ISSN- 0301-1216
Indian J. Prev. Soc. Med. Vol. 55, No.1, 2024

Association of intervention with hygiene practices during initiation of Complementary Feeding among infants in rural Varanasi.

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ABSTRACT

Background: Hygiene practices like hand washing before and after food preparation, use of separate utensils to feed infants, clean water access and sanitation, play crucial role in preventing diseases among infants, especially when the complementary foods are introduced to them. It's important to maintain good hygiene practices, specifically, when caring for infants, to minimize the risk of illnesses like diarrhoea, respiratory tract infections, gastrointestinal infections, etc. Regular hand washing, proper food handling, clean and safe storage and maintaining a clean environment are essential for preventing infections in infants. **Aims & Objectives**: The current study was conducted with an objective to assess the association of intervention with hygiene practices during initiation of complementary feeding among infants in Harahua block, Varanasi. **Methodology**: The present study was a prospective interventional study conducted in Harahua, Varanasi, from October, 2021 to November, 2022, for which 2 groups, namely intervention group and control group were assigned. In each group, 112 mother- child pairs were enrolled and were followed up every month till the child attained 1 year. An educational intervention for practising exclusive breastfeeding, proper and timely initiation complementary feeding and benefits of following adequate and proper hygiene practices was given to the respondents (mothers) of intervention group. Data was collected from the respondents after receiving written consent from them. A semi- structured questionnaire was designed to collect the data which included questions related to socio- demographic characteristics, hand washing and hygiene and feeding practices. Data was analyzed using SPSS version 21. The Chi-square test was used for testing association among variables and a P- value less than 0.05 was considered as statistically significant. **Results:** The study indicated that bottle- feeding practice was high in the control group (65.2%), as compared to the intervention group (49.1%). Only 48.2% of the mothers fed their babies with bowl and hands in the intervention group. Regular hand washing practice before preparing food for the baby was observed in 39.3% respondents from the intervention group. 49.1% mothers from control group sometimes used soap to wash their hands. It was revealed from the study that 8.9% respondents always used boiled water to prepare food for their babies, while the percentage of respondents using normal water from both groups was same (48.2%). **Conclusion:** This study observed that although there was a significant association between hygiene practices and intervention given, still there was a lack of knowledge in following proper and appropriate hygiene routines while preparing food for infants in some of the respondents. To cope up with this challenge, a long term interventions are needed to be strictly followed at the community level.

Keywords: Complementary feeding, hygiene practices**,** diarrhoea in infants, respiratory tract infection.

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Submission	15.01.2024	Revision	24.01.2024	Accepted	22.02.2024	Printing	31.03.2024

Prior Publication*: Nil*; Source of Funding:* Nil; *Conflicts of Interest*: None, *Article #73

Introduction

Complementary feeding is the process of starting an addition meal of liquids when an infant's need of energy and nutrients exceeds that of breast milk at 6 months of age. The initial 2 years of life following breastfeeding are critical for a child's growth and development.[1-2] Although beginning at 6 months, breastfeeding should be combined with safe, age- appropriate solid, semisolid, and soft foods, it should also be stored and prepared hygienically and fed with clean hands.[2-3]

Poor hygiene practices while preparing food for the infants may lead to diarrhoeal disease and in developing countries, like ours, these have always been a challenge in promoting a safe and healthy gateway to infants. This has contributed to a large proportion of infectious diseases worldwide.[3] Inappropriate feeding practices can also cause malnutrition in young children. Approximately, 600 million food-borne diseases are diagnosed annually worldwide, resulting in 420,000 deaths. Under 5- year-old children account for 30% of food-borne deaths.[4]

The process of feeding complementary foods is directly related to malnutrition. The poor hygiene practices and dietary contamination are one of the significant causes of infectious diseases that are associated with 70% of diarrhoea episodes and 88% of childhood deaths in most of the developing countries.[5-6]

Complementary foods should be prepared with appropriate hygiene, and caregivers must possess adequate nutritional knowledge and apply it to the preparation of complementary foods.[7] Evidence demonstrated that children's morbidity and mortality can be reduced significantly by improving food hygiene practices during complementary feeding.

However, intervention for hygiene practices during complementary feeding was addressed in the study area. Therefore, this study aimed to assess the association of hygiene practices with intervention during initiation of complementary feeding among infants in (Harahua block) rural area of Varanasi District.

Aims & Objectives:

To study the association of intervention with hygiene practices during initiation of complementary feeding in infants.

Material & Methods

Methodology

Study Setting: This study was a community-based prospective intervention study conducted in Harahua block (rural area) Varanasi, Uttar Pradesh for a period of one year (from October, 2021- November, 2022).

