

Impact of Digital Counselling on Infant Feeding Practices among Working Lactating Mothers

Nidhi Katiyar

Assistant Professor & Head, Department of Home Science, Avvaiyar Government College for Women, Karaikal, Puducherry-609602, India.

PA Raajeswari

Associate Professor, Department of Food Science and Nutrition, Avinashilingam University for Women, Coimbatore, Tamil Nadu-641043, India.

Abstract

Appropriate Infant Feeding Practices are one of the most important aspects of improving child survival and promoting healthy growth and development specifically during the first two years of a child's life but are a challenge for a working lactating mother to follow. The present research was undertaken to study the impact of digital counselling on infant feeding practices among working lactating mothers. About 556 working lactating mothers and infants were chosen for the prevalence survey and the intervention group. Digital counselling through Google-meet sessions and hard paper counselling through a pamphlet was imparted to the last trimester pregnant mothers and a pre intervention and post intervention comparison of KAP and a follow up survey was carried out. Information pertaining to socio demographic and socioeconomic profile, prevalent Infant Feeding Practices was collected through the semi-structured questionnaire. Adequacy of the meals of the infants was assessed using WHO Indicators. Infant feeding practices like Pre-Lacteal Feeding (PLF), Lacteal Feeding, Exclusive Breast Feeding (EBF), Complementary Feeding Practices were found to be inappropriate in the prevalence survey as only 65 per cent mothers fed colostrum and 49 per cent gave Pre-Lacteal Feeds, only 33 per cent mothers practiced Exclusive Breast Feeding for six months, majority of infants (72 per cent) in 6-9 months and 68 per cent in 9-12 months lacked Minimum Acceptable Diet. Intervention results show that digital counseled group was found to be more efficacious, with better appropriate infant feeding practices as compared to the hard paper counselled group which in turn was better than the control group. Hence it may be concluded that the digital platform proved to be a more impactful platform for counselling which has also become a new norm due to the recent SARS-COV-2 pandemic situation and should be adopted in policy making with special focus on the constraints and challenges faced by the working mothers.

Key words: *Pre-Lacteal Feeding (PLF), Lacteal Feeding, Exclusive Breast Feeding (EBF), Complementary Feeding Practices, WHO indicators, Digital counselling, Hard paper counselling.*

I. Introduction

Under nutrition is thought to be the cause of 45 percent of all child deaths (WHO, 2021). In South Asian countries, stunting and wasting are serious threats to child's survival and development (UNICEF, 2017). What, when and how young children are fed during the first two years of life lay the foundation for survival, growth and development. (UNICEF, 2024)

As per NFHS-5, Children under age 3 years breastfed within one hour of birth is only 41.8 per cent, under 6 months exclusively breastfed children are 63.7 per cent, Children age 6-8 months receiving solid or semi-solid food and breast milk is only 45.9 per cent. Total children age 6-23 months receiving an adequate diet is only 11.3 per cent which is 22.9 per cent in Puducherry. Appropriate Infant Feeding Practices are one of the most important aspects of improving child survival and promoting healthy growth and development. Good nutrition during the first two years of a child's life reduces morbidity and mortality and promotes general development (WHO, 2020). Inadequate feeding practices expose infants to a variety of health risks, including growth faltering, diarrhoea, and Respiratory Tract Infections.

Due to the responsibilities and limitations of their profession, working mothers often find it difficult to adhere to the optimum infant feeding habits, and as a result, they frequently compromise on ideal feeding practices. In order to balance their careers and household responsibilities, working women often neglect optimum infant feeding practices. In general, mothers who are not engaged in full-time employment breastfeed for a more extended period than those employed (Uribe *et al.*, 2019). With the dual burden of career and home management, women often compromise their diet and optimum IYCF. This is a dual dilemma that a working

mother faces. It has also been found that EBF guidelines can be complicated for employed mothers. Evidence has shown that continued breastfeeding is frequently adversely affected by the return of the mother to work. (Spitzmueller,2016).

