EPIDEMIOLOGIC RISK FACTORS ASSOCIATED WITH MALNUTRITION IN CHILDREN (3-5 YEARS) AT DISTRICT PESHAWAR

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ABSTRACT

OBJECTIVES

This study was designed to assess the prevalence of malnutrition in terms of wasting and stunting in children between 3 to 5 years of age and to analyze the risk factors associated with malnutrition among them in the district of Peshawar.

METHODOLOGY

This cross-sectional study was conducted in the district of Peshawar. Multi-staging simple random probability sampling selected a sample of 225 children between 3 and 5 years. The data was collected through a structured questionnaire containing demographic, risk factors and anthropometry.

RESULTS

In a sample of 225 children, the prevalence of malnutrition was quite alarming. Stunting and wasting were observed in the age group 3-5 years. Low weight- for height was observed at 20%, and leanness through mid-arm circumference among children between 3-5 years of age in Peshawar district was 28%, although the mean values for all the indicators fell at the 50th percentile. About 76.9% were exclusively breastfed, and 29.8% of children were partially vaccinated. The association of low MUAC with breastfeeding (chi-square value of 28.9 & P= <0.001), vaccination (chi-square value (χ^2) 80.3 & P=<0.001), weaning (χ^2= 31.1 & P= <0.001), mother's education (χ^2= 5.28 & P= <0.028), family income χ^2= 40.79 & P= <0.001), birth defects (χ^2= 8.39 & P= <0.009), and frequent infections (χ^2= 36.5 & P= <0.001) respectively showed that these confounding factors were the major factors behind these malnourished children. Almost the same association was found in the low ? χ2= 31.1 & P= <0.001) and the tested socio-demographic and dietary factors. However, family size failed to show negative impacts in our study.

CONCLUSION

Malnutrition tends to occur more in children who are not breastfed, started weaning later than 6 months, are not vaccinated, have birth defects and frequent infections, are born to uneducated mothers, and have low family incomes.

KEYWORDS: *Malnutrition, Anthropometry, Socio - demographic factor,Breastfeeding, Vaccination*

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INTRODUCTION

Malnutrition is a universal problem affecting most of the world's population at some point in their life. According to the World Health Organization (WHO), malnutrition refers to deficiencies, excesses or imbalances in a person's energy intake and/or nutrition. The term malnutrition covers two broad conditions: under-nutrition, overweight, obesity, and diet-related non-communicable disorders.[1] Children who suffer from growth

retardation due to poor diets and/or recurrent infections tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases, such as malaria, meningitis, and pneumonia.[2] Malnutrition among Children under five years of age is a globally recognized health issue. It alone is responsible for the death of more than 50% of children under 5 years of age worldwide, claiming 3.5 million children's lives annually.[3] Children who are moderately or severely wasted have a higher risk of mortality.[4,5] According to the 2018 Global Nutrition Report, the problem of malnutrition remains severe. The statistics in this report show that globally 150.8million children under 5 years of age are stunted, 50.5million is wasted & 38.3million are overweight.[6] Moreover, 20million newborn babies are estimated to be of low birth weight. Regionally South Asia is home to 38.9% of the world's stunted children and more than half of the wasted children.[7] Malnutrition is a significant health concern in a developing country like Pakistan. The 2011 National Nutrition Survey, Pakistan, shows that 58% of the Pakistani population is food insecure. The statistics for Khyber Pakhtunkhwa (KP) reveal that the prevalence of stunting among children under 5 years of age in KPK was 47.8%, the prevalence of wasting was 17.2%, and that of underweight was 24.1 %.[8] A study conducted in three tertiary care hospitals in Peshawar in 2015 to assess the nutritional status of children under 5 years of age suggested that 58.94% of children were malnourished & 42% of children had stunted growth.[9] Assessment of malnutrition can be made by different methods such as clinical assessment, anthropometry, and dietary & blood biochemistry tests. Anthropometric indices are constructed based on combinations of these body measurements; for example, the weight alone has no meaning unless it is related to an individual's age or height.[10] In children, the three most commonly used anthropometric indices are weight-for-height, height-for-age, and weight-for-age.[11]

