Assessment of nutrition, morbidity, and immunization status of under-five children attending government tertiary care hospital

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ABSTRACT

Background: Morbidity and mortality of under-five children is an important indicator of overall development of the country. The problems of malnutrition among under-five children can be used to determine the need for nutritional surveillance, nutritional care, or appropriate nutritional intervention programs in a community. **Objectives:** (1) The objective of this study was to study sociodemographic factors related to morbidity in under-fives, (2) To study the nutritional status of under-fives admitted in hospital, (3) To study morbidity pattern of admitted under-fives, and (4) To study the immunization status of under-fives.**Materials and Methods:** This was a hospital-based descriptive cross-sectional study. All children below 5 years of age admitted in pediatric ward of government tertiary care hospital from 1st November 2015 to 31st January 2016 were included in the study. The collected data were analyzed using SPSS 15.0. Chi-square test of significance was applied. $P < 0.05$ was considered statistically significant. **Results:** In the present study, maximum number of under-fives were males (60%) and belong to 0–12 months age group (44.5%). Maximum number of children were from rural areas (56.5%) belongs to Hindu family (66.55%). Maximum mothers of children were illiterate (60%) and fathers studied up to secondary school (57.5%). Maximum number of under-fives were suffering from respiratory tract infection (RTI) (males-42.5% and females-32.5%). Nearly 60% were completely immunized. 31% were underweight, 33.5% were stunted and 21% were wasted among males which were maximum as compared to females. In study, 79% of children were found malnourished. 33.5% were partially immunized and common morbidity found among under-fives were RTI. **Conclusion:** Major interventions needed to improve overall health status of thse under-5 children at all health-care level. Further studies should be carried out to assess the impact of health education..

KEY WORDS: Malnutrition; Under-fives, WHO Growth Charts; Morbidity; Sociodemographic Factors

INTRODUCTION

The under-five is an important age group and vulnerable section of the society as the morbidity profile of this age group has a far reaching consequences on the overall development of the country.[1] India has the highest under-five mortality rate (43 per 1000 live births) which contributes to 25% of 6.9 million (the year 2013) under-five death worldwide.[1] Most of these under-five deaths are due to swacute respiratory diseases, diarrhea, malaria, measles, HIV/AIDS, and neonatal conditions contributing 44% of under-five deaths.[2]

The three main indicators used to define undernutrition, i.e., underweight, stunting, and wasting, represent different histories of nutritional insult to the child. Low weight for age indicates a history of poor health or nutritional insult to the child, including recurrent illness and/or starvation, while a low weight for height is an indicator of wasting (i.e., thinness) and is generally associated with recent illness and failure to gain weight or a loss of weight.[3] At present, 65% under-five

children are underweight which includes 47% moderate and 18% severe cases of malnutrition (UNICEF 2006 state of Worlds children).[4]

Ninety-nine million under-five children were underweight in the globe in 2012. The global trend in prevalence of underweight continues to decrease, but at a slow pace which remains insufficient to meet the millennium development goal. In 2012, 67% of all underweight children lived in Asia and 29% in Africa. Globally, 51 million under-five were wasted and 17 million were severely wasted, respectively, in 2012; approximately 71% of all severely wasted children lived in Asia and 28% in Africa, with similar figures for wasted children at 69% and 28%, respectively.[5]

Undernutrition among under-five children in India continues to be among highest in the world: Almost 5 times more than in China and twice than in Sub-Saharan Africa. Nearly, half of all India's children almost 60 million (43%) are underweight, about 45% are stunted and 20% are wasted.[6]

MATERIALS AND METHODS

- Study design: Hospital-based descriptive cross-sectional study[7]
- Study setting: Children admitted in pediatric ward of government tertiary care center
- Study sampling: 200 children below 5 years of age admitted in pediatric ward from 1st of November 2015 to 31st of January 2016
- Study period: 1st of November 2015-31st of January 2016
- Tools[8,9]: Personal interview, clinical history, and physical examination of child were done and final diagnosis was confirmed on IPD papers. Grade of malnutrition was done using the WHO reference tables. (Comprehensive semistructured questionnaires were used to record age, sex, and medical history).

