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Effects of Nutrition Education Program on Lactating Mothers in Relation to Infant Feeding Practices

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ABSTRACT

Maternal and child health status is profoundly affected by infant feeding practices. In Pakistan, these practices are sub optimal which may lead to adverse outcomes. The initiation of breastfeeding within the first hour of birth, as well as good counseling of lactating mothers regarding infant weaning and introduction of complementary foods to the infants in a hygienic and clean environment, can decrease the risk of malnutrition and infections, leading to a decrease in infant morbidity and mortality. Increasing the awareness of mothers regarding recommended feeding practices is a key to improving this situation, especially in the region of South Asia. The current study was conducted with the aim of assessing the impacts of contextually developed nutrition education sessions on the knowledge and attitudes of women regarding infant feeding. A quasi experiment was conducted for this purpose. A sample of 400 lactating mothers between 20-30 years of age visiting a private post-natal clinic located in Lahore, Pakistan was selected. Half of the sample (200) was included in the experimental group and exposed to 12 weeks of educational intervention based on various audio-visual aids. Pretest and posttest knowledge and attitude scores of the women of both control and experimental groups were recorded. The results showed that women belonging to both control and experimental groups had similar knowledge regarding infant feeding at baseline (pretest). However, experimental group showed significant improvement in knowledge scores after intervention, as compared to control. The results also revealed that simple educational intervention can lead to profound improvements in maternal knowledge and attitudes regarding infant feeding. Increasing awareness is the first step in the translation of knowledge into practice. Therefore, similar interventions may be helpful in improving infant breast and complementary feeding practices. Effective implementation of nutrition education interventions that can improve the breastfeeding rates and also bring about improvement in complementary feeding practices is important for a developing country like Pakistan. This, in turn, may lead to better health outcomes for infants by reducing direct and indirect impacts of undernutrition.

Keywords: breastfeeding, complementary feeding, infant feeding, intervention, lactating mothers, nutrition education

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1. INTRODUCTION

Adequate nutrition during the early stages of life is regarded as essential for lifelong health and wellbeing. The period from birth till one year of age is highly critical for the growth and development of the child. Due to the fact that infancy leads to more rapid growth as compared with that in any other age, it is not surprising that inadequate nutrition during this stage may lead to consequences in later life. About 1/3rd of deaths among children under five years of age are directly or indirectly linked to malnutrition. The infant mortality rate of Pakistan is quite high (62/1000 live births), indicating that around 400,00 babies are likely to die during the first year of their life. About two-third of these deaths are attributed to inappropriate infant feeding practices. According to UNICEF (United Nations International Children's Fund) estimates, the under-five mortality rate can be reduced by 13% by exclusive breastfeeding. Improving infant feeding practices such as breast and complementary feeding is, therefore, essential to improve infant health status.

Studies have shown that exclusive and partial breastfeeding during the first year of life can lead to a considerably reduced rate of infant mortality [1]. Exclusive breastfeeding for the first six months of life, followed by the addition of responsive feeding of nutritionally adequate, safe, and age appropriate complementary foods, is recommended globally for children. Yet, barely one in three infants is exclusively breastfed during the first six months of life. Breastfeed has a very high nutritive value and breastfed infants have higher IQ and visual acuity, get fewer infections, and enjoy better muscle development with better immunity [2]. Weaning period is the most crucial period in the development of a child, as the child is prone to infections and malnutrition at this stage [3]. It has been shown that the introduction of complementary food after 4 months, the quality of the first food introduced, and the diversity of complementary food predicts better nutritional status [4]. Promoting sound feeding practices should be the focus of the community projects of nutrition and health departments.

A holistic approach for the assessment and planning of intervention in infant and childhood nutrition is the need of the hour [5]. Changing feeding practices, such as taking care of infants outside the house and early introduction of various foods, markedly affect the nutritional status of infants. Nutrition education programs comprise an important way of spreading valuable information aimed to promote good health in the community. It has been found that nutrition education imparted to post-natal mothers is helpful in promoting healthy infant feeding behavior [6]. Studies have shown that maternal education and awareness considerably improve health indicators [7]. Providing nutrition education aims at empowering mothers to make efficient and maximal usage of available resources for the benefit of their children's health. Appropriate nutrition counselling can significantly improve the health of a growing child [8]. Women education and awareness program is necessary to educate mothers about the advantages of breastfeeding, which is the major nutrient food for infants till the age of six months, and weaning with appropriate foods in a clean environment.