METHODOLOGY

The study was a cross-sectional descriptive study and included eight union councils of district Peshawar and these eight union councils were randomly selected out of the 92 union councils of district Peshawar. A sample of 225 children aged 3-5 years was included in the study Multi-stage simple random probability sampling was used to select the study units for our research. The purpose of the study was explained to the mothers, and based on their verbal/written consent, children free from or who had not had a very comparative history of infections were assessed for anthropometry, while mothers were interviewed for the socio-demographic dietary patterns of the children. Physical instruments and a well-structured questionnaire were used to gather data about socio-demographic factors, environmental factors, birth history and feeding practices, recent illness, availability of health facilities, and utilization. Simultaneously height, weight & MUAC of the children were also measured for data collection. The physical instruments comprised a standardized weighing scale for measuring weight and a standard height scale for measuring the children's height included in the research. Mid arm circumference was measured with a measuring tape. Data collected were recorded on paper questionnaires and analyzed through SPSS Software. The mean value was compared with WHO growth standards. The study was approved by the ethical approval committee following the guidelines of the Declaration of Helsinki, and all the procedures were non-invasive.

RESULTS

Table 1: Anthropometric Profile of Children between Years

Variable	Age (years)	Mean± S. D	*WHO Percentile Ranks
Weight (kg)	3 – 3.5	13.9 ±3.5	50th
	3 .6 – 4.0	14.9 ± 4.4	50th
	4.0 – 4.5	15.8 ± 3.9	50th
	4.5 – 5.0	16.4 ± 3.9	<50th &>15th
Height (cm)	3 – 3.5	98.5 ± 15.5	50th
	3 .6 – 4.0	102.1 ± 15.4	50th
	4.0 – 4.5	108.0 ± 16.2	>50th &<85th
	4.5 – 5.0	112.4 ± 16.0	50th
Muac (cm)	3 – 3.5	16.1 ± 1.34	50th
	3 .6 – 4.0	16.4 ± 1.43	50th
	4.0 – 4.5	16.5 ± 1.67	50th
	4.5 – 5.0	17.1 ± 1.55	>50th &<85th

*WHO Child Growth Standards

Table 2: Frequencies and Percentages of Various Variables

Variables		Numbers	Percentage
Mid Arm Circumference (Cm)	Normal	180	80%
	Below normal	45	20%
Weight(Kg)	Normal	162	72%
	Below normal	63	28%
Breastfeeding	Exclusive	173	76.9%
	Non-exclusive	52	23.1%
Child Vaccination	Fully immunized	136	60.4%
	Partially immunized	67	29.8%
	Not immunized	22	9.8%
Child Weaning	Before 6 months	90	40%
	At 6 months	93	41.3%
	After 6 months	42	18.7%
Mothers' Education	Literate	94	41.8%
	Illiterate	131	58.2%
Family Size	2 siblings	33	14.7%
	More than 2 siblings	192	85.3%
Family Income	Average and above	181	80.4%
	Low income	44	19.6%
Birth Defect	No	211	93.8%
	Yes	14	6.2%
Frequent Infections	No	201	89.3%
	Yes	24	10.7%

