Original Article

Demographic Profile Associated With Malnutrition

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Abstract:

Worldwide, malnutrition is the severe most health problem leading to the highest rate of disease and mortality among children less than 5 years of age. **Objective:** To find out the association between malnutrition and demographic profile. **Methods:** 350 malnourished children were chosen by non-probability convenient sampling technique from Sir Ganga Ram Hospital, Lahore. Children were assessed through pre-tested questionnaire. Data were analyzed by SPSS version 21.0. **Results:** 45% malnourished children were 1-3 years of age, majority of the children were females (52%), 89% children were from rural areas, 82.6% children were from low socioeconomic status, 54.6% mothers were uneducated, 50% malnourished children were not having their own house, 115 malnourished children were having 3 or more siblings and 89 mothers were having less than one year of pregnancy gap. **Conclusions:** Low socioeconomic status, illiteracy of mothers, rural area, gap between pregnancy and female gender has been found to be linked with malnutrition in children below 5 years of age.

Key words: Malnutrition, SGA, siblings, socioeconomic status, under five, stunting, wasting

Introduction:

Malnutrition is the serious nutritional disordered, which leads to a combination of erratic notches of under nutrition and inflammatory activity has managed to a modify body composition, contracted the function and outcome [1]. A child can be malnourished in both ways undernourished or over nourished, but mostly malnutrition occur world widely when child are undernourished [2]. The main reasons of under nutrition according to UNICEF are generally environmental, socio economic factors and poverty [3]. The anthropometric meters used to evaluate the nutritional status of children and under nutrition expression are stunting (height- for-age), wasting (weight-for-height) and underweight (weight-for-age) [4]. Under nutrition (weight-for-age) is a compound key of height-for-age and weight-for-height. Wasting (acute malnutrition) calculates body weight in reference to height and indicates the present nutritional status. Stunting (chronic malnutrition) is the sign of straight growth hindrance and progressive growth insufficiencies in children [5]. In Pakistan, 33% children less than age of 5 years were malnourished as reported in a study published in 2012 [6]. According to UNICEF annual report 2015, stunted (low height for age) was (30-40%) 6.2-8.3 million (M) and wasted (low weight for height) were 14% (2.9 M) [7]. According to the ranking, Pakistan is on second place in infant and child death in South Asia. The morbidity and mortality rates in Pakistan are elevated in newborn baby and children under 5 years of age because of malnutrition [8]. The Millennium Development Goal tries to eliminate mortality rate of children less than 5 years of age by two third between the year 1990 and 2015. And another organization that is World Fit for Children also aims to reduce the mortality rate and malnutrition of the children that are categorized under the age of 5 years by minimum of one third and make consistent efforts to decrease the rate by two third in the

year of 2015. The child mortality rate less than five year of age was 18 times higher in low income countries than the high income countries. Moreover, in Asia, the death of less than five decreased nearly half between 1990 and 2011. Hence, in 2011 the malnutrition was responsible for 3.1 M of children death, 100 M of child underweight and 52 M of wasting among children less than five [9]. The severity of malnutrition in children under 5 years of age is due to the factors influencing the child's health e.g. demographic factors (age, sex, birth order), socioeconomic (parents education, household status, residential area and nutritional status of mother). Most recognized and identified factor in child malnutrition is mother's education. Primary cause of under nutrition, particularly in children under the age of 5 years is low socioeconomic status [4].

A cross-sectional study was done by Gul R and Kibria Z, during 2013 to find out the relationship between malnourishment and socioeconomic factors among children under the age of 5 years in Peshawar. Study concluded that large household size, low socioeconomic status, uneducated mothers and pregnancy in females with earlier age group [10]. Another study conducted by Khan-Khattak MM and Shah JS, to assess the malnutrition in children below five years during 2010 concluded that underweight children were 48%, severely malnourished were 10%, stunted were 46%, wasted were 15% and 20% were acute malnourishment children. Factors responsible for malnutrition were family income, household's volume and number of children [11]. In Pakistan, Di Cesare M *et al.*, conducted a study in 2015, the major risks of malnutrition were linked with poor economic capacity and inability to consume meat, dairy products daily in their dietary practices. Malnutrition was linked to low socioeconomic status. National Nutrition Survey Report of Pakistan reported that, 45.3 M people which accounts for 28% of the population were the sufferers of food insecurity [12]. A study performed by Babatunde RO *et al.*, in children less than 5 years of rural families Nigeria, illustrated that stunted children were 23.6%, underweight were 22% and wasted were 14.2%. The outcomes explain that the risk factors of malnutrition were child sex and age, mother body mass index and education [13].