Postnatal care offers an excellent opportunity to assess the ability of new mothers in getting along with their babies, particularly with regard to infant feeding. Studies have shown that early intervention in food and nutrient intake of infants and good maternal diet and counselling leads to better infant and child health in the future [9]. In addition to maternal health and knowledge, infant feeding is also affected by sociocultural and economic factors. In developing countries where there is a lack of resources, simple nutrition education messages which are easy to understand and aimed at improving infant diet have shown to improve infant health [10].

The current study was intended to see the effects of nutrition education in the form of lectures and visual aids on the knowledge of lactating mothers regarding infant feeding practices. It was also intended to develop a nutrition education plan for mothers belonging to District Lahore, Pakistan in order to improve their knowledge of feeding practices and to replace the myths and local traditions with scientific ways of feeding and weaning. This may help to develop a conducive environment for health promotion and disease prevention, playing a part in the overall infant health.

2. METHODOLOGY

2.1. Sample and Sampling

This research was designed as a quasi-experimental research. A pretest-posttest control group design was adopted for this study.

The women who satisfied the following inclusion criteria were included in the current study:

- Women in the age group of 20-30 years nursing their young ones
- Women with at least one infant up to the age of one year
- Women living in a joint family
- Women who were stay-at-home parents or housewives

A multistage sampling technique was applied in this research. The sampling units were selected from a locally run obstetrics and gynecology clinic with a patient turnover rate of about 40-50. The clinic was selected based on researcher's convenience.

Purposive sampling technique was used to select the sample. Women who visited post-natal clinic between July 2018 and January 2019, those who fulfilled the predetermined eligibility criteria, and those who consented to participate in the current study were included in the sample. Lactating women currently responsible to take care of at least one infant (0-12 months of age) were purposively selected for this study. This is because they were more likely to receive and apply the knowledge imparted during nutrition education on infant feeding. These women were in the age group of 20-30 years. All of them were housewives and all were living in a joint family.

The minimum number of participants required for this study was four hundred (N=400) based on the National Nutrition Survey (2018) which showed the prevalence of breastfeeding mothers to be 43.7% (30,000) in Punjab, Pakistan. The confidence level was taken to be 95% and the margin of error at 5%. In order to divide the sample into control and experimental groups, systematic random sampling was used. Out of the total sampling frame of 400 units, every second unit was included in the experimental group. In this way, half (50%) of the sample (200 women) was included in

the control group and the other half in the experimental group.

2.2. Data Collection and Analysis

The first step of data collection was to assess the eligibility of women for the study sample. Written informed consent was taken from women who were selected according to the pre-determined inclusion criteria. The women were first asked about their availability and willingness for follow up for up to 12 weeks after treatment before including them in the sample. Then, the selected women were requested to respond to the pretest questionnaire. Most of the data was collected through retrospective reporting; however, weight and height measurements were documented at the clinic. Some women who were facing difficulty in responding to the self-administered questionnaire were facilitated by the researcher. The questionnaire served as an interview schedule in their case. A few words were translated into the local language (Urdu) to enhance the comprehension of some questions. Pretest data was collected individually from the participants through one-on-one researcher-participant meeting, rather than group administration.

2.3. Pretest

In order to collect data from the participants, a close-ended questionnaire was designed based on the study objectives. The questionnaire consisted of two main parts. Part A contained questions regarding socio-demographic characteristics and general health parameters (height, weight, body mass index, presence/absence of chronic illness) of the participants. Part B contained questions aimed to assess the knowledge and attitudes of the participants regarding infant feeding practices. Questions related to the initiation of breastfeed, exclusive and continued breastfeeding, colostrum feeding, benefits of breastfeeding, and responsive feeding were included. Furthermore, questions regarding baby bottle hygiene and formula milk were also included. Opinions regarding the continuation of breastfeed after conception and dietary requirements of lactating mothers were also collected.

Apart from breastfeeding, the questionnaire also contained items related to weaning. The women were probed about their knowledge regarding the types of foods suitable for introducing complementary feeding, as well as the adequacy, timing, and hygiene of feeds. The questionnaire also contained items on common diseases (especially diarrhea), as well as their prevention and management.