Rationale

Hence the present research was undertaken to study the Infant Feeding Practices among working lactating mothers. The current study is a small step towards improving Infant Feeding Practices among working lactating mothers through nutritional counselling using different platforms with the prime objective of assessing Infant Feeding practices, Pre-Lacteal Feeding (PLF), Lacteal Feeding, Exclusive Breast Feeding (EBF), Complementary Feeding Practices among working lactating mothers (0-12 months) and to study the impact of counselling (Digitized and Hard copy intervention) on Infant Feeding practices and morbidity pattern of infants. The present study was a prospective, longitudinal, interventional and a comparative study spanned over four years and divided into six phases.

II. Methodology

The study was carried out in the Karaikal district of Puducherry. In the Phase I, preliminary survey and identification of the research problem and formulation of the research hypothesis was done. The sample size was calculated through power analysis. The total sample size chosen was 577 which included 427 working lactating mothers for the prevalence survey and 150 working pregnant mothers in the last trimester for intervention, but after dropouts in the intervention and control group, the final sample size studied was 556.

The tools used in the study were semi-structured questionnaire, food checklist, pamphlet(hard paper counseling) and content for digital counselling. The tools like questionnaire, food checklist, pamphlet and content for digital counselling were self-designed and developed through a comprehensive review of literature and based on the recommendations by WHO and UNICEF as standards, standardized by first developing in English followed by translation in local language Tamil and validated by pilot testing on 50 mothers from the local community.

In Phase II, prevalence survey on the working lactating mothers, background information on the socio demographic and socioeconomic profile of the working lactating mothers, prevalent Infant Feeding Practices among working mothers focusing on Pre-Lacteal Feeding Practices (PLF), Colostrum Feeding, Exclusive Breast-Feeding (EBF) practices, continuation of breast feeding up-to one year and complementary feeding was collected through the semi-structured questionnaire using the 48 hours recall method.

Minimum Dietary Diversity, Minimum Meal Frequency, and Minimum Acceptable Diet, among other WHO indicators for breastfeeding and complementary feeding, were used to assess the adequacy of infant feeding practices and meals, which contained the following six indications (WHO, 2008).

In Phase III, a pilot survey on 50 last trimester pregnant working mothers was carried out to check the feasibility of the modules for the intervention study which included hard paper module (pamphlet) and content for digital counselling based on guidelines of WHO & UNICEF, (2003) and (2006), UNICEF, (2020) and WHO, 2009 guidelines for working mothers.

In Phase IV, a pre intervention survey was conducted among the selected mothers to collect the information on their knowledge on Infant Feeding Practices through the structured questionnaires and intervention through nutrition counselling regarding appropriate Infant Feeding Practices was given to working pregnant mothers in the last trimester. The mothers were randomly divided into three groups, Experimental Group 1(EG 1) Experimental Group 2 (EG 2) and Control group (CG) which did not receive any kind of counselling. EG 1 (N=43) comprised of 43 working lactating mothers and they received digital counselling through two sessions of counselling for 30 minutes each at fortnight interval through Google meet. The working lactating mothers in EG 2 (N=42) received counselling through hard copy namely paper modules, a pamphlet and given twice at an interval of a fortnight. The CG (N=44), did not receive any counselling. A pre- and post-intervention KAP survey regarding Infant Feeding Practices among the selected working mothers was carried out in all three groups, EG 1, EG 2 and CG.

In Phase V, a post intervention survey was carried out. A Follow up survey from birth to 12 months regarding Infant Feeding Practices, evaluation of Infant Feeding Practices with reference to WHO indicators, morbidity pattern and immunization status, in the EG 1, EG 2 and CG was started after a month of the counselling.

The data was collected and entered into MS Excel 2010 before being subjected to various statistical analyses using SPSS software version 22 in the VI phase of the study.