Study Participants: For this study, two groups- intervention and control group were assigned. The intervention group was the one that received educational intervention regarding the hygiene practices followed during initiation of complementary feeding at an appropriate age, effect of those routines on infant's health and development. While the latter group didn't received any kind of intervention. Each group comprised of 112 mother- child pair and all of them were followed- up until 1 year age to gather information of their feeding patterns and practices, illness of infants. The newborns were the study subjects and the mothers were respondents.

Sample size determination- The following formula was used to determine the sample size-

$$n = \frac{\left[Z_{\alpha/2}\sqrt{\overline{P^*Q^*}\left(1+\frac{1}{k}\right)} + \left|Z_{1-\beta}\right|\sqrt{P_1Q_1+P_2Q_2/k}\right]^2}{(P1-P2)^2}$$

Where:

n = sample size

α = level of significance = 5%; $Z_{\alpha/2}$ = critical value of z at 5% level of significance for two tailed test = 1.96

β = Power of test = 97.5%; $Z_{1-\beta}$ = critical value of z at 1 – β = 1.96

P1 = incidence of diarrhoea among timely initiated complementary feeding = 0.20;

P2 = incidence of diarrhoea among early initiated complementary feeding = 0.40

(Obtained from the pilot survey of 20 early initiated complementary feeding children and 20 timely initiated complementary feeding children).

Q1= 1- P1, Q2= 1- P2.

Taking the value of **k= 1**, the sample size was calculated to be 106. Now, after taking 5% non-response rate, final sample size was -

$$n' = \frac{106}{1-0.05} = 112$$

Hence, sample size for intervention group = **112**, and the sample size for control group = **112.**

Inclusion criteria

Mothers of all the newborns who were the permanent residents of the study area and who were available for follow-up for 1 year and who willingly gave their consent to participate in the study.

Only full- term singleton babies were included in this study.

Exclusion criteria: Babies born to mothers who had come to parental house for delivery were excluded. Since the study urged for a 1 year follow –up, thus, such participants were not included.

Mothers who were severely ill or were not giving consent for their participation were also excluded from this study.

Data Collection: During the initial phase, the investigator visited houses of the mothers within 10 days of childbirth and baseline data including socio- demographic characteristics, obstetric profile, and birth weight was collected obtaining their informed consent. Two groups were formed after 1st visit and for the first 3 months, one group received educational intervention regarding hygiene practices during preparation of food during initiation of complementary feeding while from the control group, answers were directly recorded on the questionnaire according to their responses. Thereafter, each month, new births were enrolled into each group and monthly follow-up visits were done for 1 year to collect details about their feeding practices and timing of initiation of complementary foods. The data of illness episodes was collected prior from the age of 3rd month of the infants till they attained the age of 6 months. The data collection was conducted from October, 2021 to November, 2022.

Data Analysis

All the data collected were entered coded and analyzed using SPSS 21 as per study objectives. The Chi-square test was used for testing association among variables and a P- value less than 0.05 was considered as statistically significant. Socio- demographic profile was calculated using Modified B G Prasad classification of 2023.

Results

Table -1: Socio-Demographic Profile

Socio-Demographic		Total		Intervention		Control	
		No.	%	No.	%	No.	%
Age of mother at the time of delivery in years	20 yrs or less than 20	29	12.9	16	14.3	13	11.6
	21-25 years	117	52.2	56	50.0	61	54.5
	26-30 years	57	25.4	27	24.1	30	26.8
	Above 30 years	21	9.4	13	11.6	8	7.1
Religion	**Hindu**	**213**	**95.1**	**105**	**93.8**	**108**	**96.4**
	Muslim	11	4.9	7	6.3	4	3.6
	Sikh	0	0.0	0	0.0	0	0.0
	Christians	0	0.0	0	0.0	0	0.0
Caste	General	67	29.9	36	32.1	31	27.7
	SC/ST	31	13.8	16	14.3	15	13.4
	OBC	126	56.3	60	53.6	66	58.9
Type of family	**Joint**	**201**	**89.7**	**100**	**89.3**	**101**	**90.2**
	Nuclear	23	10.3	12	10.7	11	9.8
Educational status	Illiterate	4	1.8	4	3.6	0	0.0
	Primary level	14	6.3	10	8.9	4	3.6
	Secondary level	62	27.7	33	29.5	29	25.9
	Higher Secondary	107	47.8	56	50.0	51	45.5
	Graduation/ Post-Graduation	37	16.5	9	8.0	28	25.0
Occupational status	Govt. Employee	3	1.3	2	1.8	1	0.9
	Private job	4	1.8	2	1.8	2	1.8
	Self employed	15	6.7	7	6.3	8	7.1
	Homemakers	202	90.2	101	90.2	101	90.2
Monthly income	9098 and above	3	1.3	2	1.8	1	0.9
	4549 – 9097	23	10.3	15	13.4	8	7.1
	2729 – 4550	86	38.4	39	34.8	47	42.0
	1365 – 2728	98	43.8	47	42.0	51	45.5
	Below 1365	14	6.3	9	8.0	5	4.5
Gender of baby	Male	126	56.3	57	50.9	69	61.6
	Female	98	43.8	55	49.1	43	38.4

Table-1 depicts the socio- demographic characteristics of mothers, in which total 52.2% of women were in between 21-25 years of age at the time of their delivery. Majority of women belonged to Hindu religion as shown in the table which was 95.1%. The percentage of male newborns was 12.5% more than the female newborns. Out of the total respondents from both groups, 43.8% of them belonged to lower middle class family, followed by middle class (38.4%). Majority (89.7%) of respondents belonged to the joint family.

