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Morbidity, Feeding Practices, and Immunization Status of Children 6–23 Months in Delhi

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Abstract

Optimal infant and young child feeding (IYCF) practices and immunization play a critical role in averting childhood illness and in achieving optimal growth and development among children. This was a cross-sectional study that assessed the morbidity and immunization status of children 6–23 months of age in three income groups in Delhi. The study also assessed feeding practices for children during illness. Results showed that the prevalence of diarrhea in the past 2 weeks preceding the survey was 8.6%, 18.3%, and 17.7% in urban slum, low-income group (LIG), and middle-income group (MIG), respectively. About 50% of children in LIG and MIG and about 45% in the urban slum had fever in the past 2 weeks preceding the survey. About 20% of mothers in urban slum and LIG reported that they were not washing their hands with soap before preparing food for their children. Although most of the children with diarrhea had received oral rehydration salts, they had not received zinc which is critical in the treatment of diarrhea. About 24% of mothers in the urban slum discontinued complementary feeding during illness. The immunization was complete for most of the children in all groups except for the 2nd dose of measles vaccine and booster dose of OPV and DPT vaccine whose coverage was found to be low in urban slums. There is an urgent need of counseling and support on IYCF during and after common childhood illnesses by the frontline health functionaries to reduce the high burden of undernutrition among children under 2 years.

Keywords: Complementary feeding, Immunization, Infant and young child, Morbidity

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Introduction

The under 5 mortality rate remains as high as 50 in India (NFHS-4). About 5.2 million child deaths were accounted worldwide in 2019 in children under 5 years, mostly from preventable causes, including diarrhea, pneumonia, and malaria, which could be averted with interventions such as access to immunization, adequate nutrition, hygiene, and safe water.[1]

It has been well documented that in the low- and middle-income countries, most stunting among children occurs during the first 2 years of life, caused by poor infant and young child feeding (IYCF) practices and often in conjunction with repeated infections.[2] In addition, child feeding practices during and after illness can be faulty[3] and may delay recovery, further deteriorating the nutritional status of children. Optimal IYCF and immunization play a critical role in averting childhood illness and achieving optimal growth and development. In fact, immunization is one of the most cost-effective interventions that can prevent the deaths of 2–3 million of children annually.[4] Although in India, we have the largest Universal Immunization Programme (UIP) in the world in place,[5] still gaps in policy and program exist with regard to IYCF practices for children during and after common childhood illnesses.

Methodology

This cross-sectional study was carried out among children 6–23 months of age in three income groups of Delhi to assess their morbidity and immunization status and feeding practices during illness (from February 2019 to March 2020). The three income groups were urban slum, low-income group (LIG), and middle-income group (MIG). The sample size was calculated using the formula, $n = 4pq/d^2$ and came out to 150 for each income group (total 450). Data collection was carried out three different areas of West Delhi. The information on morbidity status, hygiene practices, feeding during illness, and immunization status of children was collected using a structured interview. The socioeconomic information was analyzed using revised Kuppuswamy scale with real-time update.[6] The analysis of the data was done using SPSS (version 24). Ethical clearance was obtained from Lady Irwin College institutional ethics committee.

Results

Table 1 shows background characteristics of children belonging to the three income groups. Majority of children in urban slum were male, 51.3%, and in LIG and MIG, majority of the children were female (55.3% and 52.5%, respectively). In the urban slum, most of the children were in the age group of 16–20 months (34%), in the LIG, majority were in the age group of 6–10 months (32.6%) while in MIG, a higher percentage of children were in the age group of 11–15 months (42.4%). Modified Kuppuswamy scale was used to categorize each income group into different socioeconomic categories based on the education and occupation of the head of the household and income of the family [Figure 1]. It was observed

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that in the urban slum, majority of the population (62%) fell in the upper-lower (IV) class and about one-third of the population were in the lower-middle (III) category. In the LIG, the population was distributed equally into upper-lower (IV) and lower-middle (III) class (about 46% in each class). About 8% of the population was in the upper-middle (II) class. In the MIG, majority/50% of the population fell in the upper-middle class (II). Close to one-third were in the lower-middle (III) class and about 19% were in the upper-lower (IV) class. A very low percentage was in the upper class category (2.3%).

Table 2 shows the hand washing practices of mothers of infant and young children. The results showed that almost all the mothers in the three income groups reported to be washing their hands before preparing food for their child. However, only about 80% of mothers in the urban slum and LIG and 88.5% of mothers reported to be washing their hands with soap before preparing food for their child.

