India varies across different states and regions, influenced by factors such as poverty, food security, access to healthcare, and cultural practices. For example, states with higher levels of poverty and food insecurity tend to have higher levels of malnutrition compared to states with higher levels of economic development and access to healthcare services. In addition, cultural practices such as early marriage, limited education and decision-making power for women, and low priority given to nutrition, can also contribute to higher levels of malnutrition in certain states. Overall, addressing malnutrition in India requires a multi-faceted approach that addresses both the biological and socio-economic determinants of malnutrition, and is tailored to the unique challenges and needs of each state and region [12].

The root causes of malnutrition in the community are Socio-economic factors such as poverty, lack of education, and lack of access to clean water and sanitation contribute to malnutrition in all age groups of population. Cultural beliefs and practices, such as feeding infants with traditional teas instead of breast milk, also play a role in malnutrition among infants and young children. Access to health services and nutrition-specific interventions, such as prenatal care and proper nutrition education, is also a factor in preventing malnutrition in pregnant women and newborns. Additionally, dietary habits, such as a lack of diversity in the diet, not eating enough nutritious foods, or not having enough food to meet daily energy needs, can lead to malnutrition in all age groups. By understanding these underlying causes, interventions can be tailored to address the specific needs of different age groups and reduce the prevalence of malnutrition in the community. Malnutrition can lead to various health and social consequences, including physical and cognitive developmental delays, decreased school performance, and reduced economic productivity. These impacts can be seen across different age

groups in the community and can have long-term consequences on the individual and the community as a whole.

Disparities in malnutrition and its causes can vary across different age groups. Factors such as socio-economic status, access to health services and nutrition-specific interventions, and dietary habits can contribute to disparities in malnutrition. These disparities can have a significant impact on the health and wellbeing of individuals and the community as a whole, and thus, it is important to understand and address these disparities [13-14].

The significance and contribution of the study is indicated by the following points:

1. Highlighting the problem of malnutrition among different age groups in the community, especially among children and women.
2. Providing a comprehensive understanding of the factors contributing to malnutrition across different age groups.
3. Identifying disparities in malnutrition and its underlying causes among different population groups in the community.
4. Contributing to the development of targeted and age-specific interventions to combat malnutrition in the community.
5. Improving the design and implementation of nutrition-specific and -sensitive programs and policies to address malnutrition in the community [15-19].

METHODOLOGY

A research study was initiated at various parts of Kakinada district located at Andhra Pradesh, India. In this study the population selection was done based upon the communities selected as a whole and not on the basis of any specific individual characteristic features. The population groups were selected on a random basis for conducting the study and then the collected data was segregated on the basis of age in an ascending order and the other factors were listed out along with the initial grouping of the population. The obtained data was now studied for the prevalence on the basis of the other factors such as gender, BMI, diseased conditions and the medications being consumed by the individuals in the selected population groups under study.

Study design and population selection for the study is as follows:

- Assessing the weight and their risk towards health so as to understand the health risk of being obese or malnourished
- To understand the role of physical health and diet towards gender based (male or female)
- Measuring BMI can help to determine any health risk the person may face if it is outside of the healthy range.
- Helps in measuring the rate of malnutrition in population.
- The BMI of significant population is calculated, to helps researchers gather data that can be used to examine the obesity epidemic.
- It helps researchers determine the pattern of diet that results in obesity in a large group of people.

The study design also aims at answering the following -

- The prevalence and form of malnutrition (e.g., stunting, wasting, underweight, anemia, obesity)
- The factors contributing to malnutrition
- The health and social consequences of malnutrition
- Disparities in malnutrition and its underlying causes

Data collection methods and instruments

Data collection methods could include a combination of qualitative and quantitative methods such as:

Surveys: Structured questionnaires and/or interviews to gather information on socio-economic and demographic characteristics, dietary habits, health status, access to health services and nutrition-specific interventions, and more.

Anthropometric assessments: Measurement of height, weight, mid-upper arm circumference, and other indicators of nutritional status to determine the prevalence and form of malnutrition among different age groups.

Focus group discussions: To gain deeper insights into the social and cultural factors that contribute to malnutrition. The data collection instruments used in the study would depend on the specific research questions and objectives, as well as the population selected.

