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Original Research Article

EVALUATION OF RISK FACTORS FOR UNDERNUTRITION AMONG ONE TO FIVE YEARS AGED CHILDREN: AN INSTITUTIONAL BASED STUDY

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Abstract

Background: Undernutrition among children under five years of age in India represents a significant public health challenge. The country exhibits the highest prevalence of this issue globally, nearly twice that observed in Sub-Saharan Africa. Hence; the present study was undertaken to evaluate risk factors for undernutrition among one to five years aged children. **Materials and Methods:** Children aged one to five years with a weight-for-age ratio at or below eighty percent of the expected value and without any chronic or severe illnesses were classified as cases. In contrast, the control group consisted of healthy children within the same age range who had a weight-for-age ratio exceeding eighty percent of the expected value. The nutritional status of the participants was evaluated according to the grading system established by the Indian Academy of Paediatrics (IAP) for protein-energy malnutrition (PEM). A semi-structured questionnaire was employed to gather information from the caregivers of the study participants. The socioeconomic status (SES) of the respondents was assessed using a validated scale. The questionnaire also collected data regarding the child's growth, development, and feeding practices. Anthropometric measurements were taken using standardized instruments, with weight measured on a calibrated scale placed on a stable horizontal surface, recorded to the nearest 500 grams. Height was measured with a portable stadiometer, accurate to the nearest centimeter. A significant risk factor identified was the absence of exclusive breastfeeding for the first six months. The study included a total of 100 cases and 100 controls. **Result:** A total of 100 cases and 100 controls were evaluated. The mean age of cases and controls was 4.1 years and 3.9 years respectively. There were 44 boys and 56 girls in the cases group and there were 40 boys and 60 girls in control group. 56 percent of the subjects of the cases were joint family while 61 percent of the subjects of the controls were joint family. Risk factors for undernutrition included low birth weight, illness in last one month, presence of diluted milk in diet, Birth interval ≤ 2 years and having more than one child. **Conclusion:** Undernutrition refers to a condition of compromised health resulting from insufficient nutrient intake within the body. It continues to be recognized as one of the most critical public health challenges in developing nations. Enhancing maternal education is likely to lead to better nutritional outcomes for children. It is essential to implement strategies aimed at elevating the economic conditions within the community.

INTRODUCTION

In recent years, the Millennium Development Goals (MDGs) have evolved into the Sustainable Development Goals (SDGs), with maternal and child health (MCH) gaining unprecedented focus over the past two decades. Adequate nutrition has consistently been recognized as a vital component in achieving the targets set for maternal and child health. Enhancing the nutritional status of children is imperative, as today's youth will become the citizens of tomorrow.[1,2] From a life-cycle perspective, the

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first 1,000 days of a child's life represent a critical window for addressing nutritional needs, as this period is characterized by rapid growth and development, heightened vulnerability to infectious diseases, and a reliance on caregivers for nourishment and socialization. Furthermore, early childhood is a pivotal stage for establishing the foundations of cognitive, social, emotional, language, and physical development, which collectively contribute to lifelong learning.[3,4]

Undernutrition among children under five years of age in India represents a significant public health challenge. The country exhibits the highest prevalence of this issue globally, nearly twice that observed in Sub-Saharan Africa. Approximately 80% of the world's undernourished children reside in just 20 countries, with India accounting for nearly 60 million underweight children. In a report published by UNICEF in 2006, several factors contributing to childhood malnutrition were identified, including inadequate dietary intake, recurrent infections, suboptimal breastfeeding practices, delayed introduction of complementary foods, and insufficient dietary protein. Additional determinants of food consumption encompass health conditions, cultural food restrictions, growth patterns, and individual dietary preferences. Malnutrition may also arise from neglect, irregular meal schedules, inadequate food portions, and a lack of parental awareness regarding nutrition. Each year, the International Food Policy and Research Institute (IFPRI) releases the Global Hunger Index (GHI). The 2019 report positioned India at 102 out of 119 countries assessed.[5-7] Hence; under the light of above-mentioned data, the present study was undertaken to evaluate risk factors for undernutrition among one to five years aged children.

MATERIALS AND METHODS

Children aged one to five years with a weight-for-age ratio at or below eighty percent of the expected value and without any chronic or severe illnesses were classified as cases. In contrast, the control group consisted of healthy children within the same age range who had a weight-for-age ratio exceeding eighty percent of the expected value. The nutritional status of the participants was evaluated according to the grading system established by the Indian Academy of Paediatrics (IAP) for protein-energy malnutrition (PEM).[7] A semi-structured questionnaire was employed to gather information from the caregivers of the study participants. The socioeconomic status (SES) of the respondents was assessed using a validated scale. The questionnaire also collected data regarding the child's growth, development, and feeding practices. Anthropometric measurements were taken using standardized instruments, with weight measured on a calibrated scale placed on a stable horizontal surface, recorded to the nearest 500 grams. Height was measured with a portable stadiometer, accurate to the nearest centimeter. A significant risk factor identified was the absence of exclusive breastfeeding for the first six months. The study included a total of 100 cases and 100 controls. The data collected was tabulated and analysed using Statistical Package for Social Sciences (SPSS). Univariate analysis was done for evaluation of level of significance.