III. Results and Discussions

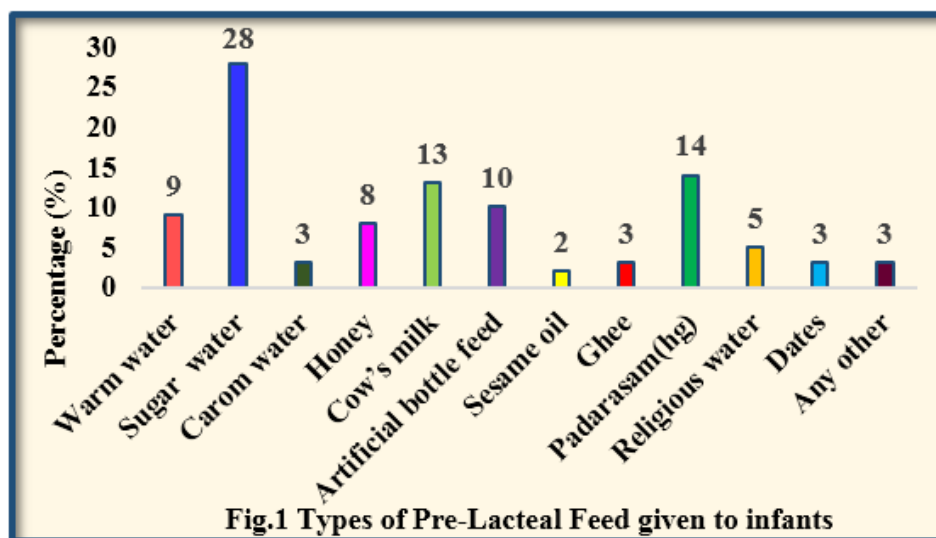
Prevalence survey

Socio-economic and demographic profile of the working lactating mothers and infants in the prevalence survey

Over all 427 mothers were studied and majority of mothers (72%) were in the age group of 21-30 years, 10 per cent of the mothers are in the 15-20 years age group and four per cent mothers belonged to 35-40 years age group. Majority 32 per cent of the mothers were intermediate pass, 29 per cent mothers were graduates, 23 per cent mothers were educated up-to middle level, 13 per cent studied up to primary class, followed by four per cent post-graduates. Most of the mothers (40%) were employed in the unorganized sectors and 38 per cent of the mothers worked in private establishments, followed by nine per cent of the mothers employed in the government organizations and 13 per cent were students. In the study, 46 per cent infants were in the age group of 9-12 months, followed by 24 per cent infants in the age group of 6-9 months, 22 per cent in 3-6 months age group and nearly eight per cent were up to 3 months of age. Forty nine per cent were male infants and 51 per cent are female.

Prevalent Infant Feeding Practices among working lactating mothers and their work parameters

Seventy per cent mothers had knowledge about colostrum but 35 per cent of mothers were unaware about the advantages of feeding colostrum to the infants. Only 65 percent mothers fed colostrum to their infants. Out of 35 per cent mothers who did not feed colostrum to their babies, majority(25%) cited caesarean to be one of the reasons for discarding colostrum. Forty nine per cent of the mothers gave Pre-Lacteal Feeds to their babies, with prime reason being customs and traditions (29 %), followed by better suckling (24%), clearing of gastrointestinal tract (17%) followed by other reasons like post caesarean difficulty, removal of red rashes, black stools, relatives and friends insistence and perceived insufficient milk supply (30%). The most common type of PLF fed was sugar water (28%), followed by *padarasam* (mercury) (14%).



About 68 per cent infants were breastfed after birth. Initiation of breastfeeding within one hour was by only 29% mothers and nine per cent of mothers delayed giving breastfeed by 12 hours. Further only 33 per cent mothers practiced EBF for six months. The main reasons for discontinuation of EBF before 6 months was resuming work post- delivery (71%). About 46 per cent 9-12 months old infants were not breastfed for up to one year. 42 per cent mothers did not breast feed during illness and the main reason cited being diarrhoea (32%).

