

Development & Evaluation of Weaning Education Tool among Mothers Infants Aged 6-24 Months in Urban Slum of Lahore, Pakistan

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Abstract— Malnutrition is the burning crisis among the infants and the link between infant weaning practices and malnutrition is well well-known. Enabling mothers through education seems to be very promising for improving nutritional status of children during weaning age. The study objective was development and evaluation of effectiveness of weaning education tool in Urdu among mothers of infants aged 6-24 months. Two staged study design was used to evaluate effectiveness of weaning education tool. Stage 1 consisted of need assessment and stage 2 was a quasi experimental research design without a control group. The tools were developed and administered face to face. The tools were role play, pictorial banner, pamphlets, activities and demonstration. The tools were evaluated by a knowledge questionnaire developed by researcher and administered as pretest on first day and as posttest on third day. The study settings were urban slums of Lahore. Participants were 30 mothers selected purposefully with infants aged 6-24 months. The data could be completed for 19 mothers only; response rate was 64%. The mean age of the mothers was 28 years; mean education 5 years and mean household income \$ 124/month. Weaning education was the independent and weaning knowledge was dependent variable. Descriptive statistics were calculated for demographic data and the non-parametric McNemar test of the paired t-test was applied to observe differences between pretest and posttest. A p-value < 0.05 was taken as significance. Results revealed that there was a significant increase in nutrition knowledge regarding weaning (P- value 0.031, 0.000, 0.000, 0.002, 0.000, 0.031, 0.002, 0.000). It was concluded that weaning education of mothers can improve knowledge regarding weaning foods and thus play an important role in the health of the weaning-age child.

Index Terms— evaluation, malnutrition, tool development, weaning education.

1 INTRODUCTION

Malnutrition is the burning crisis among the infants and children. Nutritional status of children under 5 years is a sensitive indicator of development of any country. Inadequacy of the weaning foods contributes significantly to the high rates of micro nutrient deficiencies and malnutrition, often observed in low-income countries [1]. The link between infant weaning practices and malnutrition is well well-known. National Nutrition Survey 2011 revealed the high prevalence of malnutrition among children <5 in Pakistan. Among the indicators of malnutrition, stunting was found to be highest at national, urban and rural level which is a predictor of chronic malnutrition [2]. Appropriate weaning is critical to healthy development of an infant. Weaning is defined as "The systematic process of introduction of suitable food at the right time in addition to the mother's milk in order to provide needed nutrition to the baby" [3].

According to WHO (2003) appropriate weaning should be timely, adequate, safe and properly fed [4]. During the significant period of infancy, breastfeeding and weaning practices

play a key role in determining infant growth. Educating mothers appears to be a significant solution for improving the nutritional status of infants in poor communities [5].

Nutrition Education has been defined as "Any set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviors conducive to health and well-being." Phases of nutrition education include; a motivational phase (*why* to make changes), an action phase (*how* to make changes) and an environmental component [6]. Nutrition education should be organized and delivered in accordance with target individual or group in order to be effective. Role play [7], counseling for low literacy skills [8], pamphlets [9], participatory nutrition education [10], family oriented instructional messages have previously used to give weaning education. Though Brown et al suggested that in impoverished settings weaning food education, given without attending to environmental, political and social barriers may lessen the rapid deterioration in nutritional status between 6 months to 2 years but may not promote growth unless the socio economic conditions

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are improved [11].

Infants are the greatest assets who will shape the future of our country and contribute to national development. Therefore we all must strive to ensure the optimal growth and development of the infant or children so that they can effectively contribute towards progress of the nation. Exposure to education and information empowers a mother to maximize resources around her for the health of her child. The current study aimed at developing and evaluating effectiveness of weaning education tools in Urdu among mothers with infants aged 6-24 months in urban slums of Lahore, Pakistan. Considerable weaning education material is available in many languages, but there is no material in Urdu (national language of Pakistan and understood in India). So by developing material in Urdu the researcher aims at dissemination of information to masses and facilitating future community nutritionists.

2 METHODS & MATERIALS

The study was conducted to develop and evaluate effectiveness of weaning education tool in Urdu among mothers of infants aged 6-24 months. For this a baseline assessment of weaning food knowledge was done through a questionnaire, then weaning education tool was administered and later on post tested with the same questionnaire to assess knowledge gained.