Data analysis techniques measures: The data analysis techniques used in the study will depend on the type of data collected, research objectives, and hypotheses.

Data analysis techniques can include descriptive statistics to summarize and describe the demographic and nutritional characteristics of the study population, as well as to examine relationships between malnutrition and its underlying factors. The use of the study survey could be applied to assess the strength of the association between malnutrition and age-group disparities and in between gender too.

Data analysis techniques and quality control measures

The data analysis techniques for the study include demographical surveying techniques from the selected community in which individual population from the selected community were interviewed and assessed on the basis of a pre-formulated questionnaire. The questionnaire will act as a measure of evaluation of the status and conditions of health and BMI of all of the individual members in the population under study. Based on the questionnaires mentioned below can evaluate the condition of population for malnutrition: -

- Questionnaire
 - 1) Any medical complaints? If yes, then elaborate.
 - 2) Family history
 - 3) Social history: - smoking/alcohol
 - 4) Weight of the individual (kgs)
 - 5) Height of the individual (cms)

- 6) Body mass Index[calculated by the division of the body weight by the square of the height]
- 7) Etiology[of the BMI if it is not in normal range]: - this may include factors such as hereditary factors, dietary factors, health condition, medications, stress, sedentary lifestyle, lack of sleep, socio-economic conditions
- 8) Any signs that the person is having malnutrition or obesity; if yes, what are the signs?

These survey forms are filled out individually for each member of the population under study. The data collected from these surveys help in the understanding about the prevalence of malnutrition or obesity in the study population and thus also gives a detailed insight in the prevalence of various etiological factors which influence the rates of malnutrition in the study group. This survey also helps in understanding of the relationship between health conditions, level of income and the rates of malnutrition and thus provides a idea regarding how a factor is influencing the rates of malnutrition and how it can be managed effectively and decrease its prevalence.

This study also examines the relationships between malnutrition and various factors (such as socio-economic status, access to health services, dietary habits, etc.) and to identify disparities across different age groups and gender.

Overview of previous studies on malnutrition and age-group disparities

This could include a review of previous studies that have investigated malnutrition and disparities among different age groups in the community. The aim is to provide context for the current study by highlighting what has been previously discovered about the topic, identify gaps in knowledge that the current study aims to address, and provide a basis for comparison of results. This section may include:

1. Various studies have been conducted on Malnutrition and to the extent it has been affecting various social aspects and the prevalence of malnutrition in the society. Studies conducted include: -
 - Malnutrition in India: Trends and Determinants [R. Radhakrishna and C. Ravi]
 - Prevalence of malnutrition in a tertiary care hospital in India [Chandrashish Chakravarty, Babita Hazarika, Lawni Goswami, and Suresh Ramasubban]
 - Update on the prevalence of the malnutrition among children in Asia [Geok Lin Khor]
2. Various studies that have been conducted on the prevalence show that there is an increased prevalence or a higher rate of cases of malnutrition ranging from mild to severe malnutrition case. These studies suggests that the prevalence of malnutrition is as high as 50%. The studies also suggest that there is an increased and higher prevalence of malnutrition cases which have been reported in hospitalized and non-hospitalized individuals belonging to the class of women and children.

3. There is a broad assumption which estimates that malnutrition occurs significantly more in children and women rather than young people of both genders. Malnutrition cases also have been reported in elderly people and individual from other gender and age categories which are mostly correlated with any diseased or morbid conditions. But most surveys and research studies state a higher number of cases belonging to females and children belonging to either diseased states or social groups with low standards of life quality, and various other factors

Identification of gaps in the literature

Upon analysis of the various research articles, the following gaps were identified from the review of those articles:-