Most of the items included in the questionnaire were discrete variables having more than two subcategories. However, the age of the participants and family income were recorded as numeric variables. During data analysis, these two variables were also divided into terciles based on the range of data set.

After pre-test, the sample was systematically divided into two equal parts with every second participant included in the experimental group. The participants included in the intervention group were contacted via phone and invited for educational sessions. The educational sessions consisted of 12 lectures, delivered over a period of 12 weeks. Lessons were delivered in a comfortable environment where the interest and concentration of the participants was maintained. Lessons were delivered twice a week in two parts, to an audience of around 50 women each time. The time duration of intervention was 45 to 60 minutes/day. The lectures were delivered in a simple and understandable language. Audio-visual aids were

incorporated to improve comprehension and retain interest. Charts, posters, and practical demonstrations were used to aid learning.

2.4. Intervention

After conducting pretest using the aforementioned questionnaire, the experimental group was exposed to a planned series of nutrition education sessions. The education plan focused on common problems faced by mothers in light of the expert opinion of practicing gynecologists. Also, the pretest results helped to refine the content and mode of delivery of the lecture plans. The nutrition education series consisted of twelve lectures, each with its own set of aims and expected outcomes. The initial lectures were about breastfeeding and focused on how it should be carried out exclusively during the first six months for improved infant and child health. The advantages and disadvantages of breastfeeding were discussed in a simple but detailed manner. In the following lectures, the participant mothers were given a guideline about infant growth and development and the milestones which should be achieved in the first year of life, such as giving response to sounds, neck holding, sitting up, crawling, standing, and trying to walk with support. They were taught that two infants of exactly the same age could have different weights and heights due to malnutrition, especially when their mothers are not careful about their diet and feeding. Then, lectures were delivered about maternal diet during lactation and how the mother can breastfeed the baby in the best way.

Infant weaning practices were also dealt with in detail in this program. A guideline was given about the infants first feed and the kind of diet that is best for them, as well as the food items not recommended very early because they can cause food allergy. It was taught that the diet of the child should consist of a variety of food products. Guidelines were given during the lectures with the help of practical tools about preparing simple diets, such as rice pudding and kheer, in a neat and clean environment. Also, during the program, the participant mothers were lectured about how to make food in a clean environment using clean utensils with clean hands to prevent illnesses. They were instructed about how to prepare ORS if the child falls sick with diarrohea. They were also made aware of the dietary requirements of a sick child.

2.5. Posttest

After exposure to twelve weeks of intervention, both experimental and control groups did a posttest using the same questionnaire. The pretest and posttest responses were converted into numeric scoring. The pretest and posttest scores of both groups were then compared to determine the effects of educational intervention on the knowledge of the participants.

2.6. Statistical Analysis

Statistical Package for Social Sciences (SPSS) version 24.0 was used for statistical analysis. The demographic characteristics of the sample were reported as frequencies and percentages. Independent sample t-test, paired sample t-test, Mann Whitney test, and Wilcoxon Signed Ranks test were the major inferential tests applied. Independent sample t-test was conducted to compare the results of the pretest scores of control and experimental groups. Paired sample t-test was conducted to compare the pretest and posttest scores of the experimental group. Mann-Whitney test was conducted to find the difference

between the pretest scores of control and experimental groups. Whereas, Wilcoxon Signed Ranks test was conducted to find the difference between the pretest and posttest scores of the experimental group. All hypothesis testing was done at 95% confidence interval with *p*-value ≤ 0.05 considered as significant. The results are represented in graphical and tabular formats.

2.7. Ethical Issues

Written approval was taken from the concerned participants. The purpose of study and the gathered information was kept confidential. At the end of the nutrition education program, nutrition education was also imparted to the control group, so that all the participating mothers would be able to bring about a positive change in infant feeding practices.

3. RESULTS

The results showed that the participant mothers in both groups had a similar socio-demographic profile. The sample was almost equally divided among the terciles of age ranges. As far as qualification is concerned, most (40%) of the participants in the sample had a graduation degree. The majority (92%) of the sample reported as having a family income of ≤50,000 PKR (per month). Only 8% of the participants had an income range falling in the highest tercile (Table 1).