Procedure

Height, weight, and body mass index (BMI) were measured for all the study subjects. Height was measured to the nearest 0.1 cm. Weighing scale was used to measure weight to the nearest 0.1 Kg. BMI was calculated using the formula $BMI = kg/m^2$.

WHO 'Z' Score Charts[10,11]

They were used to categorize weight for age (WAZ), height for age (HAZ), and BMI for age. Scores were categorized into < −3 standard deviation (SD), −2 to −3 SD, normal, and >2 SD.

WAZ

According to WHO 2007 Z score charts: WAZ <−3 SD implies severe underweight, −2 to −3 SD implies mild to

moderate underweight, and >−2 SD implies normal/healthy status.

HAZ

In case of HAZ, <−3 SD implies severe stunting, −2 to −3 SD implies mild to moderate stunting, and > −2 SD implies normal status.

BMI for age

In case of BMI, <−3 SD implies severe thinness, −2 to −3 SD implies mild to moderate thinness, −2 SD was normal, and >2 SD implies obesity.

Data analysis

Data were entered into Microsoft Excel 2007and analyzed using SPSS 15 software. Chi-square test was used for statistical analysis. $P < 0.05$ was considered statistically significant.

RESULTS

In our study, 200 under-fives were studied. The proportion of male was 120 (60%) and female was 80 (40%). The children were aged under-five. Maximum children were from 0 to 12 months, i.e., 44.5% (Figure 1).

Majority of study subjects belonged to Hindu religion (65.5%) followed by Muslim religion (28.5%) (Table 1).

In more than 50% of study subjects, parents were educated up to secondary and higher secondary. 21% parents of study subjects were illiterate. Majority occupations of parents were skilled work and mothers were occupied as homemaker and some as clerical, shop worker 8% (Table 2).

Majority were from class IV socioeconomic status (39.5%) (Table 3).

Most common morbidity was found to be respiratory tract infection (RTI) (75%) followed by gastrointestinal (GI)
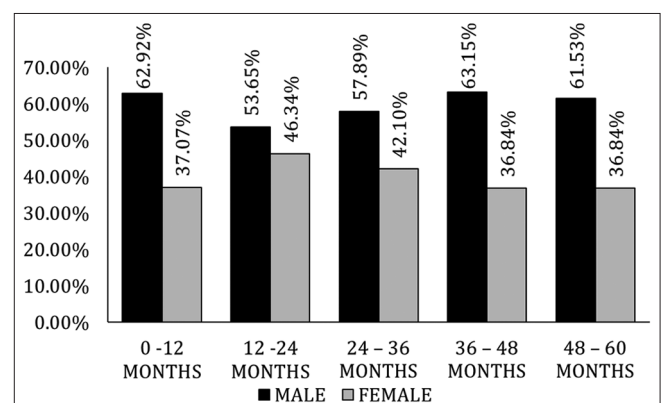

Figure 1: Distribution of under-five according to gender

infection (42%). Ophthalmic problems found in 8% of children (Table 4 and Figure 2).

Among the 200 study subjects between the age 0 and 5 years, completely immunized were 60% and 6.5% were unimmunized, there was no statistical significant association between gender of under-fives and immunization status (Table 5 and Figure 3).

Maximum number of undernutrition was seen in age group 0-12 m. 104 (52%) had underweight (Table 6). Among those who had underweight, majority, i.e., 53 (50.96%), had between the age of 0 and 12 months.

Stunting was seen in 105 (52.49%) of under-fives (Table 6).

84 (42%) had thinness based on BMI (Table 6).

There was no statistically significant association between age of children and nutritional status (Table 6).

There was equal percentage of male and female undernutrition status and no significant association found between gender and nutritional status of children (Table 7).

