Assessment of the Feeding Practices in Infants and Young Children and its Association with Nutritional Status in Urban Areas

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Abstract: *Background*: Poor nutrition at an early age leads to malnutrition, which in turn leads to an increase in risks of repeated infections, which is responsible for the poor health of children. The nutritional status of a child is directly proportional to their feeding practices, which are dependent on the knowledge and practices followed by the mother. This study assesses the level of knowledge and practices among mothers on feeding practices for their infants and young children and its association with nutritional status.

Methods and Materials: A cross-sectional study was conducted in the households of urban slums in the field practice area of the Urban Health Training Centre of a private medical college. A questionnaire consisting of sociodemographic data, knowledge of breastfeeding, knowledge of complementary feeding, and actual practices of feeding the children from 0 –2 years was used for data collection using Google Forms, followed by anthropometric measurements of the children with the help of WHO standardized growth charts to assess their nutritional status.

Results: Out of 112 participants, 37.5% of the mothers were less than 25 years old. The mean age of the babies was found to be 11 $\pm$ 6.49 months. 53.57% of mothers had good knowledge, and 72.32% of mothers followed correct feeding practices.

Conclusion: There is a significant association of good knowledge among mothers with babies who did not show wasting. There is no association between knowledge and feeding practices being followed.

Keywords: Birth to 2 years, feeding practices, infant and young child feeding, mothers' knowledge, nutritional status.

INTRODUCTION

In accordance with the Convention on the Rights of the Child, it has been established that every infant and child is entitled to appropriate nourishment. The first two years of a child's life hold immense significance, as sufficient nourishment during this period aids in reducing morbidity and mortality rates, decreasing the risk of chronic ailments, and fostering comprehensive development. The prevalence of undernutrition is estimated to be linked with approximately 2.7 million child fatalities annually, which accounts for 45% of all child fatalities. In various nations, less than a quarter of infants aged 6-23 months meet the dietary diversity and feeding frequency standards that are suitable for their age [1].

In India, as per the data provided by the National Family Health Survey-5, it was found that 36% of children were affected by stunting, 32% were underweight, 19% were wasted, and 3% were overweight. The government of India has expressed a strong commitment to achieving the 2030 Sustainable Development Goals, which encompass the eradication of hunger, the establishment of food security, and the promotion of improved nutrition [2].

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The health status of a child is directly proportional to their feeding practices, which are dependent on the knowledge and practices of the mother. Poor nutrition at an early age leads to malnutrition, which in turn leads to an increase in the risk of repeated infections. As per the recommendation of WHO and UNICEF, children from birth to 6 months are to be given exclusive breastfeeding, and after 6 months, the process of weaning is started along with breastfeeding till 2 years of age [1].

Since nutrition plays an important role in the well-being of a child, it is crucial to start feeding well at an early age, starting with breastfeeding, followed by complementary feeding and knowing its importance. Hence, the present study is planned to assess the level of knowledge and feeding practices followed by mothers and find their association with the nutritional status of their children in urban slums, as there seems to be a paucity of data in this setting. The study findings will help address the gaps and help policy making.

MATERIAL AND METHODS

The study setting was urban slums under the field practice area of the Urban Health Training Centre (UHTC) of a private medical college where the cross-sectional analytical study was carried out. Institutional

Ethics Committee permission was obtained (BVDUMC/IEC/51E). A list of all children in the age group of 0 -2 years availing services from the UHTC in urban slums was collected. All COVID-19 protocols were followed during data collection. Study participants included all children in the age group of 0 to 2 years and mothers of those children. Seriously ill children and mothers were excluded from the study. The study was conducted from August 2022 to October 2022.

An Anganwadi is a courtyard shelter started by the Indian government as a part of the Integrated Child Development Services program (ICDS) to overcome malnutrition and provide early learning [3]. One Anganwadi was selected randomly out of 33 Anganwadis in the field practice area of UHTC. A door-to-door visit was done starting from the house closest to the selected Anganwadi. If sample size could not be achieved through one Anganwadi, the next closest Anganwadi was selected, and this was continued till all the houses were covered consecutively till a sample size of 112 was achieved. The sample size was estimated using the prevalence of 60.4% from a similar study done [4]. If study participants were not available, then a maximum of a second visit was done.

After written informed consent from the mothers, the prepared questionnaire was used to conduct the interview. A pre-designed, pre-tested, validated, and semi-structured questionnaire consisting of both open and close-ended questions was used for data collection using Google Forms. The questionnaire consisted of sociodemographic data and socioeconomic status (SES) determined by using Kuppuswamy's scale [5], knowledge of breastfeeding, knowledge of complementary feeding practices, and actual feeding practices followed by mothers in terms of breastfeeding and complementary feeding. The questionnaire was made in English, translated to Marathi, and back-translated to English to assess the translation accuracy. The questionnaire was filled by a one-on-one interview by the principal investigator, and if there was any difficulty in communication or understanding, the help of the Medical Social Worker (MSW) was taken to explain to the participants.