Table 1. Demographic Profile of the Study Participants at Baseline (N=400)

Variables	Control group (n=200)		Experimental group (n=200)		Total sample (n=400)	
	n	%	*n*	%	*n*	%
Age (years)						
20-23	65	32.5	68	34.0	133	33.25
24-27	75	37.5	55	27.5	130	32.5
28-31	60	30.0	77	38.5	137	34.25
Mothers' Qualification						
Secondary	13	6.5	6	3.0	19	4.75
Higher Secondary	36	18.0	36	18.0	72	18.0
Intermediate	65	32.5	84	42.0	149	37.25
Graduate	86	43.0	74	37.0	160	40.0
Family Income (PKR)						
<20,0000	92	46.0	92	46.0	184	46.0
20,0000-50,000	87	43.5	97	48.5	184	46.0
50,000-100,000	21	10.5	11	5.5	32	8.0

Of the questions related to breastfeeding, the knowledge of the participant mothers improved with respect to almost all the parameters. Although there was a significant increase ($p < 0.05$) in knowledge in posttest about all items, the knowledge on some issues increased evidently more after intervention. A two-fold increase was observed in the

percentage of women who responded positively on early initiation and feeding of colostrum to infants after intervention (Table 2).

Table 2. Comparison of Pretest and Posttest Responses of Experimental Group on Questions Related to Breastfeeding (N=200)

Variables		Pre test		Post test	
		n	%	*n*	%
Initiation of breastfeeding after birth	Within one hour	107	53.5	178	89.0
	Within one day	82	41.0	20	10.0
	Within three days	8	4.0	2	1.0
	Within one week	3	1.5	0	0
Feeding of colostrum to infants	Should be given	82	41.0	187	93.5
	Should not be given	98	49.0	13	6.5
	No harm if given	12	6.0	0	0
	Should be avoided if possible	8	4.0	0	0
Breastfeeding should be continued for	2 years	150	75.0	177	88.5
	1 year	42	21.0	23	11.5
	6 months	5	2.5	0	0
	3 months	3	1.5	0	0
Frequency of breastfeeding in a day	On demand	142	71.0	177	88.5
	3 times 2 hourly	49	24.5	23	11.5
	Once a day	9	4.5	0	0
Length of breastfeeding session	Till fulfillment of baby	121	60.5	177	88.5
	One hour	79	39.5	22	11.0
	30 minutes	0	0	1	.5
Breast feed needs to be warmed	Yes	159	79.5	176	88.0
	No	41	20.5	24	12.0
Attitude towards exclusive breastfeeding	exclusive breastfeeding is important	105	52.5	114	57.0
	child should be breastfed partially	95	47.5	86	43.0

Regarding the benefits of breastfeeding, there was a significantly larger number of participants who began to acknowledge the benefits of breastfeeding for mothers, as well as for infants, after intervention. Indeed, a significant increase in knowledge was observed in posttest as compared to the pretest results ($p < 0.05$) (Table 3). Regarding mother's diet and health during lactation, there was a significant increase in knowledge after intervention. The majority of participants responded that lactating mother's diet should include dairy products. Moreover,

healthy women can breastfeed and that breastfeeding should be stopped after conception (Table 4).

Table 3. Comparison of Pretest and Posttest Responses of Experimental Group on the Benefits of Breastfeeding (N=200)

Variables		Pre test		Post test	
		n	%	*n*	%
Protective effect of breast milk from illnesses in infants	Yes	81	40.5	182	91.0
	No	105	52.5	17	8.5
	Impartial	14	7.0	1	.5
Protective role of breastfeeding in breast cancer	yes	122	61.0	179	89.5
	No	72	36.0	21	10.5
	May be	6	3.0	0	0
Role of breastfeeding in weight management	Yes	110	55.0	179	89.5
	No	90	45.0	21	10.5
Role of breastfeeding as natural contraceptive	Yes	120	60.0	174	87.0
	No	80	40.0	26	13.0
Role of breastfeeding in reducing infant mortality	Yes	113	56.5	172	86.0
	No	87	43.5	28	14.0
Development of stronger mother-child bond with breastfeed	Yes	132	66.0	179	89.5
	No	68	34.0	21	10.5
Benefits of breastfeed in cognitive development	Yes	97	48.5	174	87.0
	No	103	51.5	26	13.0

Table 4. Comparison of Pretest and Posttest Responses of Experimental Group on Lactating Mothers' Diet and Health (N=200)