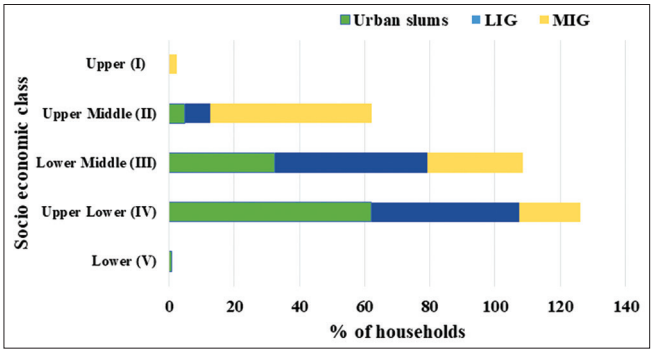

Figure 1: Socioeconomic classification as per KSS score

Table 1: Gender and age of infants and young children

Characteristics	*Urban slums*		*LIG*		*MIG*		*P-value*
	n	*%*	*n*	*%*	*n*	*%*	
Gender							
Boy	77	51.3	67	44.7	66	47.5	0.510
Girl	73	48.7	83	55.3	73	52.5	
Age (months)							
6–10	43	28.7	49	32.6	37	26.6	<0.05
11–15	40	26.7	45	30.0	59	42.4	
16–20	51	34.0	36	24.0	22	15.8	
21–23	16	10.7	20	13.3	21	15.1	

LIG: Low-income group, MIG: Middle-income group

The percentage of mothers who reported to wash their child's hand with soap before giving food was 42%, 47%, and 39.7% in the urban slum, LIG, and MIG, respectively.

Table 3 shows the morbidity status of children 6–23 months. The prevalence of diarrhea in the past 2 weeks preceding the survey was reported to be 8.6%, 18.3%, and 17.7% in urban slum, LIG, and MIG, respectively. All children with diarrhea received oral rehydration salts (ORS) in LIG and MIG while 69.2% of children with diarrhea received ORS in urban slum.

The percentage of children with diarrhea in the past 2 weeks who received zinc was reported to be 55.5%, 53.3%, and 64.3% in the urban slum, LIG, and MIG. Half of the children in LIG and MIG and about 45% in urban slum had fever in the past 2 weeks preceding the survey. The prevalence of symptoms of acute respiratory infection (ARI) in the past 2 weeks preceding the survey was found to low in all the income groups.

The percentage of mothers who reported to continued breastfeeding during illness was found to be higher in the urban slum and LIG as compared to MIG. Mothers who reported to continue complementary feeding during illness were highest in the LIG (93.9%), followed by MIG (81%). Most of the mothers reported that the frequency of complementary foods given to children decreased during illness in all the three income groups [Table 4]. The results showed that almost all the children had received the BCG vaccine. Children who had the received polio vaccine at birth were 89.6%, 92.1%, and 93.2% in the urban slum, LIG, and MIG, respectively [Table 5]. More than 97% of the children in all the three income groups had received three doses of polio, DPT vaccine, and hepatitis B vaccine. Children aged 16–23 months who had received 2nd dose of measles vaccine and booster dose of OPV and DPT vaccine were found be lower in the urban slums as compared to LIG and MIG. About 82% of children (9–23) had received the required number of vitamin doses as per their age in the urban slum and LIG. The percentage was lower in the MIG (73.9%).

Discussion

The study results showed that hand washing practices were comparable in all the three income groups and belonging to higher socioeconomic group possibly did not affect their hygiene behavior with regard to infant feeding practices. It was notable that close to 20% of mothers was not washing their hands with soap before preparing food for their child suggesting that hand

Table 2: Hand washing practices in different income groups

Practices	*Urban slums (n=150)*	*LIG (n=150)*	*MIG (n=139)*
Percentage of mothers who reported that they washed hands before preparing food for the child			
Yes	140 (93.3)	146 (97.3)	139 (100)
No	10 (6.7)	4 (2.7)	0 (0.0)
Percentage of mothers who washed hands with soap before preparing food for the child (out of those who washed their hands)			
Yes	114 (81.4)	119 (79.3)	123 (88.5)
No	26 (18.6)	27 (20.7)	16 (11.5)
Mothers who washed their child's hand before giving food			
Yes	100 (66.7)	100 (66.7)	98 (70.5)
No	50 (33.3)	50 (33.3)	41 (29.5)
Mothers who washed their child's hand with soap before giving food (out of those who washed)			
Yes	42 (42)	47 (47)	39 (39.7)
No	39 (58)	53 (53)	63 (62.2)
Percentage of mothers who treated water to make it safe for drinking	9 (6)	26 (17.3)	83 (59.7)
Boil	9 (6)	12 (46.2)	14 (16.9)
Use water filters/RO	0 (0.0)	14 (53.8)	65 (78.3)