The study was aimed to determine the association between malnutrition and demographic profile, in order to highlight the demographic factors responsible for malnutrition among children under five years of age. So that after highlighting the causative factors of malnutrition, attempts could be made to address the problem in order to reduce the burden of disease in the society.

Methods:

It was a cross-sectional study, carried out at indoor and outdoor units of Preventive Pediatrics Department, Sir Ganga Ram Hospital, Lahore. Data were collected with the help of pre-tested questionnaire. Selection of 350 malnourished children under 5 years of age which includes both genders was done through non-probability convenient sampling technique during 2017. Sample size was calculated through WHO formula, by setting alpha level of ≤0.05, probability level as 95% and the prevalence of the disorder was taken as 33% 6. Growth standards of WHO were used to define malnutrition, launched by WHO applicable to all children irrespective of their feeding practices, socioeconomic status and ethnicity. These widely being used standards in more than 125 countries of the world including Pakistan; differentiate effectively among malnourished and healthy children [14]. MS excel and SPSS version 21.0 were used for data analysis. Frequencies were derived and association among variables was determined by chi-square test ($p>0.05$). children having normal nutritional status below five years of age were excluded. Malnourished children above 5 years of age, or from other hospitals were also excluded. SPSS version 21.0 was used for recording and analyzing the data. Frequencies were derived and paired sample t-test was applied.

Results:

Demographics of 350 malnourished children are shown in **Figure 1**. 10.3% malnourished children were less than 6 months of age, 23% malnourished children were from 6months to 1 year, 45% were 1-3 years and 21.1% malnourished children were 3-5 years of age. Malnutrition rates were high in children age between 1-3 years. Majority of the children were females (52%) as compared to males(48%). 11% malnourished children were from urban areas and most of the malnourished children (89%) were from rural areas. Analysis showed that, 54.6% mothers were uneducated, 82.6% children were belonging from low socioeconomic status, while 8% were from middle and 9.4% were from high socioeconomic status.50% were not having their own house (figure 1)