Variable	Category	Baseline survey (%)
Infant breastfeed after birth	Yes	68
	No	32
Initiation of Breast feeding	1hr	29
	1-4hr	36
	5-12hr	25
	>12hr	10

Frequency of breast feeding	1-2hr	18
	2-3hr	12
	3-4hr	14
	>4hr	56
Exclusively breast feed	0 days	9
	1-3 months	19
	3-5 months	39
	>=6 months	33
Infants breastfed up to one year (out of 198)	Yes	54
	No	46

Inappropriate complementary feeding practices were observed in the prevalence survey, with 67 per cent mothers starting bottle feed before six months of age and 20 per cent mothers giving some type of liquid feed other than the breast milk right from the birth itself, followed by 37% mothers giving other liquid from one to three months of age. Frequency of feeding these liquids in majority cases was twice a day (32%) and the quantity given was in 44 per cent mothers 5-10 ml each time, with water being the most common liquid fed to the infants(70%). Out of total semi-solid food fed infants, 52% mothers either practiced early (before six months) or delayed (beyond nine months) introduction of semi-solid food. Majority (45%) gave semi solid food twice a day, followed by 31 per cent mothers feeding thrice a day and 22 per cent mothers feeding only once a day. Quantity of semi-solid foods in majority infants was inadequate accounting for 15g (55 %). Seventy six per cent mothers fed thin consistency feed even after six months of age. Out of 300 mothers 56 per cent continued feeding semi solid foods beyond 9 months of age also and 38 per cent had decided to feed semi solid food till the child attains one year of age with the main reasons for extended semi-solid food being easy swallowing (66%). Out of total 119 mothers, solid or family food introduction was delayed in nearly 100 per cent of the infants as solid foods were not introduced before 10 months of age. More than 50% of the mothers fed only twice a day as against recommended frequency of 3-4 times a day. Only 60 per cent of the mothers added some extra fat to the infant's diet.

TABLE: 2 INTRODUCTION OF SEMI-SOLID FOOD TO INFANTS, ITS FREQUENCY, QUANTITY AND CONSISTENCY (N=394)

Semi-solid Foods		Prevalence survey (%)
Age at which semi-solid started	3-5m	31
	6-9 m	48
	9-12 m	21.
Frequency of semi-solid food	Once a day	22
	Twice a day	45
	Thrice a day	31
	Four times a day	2
Quantity given at a time	1 tablespoon	56
	2 tablespoon	31
	3 tablespoon	10
	4 tablespoon	3
Consistency	Thin	76
	Thick	24

Work parameters of the mothers

Only 11 per cent mothers joined their work after the six months of maternity leave and other 89 per cent either returned between a fortnights to 5 months of delivery. More than 50 per cent of the mothers worked for an average of 6-8 hours and 70 per cent of the mothers did not return home during lunch hours to feed their baby .

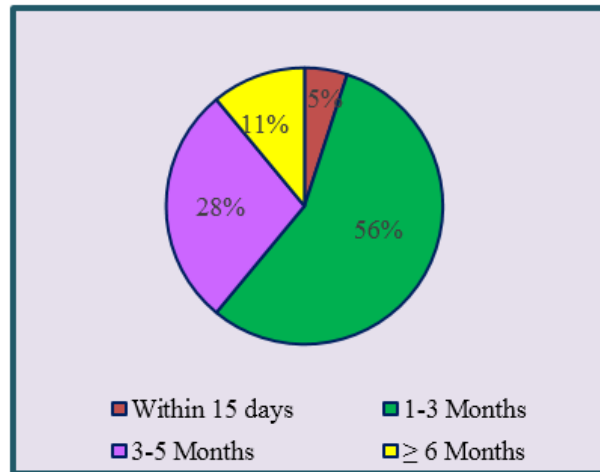


FIGURE 2 -RETURN TO WORK BY WORKING LACTATING MOTHERS POST DELIVERY

None of the mothers practiced expression of breast milk for later use which was mainly due to unawareness about pumping out milk for later use, storing, freezing and thawing of expressed milk.

Evaluation of Infant Feeding Practices with respect to the WHO indicators

Only 46 per cent and 62 per cent children had Minimum Dietary Diversity in the age group of 6-9 months and 9-12 months respectively. Sixty eight per cent in 0-6 months and 51 per cent in 9-12 months, lacked Minimum Meal Frequency respectively. Hence majority of infants, 72% in 6-9 months and 68% in 9-12 months lacked minimum acceptable diet(MAD).