After completing the questionnaire, anthropometric measurement of the child was taken consisting of weight and length/height using a baby cum child scale for measuring the weight of children from birth to 1 year of age, a salter scale to measure weight for children more than 1 year of age, and infantometer for the length of a child from birth to 1 year and stadiometer for the height of children more than 2 years of age and WHO standardized growth charts to assess the nutritional status [6-8]. The growth charts used were z-score charts of weight for age, height/length for age, and weight for height/length from birth to 2 years of age. Stunting was assessed using the height or length for age where moderate stunting ($\leq$ -2SD but $\geq$ -3SD), severe stunting (< -3SD). Underweight was assessed using weight for age chart where – moderate underweight ($\leq$ -2SD but $\geq$ -3SD) and severely underweight (< -3SD). Wasting was assessed using the weight for height or length chart where – moderate wasting ($\leq$ -2SD but $\geq$ -3SD) and severely wasted (< -3SD) if the child's weight, height, or length and weight for height or length fell between 0 to $\pm$ 2SD in the respective growth charts it was considered as normal.

As per CDC, the children were divided into age groups of 0-6 months (exclusive breastfeeding), 7 months to 12 months (weaning with soft foods without cow's milk), 13 months to 24 months (almost similar food as the rest of the family along with an introduction to cow's milk) [9].

A score of 1 was assigned for a correct answer and 0 for an incorrect answer. The scoring for knowledge was done using 5 questions. If the score was 5, it was considered as good knowledge; if it was <5, it was considered as poor knowledge, as it is expected that a mother should have knowledge of all aspects of feeding. The scoring of feeding practices for 0 to 6 months 5 questions were considered, and a score of $\geq$ 4 was considered as correct feeding practices, while a score of <4 was considered as incorrect feeding practices. For more than 6 months of age, 9 questions on feeding practices in children were used, and a score of $\geq$5 was considered as correct feeding practice, and <5 was considered as incorrect.

The data collected was coded in a Microsoft Excel sheet. The data was analyzed using SPSS (Statistical Package for Social Sciences) version 28.0 software by IBM Chicago, and a p-value of 0.05 was considered as significant.

RESULTS

A total of 112 mothers and their children (n=112) participated in the study. The mean age of the mothers was found to be 26 $\pm$ 4.5 years, and 37.5% of them belonged to the age group of less than 25 years. It was noted that 34.82% of mothers were educated till high school, and only 25.89% were graduates. Of the 112

Table 1: Association of Knowledge and Feeding Practices with Sociodemographic Data of the Participants

		Knowledge				Practice			
		Good (n=60)	Poor (n=52)	Chi-square value	p-value	Correct (n = 81)	Incorrect (n = 31)	Chi-square value	p-value
Age of the mother	<25	15 (25.00)	27 (51.92)	8.61	0.03	28 (34.57)	14 (45.16)	1.07	0.3
	≥25	45 (75.00)	25 (48.08)			53 (65.43)	17 (54.84)		
Age of the child	≤ to 6 months	18 (30.0)	10 (19.23)	7.54	0.02	17 (20.99)	11 (35.48)	2.91	0.23
	7-12 months	25 (41.67)	14 (26.92)			31 (38.27)	8 (25.81)		
	more than 12 months	17 (28.33)	28 (53.85)			33 (40.74)	12 (38.71)		
Parity	<2	30 (50.00)	24 (46.15)	0.17	0.68	38 (46.91)	16 (51.61)	0.2	0.66
	≥2	30 (50.00)	28 (53.85)			43 (53.09)	15 (48.39)		
Sex of the child	Female	27 (45.00)	21 (40.38)	0.24	0.62	35 (43.21)	13 (41.94)	0.01	0.9
	Male	33 (55.00)	31 (59.62)			46 (56.79)	18 (58.06)		
Mothers' education	Graduate	20 (33.33)	9 (17.31)	9.49	0.02	22 (27.16)	7 (22.58)	0.52	0.91
	High school	20 (33.33)	19 (36.54)			28 (34.57)	11 (35.48)		
	Middle	9 (15.00)	19 (36.54)			19 (23.46)	9 (29.03)		
	Upto primary	11 (18.33)	5 (09.62)			12 (14.81)	4 (12.90)		
Mothers' occupation	Housewife	50 (83.33)	45 (86.54)	0.22	0.64	69 (85.19)	26 (83.87)	0.52	0.91
	Service	10 (16.67)	7 (13.46)			12 (14.81)	5 (16.13)		
Type of Family	Nuclear	27 (45.00)	21 (40.38)	0.24	0.62	44 (54.32)	20 (64.52)	0.95	0.33
	Joint	33 (55.00)	31 (59.62)			37 (45.68)	11 (35.48)		
SES	Lower	35 (58.33)	39 (75.00)	4.55	0.10	56 (69.14)	18 (58.06)	1.45	0.48
	Lower middle	17 (28.33)	11 (21.15)			19 (23.46)	9 (29.03)		
	Upper Middle	8 (13.33)	2 (03.85)			6 (07.41)	4 (12.90)		

