

Maternal Age, Nutrition and Literacy; Targeting the Root Cause for Undernutrition in Children under the Age of Two Years.

Attia Bari¹, Nabeela Mushtaq², Rashidah Javed³, Habib Ullah⁴, Ahsan Waheed Rathore⁵

Abstract

Objective: To analyze the risk factors for child undernutrition in mothers of malnourished children under the age of two years.

Methods: This cross-sectional study was conducted at the Pediatric Medicine Department of The Children's Hospital Lahore from January to December, 2019. A total of 210 malnourished children in the age bracket of 2 months to 24 months and accompanying mothers admitted in the Stabilization Center for nutritional rehabilitation were included. Demographic characteristics of children and their mothers were taken.

Results:

Out of a total of 210 children there was slight male preponderance 116 (55%). Mean age of children was 8.89 + 6.74 months. During first six months of life, only 31 (15%) were exclusively breast fed and in six months or older children weaning food was not started at appropriate age in 91 (43%). Illiteracy was more in mothers as compared to fathers 140 (66.7%) vs 82 (39%). Half 104 (49.5%) of the mothers had satisfactory BMI of 18.5-23 kg/m² and remaining were either severely under nourished or overweight/obese. With advancing age (25 years and above), significantly more mothers were obese 17% as compared to 2.4% in younger age (18-25 years) (p= 0.007). Improper weaning practice was significantly more in mother of younger age group (p=0.023). A significant number of children who were older than six months of age and in whom weaning was not started at appropriate age had WHZ score <-3SD (p=0.019). There was no association of maternal nutrition, maternal/paternal education with the nutritional status of children (p=>0.05).

Conclusion: Maternal illiteracy and both undernutrition and overweight/obesity were prevalent among the mother of undernourished children under the age of two years. Improper weaning was the major contributing factor in child's malnutrition and improper weaning practice was significantly more in mother of younger age group.

Key Words: Maternal, literacy, nutrition, malnutrition, BMI, children, WHZ score, Maternal Age, Nutrition and Literacy; Targeting the Root Cause for Undernutrition in Children Under the Age of Two Years

Introduction

A major health problem of developing world is child under-nutrition, which accounts for at least half of all childhood deaths worldwide.¹ At the individual, household, and community levels, there are many plausible causes of poor nutrition and health status, or it may be a com-

ination of these causes.² Other causes of malnutrition include mother's low body mass index, poor educational status of mothers, multi parity, failure of breast feeding and young age of mother.^{3,4} Women who are undernourished are likely to experience significant negative effects, both on their own and their children's health.² Given that the impacts of undernutrition are passed on to future generations, the nutritional status of women in reproductive age is crucial.⁵ Maternal malnutrition causes fetal growth restriction, which raises the risk of low birth weight babies, preterm labor, neonatal death, as well as the likelihood of stunting by the time the child is two years old.⁶ Mothers who are severely undernourished produce less milk, which increases the risk of child mortality.⁷ Later on these children have poor cognition, academic performance, professional achievement as adults.⁸ There is strong association of child's health with maternal education and it is documented that children of educated mothers are usually well nourished.⁹ If mother has good knowledge of nutritious diet, she can raise children well by giving them balanced diet and it is found that not only education but health related education has great impact on child's health.¹⁰ In a developing country like Pakistan, less attention is paid on maternal nutrition and education. According to the National Survey of Pakistan 2011, undernutrition among children and mothers is very common in Pakistan. In Pakistan, about 44% of children suffer stunted growth, and one in every two mothers is anemic because of a deficiency of iron.¹¹ Strategies for improving maternal nutritional status both during pregnancy and afterward (when nursing) have the positive affect both on mother and child health.¹² We should make possible efforts to increase literacy and health awareness of mothers. Major benefits can be obtained by making health information accessible. There is scarcity of research on this topic from our country to determine the maternal health status of young children. We planned this study in order to comprehend and gain insight into the child malnutrition and its related factors like maternal wellness, literacy and feeding/weaning practices for their children under the age of two years. For this purpose more qualitative and mixed method research studies need to be done.