LIG: Low-income group, MIG: Middle-income group

Table 3: Morbidity status of children and feeding practices during illness

Indicator	*Urban slums (n = 67)*	*LIG (n = 82)*	*MIG (n = 79)*
Prevalence of diarrhea (reported) in the past 2 weeks preceding the survey (%)	13 (8.6)	15 (18.3)	14 (17.7)
Children with diarrhea in the past 2 weeks who received ORS (%)	9 (69.2)	15 (100)	14 (100)
Children with diarrhea in the past 2 weeks who received zinc (%)	5 (55.5)	8 (53.3)	9 (64.3)
Children with diarrhea in the past 2 weeks taken to a health facility (%)	12 (92.3)	15 (100)	11 (78.6)
Children who had fever in the past 2 weeks preceding the survey (%)	30 (44.7)	42 (51.2)	40 (50.6)
Children who had cold/cough in the past 2 weeks preceding the survey (%)	32 (47.7)	30 (36.6)	28 (35.4)
Prevalence of symptoms of ARI in the past 2 weeks preceding the survey (%)	2 (1.3)	3 (3.7)	0 (0.0)
Children with fever or symptoms of ARI in the past 2 weeks preceding the survey taken to a health facility (%)	2 (100)	1 (33.3)	0 (0.0)
Percentage of mothers who reported that they continued breastfeeding during illness	58 (86.6)	73 (89.0)	58 (73.4)
Percentage of mothers who reported that they continued complementary feeding during illness (out of those who were given complementary foods)	51 (76.1)	77 (93.9)	64 (81.0)

ORS: Oral rehydration salts, ARI: Acute respiratory infection, LIG: Low-income group, MIG: Middle-income group

Table 4: Frequency of breastfeeding, non-breast milk liquids, and complementary foods during illness for children 6–23 months

	Increased n (%)			*Decreased n (%)*			*Remained same n (%)*		
	US	*LIG*	*MIG*	*US*	*LIG*	*MIG*	*US*	*LIG*	*MIG*
Breastfeeding	4 (6.9)	2 (2.7)	6 (10.3)	25 (43.1)	33 (45.2)	16 (27.6)	29 (50)	38 (52.0)	36 (62.1)
Complementary foods	1 (4.8)	1 (1.4)	1 (1.5)	41 (80.4)	64 (83.1)	48 (75)	9 (17.6)	12 (15.5)	15 (23.4)

US: Urban slums, LIG: Low-income group, MIG: Middle-income group

Table 5: Child IMMUNIZATIONS and Vitamin A supplementation

Indicator	*Urban slums*		*LIG*		*MIG*	
	n	*%*	*n*	*%*	*n*	*%*
Children aged 6–23 months who have received BCG (%)	142	98.6	140	100	133	100
Children aged 6–23 months who have received polio vaccine at birth (%)	129	89.6	129	92.1	124	93.2
Children aged 6–23 months who have received hepatitis B vaccine at birth (%)	125	86.8	127	90.7	122	91.7
Children aged 6–23 months who have received three doses of polio vaccine (%)	140	97.2	139	99.3	129	97.0
Children aged 6–23 months who have received three doses of DPT vaccine (%)	140	97.2	139	99.3	131	98.5
Children aged 6–23 months who have received three doses of hepatitis B vaccine (%)	140	97.2	139	99.3	129	97.0
Children aged 9–23 months who have received 1st dose of measles vaccine (%)	114	92.7	104	98.1	106	99.1
Children age 16–23 months who received 2nd dose of measles vaccine (%)	54	78.3	46	97.9	33	100
Children age 16–23 months who received booster dose of OPV and DPT vaccine (%)	53	76.8	44	95.7	31	96.9
Percentage of children (9–23) who received the required number of vitamin doses as per their age	77	81.9	92	82.1	85	73.9

washing with soap before food preparation was not a norm. Zinc supplementation during diarrhea can reduce both the severity and duration of the diarrheal episode.[7] It was found that although most of the children with diarrhea had received ORS they had not received zinc which is critical in the treatment of diarrhea. Half of the children in LIG and MIG and about 45% had fever in the past 2 weeks preceding the survey which is a matter of concern. The prevalence of fever in India was 12.8% among under-5 children during the past 2 weeks preceding the date of the survey as per the NFHS 4.[8] The prevalence was found to be much higher in our study. The results showed that about 24% of mothers in the urban slum discontinued complementary feeding during illness. This could be attributed to lack of knowledge on appropriate feeding practices during and after illness. A recent systematic review indicated that withdrawal of complementary foods during illness was frequent due to children's anorexia (perceived/real), lack of awareness of caregiver about the feeding requirements of children during illness and traditional beliefs or substandard counseling, and support by health workers.[9] The immunization status of children was comparable in all the income groups except for 2nd dose of measles vaccine and booster dose of OPV and DPT vaccine that was found be lower in urban slums. UIP, one of the largest public health programs, targets close of 2.67 crore newborns and could have led to the high coverage of children being immunized.

Conclusion

A considerable proportion of children reported some or the other morbidity in the preceding week of the survey in all the three income groups. Child feeding practices during illness were suboptimal. There is an urgent need of counseling and support on IYCF during and after common childhood illnesses to be provided by the frontline health functionaries to reduce the high burden of undernutrition among children <2 years.

Conflicts of Interest

The authors declare no conflicts of interest.

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