- ✓ The survey data and the research based upon the collected survey data indicates higher prevalence of malnutrition in the global scenario, but the data and the result obtained is un-indicative of the social, biological and co-morbidity details of the group or the sample population.
- ✓ Research and surveys conducted on the selected population which take into account the various aspects of the global scenario such as nutritional status, social status, level of income, diseased or morbid conditions, quality of living but this leads to assumption of the group as a whole, that means each and every member of the selected sample population shares the common characteristics on the basis of which the study was conducted. It does not take into account the individual differences and variations of all the members of the sample population.
- ✓ The survey and research data collected includes different biological aspects such as gender, age, etc. but it does not take into account the variations of the genotype and phenotype of the individual members of the group or the group's characteristics as a combined genetic group.
- ✓ Even though most studies suggest there is no statistically significant difference between the gender groups [Male and Female] of the selected sample population under study, but there is an indication of the fact that there is an increased or higher rate of cases of malnutrition in the any of the gender groups based upon the social and biological factors

Theoretical framework and conceptual model might include the following by figure 1:

- **Theoretical framework:** The study is based upon the comparison of various factors that affect the selected population and also study the extent of the effects on the prevalence of malnutrition caused by the factors under study.
- **Conceptual model:** The objective of the research can be conceptually understood as follows:



Figure 1: Basic Causes of Malnutrition

UNICEF's Conceptual Framework for the cause of malnutrition. Adapted from UNICEF (1998)

- **Hypotheses:** The following hypothesis are being tested with the study being conducted: -
 - I. The prevalence of malnutrition is higher among children and women compared to other groups.
 - II. The causes of malnutrition among the community are influenced by socio-economic and cultural factors, access to health services and nutrition-specific interventions, and dietary habits.
 - III. Malnutrition has negative impacts on physical and cognitive development, school performance, and economic productivity among different age groups in the community.
 - IV. Disparities in malnutrition and its underlying causes vary across different age groups in the community.
- **Variables:** A number of variables are being used to approach the subject of prevalence of malnutrition and understand the extent up to which the listed variables are affecting the data and the results of the study. The variables are listed out as follows: -
 - I. Age
 - II. Gender
 - III. Body Mass Index
 - IV. Diseased conditions
 - V. Medications [consumed by the individuals in the population and its effect on the incidence of malnutrition]

Relationships: All the variables that are being studied are inter-related to each other and also together show a visible combined effect on the extent and prevalence of malnutrition. Age and gender are important factors in these studies, as shown there is a higher incidence of malnutrition, similarly it has been seen in recent studies that the prevalence of malnutrition is higher in the gender group of females

over the male group or the male population. BMI values lower than 18 may indicate towards a tendency or might confirm the existing condition of malnutrition in the selected individuals from a sample population.

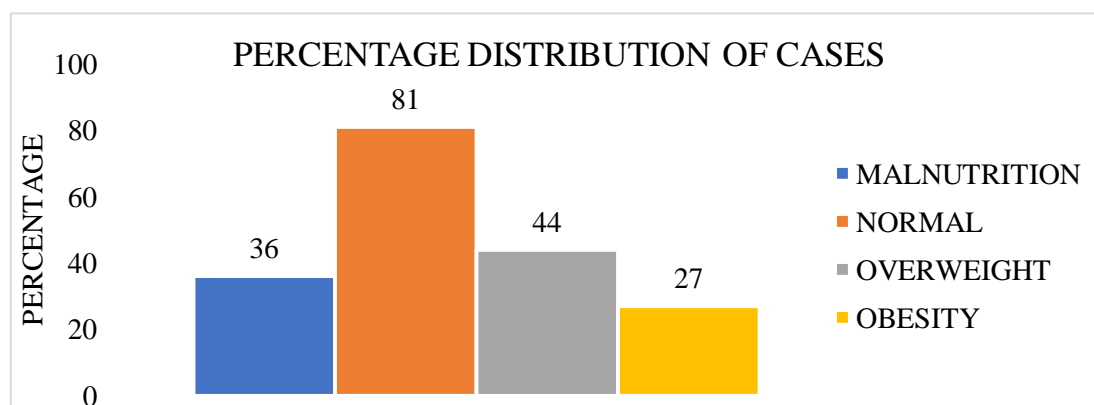
RESULTS

Descriptive studies of the study population:

Descriptive studies for the specified population are used to summarize the characteristics of the study population to collecting data for malnutrition from various factors such as age groups, gender, socioeconomic status, and dietary habits with respect. The studies provide a snapshot of the population which is done over different locations as specified to obtain data over various locations thus including the demographic factors which helps to identify any notable patterns or trends that may exist. Descriptive methods of studies could include the study of multi-factorial studies and find the correlation between these factors such as age, gender, diseased conditions, medications and how the individual factors are affecting the trends of malnutrition in the study population and how the inter-relation between the factors are contributing to the malnutrition prevalence. The results of the descriptive studies will provide valuable information for the interpretation of the study findings and may help to identify areas where further research is needed.