Methods

From January to December 2019, we conducted this cross-sectional study at The Children's Hospital Lahore. In the Stabilization Center for Nutritional Rehabilitation all malnourished children admitted between the ages of 2 months and 2 years, along with their accompanying mothers were included. After receiving the mothers' written informed consent and receiving approval from the hospital's institutional review board, data was

¹Professor, Department of Pediatric Medicine, The Children's Hospital and Institute of Child Health, Lahore.

²Assistant Professor, Department of Pediatric Medicine, The Children's Hospital and Institute of Child Health, Lahore.

³Nutritionist, The Children's Hospital and Institute of Child Health, Lahore.

⁴Senior Registrar, Department of Pediatric Medicine, The Children's Hospital and Institute of Child Health, Lahore.

⁵Professor, Department of Pediatric Medicine, Vice Chancellor, University of Health Sciences, Lahore

Correspondence to

Dr. Attia Bari

Professor, Department of Pediatric Medicine, The Children's Hospital and Institute of Child Health, Lahore.

E-mail: drattiabari@gmail.com

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gathered. By using the prevalence of wasting in children under the age of five as 15% and malnutrition in women of childbearing age as 18% in Pakistan, a sample size of 210 is computed with a 95% confidence interval and a 5% margin of error. All children and their mothers had their height and weight anthropometrically measured. Weight of both mothers and children were measured using a digital scale, and the results were recorded (to the nearest 0.1 kg). Measurements of child and maternal height were taken using the infantometer and the stadiometer, respectively (to the nearest 0.1 cm). For children, the WHZ score was plotted and for moms, the BMI was determined.

Severe acute malnutrition (SAM) (WHZ score; -3SD) and moderate acute malnutrition (MAM) (WHZ score; -2SD) were classified according to the standard malnutrition classification. BMI was calculated using the weight in kilograms divided by height in meters squared calculation and defined by the WHO as underweight (BMI=18.5 kg/m²), normal (BMI=18.5-23 kg/m²), overweight (BMI=24-30 kg/m²), and obese (BMI=30 kg/m²).¹³ Our qualified staff nurse who is a permanent employee of the Stabilization Center gathered the data, and a nutritionist determined BMI.

Age, gender, bottle feeding, and the beginning of weaning from breast milk were among the demographic details noted. Both the mother and father's literacy data were gathered and classified as either illiterate or educated (primary, secondary, graduate, or master's degree). Also highlighted was the father's employment status. Data analysis was done using SPSS version 22 statistical software. Quantitative variables like age and BMI were described as mean and SD. By calculating frequency and percentages, qualitative characteristics like gender, feeding habits, parental education, and fathers' employment position were presented. The relationship between categorical variables was determined using the chi-square test, and a p-value of 0.05 or below was deemed significant

Result

A cohort of 116 (55%) of the total 210 children under the age of two who presented were male. Ninety (43%) of the children were under the age of six months, with an overall mean age of 8.89 + 6.74 months. Majority 152 (72%), were -3SD. Only 31 (15%) of all children received breast milk exclusively for the first six months of life. Weaning food was not introduced to 91 (63%), who were six months or older (Table 1).

Table-1: Demographic Profile of Children

Characteristics	N(%)
Child's Age (mean ± months) 8.89 + 6.74	
<6 months	90(43%)
6 months- <1 year	55(26%)
1 year- 2 years	65(31%)
Sex distribution	
Male	116(55%)
Female	94(45%)
Child's Nutritional Status	
<1 SD	14(07%)
<2 SD	44(21%)
<3 SD	152(72%)
Child's feeding	
Exclusive Breast Fed (BF)	31(15%)
Exclusive Top fed	93(44%)

B.F & Top fed	86(41%)
Weaning Practices	
6 months or older & not started yet	91(43%)
At < 6 months	13(06%)
At 7-8 months	80(38%)
At >10 months	26(13%)

Parental demographic characteristics are shown in (Table 2). Illiteracy was more in mother as compared to fathers' 82 (39%) vs 140 (66.7%) and two third 134 (63.8%) of fathers' work on daily wages. Almost half 104 (49.5%) of the mothers had satisfactory BMI of 18.5-23 kg/m² and remaining were either severely under-nourished, overweight or obese.