Socioeconomic and Demographic profile of the mothers and Infants and the Employment Status of the Working Lactating Mothers in the Intervention groups and the CG

In the EG 1 and EG 2, most of the mothers 35 per cent and 33 per cent belonged to the age group of 21-25 years respectively and in the CG, 36 per cent mothers belonged to the age group of 26-30 years. In all the groups majority of the mothers were intermediate pass, 37 per cent in EG 1, 40 per cent in EG 2 and 36 per cent in CG respectively and over 30 per cent were graduates in all the three groups. In EG 1, EG 2 and CG most of the mothers (33%, 33% and 32% respectively) worked in the private sector, followed by 28 per cent and 33 per cent in the unorganized sector and 25 per cent and 29 per cent mothers were students. Most of the mothers in all the three groups belonged to below poverty line with monthly family income ranged between Rs. 2391-7101, EG 1(42%), 45 per cent in EG 2 (45%) and 39 per cent in the CG.

Impact of Intervention

KAP survey on Infant Feeding Practices

Pre-intervention knowledge among mothers from EG 1, EG 2 and CG regarding awareness about colostrum was comparable. The knowledge levels increased immensely after counselling from 65 per cent to 93 per cent in EG 1, from 64% to 86 per cent in EG 2 respectively, whereas the knowledge remained similar for the CG (66%). The Attitude about benefits of colostrum was again found to have improved from 64 per cent and 63 per cent to 93 per cent and 86 per cent in EG 1 and EG 2 respectively with no change in the CG. EG 1 had the highest feeding percentage of colostrum feeding (86%), followed by EG 2 (81%), and only 61 per cent fed in the CG.

A strong significant proportional difference (p=0.023) between EG 1, EG 2 and CG was found. Hence it can be inferred that counselling had a significant impact on the colostrum feeding practices. Forty two per cent in EG 1, 41 per cent each in EG 2 and CG mothers in pre-intervention survey believed that PLF should be given and in post-intervention survey their knowledge levels improved to 95 per cent and 93 per cent in EG 1 and EG 2 to prohibit PLF with no improvement in CG. Even the attitude towards benefits changed in EG 1(95%) and EG 2 (93%) where the mothers post-intervention believed that PLF is not beneficial to the child with no improvement in the CG.

Prevalence of PLF was least in EG 1, followed by EG 2 and it was practiced widely in the CG as only 14 per cent mothers in the EG 1 gave PLF followed by 26 per cent in the EG 2 and maximum 43 per cent mothers in the CG gave PLF. All types of PLF were given least in the EG 1 followed by EG 2 and most of the mothers in CG gave various PLF including *padarasam*(mercury) (16%), but none of the mothers in EG 1 or EG 2 gave

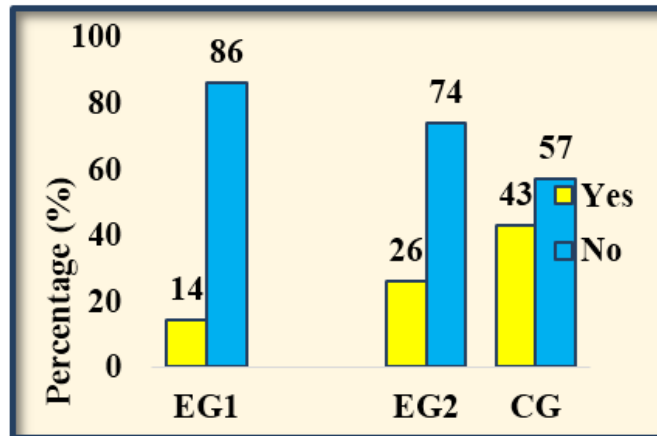


FIGURE 3 - PRACTICE OF FEEDING PRE-LACTEAL FEEDS padarasam.

