

Role of Nutritional Education in Improving Maternal and Child Health

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Abstract: Maternal and child health remains a global public health priority, with nutrition playing a pivotal role in determining health outcomes. This abstract provides an overview of nutrition-specific interventions aimed at reducing child and maternal mortality. The interventions encompass diverse strategies targeting pregnant women, mothers, and children at various stages of development. Prenatal and antenatal nutrition education, iron and folic acid supplementation, and micronutrient interventions for children aim to enhance maternal and child well-being. Promotion of exclusive breastfeeding, complementary feeding programs, and treatment of acute malnutrition address early childhood nutrition. Nutrition counseling for caregivers, integration of nutrition into agriculture and food security programs, and WASH interventions contribute to a comprehensive approach. School-based nutrition initiatives, family planning services, and maternal nutrition support during lactation focus on specific life stages. These interventions, implemented through diverse channels such as health clinics, community outreach, and educational programs, collectively contribute to improved maternal and child health outcomes. The abstract emphasizes the importance of a multi-sectoral approach, aligning with global efforts to address the intricate relationship between nutrition and mortality. The outcomes include enhanced maternal nutrition, reduced birth defects, improved child immunity, prevention of malnutrition, and overall community health improvements. Implementation strategies and targeted interventions may vary based on regional contexts, underscoring the need for tailored approaches to address specific challenges and contribute to sustainable health improvements.

Keywords: Nutritional Education, Maternal Health, Child Health, Evidence-Based Interventions, Undernutrition, Global Exposures, Developmental Potential, Early Childhood, Global Nutrition Report.

I. Introduction

Maternal and child health is a critical aspect of public health, influencing the well-being of both current and future generations. Nutrition plays a pivotal role in shaping the health outcomes of mothers during pregnancy and lactation, as well as the growth and development of infants and young children. Recognizing the profound impact of nutrition on maternal and child health, educational interventions have emerged as key strategies to empower individuals with the knowledge and skills necessary for making informed dietary choices [1]. This introduction explores the significant role of nutritional education in improving maternal and child health. From promoting optimal pregnancy outcomes to preventing malnutrition and fostering long-term health benefits, the impact of education on nutritional practices extends beyond individual households to community-wide well-being. By addressing cultural practices, encouraging positive behavioral changes, and empowering caregivers, nutritional education serves as a catalyst for positive health outcomes, contributing to healthier mothers, children, and communities [2].

A. Background Study

The background surrounding maternal and child health, particularly in the context of nutrition, is marked by persistent global challenges and efforts to address them. Maternal and child health is a critical aspect of public health, and adequate nutrition during pregnancy, lactation, and early childhood is pivotal for optimal outcomes. However, many regions continue to grapple with the burden of malnutrition, leading to adverse consequences for both mothers and children [3]. Globally, maternal mortality rates remain a concern, with many women facing barriers to quality healthcare, particularly in low-income and resource-constrained settings [4]. Malnutrition exacerbates these challenges, contributing to complications during pregnancy, childbirth, and the postpartum period. The impact of maternal malnutrition extends beyond immediate health outcomes, influencing the long-term health and development of the child [5]. Childhood

malnutrition, encompassing issues of undernutrition and overnutrition, is a persistent global issue affecting millions of children. Stunted growth, micronutrient deficiencies, and vulnerability to infections are among the consequences of inadequate nutrition during the crucial early years of life. The World Health Organization (WHO) estimates that nearly half of all deaths in children under the age of five are attributable to malnutrition [6]. Cultural practices, socio-economic disparities, and limited access to healthcare contribute to the complex landscape of maternal and child nutrition. Recognizing the intricate interplay of these factors is essential for developing effective strategies to improve health outcomes. Over the years, there have been concerted efforts by governments, non-governmental organizations, and international agencies to address these challenges through various interventions, including nutritional education, healthcare infrastructure improvements, and policy advocacy [7].