Table-2: Socio demographic Profile of Parents

Characteristics	N(%)
Maternal Age (mean 28.09 ± 5.21 years)	
18-25 years	84(40%)
26-30 years	74(35.2%)
31-40 years	52(24.8%)
Maternal Health/ BMI (mean 24.0 ± 5.58)	
<18.5	26(12.4%)
18.5-23	104(49.5%)
24-30	58(27.6%)
>30	22(10.5%)
Maternal Education	
Illiterate	140(66.7%)
Primary	33(15.7%)
Secondary	27(12.8%)
Graduate	8(3.8%)
Masters	2(1%)
Father Education	
Illiterate	82(39%)
Primary	64(30.5%)
Secondary	55(26.2%)
Graduate	4(1.9%)
Masters	5(2.4%)
Father's Occupation	
Employee	62(29.5%)
Daily Wages/ laborer	134(63.8%)
Business	8(3.8%)
Unemployed	4(1.9%)
Farmer	2(1%)

With advancing age (25 years and above) significantly more mothers were obese 17% vs 2.4% in younger age (18-25 years) as more mothers in this younger age group had low BMI of <18.5-23 kg/m² 19% vs 02% in mother in 31-40 years of age (p= 0.007) (Figure-1).

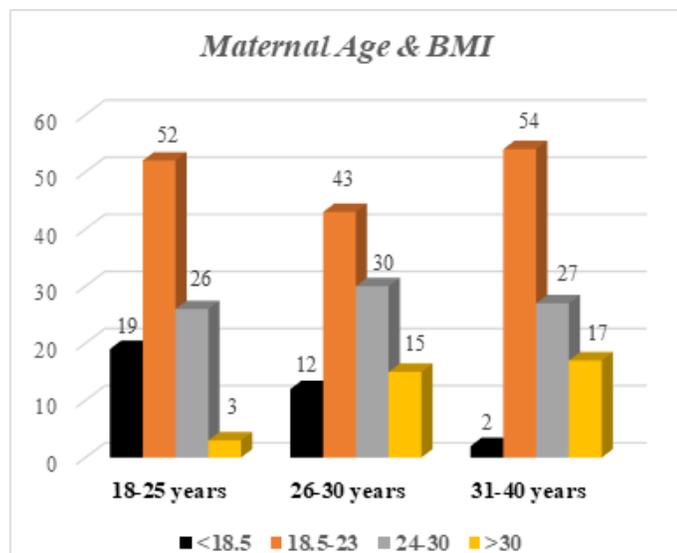


Figure-1: Maternal Age & Nutritional Status based on BMI

The nutritional status of children was unrelated to maternal nutrition or maternal/paternal education (p 0.05). Improper weaning practice was significantly more in mother of younger age group (p=0.023). Significantly more children who were older than six months had SAM with WHZ score <-3SD in which weaning was not started at appropriate age (p=0.019).

Discussion

Malnutrition of mothers and children, which frequently occurs in low- and middle-income countries, significantly raises mortality rates and disease burden. Stunted children are disproportionately prevalent in South Asia and have worse health, cognitive, and academic outcomes.⁸ In this study, we present our data analyses to quantify the effects of maternal nutritional status, literacy, and their feeding/ weaning practices connected to child's health status.

A study conducted in several South Asian nations found a 25% to 50% link between maternal malnutrition and fetal growth retardation and malnutrition in later life, underlining the importance of assessing and improving maternal nutrition for good outcomes.¹⁴ According to our research, mothers of undernourished children suffer from malnutrition in the form of undernutrition, over-weight, and obesity. In our country, preterm birth, low birth weight neonates, and fetal distress are all linked to iron deficiency anemia in pregnant women, maternal stress and pre/post-partum depression.