A Significant proportion difference (P value = 0.05) was observed between the groups indicating marked effect of digital counselling, followed by hard paper counselling vis a vis CG. Infants breastfed after birth are highest in the EG 1, 86 per cent followed by EG 2, 76 per cent whereas in the CG only 66 per cent mothers breastfed after birth. Initiation of breastfeeding within an hour of birth is also highest in the EG 1, followed by EG 2, 51 per cent and 50 per cent respectively. However only 14 per cent in CG breastfed within 1 hour of birth. Breastfeeding practices were found to be best in EG 1 than EG 2 and lowest in the CG. EBF for 6 months was highest in EG 1, 67 per cent followed by 62 per cent in EG 2 and lowest EBF was observed in the CG (25%). In all the three groups, the main reasons for discontinuation of EBF

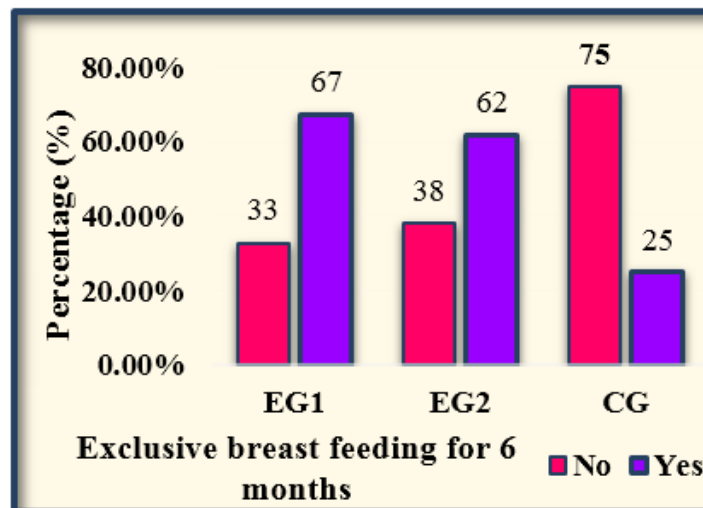


FIGURE 4 - EXCLUSIVE BREAST FEEDING FOR 6 MONTHS

before six months was return to work, EG 1, 71 per cent, EG 2, 56 per cent and CG 63 per cent. Continuation of breast feeding for one year was found to be highest in EG 1, 72 per cent, to followed by EG 2, 64 per cent but was lowest in CG, 48 per cent. Counselling did help in increasing initiating breast feeding in an hour of birth but not significantly (P value = 0.14). Breast feeding frequency of EG 1 was found to be significantly higher than EG 2 and CG with feeding every 2-3 (P Value = 0.0015). EBF was significantly highest in EG 1 followed by EG 2 and lowest in the CG (P value =0.042). In EG 1, only 21 per cent and 38 per cent in EG 2 mothers started giving liquids other than the breast milk from one to three months ,as compared to (64 %) in the CG .Bottle feeding before six months was the lowest in EG 1 (33) as compared to EG 2 (38%) and 75 per cent in the CG. Plain water was the most popular liquid fed to the infants, forty three per cent, forty four per cent and fifty four per cent in EG 1, EG 2 and CG respectively.

Majority of the mothers in EG 1 and EG 2 started semi solid food from 6-9 months, 56 per cent and 53 per cent respectively as compared to delayed introduction of semi solid foods in 9-12 months (27%). A significant proportion difference (P value = 0.047) was observed, indicating positive impact of the digital counselling. Also complementary feeding frequency was high and equal in EG 1 and EG 2 (49%), but was only twenty per cent in the CG with a significant proportional difference (P value = 0.052) indicating positive

impact of counselling.

Post-intervention, in EG 1 and EG 2, 33 per cent and 26 per cent mothers respectively expressed milk out for later consumption either through hand expression or through breast pump as compared to none in the CG. This was perhaps one of the important impacts of counselling which resulted in extended periods of EBF in EG 1 and EG 2.