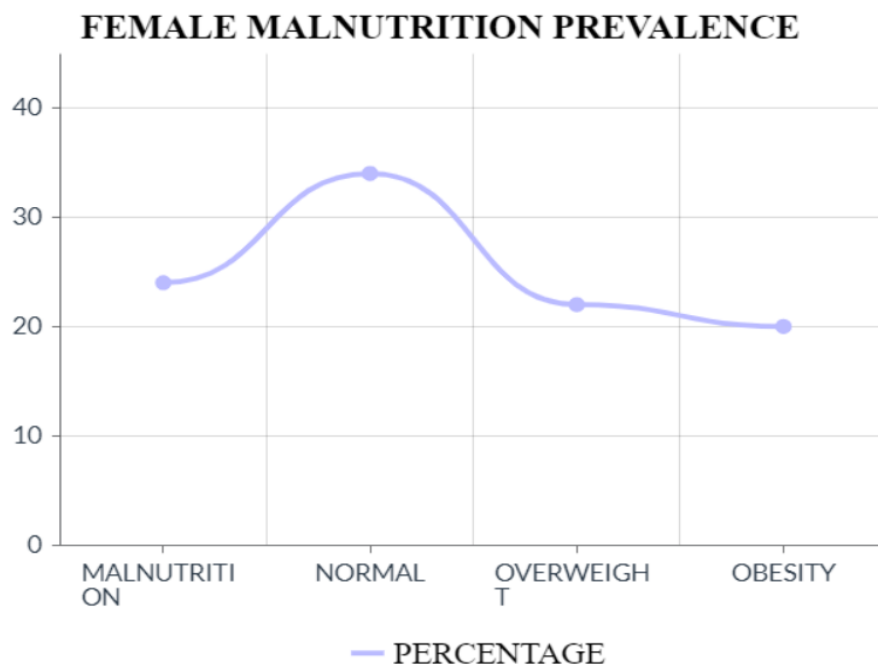
Key findings on the prevalence and patterns of malnutrition in different age groups

The prevalence and patterns of malnutrition in different age groups were shown below in Figure 2. The discussions is a reflection based on the BMI data collected from the population and plotted in a graphical representation. The total population that was studied is categorized in to 4 broad categories which distributes the total population according to the obtained data from the population. The graph is showing clearly about the distribution of malnutrition cases, Healthy population, obese

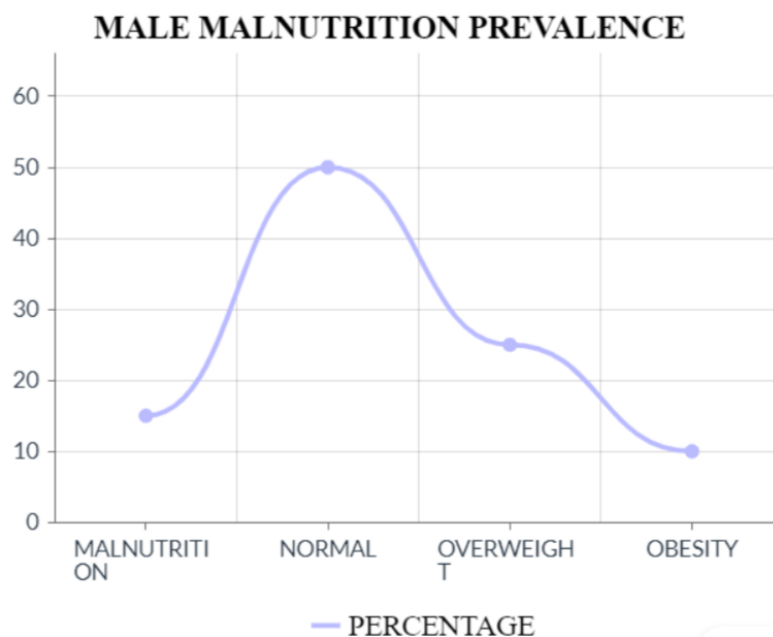


cases and overweight cases in different age groups.