Variables		Pre test		Post test	
		n	%	*n*	%
Milk and dairy should be increased in diet	Yes	119	59.5	172	86.0
	Regular diet is sufficient	81	40.5	25	12.5
	Should be avoided	0	0	1	.5

Variables		Pre test		Post test	
		n	%	*n*	%
of lactating mother	No	0	0	2	1.0
All healthy mothers breastfed their children	Yes	118	59.0	176	88.0
	No	82	41.0	24	12.0
Stopping breast feeding upon conception by mother	Should be tapered off within a period of few weeks	73	36.5	154	77.0
	Should be continued through out	124	62.0	43	21.5
	Should be stopped immediately	3	1.5	3	1.5

The majority of women after intervention responded that formula milk is more expensive and linked to higher infection rates in infants, as compared to breastfeed. Also, the percentage of women who responded that feeding bottles are not required for infants less than six months old and exclusive breastfeed should be supported during this time period also increased significantly ($p < 0.05$) in posttest (Table 5). A significantly larger number of women responded that complementary feed should be adequate, appropriate, hygienically prepared, and introduced timely. The majority of women also responded correctly on food items that should not be fed to infants after intervention (Table 6). Knowledge regarding infants' health and diseases also increased significantly. The majority of the participants were able to recognize the causes of diarrhea and its management using oral rehydration after intervention. They were able to respond positively about the role of personal hygiene in the prevention of infectious diseases in posttest (Table 7).

Table 5. Comparison of Pretest and Posttest Responses of Experimental Group on Bottle Feeding (*N*=200)

Variables		Pre test		Post test	
		n	%	*n*	%
Formula milk is more expensive and difficult to manage	Agreed	112	56.0	170	85.0
	Mildly agreed	85	42.5	30	15.0
	Disagree	3	1.5	0	0
Higher infection rate in bottle fed infants	Yes	106	53.0	170	85.0
	No	94	47.0	30	15.0
	Every time after feed	126	63.0	171	85.5

Frequency of sterilization of feeding bottles	Twice a day	74	37.0	29	14.5
Feeding bottles must be given during first six months	Not required	111	55.5	163	81.5
	Three times a day	89	44.5	37	18.5

Table 6. Comparison of Pretest and Posttest Responses of Experimental Group on Complementary Feeding (*N*=200)

Variables		Pre test		Post test	
		n	%	*n*	%
Appropriate time of introducing complementary feed	Before 6 month	136	68.0	165	82.5
	After six month	64	32.0	35	17.5
Termination of breast feeding after starting weaning	After a month	136	68.0	179	89.5
	Yes	64	32.0	21	10.5
First food that should be given	Rice cereal	124	62.0	179	89.5
	Mashed chicken	76	38.0	21	10.5
Ready to make foods available in the market better than home-made food	No	121	60.5	168	84.0
	Yes	79	39.5	32	16.0
Frequency of complementary feed	3 meals a day	114	57.0	165	82.5
	Only milk is sufficient	86	43.0	35	17.5
Foods generally forbidden for infants	Fish and nuts	125	62.5	169	84.5
	Mashed vegetables	75	37.5	31	15.5
Food for infants should always be prepared in	Clean utensils	134	67.0	172	86.0
	A day before	65	32.5	28	14.0
	In used pots	1	.5	0	0.0

Table 7. Comparison of Pretest and Posttest Responses of Experimental Group on Infant Health (*N*=200)

Variables		Pre test		Post test	
		n	%	*n*	%
A healthy infant should approximately weigh	3 times the weight at birth	110	55.0	174	87.0
	As much as at the birth weight	90	45.0	26	13.0

Variables		Pre test		Post test	
		n	%	*n*	%
Common illness of infancy	Diarrhea	142	71.0	172	86.0
	Chicken pox	58	29.0	28	14.0
Common causes of diarrhea in infants	Being unclean	129	64.5	174	87.0
	Mother feed	67	33.5	26	13.0
	Eating mashed vegetables	4	2.0		
Important life saving measure for diarrhea	Give ORS	126	63.0	172	86.0
	Not giving anything	74	37.0	28	14.0
In order to avoid diseases, mother should	wash hands with soap	145	72.5	165	82.5
	make food as per routine	52	26.0	35	17.5
	wash hands with plain water	3	1.5	0	0