B. Scope of the Problem:

Maternal and child health disparities persist globally, with inadequate nutrition standing out as a significant contributor to adverse outcomes. The scope of the problem encompasses a range of challenges, from insufficient access to nutritious foods and limited healthcare resources to cultural practices that may hinder optimal nutrition. Understanding the multifaceted nature of these challenges is crucial for developing effective strategies to address and mitigate the impact on maternal and child health. Malnutrition remains a pervasive issue, affecting millions of mothers and children worldwide. Both undernutrition and overnutrition pose substantial risks to health, leading to stunted growth, micronutrient deficiencies, and increased susceptibility to diseases. Insufficient nutrition during pregnancy can result in low birth weight, preterm births, and developmental issues in newborns. Maternal undernutrition also heightens the risk of complications during childbirth, impacting both maternal and infant mortality rates. Children facing malnutrition are at risk of stunted growth, cognitive impairments, and compromised immune systems. Malnourished children are more susceptible to infections and face higher mortality rates than their well-nourished counterparts. Many communities, especially in low-income regions, face challenges in accessing a diverse and nutrient-rich diet. Limited availability and affordability of nutritious foods contribute to suboptimal nutrition for both mothers and children. Cultural beliefs and practices can influence dietary choices and feeding practices,

sometimes leading to suboptimal nutrition. Addressing cultural factors requires culturally sensitive approaches to nutritional education and interventions. Disparities in access to healthcare services contribute to the nutritional challenges faced by mothers and children. Limited access to antenatal care, nutrition counseling, and essential healthcare resources exacerbates the problem. Global challenges such as climate change, conflicts, and economic instability can further exacerbate nutritional issues. Disruptions to food supply chains and increased vulnerability to environmental factors can have profound effects on maternal and child nutrition. The scope of the problem extends beyond nutritional aspects to include social determinants of health, such as education, income, and gender equality. Addressing these interconnected factors is crucial for sustainable improvements in maternal and child health.

II. Literature Review

The literature survey based on the provided research papers presents a comprehensive overview of studies addressing the role of nutritional education in improving maternal and child health [8]. The first study emphasizes evidence-based interventions for maternal and child nutrition, focusing on feasibility and cost-effectiveness [9]. The subsequent papers delve into global and regional exposures of maternal and child undernutrition, shedding light on health consequences. One study underscores undernutrition as an underlying cause of child deaths associated with major diseases, highlighting the need for preventive measures [10]. Another contribution explores the developmental potential in the first five years for children in developing countries. The Global Nutrition Report addresses actions and accountability to accelerate progress on a global scale. A study investigates the association between anaemia during pregnancy and blood loss at and after delivery, particularly in Zanzibar, Tanzania [11]. Cross-country comparisons of anemia prevalence and anemia reduction interventions provide valuable insights. A comparative risk assessment of disease burden attributable to various risk factors emphasizes the importance of addressing maternal and child nutrition [12]. Insights into the prevention of postpartum hemorrhage, a critical issue in maternal health, are provided. A global analysis of maternal death causes offers valuable insights into improving maternal health outcomes. The relationship between maternal hemoglobin concentration and birth weight is explored, providing valuable information for maternal nutrition [13]. A systematic analysis of trends in hemoglobin

concentration emphasizes the need for population-representative data. Additional studies focus on various aspects such as anthropometric assessment, the impact of maternal education, and the analysis of changes in child malnutrition levels [14].

Study	Area	Methodology	Key Findings	Challenges	Pros	Cons	Application
Bhutta et al.	Maternal and Child Nutrition	Evidence-based interventions	Feasibility and cost-effectiveness	Implementation cost, scalability	Effective in improving maternal and child nutrition	Cost implications, potential resource constraints	Public health policy and program design
Black et al. (2008)	Global and regional exposures	Literature review and analysis	Undernutrition's impact on health	Limited resources, regional disparities	Provides a global perspective on undernutrition	May not capture all regional nuances	Public health planning at global and regional levels
Caulfield et al. (2004)	Child deaths associated with diseases	Epidemiological analysis	Undernutrition as an underlying cause	Disease-specific interventions needed	Highlights the need for preventive measures	Focuses primarily on underlying causes	Informing public health strategies targeting specific diseases
Grantham-	Developmental	Longitudinal study	Early childhood	Resource-intensive,	Emphasizes the	Requires	Early childhood