mothers, only 15.18% were working, while the rest, 84.82%, were housewives. The mean age of the babies was found to be 11 ± 6.49 months, and 25% of the infants were aged less than six months, while the majority, comprising 75%, were aged more than six months. Notably 57.14% of the babies were males and the rest 42.85% were females. It was noted that 55.35% belonged to joint families, and the remaining 41.96% belonged to nuclear families.

This study noted that 53.57% of mothers had good knowledge, and 46.42% had poor knowledge regarding feeding practices. Regarding the actual feeding practices, it is noted that 72.32% of mothers follow

correct feeding practices, and 27.67% of mothers follow incorrect practices.

Table **1** shows the knowledge of the feeding practices of mothers and their association with the demographic details and nutritional status of 0 to 2 year-old children. In this table, it is noted that there is a significant association of good knowledge in – mothers whose children are in the age group of 7 months to 12 months (41.67%), mothers whose age is ≥ 25 years (75.00%), mothers who have completed education till high school and above (66.66%). It also noted that there is a significant association of sociodemographic details with feeding practices being followed.

Table **2** shows that there is a significant association (p = 0.003) between good knowledge of mothers and absence of wasting.

Table **3** shows no significant association between knowledge and actual feeding practices followed.

DISCUSSION

This study was done to assess the knowledge of mothers and the actual feeding practices they follow for their children from birth to 2 years of age. As per this study, 53.57% of mothers had good knowledge regarding feeding practices, out of which 76.66% followed correct feeding practices, and 23.33%

Table 2: Association of Knowledge and Feeding Practices Followed by Mothers with the Nutritional Status of their Children

		Knowledge				Practice			
		Good (n=60)	Poor (n=52)	Chi-square value	p-value	Correct (n = 81)	Incorrect (n = 31)	Chi-square value	p-value
Underweight	Normal	36 (60.00)	32 (61.54)	0.06	0.97	53 (65.43)	15 (48.39)	2.75	0.25
	Moderate	15 (25.00)	12 (23.08)			17 (20.99)	10 (32.26)		
	Severe	9 (15.00)	8 (15.38)			11 (13.58)	6 (19.35)		
Stunting	Normal	31 (51.67)	31 (59.62)	4.69	0.09	46 (56.79)	16 (51.61)	1.73	0.42
	Moderate	6 (10.00)	10 (19.23)			13 (16.05)	3 (09.68)		
	Severe	23 (38.33)	11 (21.15)			22 (27.16)	12 (38.71)		
Wasting	Normal	40 (66.67)	29 (55.77)	7.37	0.03	50 (61.73)	19 (61.29)	0.03	0.98
	Moderate	4 (06.67)	13 (25.00)			12 (14.81)	5 (16.13)		
	Severe	16 (26.67)	10 (19.23)			19 (23.46)	7 (22.58)		

Table 3:Association between the Knowledge and the Actual Practices being Followed by the Mothers

Knowledge and Practices						
		Practice		Total	Chi-square value	p-value
		Correct	Incorrect			
Knowledge	Good	29 (59.2)	31 (49.2)	60 (53.57)	1.10	0.29
	Poor	20 (40.8)	32 (50.8)	52 (46.42)		
Total		49 (43.75)	63 (56.25)	112 (100)		

followed incorrect feeding practices. It was found that 58.9% of mothers were cognizant of the fact that the initiation of breastfeeding ought to be carried out within the first hour of the child's birth, but only 51.78% practiced it.

Knowledge

In this study, it was seen that 76.78% of mothers knew that exclusive breastfeeding should be done till 6 months of age. In a study done in postnatal mothers, it was found that 85.2% of mothers knew that exclusive breastfeeding should be done up to 6 months of age [10]. This difference may be because of the study participants included in our study, that is, the mothers whose children are in the age group of 0 to 2 years, and possibly due to recall bias. Another study done in West Bengal showed that 60.5% of mothers knew that exclusive breastfeeding is to be done till 6 months of age [11]. A similar finding was noted in a study done in Kakinada, where 60% of mothers knew about the duration of exclusive breastfeeding [12]. This shows that mothers' knowledge regarding exclusive breastfeeding is better now than before. A study done in a rural area of Kerala shows that only 44.4% of mothers knew the correct duration of exclusive breastfeeding [13].