DISCUSSION

In the present study, majority (44.5%) belong to 0-12 months age group. Most of the people resides in urban (56.5%) locality and most of them belong to Hindu family (65.5%).
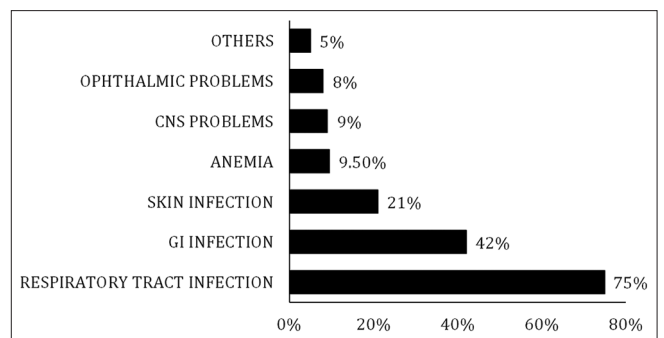
Table 1: Distribution of under-fives according to sociodemographic factors (*n*=200)[12]

Sociodemographic factors	*n* (%)			Chi-square *P* value
	Male	**Female**	**Total**	
Region				
Urban	61 (53.98)	52 (46.01)	113 (56.5)	χ^2=3.92 *P*<0.05 d.f=1
Rural	59 (67.81)	28 (32.18)	87 (43.5)	
Religion				
Hindu	86 (65.64)	45 (34.35)	131 (65.5)	χ^2=4.54 *P*>0.05 d.f=2
Muslim	29 (50.87)	28 (49.12)	57 (28.5)	
Buddhism	4 (45.45)	7 (63.63)	11 (5.5)	
Others	1 (100)	0	1 (0.5)	
Type of family				
Nuclear	59 (67.81)	28 (32.18)	87 (43.5)	χ^2=4.54 *P*>0.05 d.f=2
Joint	44 (56.41)	34 (43.58)	78 (39)	
Three generation family	17 (48.57)	18 (51.42)	35 (17.5)	

Table 2: Education and occupation of parents[12]

Characteristics	*n* (%)		Chi-square *P* value
	Father	**Mother**	
Literacy			
Primary	30 (15)	56 (60)	χ^2=15.6 *P*<0.05 d.f=4
Secondary	20 (10)	21 (10.5)	
Higher secondary	115 (57.5)	98 (45)	
Graduate	23 (11.5)	19 (9.5)	
Postgraduate	12 (6)	4 (2)	
Total	0 (0)	2 (1)	
Others	1 (100)	0	
Type of family			
Nuclear	59 (67.81)	28 (32.18)	χ^2=9.6 *P*<0.05 d.f=4
Joint	44 (56.41)	34 (43.58)	
Three generation family	17 (48.57)	18 (51.42)	

Table 3: Distribution of under-fives according to socioeconomic status[13]

SES	*n* (%)		
	Male	**Female**	**Total**
II	7 (46.66)	8 (53.33)	15 (12.5)
III	29 (67.44)	14 (32.55)	43 (31)
IV	38 (55.07)	31 (44.92)	69 (39.5)
V	46 (63.01)	27 (36.98)	73 (17)
Total	120 (60)	80 (40)	200 (100)

No under-five belongs to SES Class I, SES: Socioeconomic status

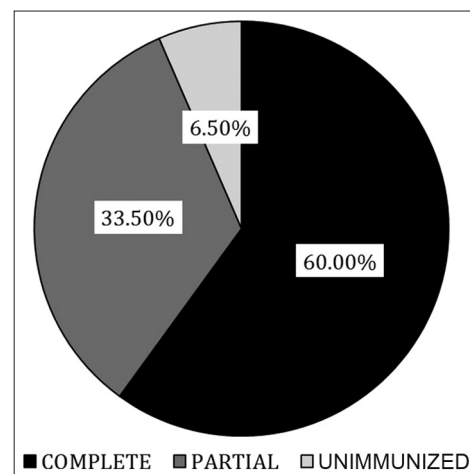**Figure 2:** Distribution of under-fives according to morbidity