McGregor et al. (2007)	potential		development	long-term commitment	importance of early interventions	sustained investment	development programs
International Food Policy Research Institute	Global Nutrition Report	Policy analysis	Accountability in global nutrition efforts	Political resistance, data reliability	Encourages global collaboration and accountability	Potential biases in reporting	Global nutrition policymaking and advocacy
Kavle et al. (2008)	Association between anaemia and blood loss	Cross-sectional study	Anaemia and postpartum hemorrhage	Limited generalizability, confounding factors	Identifies an association between anaemia and postpartum blood loss	Cross-sectional nature limits causal inference	Informing antenatal care and blood loss prevention strategies
Lim et al. (2012)	Comparative risk assessment	Systematic analysis	Burden of disease attributable to risk factors	Data availability, risk factor classification	Provides a comprehensive overview of global risk	Dependent on accurate risk factor data	Informing global health priorities and resource allocation

					factors		n
Maternal and Child Health Integrated Program	Prevention of postpartum hemorrhage	Program evaluation	Effectiveness of postpartum hemorrhage prevention	Implementation challenges, resource constraints	Demonstrates effectiveness in preventing postpartum hemorrhage	Resource-intensive in some settings	Maternal health program planning
Sayet al. (2014)	Global causes of maternal death	Systemic analysis	Major causes of maternal mortality	Data availability, classification issues	Identifies leading causes of maternal death globally	Relies on reported data	Informing maternal health policies and interventions
Steer (2000)	Maternal hemoglobin concentration	Retrospective analysis	Relationship with birth weight	Limited to retrospective data, confounding factors	Establishes a relationship between hemoglobin and birth weight	May not account for all confounding variables	Informing antenatal care strategies and interventions
Stevens	Trends in	Systematic	Global	Data gaps,	Highlight	Depend	Informing

et al. (2013)	hemoglobin concentration	analysis	trends in anemia prevalence	regional variations	s trends in anemia prevalence globally	ent on data availability	g global anemia reduction strategies
Chen et al. (1980), Cleland (1990), Chou et al. (2007), Desai and Alva (1998), De Onis et al. (2000)	Various aspects (anthropometric assessment, impact of maternal education, changes in child malnutrition)	Varied methodologies	Diverse findings across studies	Heterogeneity in methodologies	Contribute to a broad understanding of nutrition-related factors	Lack of uniformity in findings	Informing policies addressing diverse aspects of maternal and child health

Table 1. Summarizes the Review of Literature

III. HOW NUTRITION IMPACTS CHILD MORTALITY

Nutrition significantly impacts child mortality, playing a pivotal role in the survival and overall health of infants and young children. Chronic undernutrition, often manifested as growth stunting, is associated with an increased risk of mortality in children under five. Low birth weight, a consequence of inadequate maternal nutrition during pregnancy, poses a significant risk

for neonatal mortality. Insufficient intake of essential micronutrients weakens the immune system, making children more susceptible to infections, while malnutrition hinders the recovery process, prolonging illness and increasing the risk of complications. Optimal breastfeeding practices, providing essential nutrients and antibodies, contribute significantly to reducing child mortality. Malnutrition not only influences short-term survival but also has long-term consequences on cognitive development, educational attainment, and overall well-being. Addressing child mortality requires a comprehensive approach that includes nutrition-sensitive interventions, promoting access to nutritious foods, improving maternal nutrition, and enhancing healthcare services to ensure the healthy development of children worldwide.

A. Undernutrition and Growth Stunting:

- Chronic undernutrition, often indicated by growth stunting, is associated with an increased risk of mortality in children under five years old.
- Stunted growth reflects long-term nutritional deficiencies during the early years of life, impacting physical and cognitive development and making children more vulnerable to infections and illnesses.