Figure 2. Percentage distribution of surveyed cases

**Figure 3.**

Male malnutrition prevalence

**Figure 4.** Female malnutrition prevalence

The then study represents Clearly in Figure 3. about the prevalence of malnutrition in only male population. The distribution of the malnutrition cases based on the selection of Male gender category from the selected population under study & can be understood by the pie chart provided as it provides an estimated percentage of the prevalence of malnutrition within the study population in a selected category which stands at an estimated of 15% of the total cases. The graph clearly indicates about malnutrition, Healthy, Overweight, Obese cases were found to be 15%,50%,25% and 10% respectively

The data represented in the Figure 4. is a based on the prevalence of malnutrition in female gender category. As per the data obtained by studying the entire population a pie graph is a representation for malnutrition cases, Healthy cases, Overweight cases & Obese cases in females. Based on the BMI data surveyed from the female population it showed 24% malnutrition cases, 34% Healthy cases, 22% Overweight cases & 20% Obese cases.

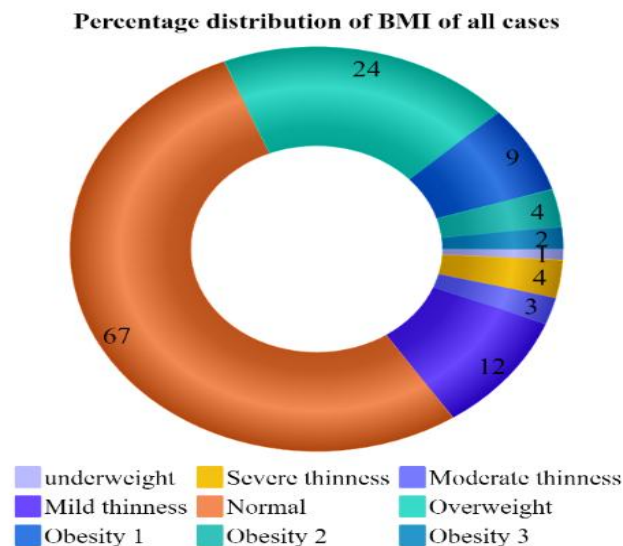


Figure 5. Percentage distribution of BMI of all cases

The Figure 5 is a representation of the entire surveyed population, based on BMI the categories were distinguishes into Underweight, Severe Thinness, Moderate Thinness, Mild Thinness, Normal, Overweight & obese cases. without basing it on different gender or age groups. It also shows the prevalence of malnutrition in a comparative manner along with prevalence of other BMI categories in the entire study population which co-exist at the same time.