2.1 Study Design

Two staged study design was used to evaluate effectiveness of weaning education tool. Stage one consisted of need assessment and stage two was a quasi experimental research design without a control group. In the first stage, a brief need assessment was done by a focus group with 7 mothers of infants aged 6-24 months. It revealed that mothers lacked information on when and why should weaning foods be initiated. They had idea about what weaning foods should be given in 6-8 months but were unable to specify quantity to be given. There was a gap in knowledge about weaning foods to be given at 9-12 months of age. Mostly given foods were Cerelac, yogurt with banana and kichdi. The diets of infants lacked in vegetable (because of lack of knowledge) fruit and protein group (because of socio economic status). They had a fair concept of hygiene but lacked application. They had satisfactory knowledge about method of preparation of weaning foods but did not know the right consistency of the weaning food.

In the second stage, a quasi experimental research design, without a control group was used.

Pretest → Intervention → Posttest

2.2 Development of Tools

After need assessments tools were developed to impart weaning education to mothers. All of the tools have been used alone and in combination to impart education to people with low literacy skills [7, 8, 9, 10, 11]. They are appropriate culturally and according to the literacy level of the participants.

1. Role play

The setting of role play was Primary Health Care center. Role

play consisted of a mother with a malnourished child, coming to a volunteer community nutritionist for guidance on reference from a lady health worker. On over hearing other mothers with other health, nutrition and weaning issues come and discuss their problems and are advised accordingly.

2. Activities

1. Choose the correct option

A board activity was planned, mothers were asked to choose the correct option from given choices on various weaning knowledge questions.

2. Demonstration & Evaluation

Consistency of weaning food was shown to the mothers, initial consistency should be runny but after 8 months the consistency should be thick to provide nutrient density. Weaning food was distributed among the mothers for sensory evaluation and acceptability.

3. Visual Aids

Weaning knowledge was reinforced through the handouts and banner. Pictorial images consisted of type, consistency and quantity of food. It also emphasized hand washing and covering eatables.

2.3 Participants

A sample of 30 mothers with infants aged 6-24 months residing at Mochipura, Lahore were selected purposefully on the basis of availability. The project was reviewed and approved by IRB, College of Home Economics, Gulberg, Lahore. The research was conducted in compliance with the ethical principles for medical research involving human subjects of the Helsinki Declaration [12]. Informed verbal consent was obtained from all subjects. The right to privacy, anonymity, voluntary participation and confidentiality were observed.

2.4 Measurement Instruments

A structured questionnaire was developed by the researcher for this study. The questionnaire included brief demography, multiple choice questions and a few open ended questions on weaning knowledge. The instrument was administered as pre test and post test.

2.5 Data Collection Procedure

The site of activity was slums of Mochipura, Lahore. The activity was arranged by a facilitator at her home. 30 mothers were given token and incentives for participation. On the first day, 25 mothers arrived. The mothers were pre tested by a weaning knowledge questionnaire. The questionnaire was completed by one-on-one interviews with the participants. The first role play explained the concept of when to start weaning foods and why it is important to start it timely. At the end, a focus group was done and their ambiguities and queries were resolved. The session took about 1 hour and 30 minutes. The participants were given quarter packs of milk at the end.

On the second day, 22 participants appeared. The role play emphasized on what is to be given as weaning food, how to prepare it and the amount to be given at different age intervals. Recipes were shared with participants. The first activity consisted of choosing the correct option. Participants answered questions on best weaning foods and quantity to be given when starting weaning foods. Next a demonstration was given to mothers to show appropriate consistency of weaning foods. (Sticky vs. runny) Mothers observed the consistency of the thick and thin Sooji ki kheer and each was given a sample

to try themselves and to offer to their children. Hotz and Gibson have previously used the demonstration and evaluation method and found it to be really useful. The session was completed in one hour. On the third day, 19 participants appeared. They were given a brief lecture on self and environmental hygiene, hygienic conditions during preparation and serving of food. Handouts were explained and distributed among participants. Biscuits were distributed among children. The questionnaires were filled again after intervention as post test to evaluate knowledge gained as used by Theron & Egal (13).

2.6 Data Analysis

Complete data was collected for 19 women therefore; data was analyzed for 19 participants only. The response rate was calculated to be 64%. Descriptive statistics were calculated for continuous demographic data. McNemar Test was applied to observe differences between pretest and posttest and to determine the efficacy of weaning education tool by measuring knowledge gained. A p-value < 0.05 was taken as significant. SPSS version 17 was used to analyze data.