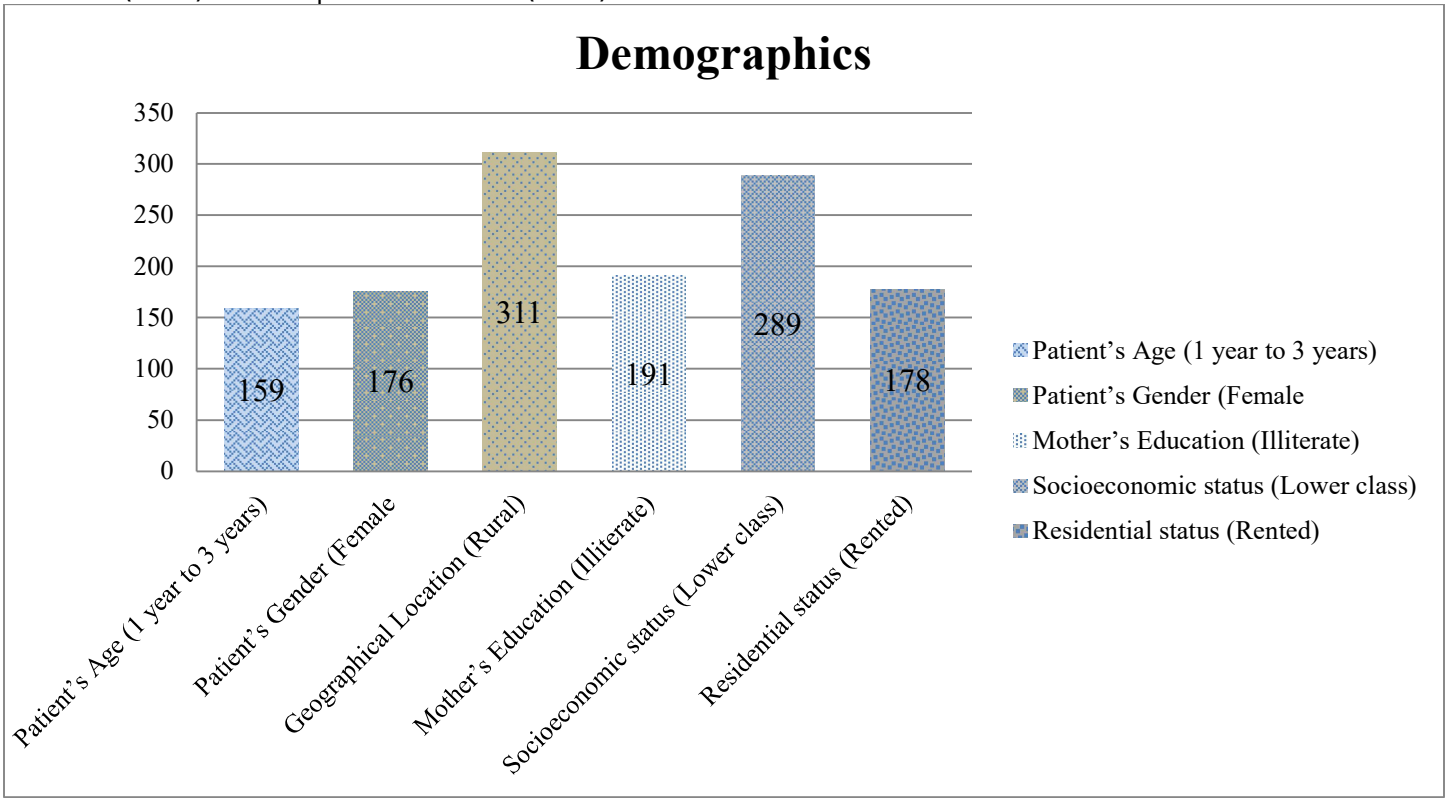

Figure 1: Demographics of malnourished children

Analysis revealed that mother's age at the time of conception associated with Subjective Global Assessment (SGA) of child (p=0.000). 23 underweight and stunted children had mothers with age less than 20 years (Table 1). 56 underweight and wasted children had mothers within age range of 21-25 years. While 22 stunted children, wasted and underweight children had mothers with 26-30 years of age. 13 underweight and stunted children had mothers in in the age group of 31-35 years (Table1). 3 underweight and 3 wasted children had mothers in age group 36-40 years (Table 1). Analysis revealed that there was strong association between Subjective Global Assessment (SGA) and demographic profile of families (p=0.004) (Table 1). 34 underweight children were from rural areas while no one from urban areas. 20 wasted children were from rural area while only 3 were from urban areas. 47 stunted children were from rural area while 4 were from urban areas. 79 underweight and stunted children were from rural area while 7 were from urban areas. 60 underweight and wasted were from rural areas while 18 were from urban areas. 71 stunted, wasted and underweight children were from rural area and 7 were from urban areas (Table 1).

Subjective Global Assessment of child		Under weight	Wasted	Stunted	Under weight and Stunted	Under weight and Wasted	Stunted Wasted and Under weight	Total	P - value
Mother' s Age at the time of conception (Years)	<20	0	3	6	23	3	7	42	0.000
	21-25	24	11	32	33	56	46	202	
	26-30	7	3	10	17	11	22	70	
	31-35	0	3	3	13	8	3	30	
	36-40	3	3	0	0	0	0	6	
	Total	34	23	51	86	78	78	350	
Geographic al Location	Urban	0	3	4	7	18	7	39	0.04
	Rural	34	20	47	79	60	71	311	
	Total	34	23	51	86	78	78	350	

Table 1: Association between mother's age and Geographical Location with SGA of children

There is significant association observed between mother's education and number of siblings (p=0.000). As shown in Table 2, 83 illiterate mothers were having 3 or more children. While most of (48) educated mothers were having only one other child. Socioeconomic status of family and gap between pregnancy were also significantly associated (p=0.01).