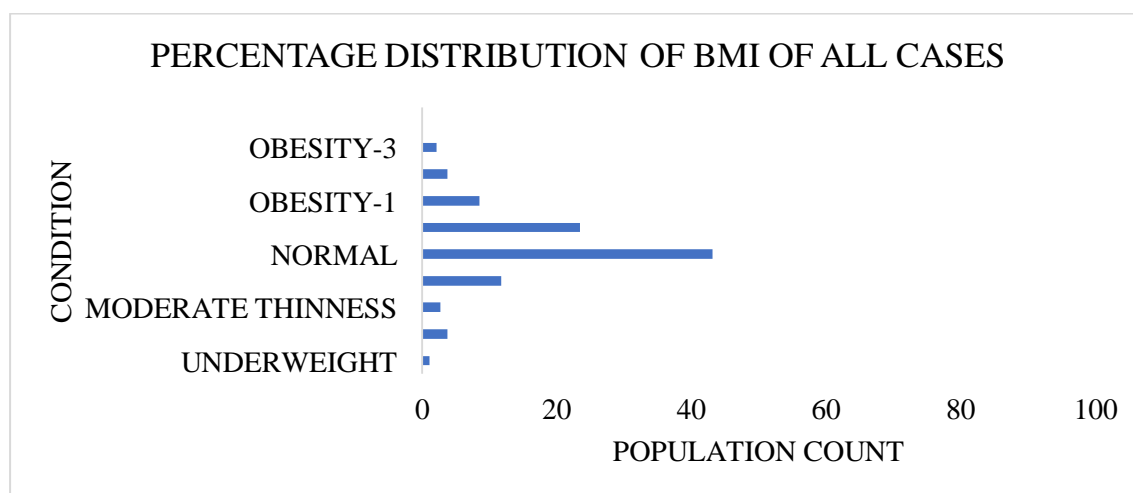


Figure 6. % distribution of BMI of all classes

The obtained data for the prevalence of malnutrition cases takes into account the cases which include cases ranging from mild thinness, moderate thinness, severe thinness and underweight conditions of individuals which stands at an estimated total of about 19% of the total surveyed

population. This data is used to study the prevalence of malnutrition in both the gender categories separately in figure 6.

DISCUSSION

Interpretation of the findings:

Upon analysis of the total data obtained from the selected groups of sample population, the following interpretation were made: -

- a. The prevalence of malnutrition based upon the descriptive studies conducted on the selected survey population based on the gender categorization, had shown higher prevalence and frequency of malnutrition reported in female gender than males. It is to be noted that this prevalence distribution is based solely on the criteria of gender and does not take into account about other factors such as age, diseased conditions and other regional and demographic factors such as medications, income levels, nutritional status, access to healthcare. The reason behind this is due to several factors as shown below
 - ✓ Lower rates of income
 - ✓ Poor access to healthcare facilities
 - ✓ Lower nutritional status
 - ✓ Lack of healthy food
 - ✓ Lack of Nutritional Knowledge
- b. An interpretation of the overall studies conducted on the total study population provides an estimate of the percentage of population which is suffering from malnutrition by taking into account the factors which have a major effect on the incidence of malnourished individuals. It also provides an insight regarding how the factors are affecting and the extent up to which the factors are affecting the existence of malnutrition which might be useful in controlling and decreasing the prevalence of malnutrition in the population.

Comparison of results:

Identification of disparities and potential risk factors

Potential risk factors for malnutrition of the study aimed to assess the existence of malnutrition and identify the key factors contributing to its occurrence in the community. A comprehensive analysis of the data collected from the sample population was conducted to determine the impact of demographic details and other variables, such as age, dietary habits, and access to healthcare, on malnutrition. The study aimed to identify the role of socio-economic factors in the development of malnutrition and to highlight any disparities in the prevalence of malnutrition between different demographic categories. The findings of this survey provide valuable insights into the factors contributing to malnutrition and can be used to develop targeted interventions to improve nutritional status in the community.

Implications for public health and policy

Table 2: Various Schemes by Indian Government to avoid Malnutrition: - These schemes should be carefully planned to reach to the people in the community who are lying to below poverty line.

SCHEME	YEAR
National Rural Health Mission	2005-06
National Horticulture Mission	2005-06
Mahatma Gandhi National Rural Employment Guarantee Scheme	2005-06
Janani Suraksha Yojana	2006-07
Midday Meals	2008-09
Integrated Child Development Services [ICDS] Scheme	2008-09
National Rural Livelihood Mission	2010-11
Total Sanitation Campaign/Nirmal Bharat Abhiyan	On Going

To address these challenges, there is a need for a comprehensive approach that addresses the different sectors and dimensions of nutrition. There are two complementary approaches in reducing undernutrition, direct nutrition, and indirect multi-sectoral approaches.