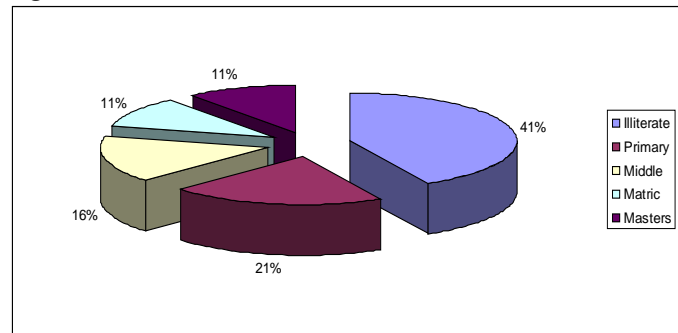
3 RESULTS

The study aimed at development and evaluation of weaning education tool. Data analysis yielded continuous data on demography of infant and mother and categorical data for nutrition knowledge in pretest and posttest. The mean age of the infant was 18.368 months and mean height was 30.052 inches whereas the mean weight was 10.684. The mean age of the mothers was 28.105 years where as mean education of mothers was 5 years. Mean household income was Pakistani Rs. 12789/month i.e. \$127.89/month (Table 1). Majority of the mothers, (42%) were illiterate and 21% had education up to grade 5. (Fig 1)

Table 1: Anthropometric data of infant and Socio-demographic Data of the Mother (n=19)

Variables	Mean	Standard deviation
Infant age (months)	18.368	5.649
Infant height(inches)	30.052	3.027
Infant weight (kilograms)	10.684	2.083
Mother age (years)	28.105	5.342
Mother education (years)	5.052	5.369
Household income \$/month	127.89	5.191

Fig 1: Education Level of the Mothers



There was a drastic increase in weaning knowledge as evident from the results of posttest. Mothers had a fair concept of age at which weaning should be initiated. At pre test 63% answered 6 months and 26% thought weaning should be started when infant is 4 months. After weaning education 95% answered correctly.

Before weaning education, majority mothers (31%) thought Cerelac was ideal weaning food followed by Rusk (26%). Only 16% thought that porridge should be given as first weaning food. After weaning education results were highly significant with 89% retaining the information.

All mothers were confident that mother herself should prepare child's food, both in pretest and posttest.

Questions concerning hygienic practices were 100% correct both in pretest and posttest, therefore, not statistically significant. Mothers knew that washing ones hand before food preparation is important.

The question on method of feeding was significant because initially mothers thought feeding with a spoon was a good practice, but afterwards all chose to feed with properly washed hands.

Before weaning education mothers thought that an infant should be fed twice or thrice a day but afterwards 86% answered correctly that is once a day.

At pretest half of mothers selected that one should feed 1/2 cup of weaning food for the first time but at post test 84% selected correct response.

Using readymade baby food was found to be really popular before weaning education 53% used and thought using readymade baby food was beneficial for infant, which was discouraged and later 100% answered home prepared should be preferred for infant.

Initially 69% mothers thought that one should give thick weaning foods but later on were corrected that initial consistency should be runny and thick food should be started later. (Table 2)

The categorical responses were converted into correct and incorrect answers and the non-parametric McNemar test of the paired t-test was applied to observe differences between pretest and posttest and to determine the efficacy of weaning education tool by measuring knowledge gained. Questions 3, 4 and 5 could not be calculated because answers were correct both in pre test and post test. (Table 3)

Table 2: Respondents knowledge regarding weaning foods in Pre test and Post test n=19

#	Questions	Answers	Pre test	Post test
			F (%)	F %
1.	When should be weaning started?	4 months	5(26)	1(5)
		6months	12(63)	18(95)
		1 year	2(11)	0(0)
2.	Which food should be given as a first weaning food?	Rusk	5(26)	0(0)
		Porridge	2(11)	14(89)
		Potato	4(21)	5(11)
		Banana	2(11)	0(0)
		Cerelac	6(31)	0(0)
3.	Who should prepare child's food?	Mother herself	19(100)	19(100)
		Any one	0(0)	0(0)
4.	Should the child's face be washed before feeding?	Yes	19(100)	19(100)
		No	0(0)	0(0)
5.	Should one wash hands before preparing child's food?	Yes	19(100)	19(100)
		No	0(0)	0(0)
6.	How should you feed your child?	Spoon	13(68)	0(0)
		Hand	6(32)	19(100)
7.	When you start weaning, how many times a day should child be fed solid foods?	Once	6(31)	16(84)
		Twice/thrice	11(58)	3(16)
		Five times	2(11)	0(0)
8.	How much quantity should be given the first time?	One spoon	10(53)	16(84)
		Half cup	9(47)	3(16)
9.	Should readymade baby food be preferred?	Yes	10(53)	0(0)
		No	9(47)	19(100)
10.	What consistency of porridge is given at initial stage of weaning?	Runny	1(5)	19(100)
		Thick	13(69)	0(0)
		Don't know	5(26)	0(0)