Table -2: Hygiene practices and Intervention

Variables		Groups				χ^2 Test	P-value
		Intervention		Control			
		No.	%	No.	%		
What do you use to feed the baby	Bowl and spoon	3	2.7	0	0.0	9.128	0.010*
	With bowl and hands	54	48.2	39	34.8		
	By bottle as well as by hands	55	49.1	73	65.2		
Do you wash your hands before preparing food for the baby	Always	44	39.3	38	33.9	2.003	0.367
	Sometimes	68	60.7	73	65.2		
	Never	0	0.0	1	0.9		
How do you wash your hands before preparing food	Always with soap	49	43.8	38	33.9	17.814	0.000*
	With water only	2	1.8	18	16.1		
	Sometimes with soap	61	54.5	55	49.1		
	Never wash hands	0	0.0	1	0.9		
Do you wash your hands before feeding the baby	Always with soap	50	44.6	30	26.8	15.327	0.000*
	Sometimes with soap	60	53.6	67	59.8		
	Without using soap	2	1.8	15	13.4		
	Never wash hands	0	0.0	0	0.0		
Do you use separate utensils for feeding the baby	Yes, always	11	9.8	22	19.6	5.492	0.139
	Sometimes	56	50.0	45	40.2		
	Never	40	35.7	42	37.5		
	Feeds the child in the pot as per his wish	5	4.5	3	2.7		
Do you use boiled water for preparing the food for the baby	Always	2	1.8	10	8.9	6.438	0.040*
	Sometimes	56	50.0	48	42.9		
	Use normal water only	54	48.2	54	48.2		

*Implies significant at 5% level of significance

Table 2 shows that the significant association was found between various hygiene practices (like- feeding tools for baby, washing hand before preparing food, washing hand before feeding baby and using boiled water for preparing food for baby) and intervention given. The study indicated that bottle- feeding practice was high in the control group (65.2%), as compared to the intervention group (49.1%). Only 48.2% of the mothers fed their babies with bowl and hands in the intervention group. Regular hand washing practice before preparing food for the baby was observed in 39.3% respondents from the intervention group. 49.1% mothers from control group sometimes used soap to wash their hands. It was revealed from the study that 8.9% respondents always used boiled water to prepare food for their babies, while the percentage of respondents using normal water in both the groups was same (48.2%).

Discussion

This study was conducted to determine the association of intervention with hygiene practices during initiation of Complementary Feeding among infants in rural Varanasi.

During intervention phase, practicing exclusive breast feeding and timely introduction of complementary feeding formed the core of our study. Mothers were suggested and encouraged for adoption of improved hygiene practices.

In this study, most of the respondents (56.3%) belonged to the OBC category (Other Backward Class) and 89.7% were from joint family. Socio- economic status shows that 43.8% of the respondents were from lower middle class, while 38.4% belonged to middle class family. In this it was found that 48.2% in the intervention group used bowls and hands to feed their babies.

It was observed that 43.8% mothers from intervention group and 33.9% from control group, always used soap to wash their hands before preparing food for the baby. Results of a study in north-western Nigeria showed that only 28% of mothers washed their hands before preparing meal[8].

This study found that 44.6% mothers from intervention group, always washed their hands using soap before feeding the child. This number was slightly high from another study conducted by Alelign Alemu Demmelash et al.[9], where only 8.9% of respondents always washed their hands with soap and water before feeding the baby.

Conclusion

The present study depicts that educational interventions can bring up more positive results in improving the hygiene practices followed by the women residing in rural areas. Socio- demographic factors, educational status can be some of the determinants effecting hygiene practices in such areas. Therefore, it is a must needed aspect that rural women are educated and given knowledge of following adequate and safe hygiene practices before and after preparing foods.

Authors Contribution: All authors have contributed equally.

Acknowledgement: Heartfelt thanks to all the mothers who participated in the study enthusiastically. Our sincere gratitude to the ANM and ASHA at the Harahua Block, District Varanasi for their support during the data collection. Without their help, this study would have never been

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Citation: Yadav Anu, Shankar R, Prasad R, Srivastava P. Association of intervention with hygiene practices during initiation of Complementary Feeding among infants in rural Varanasi, Indian J Prev Soc Med. 2024; 55 (1): **45-51.**