Around 83.92% (94) mothers knew that complementary feeding should be started at or after 6 months of age, while 8.03% (9) thought that complementary feeding could be started at an earlier age than 6 months, and 8.03% (9) mothers thought that the complementary feeding could be started at a later age. Study findings are similar to a study conducted by Kazmi S. *et al*., done in central India, where 83.75% of mothers knew the right age for initiation of complementary feeds, while 8.75% of mothers thought that it should be done before 6 months of age and 7.5% mothers thought it should be started after 7 months of age [14]. There seems to be hardly any difference regarding the knowledge about complementary feeding.

Educational status of mothers – It is noted that the level of education is poorer in the slum population than in the non-slum population. It is, however, noted from a study done in 2007 by Mittal A. that mothers were educated up to high school and beyond only 21.2% [15] whereas in our study, it was found to be 34.82%, which has increased but still needs to improve. Zeeshan mentions in their study that a mother's education has multiple benefits for her child's health, education, and overall growth. She also ensures her child's development by providing nutritious food and preventing illness [16].

Practices

This study found that 58.9% of mothers initiated breastfeeding within one hour of birth, exclusive breastfeeding was practiced by 77.67% of mothers, and colostrum was given to their babies by 84.82%. As per NFHS 5 data, breastfeeding was initiated within one hour of birth by 41% of mothers, and exclusive breastfeeding (EBF) up to 6 months of age was practiced by 64% of mothers. A study done in Patna slums shows that EBF up to 6 months is practiced by only 27.6% of mothers, and 78.5% of mothers gave colostrum to their babies [17]. This shows that this population might have received multiple counseling sessions on good breastfeeding practices, and cultural background might be making a difference.

In another study conducted in two urban districts by Bansal SC *et al*., breastfeeding was initiated by 77.67% of mothers, and 88.07% of mothers gave colostrum to their newborns [18]. The difference in the results could be because of differences in region and population selected for the study, which included children in the age group of 2 to 6 years of age, and possible recall bias.

Complementary feeding was started at or after 6 months of age by 68.75% of mothers, and 28.18% of mothers started early complementary, of which 77.41% of mothers knew that it should actually be started after 6 months of age; it was also found that 3.5% mothers started complementary feeding late for their children. As per a study in Kerala done by Kuruvilla BS *et al*., complementary feeding was started by 6 months by 71.2% of mothers, and delayed complementary feeding was seen in 0.5% of mothers in urban areas, which is not very different from the findings in this study [19].

Nutrition

This study shows that stunting is seen in 44.64%, wasting in 38.39%, and underweight in 39.29% of children. As per the NFHS 5 data, stunting is 36%, wasting is 19%, and underweight is seen in 32% of children in the age group of 0 to 5 years. This contradictory finding could be because of the study population chosen, which was urban slums where poverty is seen largely, and the children have no access to proper meals or food items necessary for

their growth and development. An almost similar finding was noted from a study conducted by Murarkar S *et al*. with respect to the stunting and underweight results, which were 49.7% and 36.8%, respectively, but wasting seen was quite less compared to our study, which is 18.4% [20].

LIMITATIONS

The limitations of this study were that a small sample size was taken and the possibility of recall bias in some of the participants.

CONCLUSION

The current study shows that good knowledge has a significant association with the absence of wasting in children, and there was no association between the knowledge and the actual feeding practices being followed. The weaning period plays a crucial role in the health and well-being of the children. A faulty feeding practice will result in poor health and decreased immunity, and if it continues in the same way for a prolonged period of time, it can result in malnutrition of the child.

This study identifies an important gap among mothers of children below two years of age regarding the knowledge of feeding practices and the actual feeding practices followed by them and how this affects the nutritional status of a child that social workers should intervene and correct the mothers on the incorrect feeding practices being followed along with providing them knowledge on breastfeeding and complementary feeding. These numbers show that more attention needs to be paid to this section of society where providing only awareness or monitoring growth is not going to be sufficient.

Mothers who followed incorrect practices or had inadequate knowledge about the feeding practices were educated regarding the same. Scopes of future research prospects could include taking a larger sample size along with an intervention on a follow-up basis, which would include providing frequent health education with close monitoring of feeding practices being followed by the mothers and also monitoring the improvement of nutritional status of those identified as malnourished during the study.

RECOMMENDATION

Hence, early detection and intervention are the keys to reducing or preventing the occurrence of malnutrition in children. This can be done by regular visits by the social worker and not only provide knowledge about feeding practices but also monitor the feeding practices being followed by the mothers.

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