Table 3: Frequency & Percentages of Correct Responses and Analysis of Differences n=19

#	Questions	Pretest	Posttest	Pretest	Posttest	Mac Ne-mar*
		F	F	%	%	
1.	When should be weaning started?	12	18	63	95	0.031*
2.	Which food should be given as a first weaning food?	2	17	10.5	89.5	0.000*
3.	Who should prepare child's food?	19	19	100	100	1.000
4.	Should the child's face be washed before feeding?	19	19	100	100	1.000
5.	Should one wash hands before preparing child's food?	19	19	100	100	1.000
6.	How should you feed your child?	6	19	31.5	100	0.000*
7.	When you start weaning, how many times a day should a child be fed solids?	6	16	31.5	84	0.002*
8.	How much quantity should be given the first time?	10	16	52.5	84	0.031*
9.	Should readymade baby food be preferred?	9	19	47.3	100	0.002*
10.	What consistency of porridge should be given at initial stage of weaning?	1	19	5.3	100	0.000*

*p value Mac Nemar test

4 DISCUSSION

Nutrition education is a key element to promote lifelong healthy eating and should start from the early stages of life. Young children do not use what they eat but their parents decide and prepare the food from them. Enabling mothers through education seems to be very promising to improve nutritional status of children during weaning age [12].

National Nutrition Survey 2011 had highlighted the grave condition of nutritional status of infants in Pakistan, [2] a lot of which can be attributed to lack of nutrition knowledge.

The mean weight and mean height were considerably lower for mean age. When plotted on CDC growth charts 68% fell below the 50th percentile weight for age and height for age. Mean education of mother was primary and all lived well below the poverty line (mean \$0.83/person/day). Low maternal education and socioeconomic status have strong established correlation with poor weaning practices and poor nutritional status of infants and children.

An integrated approach was employed and multiple meth-

ods of weaning education were used to obtain maximum results. Focus group discussion was done for need assessment. Brown et al, had previously suggested that knowledge is a consequence of nutrition education but it does not affect nutritional status without addressing economic barriers [11]. Due to time constraints researchers could not assess the change of dietary practices and its effects on nutritional status, but there was a significant increase in knowledge. A participatory approach was employed to achieve adoption of new feeding practices [10]. Mothers participated in development of nutrition education program; initially through focus group discussion. Role play was the main tool of weaning education [7]; it greatly caught attention of illiterate and less educated mothers. Interactive activities, demonstration and sensory evaluation by the mothers were done to give hands-on experience. Pictorial banner was displayed and handouts were distributed for reinforcement of weaning education among mothers. Individual counseling session was held in the end to address nutrition concerns of mothers as previously proposed [8].

The current nutrition education incorporated motivation

and action phase [6] of nutrition education which enabled participants in why and how to make changes but did not address environmental support- the third phase of nutrition education. One interesting thing was found that women preferred and thought readymade weaning food to be beneficial for infants even in those living below poverty line. This could be attributed to media. There was a drastic increase in weaning knowledge as evident from the results. Therefore, the main objective of the study was fulfilled. How much of this is retained over time and leads to change in eating behaviours and dietary practices could not be measured. The study had a limitation that all the weaning education tools were used simultaneously and effect of each individual tool was not tested.

4 CONCLUSION

Early introduction of solid foods and unhygienic practices predispose infants to malnutrition, growth retardation, infection, and high mortality. This project was designed to develop and evaluate weaning education tools with the potential for behavior change and for a positive impact on child health. Given the time and financial limitations, there was a remarkable increase in knowledge between the pre-

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test and posttest. The results suggest that through appropriate channels, families should be encouraged to feed hygienic, cheap, energy rich weaning foods to breast-fed infants after 6 months of age. We conclude that weaning education of mothers can play an important role in the health of the weaning-age child.

Implication for Research and Practice

Effectiveness and impact of each of the weaning education tools as well as in combination should be evaluated. Evaluation should be done not just for increase in knowledge but also dietary intake and behaviour change. Memory retention over a longer period should also be measured, though it is easier said than done. Mothers should have been sensitized before the program. Media was found to be a strong influence on weaning food choice of mothers so it must be used as a weaning education tool.

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