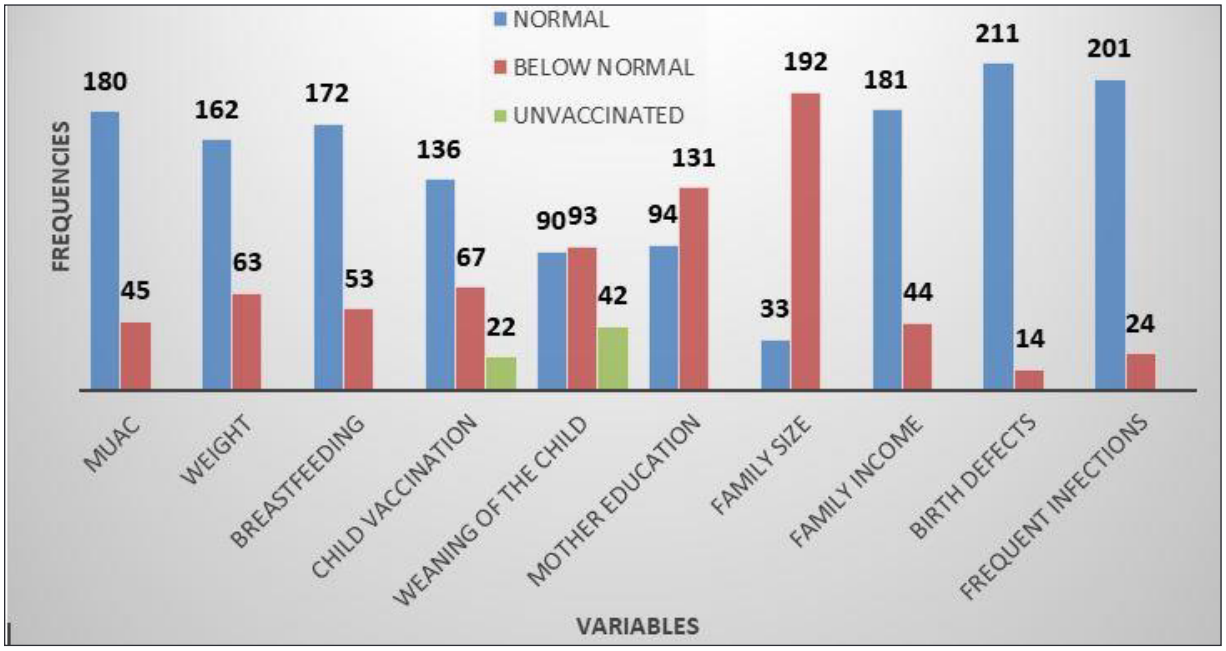

Figure 1: Frequencies of Various Variables

**Normal MUAC, weight, breastfeeding, fully vaccinated child, weaning before 6 months, educated mother, family size <2 members, family income average and above, no birth defect, no frequent infections. Below normal MUAC, weight, no breastfeeding, partially vaccinated child, weaning at 6 months, un-educated mother, family size >2 members, family income low, have a birth defect, have frequent infections. Un-vaccinated child, weaning after 6 months. Un-vaccinated child, weaning after 6 months.*

Table 3: Association of Variables with Below Normal Mid Upper Arm Circumferences

Variables	Sample's Status	Mid Arm Circumference		Chi-square 'x' value	P-Value
		Normal	Below Normal		
Breast Feeding	Exclusive	152	21	28.9	<0.001
	Non-exclusive	28	24		
Child Vaccination	Fully immunized	132	4	80.31	<0.001
	Partially immunized	43	24		
	Not immunized	5	17		
Child Weaning	Before 6 months	88	2	31.1	<0.001
	At 6 months	66	27		
	After 6 months	26	16		
Mother Education	Literate	82	12	5.28	0.028
	Illiterate	98	33		
Family Size	2 siblings	27	6	0.08	1.0
	More than 2 siblings	153	29		
Family Income	Average and above	160	21	40.79	<0.001
	Low income	20	24		
Birth Defect	No	173	38	8.39	0.009
	Yes	7	7		
Frequent Infections	No	172	29	36.5	<0.001
	Yes	8	16		