4. DISCUSSION

The provision of adequate nutrition through optimal infant and child feeding practices is instrumental for their overall health, growth, and physical and mental development. Infancy is the critical period from birth to one year of age and remains highly significant for good growth and development of the child. The main purpose of this study was to document the effects of educational intervention on the knowledge, attitudes, and practices of lactating mothers towards infant feeding in the local population of Lahore Cantt. The sample selected for the study consisted of four hundred (400) lactating mothers of the age group 20-30 years. All had a lactating infant of up to one year of age, all lived in a joint family, and all were stay-at-home mothers or housewives. A nutrition education program was devised after getting to know the community well, understanding their needs and wants, and with the aim to resolve the nutrition issues of the children from birth to one year of age.

The demographic information of the participant mothers of both control and experimental groups showed that their demographic profiles were similar (Table 1). Independent sample *t*-test showed no significant difference in the mean scores of both control and experimental groups in pretest. Paired sample t-test results of experimental group showed that there was a significant difference in mean pretest and posttest scores ($p < .001$). The mean score of posttest (M=27.17, SD=2.11) was higher than the mean score of pretest (M=18.64, SD=4.14). The results of the Mann Whitney test showed that the responses of mothers of both control and experimental groups was almost similar ($p > .5$) in all statements. The similarity of experimental and control groups at baseline is one of the key requirements for properly conducting any experiment. In order to rule out bias, it is necessary that there are a minimum of pre-intervention differences between control and experimental groups. The results shown in Table 4.2 indicate that both control and experimental groups were very similar with regard to knowledge about infant feeding.

Pretest and posttest results showed that the responses of the experimental group increased significantly on all items related to infant feeding after intervention.

Educating women regarding infant health and nutrition is regarded as one of the best ways to improve child health. Awareness is the first step for a better outcome in this regard. This study is in line with previous researches conducted to improve the knowledge of mothers regarding infant feeding [11]. It was found that a short duration nutrition education program which uses a simple and easy method of counseling and communication can not only raise awareness but also improves infant feeding practices [12]. Evidence suggests that country-based nutrition programs that emphasize infant feeding and care can be used to prevent early childhood malnutrition [13].

It has been claimed that the intervention should be culturally sensitive, accessible, and integrated with the customs and culture of the local community [14]. The educational material used in this research was developed according to the local context, keeping in view the problems prevailing in the community. The educational materials used were delivered in the local language so as to aid in their comprehension by the public.

The introduction of breastfeed within one hour of birth and the feeding of colostrum is highly recommended by the WHO and UNICEF. In this study, only about 54% of the participant mothers responded positively about early initiation. Further, about 40% responded positively about colostrum feeding at baseline. However, after intervention, this figure improved twofold and the majority of women responded positively on early initiation and colostrum feeding.

In addition to early initiation, continued breastfeeding is also a major recommendation by WHO. Breastfeeding should be continued up to 2 years of age. The percentage of women who believed so increased from 75% to 85% after intervention. Also, the knowledge regarding responsive and on demand feeding also increased significantly after intervention (Table 4.5).

Exclusive breastfeeding is regarded as the healthiest method of feeding in term infants [15]. This is because breastfeeding is not solely a mother's decision and the society must contribute to promote this behavior. The attitude of the participants regarding promoting a good environment to aid in exclusive breastfeeding was changed after intervention. In pretest, about 57% of women argued for the need of having a good environment to promote breastfeeding. This number increased to about 84% in posttest.

Several nutritional, social, and health benefits of breastfeeding for mothers and infants have become evident in various researches [15]. However, in this study, only about half of the women were aware of its benefits. This knowledge increased after intervention (Table 3). The women responded positively about the health benefits of breastfeeding after intervention, namely it prevents infections in infants and decreases the risk of breast cancer in mothers. There was also a significant increase in the percentage (from 59% to 87%) of women who regarded breastfeeding as a natural contraceptive. Also, the majority of women came to believe that feeding bottles are a major source of infection after intervention. Poverty is one of the major problems in Pakistan. Still, formula feeds are very commonly used despite the benefits and cost effectiveness of breastfeed. In this research, 56% of women responded that formula feed is more expensive than breastfeed. This attitude was observed in 85% of women after intervention.