B. Low Birth Weight:

- Inadequate maternal nutrition during pregnancy can result in low birth weight, which is a significant risk factor for neonatal mortality.
- Low birth weight infants are more susceptible to infections, respiratory distress, and other complications, increasing the likelihood of mortality in the first few weeks of life.

C. Micronutrient Deficiencies:

- Insufficient intake of essential micronutrients, such as vitamin A, iron, and zinc, can compromise the immune system, making children more susceptible to infectious diseases.
- Micronutrient deficiencies contribute to a higher risk of morbidity and mortality from common childhood illnesses such as diarrhea, respiratory infections, and measles.

D. Immunodeficiency:

- Malnutrition weakens the immune system, reducing the body's ability to fight off infections and diseases.

- Children with poor nutritional status are more likely to experience severe and life-threatening complications from preventable and treatable illnesses.

E. Increased Susceptibility to Infections:

- Malnourished children are more prone to infectious diseases, including pneumonia, diarrhea, and malaria.
- Infections can be more severe and have a higher mortality rate in malnourished children due to weakened immune responses.

F. Delayed Recovery from Illness:

- Malnutrition hinders the recovery process for children who become sick. Inadequate nutritional status can prolong illness duration and increase the risk of complications.
- Malnourished children may experience slower wound healing and reduced ability to withstand the stress of illness.

G. Breastfeeding Practices:

- Optimal breastfeeding practices, including exclusive breastfeeding for the first six months of life, contribute significantly to reducing child mortality.
- Breast milk provides essential nutrients and antibodies that protect infants from infections and contribute to overall health.

H. Impact on Cognitive Development:

- Malnutrition during the critical early years of life can have long-term consequences on cognitive development, educational attainment, and overall well-being.
- Impaired cognitive development may lead to a higher risk of accidents, injuries, and poor decision-making, contributing to mortality risks.

Addressing child mortality requires comprehensive strategies that include nutritional interventions to prevent and treat malnutrition. Nutrition-sensitive approaches, such as promoting access to nutritious foods, improving maternal nutrition, and enhancing healthcare services, are essential components of efforts to reduce child mortality and ensure the healthy development of children around the world.

IV. Theory on the Relationship between Education and Health

The relationship between education and health is often conceptualized through various theoretical frameworks that highlight the multifaceted and interconnected nature of these two dimensions. One prominent theory that explores this relationship is the Social Determinants of Health (SDH) framework. This framework posits that social factors, including education, significantly influence health outcomes.

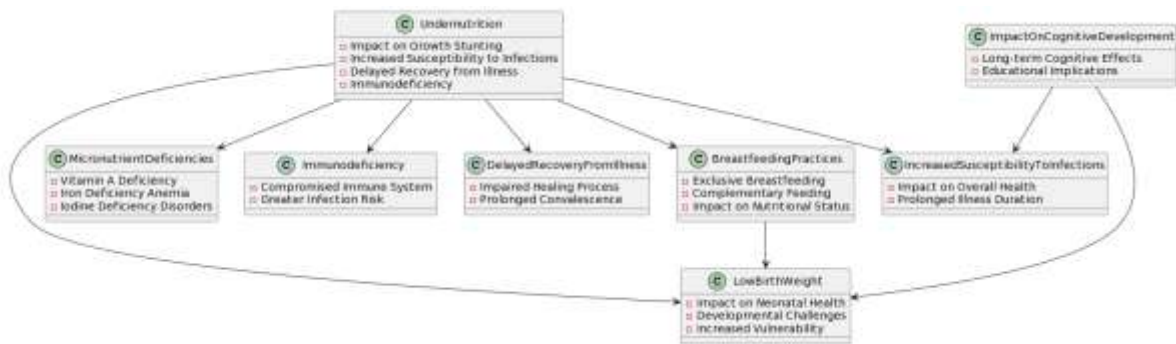


Figure 1. Depicts the Relationship between Education and Health

A. Social Determinants of Health (SDH):

- The SDH framework, endorsed by organizations like the World Health Organization (WHO), emphasizes the impact of social and economic conditions on health. Education is considered a key social determinant influencing health status.
- Higher levels of education are associated with better health outcomes. Education provides individuals with the knowledge and skills to make informed health-related decisions, access healthcare services, and adopt healthier lifestyles.
- Education also influences socio-economic status, which, in turn, affects living conditions, employment opportunities, and access to resources that contribute to overall health.