Based on BMI, we discovered that over half of the moms were malnourished, either in the form of undernutrition, overweight, or obesity. In a study from Ethiopia, maternal nutritional status was assessed by using MUAC, and it was discovered that 24% of pregnant moms were malnourished.¹⁵ Similarly, over 20% pregnant women in South Asia based on BMI were discovered to be malnourished.¹⁶ Things have not been changed over years as in a recent study published in Mater Child Nutr, 23% of mothers were underweight, 12 percent were overweight/obese, and 11 percent had excess body fat, according to BMI.¹⁷

The majority of food consumed in resource-poor countries is

carbohydrate-based, which contributes to adult obesity tendencies. More than a quarter of the female participants who consumed cereal as their primary source of nutrition had malnutrition in a research conducted in Nepal, as indicated by a low BMI of 18.5.¹⁸ The basic food for poor class in our country is also carbohydrate including wheat and rice resulting in tendency to be over-weight and obesity in mothers who participated in our research.

Our data included malnourished children who were admitted for nutritional rehabilitation, and we discovered that only 15% of those children were exclusively breastfed during their first six months of life, while in remaining children half were exclusively bottle-fed and the other half received both bottle and breast milk. Similar findings were found in a South Indian study that children who received supplementary feeding at 14 weeks had a roughly 2.5 times higher likelihood of being wasted than infants who were solely breastfed (OR: 2.449, p-value: 0.002).¹⁹ Improved breast-feeding practices and mother nutritional supplements are directly linked to higher child growth outcomes, according to a study conducted in Vietnam.²⁰

In our research regarding the appropriate age of weaning food introduction, improper weaning practice was significantly more in mother of younger age group and significantly more children who were older than six months had SAM with WHZ score <-3SD in which weaning was not started at appropriate age. Similar findings were show in a study published in BMC Public Health in which majority of children were weaned at >6 months and were found to be more undernourished (79.34%) as compared to those in whom weaning food was introduced between 4 and 6 months, (61.50%). Moreover, malnutrition was discovered in the majority of children who were weaned insufficiently, both in terms of frequency and amount.²¹

Demonstrating a strong link between maternal educational status and child health, our study showed that illiteracy was found in 66.7% of mothers of malnourished children referred for nutritional rehabilitation although no relation was found with the severity of wasting in the present study. Similar results were shown in research from our country that significantly more children were discovered stunted, wasted and underweight in illiterate mothers or having low level of education.²² In research comparing Bangladesh and Indonesia, higher maternal education was found to be associated with a lower risk of stunting in children shown by the figures of 50.7% stunted children in Bangladesh, compared to 33.2 % in Indonesia.²³

Limitations: Major limitation is that only malnourished children admitted for nutritional rehabilitation who belonged mostly to poor social class were included and secondly it was a single centered study limiting the generalization of our results to normally nourished children and other social classes. Another limitation was that we only took BMI of mothers as an indicator of their nutrition and we did not dig into the amount and type of daily diet consumed by the mothers which may have given us true picture and underlying dietary factors of maternal undernutrition and obesity as well.

Authors' Contribution

AB Conceived, data analysis, manuscript writing, NM Contributed in manuscript writing; RJ Maternal data collection, HU did data management, AWR gave Final Approval;

Conclusion:

Malnutrition primarily affects children of lower economic class, and the nutritional wellness of these malnourished children's mothers is also suboptimal. Maternal illiteracy and malnutrition both undernutrition and overweight/obesity, is prevalent among the mother of undernourished children under the age of two years. Improper weaning was the major contributing factor in child's malnutrition and improper weaning practice was significantly more in mother of younger age group. We should spe-

cifically focus on the general health of our young mothers and also work on media campaigns on awareness of weaning food.

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¹Medical Student 4th year MBBS, Central Park Medical College Lahore, Pakistan

²Medical Student 2nd year MBBS, Central Park Medical College Lahore, Pakistan