Figure 3: Distribution of under-fives according to immunization status

Table 4: Distribution of under-fives according to morbidity

Morbidity	n (%)		
	Male	**Female**	**Total**
RTI	85 (56.66)	65 (43.33)	150 (75)
GI infection	41 (48.80)	43 (51.19)	84 (42)
Skin infection	27 (64.28)	15 (35.71)	42 (21)
Anemia	3 (15.78)	16 (84.21)	19 (9.5)
CNS problems	5 (27.77)	13 (72.22)	18 (9)
Ophthalmic problems	10 (62.5)	6 (37.5)	16 (8)
Others	7 (70)	3 (30)	10 (5)

RTI: Respiratory tract infection, GI: Gastrointestinal, CNS: Central nervous system

Table 5: Distribution of under-fives according to immunization status

Immunization status	n (%)		
	Male	**Female**	**Total**
Complete	75 (62.5)	45 (37.5)	120 (60)
Partial	40 (59.70)	27 (40.29)	67 (33.5)
Unimmunized	5 (38.46)	8 (61.53)	13 (6.5)
Total	120 (60)	80 (40)	200 (100)

χ^2=2.83, d.f=2, P>0.05, no significant association

Table 6: Distribution of under-fives according to nutritional status

Children months	n (%)		
	Underweight	**Stunting**	**Wasting**
0-12	53 (50.96)	43 (40.95)	49 (58.33)
13-24	14 (13.46)	21 (20)	11 (13.09)
25-36	23 (22.11)	21 (20)	15 (17.85)
37-48	10 (9.6)	10 (9.52)	8 (9.5)
49-60	4 (3.84)	10 (9.5)	1 (1.1)
Total	104 (52)	105 (52.49)	84 (42)

χ^2=12.1, d.f=6, P>0.05, no significant association

Table 7: Correlation between nutritional status and gender

Gender	n (%)		
	Underweight	**Stunting**	**Wasting**
Male	62 (59.61)	67 (63.80)	42 (50)
Female	42 (40.38)	38 (36.19)	42 (50)
Total	104 (52)	105 (52.49)	84 (42)

χ^2=3.77, P>0.05, d.f=2, no significant association

In a study done in Midnapore Medical College, Paschim Medinipur, Medinipur, West Bengal, by Sarkar et al.,[1] majority (42.4%) under-fives belongs to 24–59 months age group. Most of the people reside in urban (55.8%) locality and most of them belong to Hindu family (62.5%); findings were similar to our present study. In another study done by Basu et al.,[3] majority of under-fives belong to 24–59 months

and they belong to Hindu family. In another study done by Singh et al.,[2] majority (44.73%) belongs to 49-60 months.

In our study, nutritional status of under-fives 52% was underweight, 52.49% were stunted, and 42% were wasted. In a study done by Sarkar et al.,[1] 32% were underweight which was less than the present study. In another study done in rural medical college of West Bengal by Basu et al.,[3] 42.44% were underweight, 51.78% were stunted, and 20.22% were wasted.

In the present study, common morbidity found was RTI 75% followed by gastrointestinal (GI) 42.44%. Similar findings were found in studies done by Sarkar et al.[1] and Basu et al.[3] In study done by Sarkar et al.,[1] common morbidities found were RTI 40% followed by GI 19.9% and in another study done by Basu et al.,[3] common morbidities found were RTI 54.22% and GI 52.66%.

CONCLUSION

The present study shows pattern of morbidities and undernutrition among under-five children. In our study, 200 under-fives were studied. Morbidity shows respiratory infection to be predominant in males (56.66%) as compared to females (43.33) whereas GI infection (51.19%), anemia (84.21%), skin infection (72.22%) in males as compared to males. About immunization, females are more unimmunized (61.53%) compared to males (38.46%). Majority of under-five children were malnourished (79%), and among them, 52% children were underweight, 52.49% children were stunted, and 42% were wasted. Here, malnutrition was more common in males than females. Nutrition status shows decrease in trend of underweight, stunting, and wasting as the age increases. 79% of under-five studied are malnourished and 21% under-five are nutritionally normal. Major interventions needed to improve overall health status of the under-five children at all health-care level. Further studies should be carried out to assess the impact of health education.

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