Table 4: Association of Variables with Below Normal Weight

Variables	Sample's Status	Weight		Chi-Square 'x' value	P- Value
		Normal	Below Normal		
Breast Feeding	Exclusive	138	35	22.4	<0.001
	Non-exclusive	24	28		
Child Vaccination	Fully immunized	121	15	60.3	<0.001
	Partially immunized	37	30		
	Not immunized	4	18		
Child Weaning	Before 6 months	79	11	18.5	<0.001
	At 6 months	57	36		
	After 6 months	26	16		
Mother Education	Literate	78	16	9.6	0.002
	Illiterate	84	47		
Family Size	2 siblings	26	7	0.884	0.407
	More than 2 siblings	136	56		
Family Income	Average and above	148	33	43.8	<0.001
	Low income	14	30		
Birth Defect	No	157	54	9.7	0.004
	Yes	5	9		
Frequent Infections	No	155	46	24.4	<0.001
	Yes	7	17		

DISCUSSION

The current study endeavored to investigate the prevalence of malnutrition in children between 3 to 5 years of age & the risk factors associated with malnutrition in district Peshawar. The prevalence of underweight among children between 3 to 5 years of age in Peshawar district was 28%, more than the National Nutrition Survey (NNS) 2018 for Khyber Pakhtunkhwa. The current study suggested that wasting (lower mid-arm circumference) in district Peshawar among children is 20%. This shows that wasting is more prevalent in the Peshawar district than data for Pakistan in National Nutrition Survey(NNS) 2018.[8] About 25.3% of the exclusive breastfed and 53.8% of the non-exclusively breastfed children were underweight. Regarding average weight for age, the percentage was 70% for the exclusively breastfed children and 49% for the non-exclusively breastfed children, with the significant chi-square value of 22.4 and 28.9, respectively. These results were not consistent with some results found in the literature that is exclusive breastfeeding and infant feeding in the first six months of life have no significant effect on the nutritional status and body composition of children.[13] The percentage of normal children was 83.9% for those weaned at or before 6 months and 16.1% for those weaned at an age later than six months (chi-square 31.1, 18.5). This shows a significant relationship between the time of initiation of weaning and the nutritional status of children. Prevalence of malnutrition was more in

cases where the weaning of children was started later than 6 months. Our results agree with the research which also concluded in their study that the timing of weaning is significantly associated with stunting among children in India.[14] In the same way, 83% of children of educated mothers were found to be of average weight, and 64% of children of illiterate mothers were of normal weight. A study highlighted three links through which education may affect child health. First, formal education of mothers directly transfers health knowledge to future mothers. Second, the literacy and numeracy skills that women acquire in school. Third, an increased number of years in school makes women more receptive to modern medicine. This significant difference shows the importance of an educated mother for a child's normal health and nutrition.[15] The current study also shows a significant relationship between the child's weight for age and immunization status. Out of 225 children included in our study, 136 were fully immunized, of which 121(88.9%) had normal weight for age, 67 were partially immunized, of which 37(55.2%) were normal, and of the 22 non-immunized children, only 4(18%) were having normal weight. There were 63 underweight children, out of which 68.1% of children's family income was below 10000, and only 18% of children from families with income > 10000 were underweight. However, most of the previous data suggested that food-insufficient groups have higher obesity rates than food-sufficient groups; our analysis did not show that food insufficiency is associated with self-reported measures of obesity in children but was the opposite.[16,17,18] Similarly, birth defects (cardiac, gastrointestinal, musculoskeletal) and frequent child infections (chest and diarrhoea) are significant risk factors for malnutrition in children below five years of age (X; 8.39, 9.7 and 36.5, 24.4, respectively).Interestingly, unlike the literature review, family size is not found to be a significant risk factor. The possible reason may be that family planning is not adopted in our region, and that's why most children have more than two siblings.

CONCLUSION

Malnutrition tends to occur more in children who are not breastfed, started weaning later than 6 months, are not vaccinated, have birth defects and frequent infections, are born to uneducated mothers, and have low family income. Educated mothers having proper nutritional guidelines regarding the healthy upbringing of a child can play an important role in lowering the ratio of malnutrition in Peshawar, KP.

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