

# Effect of Educational Video on Maternal Nutrition, Hygiene and Sanitation Among Maternal Age Group Women: A Prospective Interventional Study from Prayagraj, Uttar Pradesh, India

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## ABSTRACT

**Introduction:** Interventions that try to alter behaviour in order to promote health and disease management are typically time and resource-consuming. At the moment, boosting maternal and child nutrition is the main focus of nutrition programs in India. This paper discusses the most effective methods to change eating habits, hygiene, and sanitisation particularly the significance of contemporary Information Technology (IT) in health education.

**Aim:** To determine the pre education knowledge level and create awareness regarding maternal nutrition, hygiene and sanitation through the developed education video on personal hygiene and sanitation among maternal-aged group women.

**Materials and Methods:** The community-based prospective interventional study was conducted from October 2019 to April 2021 by using the prospective intervention study design. Based on the Socio-demographic profile, anthropometric measurement, and clinical assessment, specific questions regarding dietary knowledge and personal hygiene were recorded by using the questionnaire. By using the recorded data through a questionnaire, 100 respondents were selected through stratified random sampling and divided into the control group (n=50) and experimental group (n=50) involved in the intervention study. The experimental group which consisted of 50 respondents was

grouped into two groups E1 (n=25) and E2 (n=25) and educated separately (due to COVID-19 restriction on mass gatherings) three times a month at 15 days intervals. The nutrition education intervention was given through an educational video in the Hindi language. The effects of the intervention were studied among the participants of the experimental group. The control group did not receive any nutritional awareness sessions. Knowledge level before and after the education intervention was recorded by using the self-structured questionnaire consisting of 15 multiple questions. The data was analysed by using Analysis of variance (ANOVA) technique.

**Results:** Analysis was done for the complete data collected from 100 participants (15-35 years of age, 50 in each control and experimental group) included in the present study. The mean age of maternal age group women was 22 years. No significant difference was found between the knowledge of the control and experimental group at baseline (p-value >0.05). However, the post-intervention, there was significant gain in knowledge in the experimental group (p-value <0.001).

**Conclusion:** It was found that providing the nutrition education through the developed information and communication technology proved effective by increasing knowledge level among the maternal aged group women.

**Keywords:** ICT tools, Maternal malnutrition, Water, Sanitation and Health practices, Questionnaire

## INTRODUCTION

The triple burden of malnutrition is a continuing issue in developing nations today [1]. The mother's past nutritional status has a significant impact on both her health during pregnancy and the health of the foetuses it harbours. Maternal, newborn, and child health are directly affected by sanitation situations. Growing research points to a connection between household Water, Sanitation, And Hygiene (WASH) practices and children's linear growth [2]. According to United Nations International Children's Emergency Fund (UNICEF), the maternal malnutrition prevalence rate was 17.3% published in 2019 ranging from 16-18.2% so the mean value was taken as 20% maternal women [3]. According to National Family Health Survey (2020-21), 45.9 percent of pregnant women aged (15-49 years) were found anaemic, and 50.6 percent of non pregnant women aged 15-49 years were anaemic [4]. Comprehensive National Nutrition Survey stated that (2016-18), 24% of adolescents aged 10-19 years had vitamin D deficiency [5]. There is a high prevalence of vitamin B12 deficiency in Indian women during pregnancy 40-70% [6].

Numerous variables are closely related to nutrition. While inadequate nutritional intake is directly linked to malnutrition, other variables such as access to clean water and poor sanitation also play a role in the recurrence of infectious disorders such as diarrhoea and intestinal worms. These parasites disrupt the digestive process by vying with the host for nutrition and preventing nutrient absorption, impairing immunity [7,8]. According to the World Bank (2020), Report 15% of people is still practicing open defecation [9]. Video learning improves practice by enhancing mastery abilities, which in turn improves knowledge and understanding in the individual [10,11]. An educational program that employs a pre- and post-testing strategy is more likely to be successful. Similarly, an education program held in Fatehabad for two months at 15 days interval concluded an improvement in post-test scores of the children who received education about correct nutrition [12].