B. Human Capital Theory:

- Human Capital Theory posits that education enhances an individual's skills, knowledge, and productivity, leading to improved economic outcomes and, consequently, better health.

- Higher educational attainment is linked to increased earning potential, which allows individuals to afford better healthcare, nutrition, and living conditions.
- Education contributes to the development of cognitive and non-cognitive skills, influencing health behaviors and the ability to navigate complex healthcare systems.

C. Health Capital Model:

- The Health Capital Model builds on the concept of human capital but specifically focuses on health as a form of capital that individuals invest in through education and health-related behaviors.
- Education is seen as an investment in health capital, leading to healthier choices, preventive behaviors, and improved overall well-being.

D. Life Course Perspective:

- The Life Course Perspective examines how events and experiences throughout an individual's life, including educational attainment, shape health outcomes.
- Early-life educational experiences can have lasting effects on health in later years. Educational interventions and opportunities during critical developmental stages contribute to long-term health benefits.

E. Behavioral Model of Health Services Use:

- The Behavioral Model of Health Services Use highlights the role of predisposing, enabling, and need factors in determining healthcare utilization.
- Education acts as an enabling factor, facilitating access to healthcare services by providing individuals with the skills to navigate health systems and understand health information.

F. Social Cognitive Theory:

- Social Cognitive Theory, developed by Albert Bandura, emphasizes the role of observational learning and social influence in shaping health behaviors.
- Higher levels of education provide individuals with the cognitive tools to process health-related information, critically evaluate health messages, and adopt behaviors that promote well-being.

V. Nutrition-Specific Interventions to Reduce Child and Maternal Mortality

Nutrition-specific interventions play a crucial role in reducing child and maternal mortality by addressing the specific nutritional needs of mothers and children. These interventions aim to prevent and treat malnutrition, improve overall health, and contribute to positive maternal and child health outcomes. Here are some key nutrition-specific interventions:

A. Prenatal and Antenatal Nutrition Education:

Providing education to pregnant women on the importance of a balanced diet, adequate calorie intake, and essential nutrients during pregnancy.

Emphasizing the significance of prenatal vitamins, including folic acid and iron, to prevent birth defects and anemia.

B. Iron and Folic Acid Supplementation:

Distributing iron and folic acid supplements to pregnant women to prevent and treat anemia, which can have severe consequences for both maternal and child health.

C. Micronutrient Supplementation for Children:

Implementing programs that provide vitamin A supplements to children, as vitamin A deficiency can lead to blindness, weakened immune function, and increased mortality.

D. Promotion of Exclusive Breastfeeding:

Encouraging and supporting mothers to practice exclusive breastfeeding for the first six months of a child's life, as breast milk provides essential nutrients and helps protect against infections.

E. Complementary Feeding Programs:

Implementing initiatives to ensure timely and appropriate introduction of complementary foods, addressing the nutritional needs of infants and young children beyond the breastfeeding period.

F. Treatment of Acute Malnutrition:

Establishing and strengthening programs for the early detection and treatment of acute malnutrition through the provision of therapeutic foods and nutritional rehabilitation.

G. Nutrition Counseling for Mothers and Caregivers:

Offering nutrition counseling to mothers and caregivers, focusing on promoting healthy dietary practices, optimal feeding practices for infants and young children, and preventing malnutrition.

H. Nutrition-Sensitive Agriculture and Food Security Programs:

Integrating nutrition-sensitive approaches into agriculture and food security programs to improve the availability and accessibility of diverse, nutrient-rich foods for vulnerable populations.

I. Clean Water, Sanitation, and Hygiene (WASH) Interventions:

Implementing WASH interventions to ensure access to clean water and sanitation facilities, reducing the risk of waterborne diseases and improving overall health.