RESULTS

A total of 100 cases and 100 controls were evaluated. The mean age of cases and controls was 4.1 years and 3.9 years respectively. There were 44 boys and 56 girls in the cases group and there were 40 boys and 60 girls in control group. 56 percent of the subjects of the cases were joint family while 61 percent of the subjects of the controls were joint family. Risk factors for undernutrition included low birth weight, illness in last one month, presence of diluted milk in diet, Birth interval ≤ 2 years and having more than one child.

Table 1: Demographic data.

Variable	Cases	Controls
Mean age (years)	4.1	3.9
Boy	44	40
Girls	56	60
Joint family	56	61
Nuclear family	44	39
Socioeconomic class- Upper	22	25
Socioeconomic class- Middle	38	35
Socioeconomic class- Low	40	30

Table 2: Risk factors for under-nutrition

Factors	Cases	Controls	p-value
Low birth weight	33	9	0.001*
Illness in last one month	72	34	0.000*
Diluted milk in diet	89	48	0.001*
Birth interval ≤ 2 years	49	22	0.001*
Having more than one child	79	42	0.001*

*: Significant

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DISCUSSION

Malnutrition continues to be a significant contributor to adverse health outcomes and mortality rates among school-aged children in economically disadvantaged regions.[8] Over 200 million children in this age group are affected by stunting and wasting, with an estimated one billion children facing long-term physical and developmental consequences as a result.[9,10] The World Health Organization's (WHO) Growth and Assessment Surveillance Unit reports that the global prevalence of malnutrition, as measured by stunting among children aged 5 to 14 years, stands at approximately 28%, equating to 171 million children, with Eastern Africa exhibiting a notably higher prevalence of 45%.[11,12] Furthermore, it is estimated that between 20% and 80% of schoolchildren in low-income countries experience inadequate nutrition. In Ethiopia, school-aged children encounter a variety of nutrition-related challenges, primarily stemming from food inadequacy and insecurity. Undernutrition is believed to significantly contribute to child mortality, impair cognitive development, and lead to increased healthcare costs, estimated at around 55.5 billion birr annually.[13] Although factors contributing to the prevalence of childhood undernutrition have been a subject of research in recent years, evidence shows variations in the specific factors contributing to undernutrition across countries and regions.[11-13] Hence; under the light of above-mentioned data, the present study was undertaken to evaluate risk factors for undernutrition among one to five years aged children.

A total of 100 cases and 100 controls were evaluated. The mean age of cases and controls was 4.1 years and 3.9 years respectively. There were 44 boys and 56 girls in the cases group and there were 40 boys and 60 girls in control group. 56 percent of the subjects of the cases were joint family while 61 percent of the subjects of the controls were joint family. Risk factors for undernutrition included low birth weight, illness in last one month, presence of diluted milk in diet, Birth interval ≤ 2 years and having more than one child. Pal A et al, in a previous study, determined the extent of child malnutrition in West Bengal, India, as well as the risk factors linked with it. In diverse districts of West Bengal, a community-based cross-sectional study was undertaken utilizing multi-stage stratified cluster sampling followed by systematic random sampling. Stunting, underweight, and wasting were shown to be prevalent in 25.48%, 33%, and 26.88% of children, respectively. With age, the likelihood of a child becoming malnourished increased. In comparison with girls, boys had a greater chance of being malnourished. Separately, parental educational and occupational statuses were linked to child malnutrition. Undernourished children were more likely to have a mother who was uneducated or undereducated. Children from economically disadvantaged families were more likely to be malnourished. Children from households with untreated drinking water and poor sanitation were more likely to be malnourished. The study showed that there are several risk variables linked to child malnutrition. Undernutrition was caused by illiteracy, filthy drinking water, and poor sanitation, all of which were independent risk factors.[14] Siddiqa M et al investigated the role of various social-, maternal-, and child-level factors considered to be responsible for nutritional health disparities among children. The results of their study revealed that the leading determinant associated with Composite Index of Anthropometric Failure (CIAF) was the child's age in months, low birth weight, lack of breastfeeding, lack of maternal education, poor economic status of the household, and poor-quality water sources. The factors associated with stunting comprised the child's age in months, low birth weight, underweight maternal body mass index, and uneducated mothers. The findings of study reinforce the significance of maternal health, parental education, and household economic profile in the prevention of malnutrition within young children of normal birth weight, as well as better overall health care up to adolescence. In emerging nations, evidence-based policies are crucial for fostering children's optimal physical and mental development to ensure a healthier future generation. Therefore, the execution of national health policies aimed at the improvement of maternal and societal factors could result in improved nutrition levels among children below 5 years of age.[15]

CONCLUSION

Undernutrition refers to a condition of compromised health resulting from insufficient nutrient intake within the body. It continues to be recognized as one of the most critical public health challenges in developing nations. Enhancing maternal education is likely to lead to better nutritional outcomes for children. It is essential to implement strategies aimed at elevating the economic conditions within the community.

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