The diet of lactating mothers is very important because of the already depleted nutrient stores during pregnancy. A well-balanced diet with increased calories is usually recommended to lactating women. Only 59.5% to 61% of the participant mothers observed that milk and dairy products should be taken in greater quantity during lactation, while 86% believed so after posttest. Therefore, the knowledge regarding the special dietary needs of lactating mothers improved after intervention. This is in line with a previous research which found that nutrition education intervention with counselling and care during the antenatal visits could lead to better maternal and infant health in the future [16].

Timely introduction of complementary feed is essential for the health of infants. In this research, only 65% of the participants knew that weaning should be started by six (6) months of age, while this figure increased to 82% in posttest. Inappropriate child feeding practices and complementary feeding leads to malnutrition. Appropriate nutrition education intervention and improvement in maternal knowledge can contribute towards improving the frequency of meals and sanitation practices [17]. In this research, about 65% of women regarded rice cereal as an introductory complementary feed in pretest, while this number increased to about 90% after intervention. According to a research carried out in Haryana, India, complimentary feeding practices are often inadequate in developing countries. Nutrition education did bring about an improvement in complementary feeding practices through the existing nutrition education program but its effect on physical growth was limited [18]. Imparting nutrition education at household level, population coverage, and encouraging communities to participate in nutrition education programs can help in the adequate growth of children. According to a study carried out in Ghana, it was found that better complementary feeding practices could lead to better infant health by educating the mothers through nutrition education intervention [19]. Another study carried out in China indicated that the caregiver's knowledge and complementary feeding practices can be enhanced via educational intervention delivered through local health services [20].

Malnutrition has a direct link with disease rates in infants, while undernutrition has a two-way association with morbidity and mortality. Therefore, it is necessary that the caretakers of infants are informed about the causes and management of common infectious diseases. In this study, only 60% of women regarded unhygienic conditions to be a cause of infantile diarrhea, while this number increased to about 90% after intervention. Oral rehydration is recommended by the WHO for the management of diarrhea and has been linked to reducing the mortality rate and the burden of malnutrition linked with diarrhea. However, only 63% of women regarded ORS to be a lifesaving solution to diarrheal disease in infants. Post-intervention responses showed a significant increase in the number of women who acknowledged ORS as a management strategy for diarrhea.

Evidence suggests that nutrition education can be helpful in inculcating knowledge about infant feeding. This finding is in line with previous researches and shows that nutrition education does have a significant impact on infant feeding practices. It also shows that nutrition education is essential for improving nutritional status and health.

Through demographic surveys and health studies, it has been proved that Pakistan is a nutritionally deficient country because of overpopulation, a low literacy rate, a high fertility rate, and financial restrictions. Further, with the rising inflation which hinders the consumption of meat and poultry, as well as milk and dairy products, and due to chronic malnutrition, stunting, and wasting are witnessed in children and adults later on in life. Hence, the nutritional status of children and infants of a certain region is an indirect key indicator of its socioeconomic status, food security, and health conditions of that area. Infant motility rate is still very high in Pakistan, that is, 62/1000 live births. It should be reduced to 40/1000 live births, according to the Millennium Development Goals (MDGs). Moreover, inadequate nutrition due to poor infant feeding practices is a major contributor to chronic malnutrition which directly or indirectly leads to infant morbidity and mortality. The under 5 child mortality rate is also high, that is, 74/1000 live births. The neonatal motility rate in the first month of life is 42/1000 live births.

4.1. Conclusion

The women in the experimental group showed significant improvement in their infant feeding practices. After imparting nutrition education to the experimental group, it showed a significant improvement in the knowledge of lactating mothers regarding infant feeding as well as complementary feeding practices, along with sanitation and hygiene training at home with preventive measures of diarrhea. The control group showed no significant change during this period as compared to the experimental group which showed a significant difference. With each passing day inflation is on the rise, population is increasing rapidly, and there continues to be a lack of formal education among women. Women empowerment and education should be worked on and women health should be looked into. Keeping in view the MDGs, infant and child morbidity and mortality should be decreased. Antenatal and post-natal follow ups should be encouraged. At least 4 antenatal visits should be compulsory. A friendly environment should be provided and women should be counseled especially about the importance of exclusive breastfeeding, the diet of a lactating mother, and appropriate complementary feeding practices for the better health of the child and for a better tomorrow.

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