- ✓ **Direct interventions:** Like breastfeeding, complementary feeding and hand washing practices complement the long-term sustainable multi-sectoral approach like improving access to healthcare facilities, improving nutritional status, preferring healthy food and to gain Nutritional Knowledge like sources of protein, vitamin & mineral rich diet.
- ✓ **In-Direct interventions:** Under the indirect multi-sectoral approaches, the Government is committed to address the Nutritional Challenges of India. Several programmes and schemes with the potential to improve the current nutritional situation of the country have been launched and expanded. Several of these schemes, namely

CONCLUSION

Summary of key findings

Based upon the data and the studies conducted, the result obtained can be summarized by the following points: -

- There is a significantly higher incidence and higher rates and prevalence of cases of malnutrition in females in the selected sample population under study as compared to male gender category.
- Out of all the groups, there is higher incidence of malnutrition conditions in children and women as it was already established earlier studies
- Malnutrition conditions are mostly caused due to lifestyle problems and improper nutritional diet consumption. Some incidences may be related to some diseased conditions which result

in improper absorption of vitamins, minerals and essential nutrients which upon prolonged duration may lead to development of malnutrition conditions.

Implications for practice and future research

The data and the methods being used for conducting this study may provide an outline and a base for future research and studies which might be conducted on the topic of malnutrition and also as an outline for the selection of population or sample groups for other research or studies which might be chosen on the basis of the individual characteristics such as the nutrition. Previously conducted studies on malnutrition and factors affecting, its causes and its relation and effect on other diseased conditions act as a base for conducting this study as it helps to take into account the various factors that might influence the end result of this study.

Based upon the study conducted, the results obtained provides a clear perspective on the prevalence of malnutrition in respect to specific demographic locations along with correlation of enlisted variables such as age, gender, diseased or comorbid conditions.

A clarified perspective on these variables serves as an important tool that can be used as a baseline for the detailed and extensive future prospects and study projects that can be conducted on various facets of the problem of malnutrition such as a detailed theory on the correlation between nutritional status and socio-economic factors, biological, genetical, environmental factors or demographic factors and variables such as genotype variables, phenotype variables, population characteristics, nutritional sources, quality of life etc., all such factors can be studied, investigated and an inference can be drawn on the basis of the results obtained on the prevalence of malnutrition by the current study.

The results obtained based on the study conducted give us a perspective on the following facets of the study: -

Strengths of the study:- the study conducted list out the following strengths

- It provides a detailed explanation of the prevalence of the malnutrition over a selected sample population which has the combination of the individuals of all ages, gender and with certain diseased conditions.
- It provides a result on the correlation on the various factors affecting and causes and gives an outline between the exposure and outcome relations between certain factors.
- It provides an idea about the incidence of malnutrition out of the total sample population within different ages, different genders and also along with different diseases which may affect and may cause malnutrition.
- It also provides an understanding how the prevalence of malnutrition can be affected by factors such as dietary habits, diseased conditions, access to health services, socio-economic status etc.
- This type of distribution studies leads to the ease of understanding the data and also helps in obtaining an inference based on the observations made.
- This method of study allows or enables to study the variations in small sample groups and also allows to draw various inferences which enables us to make assumptions on the

distribution of the various factors and the way these factors influence the occurrence and incidence of malnutrition and thus draw a conclusion on the prevalence of malnutrition cases as per the variables and the corresponding age groups such as different age groups, different gender groups, groups of people with different diseased conditions which may affect or cause malnutrition conditions.

Limitations of the study:- The study has the following limitations to its extent of its usefulness

- The study does not elaborate on the data of the distribution of age, Disease state and other factors which is included in the population.
- It does not provide an accurate description or an outline about how the various factors are affecting the incidence and prevalence of malnutrition in that specific committee
- The study of a selected sample population is not accurate representation of the universal population which might be suffering from malnutrition as it provides a vague idea about the percentage of malnutrition cases that are occurring due to the theoretical assumption of homogenous distribution of the population groups.
- The causes of malnutrition differ from every demographic location to another as the environmental conditions heavily influence the genetics of the local population, the genotype and phenotype variations, the nutrient sources, the socio-economic status, health care facilities, etc.
- The selection of the population theoretically should be a homogenous mixture of individuals who share the common characteristics as a group which are to be studied but in practical applications it is mostly seen that the sample population is not a homogenous mixture but rather a mixture of individuals who share the listed characteristics in different extents and different proportions.
- The above-mentioned limitations lead to the rise of many potential biases which influence the result of the study as it is not taking into account the errors of the selection of a non-ideal or a group with variations or deviations from the ideal assumption, thus leading to obtaining an error or faulty results.

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