Mother's Education	Siblings				Total	P-value
	1	2	3 Or more	None		
Illiterate	43	38	83	27	191	0.000
Educated	48	33	32	46	159	
Total	91	71	115	73	350	

Table 2: Association between mother's education and number of siblings

As shown in Table 3, 82 mothers with less than one year of pregnancy gap were from low socioeconomic status, 162 (46.2%) with more than one year of gap and 45 (12.8%) having single child were also from low socioeconomic status.

Gap between Pregnancy	Socioeconomic status of family			Total	p-value
	Lower class	Middle class	High class		
Less than one year	82	3	4	89	0.01
More than One year	162	22	19	203	
Mother with one child	45	3	10	58	
Total	289	28	33	350	

Table 3: Association between socioeconomic status and pregnancy gap

Discussion:

According to the current study, malnutrition was more prevalent among female children. Similar results were found by Nagar V *et al*, during 2018 that the prevalence of malnutrition was less in males and higher in females comparatively [15]. Riaz T and Naeem M, in 2017 also concluded that female gender was a major factor for malnutrition [16]. Another similar finding was observed by Minhas A and Sharma S [17]. But contradictory results were observed in a study conducted at Swat, Pakistan [18]. According to the results of current study, majority of the mothers were uneducated. These results are similar to a study performed by Jawad IH *et al.*, during 2018 [19]. Another similar finding was observed by Riaz T and Naeem M, during 2017, at Nawaz Sharif Social Security Hospital, Lahore. Previous study showed that illiteracy among mothers leads to malnutrition [16]. Similar results were also observed in children within age range of 0-59 in sub Himalayan area during 2017, High risk of under nutrition was observed in children with uneducated mothers [17]. Ghaffar F *et al.*, also concluded that one of the risk factor for under nutrition was illiterate mothers [20]. A similar study conducted in Peshawar (KPK) during 2015, reporting 84.5% mothers of malnourished children were uneducated [21].

In the current study, household status of 50% children didn't own house while similar result were revealed by Sackou KJ *et al.*, in 2016 performed a cross-sectional study in Abidjan, that household status is one of the high risk factor of malnutrition [22]. According to Asfaw M *et al.*, in 2015, household status was the main causing agent of under nutrition [23]. Another similar finding was also observed in Ethiopia during 2013 [24]. Findings of the current study revealed that 82% malnourished children belonged to lower class, 8% belonged to middle class whereas 10% belonged to high socioeconomic status, the results of our study were similar to study conducted during 2018 by Nagar V *et al*, that children belonging to lower socio-economic status were more malnourished as compared to upper socio-economic status [15]. Minhas A and Sharma S also observed similar results [17]. Current findings showed that 13% mothers age were 15-20 years at the time of conception, 56% mothers age were 21-25 years at the time of conception, 20% mothers age were 26-30 years at the time conception while 9% mothers age were 31-35 years and only 2% mothers age were between 36-40 at the time of conception. The results of our study are also in accordance with Ullah H *et al*, in Swat, Pakistan, that adolescent pregnancy was one of the major risk factor of malnutrition; 28.6% mother's age of malnourished children was < 20 years 23. This research found that, 26% mothers of malnourished children had < 1 year of pregnancy gap, 57% mothers were found becoming pregnant with > 1 year of time period and only 17% mothers were having single child. Wazir KU *et al.*, conducted a cross-sectional study during

2015, that 48.5% mothers having multiple pregnancies [21].

According to the current study, the prevalence of malnutrition was 26% among children having 1 sibling, 21% with 2 siblings, whereas the prevalence was higher 32% in children having 3 or more siblings. Similar results were revealed by Nagar V*et al*, during 2018, that the prevalence of malnutrition was lower 23.6% in children having one to two siblings, as compare to the children having more than three siblings 28.3% [15]. Similar findings were also concluded in Sindh, Pakistan during 2017 [25]. The results of another study performed by Ghaffar F *et al.*, in 2017 illustrate that large household size was the main determinant of malnutrition [20]. Demissie S and Worku A, also concluded that more number of children in a family leads to malnutrition [24].

Conclusions:

Low socioeconomic status, illiteracy of mothers, rural area, gap between pregnancy and female gender has been found to be associated with malnourishment in children under 5 years of age.

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