J. School-Based Nutrition Programs:

Implementing nutrition education and school feeding programs to address the nutritional needs of school-age children, promoting both health and educational outcomes.

K. Family Planning Services:

Integrating nutrition services with family planning programs to ensure that women have access to reproductive health services, including proper spacing of pregnancies, which can positively impact maternal and child health.

L. Maternal Nutrition Support during Lactation:

Providing support and education to lactating mothers to ensure they maintain adequate nutrition during the breastfeeding period, benefiting both maternal and child health.

Intervention	Target Group	Objective	Implementation Approach	Key Outcomes
Prenatal and Antenatal Nutrition Education	Pregnant Women	Provide education on balanced diets, calorie intake, and essential nutrients during pregnancy.	Health clinics, community outreach, and educational programs	Improved maternal nutrition, reduced birth defects.
Iron and Folic Acid Supplementation	Pregnant Women	Distribute iron and folic acid supplements to prevent and treat anemia during pregnancy.	Health facilities, antenatal care programs	Reduced maternal anemia, improved birth outcomes.
Micronutrient Supplementation for Children	Children	Provide vitamin A supplements to prevent deficiency-related complications and mortality.	Health clinics, outreach programs	Improved child immunity, reduced mortality.
Promotion of Exclusive Breastfeeding	Mothers and Newborns	Encourage exclusive breastfeeding for the first six months, promoting optimal infant nutrition.	Maternity wards, health education campaigns	Improved infant health, reduced risk of infections.
Complementary Feeding Programs	Infants and Young	Implement initiatives for	Health clinics, community	Improved nutritional

	Children	timely and appropriate introduction of complementary foods.	education programs	status, prevention of malnutrition.
Treatment of Acute Malnutrition	Malnourished Children	Establish programs for early detection and treatment of acute malnutrition.	Nutrition rehabilitation centers, community health workers	Recovery from malnutrition, improved child survival.
Nutrition Counseling for Mothers and Caregivers	Mothers and Caregivers	Provide guidance on healthy dietary practices, optimal feeding practices, and malnutrition prevention.	Health clinics, community health workers	Improved knowledge, better feeding practices.
Nutrition-Sensitive Agriculture and Food Security Programs	Vulnerable Populations	Integrate nutrition-sensitive approaches into agriculture programs to improve food availability.	Agricultural extension services, community development	Diverse, nutrient-rich food availability, improved nutrition.
Clean Water, Sanitation, and Hygiene (WASH) Interventions	Communities	Implement WASH interventions to ensure access to clean water and	Public health campaigns, community development	Reduced waterborne diseases, improved community

		sanitation facilities.		health.
School-Based Nutrition Programs	School-Age Children	Implement nutrition education and school feeding programs to address nutritional needs.	School health programs, community engagement	Improved child nutrition, enhanced educational outcomes.
Family Planning Services	Women of Reproductive Age	Integrate nutrition services with family planning programs to promote optimal pregnancy spacing.	Reproductive health clinics, community outreach	Improved maternal and child health, reduced maternal mortality.
Maternal Nutrition Support during Lactation	Lactating Mothers	Provide support and education to ensure adequate nutrition during the breastfeeding period.	Maternity wards, community health programs	Enhanced maternal health, improved infant nutrition.

Table 2. Comparative Study of Nutrition-Specific Interventions

VI. Conclusion

Expanding the reach of impactful nutrition interventions is crucial for preventing maternal and child fatalities. Prioritizing the integration of nutrition-specific measures into maternal and child health initiatives is essential for USAID health projects. Ensuring optimal nutrition for mothers and children during the initial 1,000 days contributes to the well-being of both mothers and newborns, fostering healthy growth and development in infants and children. Moreover, it

diminishes susceptibility to infectious diseases and breaks the detrimental cycle of illness and undernutrition that can lead to child mortality. The global consensus supports the effectiveness of these pivotal, high-impact, and cost-effective interventions for maternal and child nutrition. In implementing these programs, missions must carefully address context-specific challenges and evaluate cost-effectiveness, as detailed in the accompanying guidance briefs within this series.

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