



## **Impact of Socioeconomic Inequalities on Child Malnutrition**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Socioeconomic status and the education of mother plays important role in providing better health care and nutrition to children. To the best of our knowledge the major population of Pakistan belongs to middle class and identification of malnutrition in our setups may help the policy makers to develop certain parameters to provide better nutrition to children under 5 years of age. The aims of current study were to analyze the prevalence of malnutrition and their association with different socioeconomic status in tertiary care hospital of Hyderabad.

**Study Design:** Cross sectional.

**Place and Duration of Study:** Study was performed at nutritional stabilization center of pediatric department of tertiary care hospital Hyderabad during the month of July 2019 to January 2020.

**Methodology:** Preformed proforma was designed to record the data of participants. Hospital protocols using WHO guidelines (17) i.e. 10 steps for in-patient care of severe malnutrition were started & followed with feeding F-75 & F-100. Data was analyzed on SPSS-20.

**Results:** The minimum age recorded was 8 months and maximum was found to be 45 months (3 years 9 months). 72% were females and 70% of participants had Weight to height ratio below

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normal. Prevalence of severe acute malnutrition was found to be 35.2%. After admission and management protocols 91.6% were recovered however, mortality was observed in 8.9% participants. Chi square analysis of all socioeconomic groups showed highly significant results with severe acute malnutrition (p-value= 0.001).

**Conclusion:** Current study concluded a high prevalence of SAM in Pakistani population that is about 35.2%, out of which majority was from lower socioeconomic class.

**Keywords:** Malnutrition; socioeconomic status; severe acute malnutrition; SAM.

## ABBREVIATIONS

*BMI* : Body Mass Index  
*FFMI* : Fat Free Mass Index  
*MUAC* : Mid Upper Arm Circumference  
*MAM* : Moderate Acute Malnutrition  
*SAM* : Severe Acute Malnutrition

## 1. INTRODUCTION

Low body mass index (BMI), unintentional weight loss along with a lower fat free mass index (FFMI) at certain cut off points describes a person as malnourished [1]. Children under 5 years of age, living in low to middle income countries are more prone to develop muscle wasting and kwashiorkor that is ultimately classified as severe acute malnutrition [2]. When a child loses his weight and become extremely thin the condition is known as Acute Malnutrition which is indicated by low weight for height or by mid upper arm circumference (MUAC) [2]. Based on wasting acute malnutrition may be moderate acute malnutrition (MAM) or severe acute malnutrition (SAM) [3]. The most common cause of death i.e. 35-50% among children under five years is severe acute malnutrition [4,5], in developing countries it is predicted that 174 million children under the age of 5 years are malnourished and 230 million are stunted. Poor physical and cognitive development along with lower resistance to illness are attributed to malnutrition [6,7].

Malnutrition in children is thought to be associated with socioeconomic status of home in which they are born, a study conducted in Sri Lanka concluded that there is an association of poor maternal nutritional status with child malnutrition [8]. The correlation between malnutrition and socioeconomic status has been studied in multiple studies some have linked it with unequal distribution of households in females particularly in mothers and some have linked it with poor attention towards the nutrition of newborns [9-11]. For the health of child education of mother have prime importance as

proved in a study which revealed that the higher education of mother was proved to provide better attention in terms of health when compared to less educated mothers however, the educational status was directly proportional to low socioeconomic status of female [12]. Assessment of malnutrition in different socioeconomic status showed stunning in 30% in studied population and in same study it was reported that 40% of studied population participants who belonged to low socioeconomic status were anemic [13,14].

Socioeconomic status and the education of mother plays important role in providing better health care and nutrition to children under 5, this is not only confined to age under 5 because over nutrition is also becoming prevent in the adults due to provision of junk food at developmental age that ultimately is leading to obesity particular in adult age group [15,16]. Socioeconomic status of family determines the health status of its members, to the best of our knowledge the major population of Pakistan belongs to middle class (mediocre socioeconomic status) identification of malnutrition in our setups may help the policy makers to develop certain parameters to provide better nutrition to children under 5 years of age. The aims of current study were to analyze the prevalence of malnutrition and their association with in different socioeconomic status in tertiary care hospital of Hyderabad.

## 2. MATERIALS AND METHODS

It was a cross sectional study performed at nutritional stabilization center of pediatric department of tertiary care hospital Hyderabad during the month of July 2019 to January 2020. Calculated sample size was 273 and by using non probability consecutive sampling technique, children of both genders, with age range from 6 months to 5 years admitted in nutritional stabilization ward were recruited as study participants after taking consent from their parents. Preformed proforma was designed to

record the data of participants that included demographic (age, gender, ethnicity) as well as data regarding primary outcome variable socioeconomic status. Hospital protocols using WHO guidelines [17] i.e. 10 steps for in-patient care of severe malnutrition were started & followed with feeding F-75 & F-100. Data were analyzed on SPSS-20, numerical data are represented in means  $\pm$  SD, categorical data is represented in frequencies and percentages, chi square test was applied to check the association among variables, p-value  $<0.05$  was considered as significant.