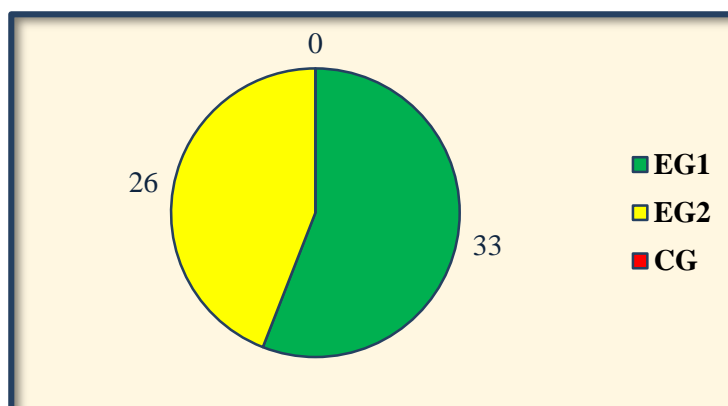


FIGURE 5 EXPRESSION OF BREASTMILK FOR LATER USE

Infant Feeding Practices in relation to the WHO indicators

In EG 1, the majority of infants (79%) in the age group 6-9 months and 86% in the age group 9-12 months had Minimum Dietary Diversity (MDD), followed by EG 2 (67%) in the age group 6-9 months and 71% in the age group 9-12 months, but only 36% in the age group 6-9 months and 43% in the age group 9-12 months had MDD in CG. As far as Minimum Meal Frequency (MMF) is concerned, in 6-9 months infants, majority had optimum MMF in EG 1 and EG 2, 88 per cent and 79 per cent respectively and only 68 per cent in CG had MMF. In 9-12 months, majority infants in EG 1 and EG 2 had MMF 93 per cent and 76 per cent respectively but in CG only 30 per cent infants in 9-12 months age group had MMF. Therefore, in EG 1 most of the children had MDD, MMF Minimum Acceptable Diet (MAD) was highest in EG 1 (72%) in the age group 6-9 months and (79%) in the age group 9-12 months, followed by EG 2 (67%) in the age group 6-9 months and 71% in the age group 9-12 months, as compared to only 27% in the age group 6-9 months and 27% in the age group 9-12 months.

Table 3 MINIMUM ACCEPTABLE DIET OF 6-12 MONTHS OLD INFANTS

MAD	EG 1		EG 2		CG	
	6-9 m	9-12 m	6-9 m	9-12 m	6-9 m	9-12 m
	(%)	(%)	(%)	(%)	(%)	(%)
Yes	72	79	67	71	27	27
No	28	21	33	29	73	73

Therefore, in EG 1 most of the children had MDD, MMF and MAD, followed by EG 2 and the infants in the CG had the lowest MDD, MMF and MAD.

IV. CONCLUSION

From the above discussions, it may be concluded that in the prevalence survey majority of the working lactating mothers were following inappropriate Infant Feeding Practices and a strong association was found between the Education, Employment status and Family Monthly Income of the working lactating mothers, Nutritional status of the infants and the Infant Feeding Practices. In the pre-intervention KAP survey also most of the mothers' knowledge and Attitude regarding Infant Feeding Practices was poor and comparable among the experimental and control groups. In the post-intervention KAP survey, knowledge, Attitude and Practices improved in the intervention groups as compared to the control group. Digital or virtual counselling was found to be more efficacious than the hard paper intervention as digitally counselled mothers followed most of the correct Infant Feeding Practices; breast feeding within one hour of birth, Colostrum Feeding, Exclusive Breast Feeding for six months, practicing expression of breast milk and storing it for later use when the mother is at work place, timely initiation of complementary feeding, giving age appropriate right

consistency of complementary food, diet pattern and simultaneously discouraged the faulty infant feeding practices like prohibition of PLF and discarding of colostrum feeding. The morbidity prevalence and frequency were also found to be low in the infants of digitally counselled mothers along with a better nutritional status as compared to the Hard paper counselled group which in turn was better than the control group. Moreover, the Digitally counselled group performed better in all the WHO standard indicators, 2008.

Hence it may be concluded that the Digital or virtual platform proved to be a more impactful platform for counselling than the Hard paper counselling in improving Infant Feeding Practices among working lactating mothers.

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