### 3. RESULTS

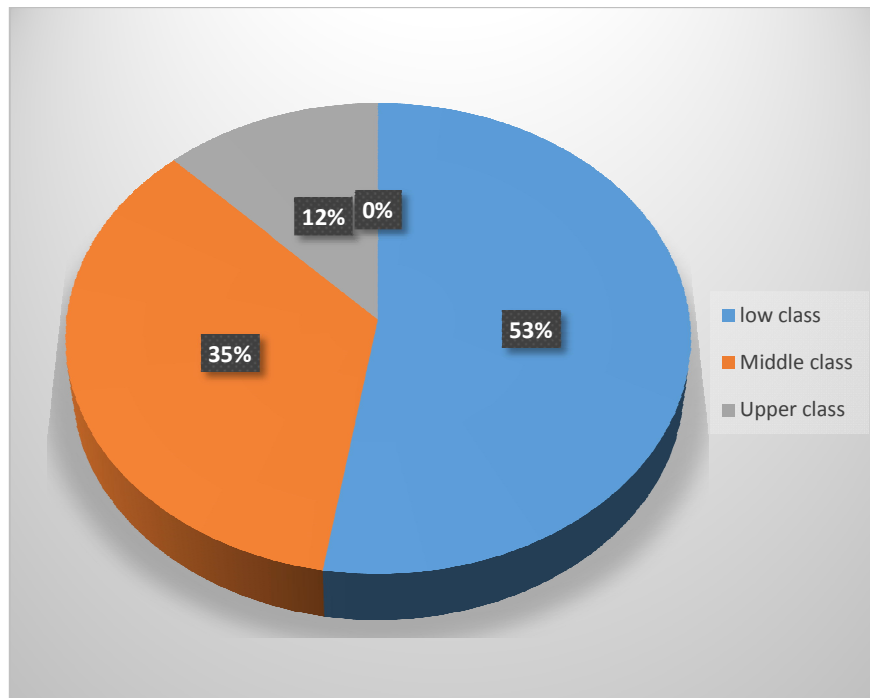
The minimum age recorded in our data was 8 months and maximum was found to be 45 months (3years 9 months). Mean age, weight, circumference of mid upper arm is represented in Table 1. Out of N= 273 participants, 72% were females and 28% were males. Weight to height ratio was categorized as normal and below normal in our study we observed that 70% of participants as below normal. Pedal edema was also noted in 20.5% of participants. Out of recruited participants (n=273) admitted in nutritional center prevalence of severe acute

malnutrition was found to be 35.2%. After admission and management protocols 91.6% were recovered however, mortality was observed in 8.9% participants. The distribution of socioeconomic status in study population as shown in Fig. 1 was 53.4% belonged to low class, 35.1% belonged to middle class and 11.5% from upper class.

**Table 1. Mean age, weight, height and circumference of mid upper arm of study participants (n=273)**

Variables	Mean $\pm$ SD
Age	13 $\pm$ 6.3 months
Weight	5.08 $\pm$ 1.7 kg
Height	65.77 $\pm$ 11.56 cm
Circumference of mid upper arm	8.94 $\pm$ 1.67 cm

Chi square analysis of all socioeconomic groups showed highly significant results with severe acute malnutrition in targeted population (p-value= 0.001). Out of total malnourished participants 19.8% were from lower class, 11.4% from middle class and 4.2% were from upper socioeconomic class as shown in Table 2.



**Fig. 1. Distribution of socioeconomic status among study participants**

**Table 2. Chi-square analysis of socioeconomic status with malnutrition**

Socioeconomic status	Malnutrition		Total	p-value
	Yes	No		
Lower	54(19.8%)	92(33.6%)	146(53.4%)	0.001
Middle	31(11.4%)	65(23.8%)	96(35.1%)	
Upper	11(4.2%)	20(7.3%)	31(11.5%)	
Total	96(35.2%)	177(64.8%)	273(100%)	

#### 4. DISCUSSION

The prevalence of SAM in our study was 35.2% (96/273), and the group of children who had the SAM were 8-48 months old these findings are contrary with the findings of Bhadoria et al. who reported only 2.2% prevalence among his study participants [18,19]. The findings of another study conducted in children up to five years of age showed 10.1% prevalence of SAM [20] which is quite less than the findings of our study. The data reported by above recently conducted studies is showing that the prevalence of SAM in children is higher in our study participants that may be due to their socioeconomic back ground or lack of education among the mothers regarding the nutrition of their new born children or may be due to poor interest of government on such issue and lack of health policies.

Data across the world is suggesting a strong association of socioeconomic status with SAM. Likewise a study conducted in Nepal reported significant association of socioeconomic status with muscle wasting and malnutrition. According to that children with low socio economic back ground are more prone to develop malnutrition and the adjusted odds ratio calculated was 4.41. In Nepal the prevalence of SAM was found to be 4.41% however the association of socioeconomic status was significantly associated with malnutrition and wasting. Current study favors this finding that lower socioeconomic class having high prevalence of SAM followed by middle class and upper class respectively. In a review of Vietnam the changes in trends of malnutrition were observed from 2011 to 2016, in that review the researchers concluded that socioeconomic status has a role in malnutrition of children under 5 years [21].

Similar to current study, a study conducted in Bangladesh, the two groups of pregnant females were compared in one group they educated the females and in other they do not performed intervention, results of the study concluded that mother education had a very significant role in

reducing the prevalence of malnutrition but beside that they also emphasize that only education is not enough to increase birth weight and reduce malnutrition there were many other related environmental factors including socioeconomic status that should also take into consideration [22].

Another study regarding SAM prevalence in Tajikistan showed that there is a relation of socioeconomic status with its prevalence they identified that people who were living in urban area did not suffer SAM because they have been provided all the basic health facilities and were mostly well educated however people who were resident of rural areas had SAM so concluded a strong association of both factors including socioeconomic status and mother education with SAM [23].

Current study setup was a government sector tertiary care hospital and was a single centered study which limits the results so we recommend studies on larger scales and also educational sessions for mothers to improve the health status of our children to give them a better and healthy future.

#### 5. CONCLUSION

This study concluded a high prevalence of SAM in Pakistani population that is about 35.2%, out of which majority was from lower socioeconomic class. Furthermore, study showed a strong significant association of SAM with socioeconomic status.

#### CONSENT

As per international standard, parental written consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

Ethical approval was taken from Ethics Review Committee of concerned tertiary care hospital (under reference number LUMHS/11018/ANJ).

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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