According to the census of India 2011, Uttar Pradesh, Prayagraj district had a population of 5,954,391 out of which 3,131,807 were male and 2,822,584 were female citizens. The overall literacy rate

was found 72.32% and the female literacy rate is poor than the male among the population of Prayagraj, UP, India [13]. Therefore, the acute need was felt to provide accurate knowledge about food and health policies to tackle malnutrition among them. Additionally, this approach was designed for the maternal age group's critical thinking, comprehension, and focus. The purpose of the specified study was to determine the pre-awareness level and create awareness regarding hygiene and sanitation through the developed education video on personal hygiene and sanitation among maternal-aged group women.

## MATERIALS AND METHODS

The community-based prospective interventional study was carried out in the Department of food, nutrition and Public Health, Ethelind College of Home Science, Sam Higginbottom University of Agriculture, Technology and Sciences, (SHUATS) Prayagraj, Uttar Pradesh. The research was conducted from October 2019 to April 2021. Maternal aged group of women (15-49 years) were selected from the Prayagraj District. Women who were permanent residents of the study area were included in the study. Stratified random sampling was used to select the study participants. Ethical approval (Letter Registration No.-IEC/SHUATS/2019/E/06) was taken by the Department of Public Health, Shalom Institute of Health and Allied Sciences (SIHAS), SHUATS Prayagraj, Uttar Pradesh, India, before starting the study. The study was done with the incorporation of a Community Health Officer and Auxiliary nurse midwife of the villages where the educational intervention was given. All information was anonymously collected, and the outcomes were used for research purposes.

**Inclusion criteria:** Pregnant and lactating mothers from a rural area or population from the area that never got any training or educational intervention, those with lack of access to household water treatment products by the populace and lack of knowledge regarding diet, hygiene, and sanitisation were included in the study.

**Exclusion criteria:** Pregnant and lactating women suffering from any systematic diseases, those women suffering from any hormonal disturbance and earlier abortion, pregnant and lactating women belonging from lower body mass index levels, low socio-economic status, and poor clinical symptoms and health issues were excluded from the study.

## Procedure

The list of pregnant and lactating women was selected from the Gram Panchayat with the help of Auxiliary Mid Wives (AMW) and Accredited Social Health Activist (ASHA) workers of the selected villages of Prayagraj. Hundred pregnant and lactating women were randomly selected from the two villages such as Mahewa Purab patti and Mahewa Pashchim patti of Prayagraj district based on their clinical symptoms, anthropometric measurements, and biochemical profile. The Information and Communication Technology (ICT) tools were designed related to nutrition, health, and hygiene to provide and assess the impact of educational intervention.

- **Data collection procedure:** The instrument for data collection was a self-developed questionnaire which was formulated and validated by the five experts (Assistant Professors and Professors) from the Department of Food Nutrition and Public Health, Ex-servicemen Contributory Health Scheme (ECHS), SHUATS, Prayagraj and found acceptable to gain data. Hundred respondents were selected by following COVID-19 pandemic regulations and guidelines. Fifty respondents were taken as the control group (no educational intervention was given) and 50 respondents were taken as the experimental group (educated three

times in a month in 15 days intervals). Due to the Corona Virus Disease (COVID) guidelines, the experimental group was divided into two groups i.e., experimental group E1 (N=25) and experimental Group E2 (N=25), and educational intervention was given through the educational videos, in Hindi.

**Educational intervention:** Nutrition education was imparted on various aspects of food and personal hygiene to improve maternal health. The sessions were conducted by the researcher in the presence of auxiliary nurse midwives, community health officers, and Accredited Social Health Activist (ASHA) workers. The educational session was delivered for 15 minutes at Anganwadi Kendra of Mahewa, Prayagraj, Uttar Pradesh, India. The researcher compiled the educational content with the help of specific books regarding food and personal hygiene. The audio was recorded for the video and developed by the researcher by Department of Extension and Communication, of the study institute for a total timing of 02:05 minutes.

**Questionnaire:** Prior to providing the education, the participants completed a pre-education questionnaire to assess baseline knowledge regarding malnutrition. A well-framed and standardised questionnaire was formulated consisting of 10 multiple-choice questions based on: i) maternal malnutrition causes, symptoms, and prevention through dietary management; and ii) Hygiene and sanitation. Multiple-choice answers received one point for a correct answer and incorrect answers received zero points. During the first session, before providing the education to the experimental group, the questionnaire was filled up by the control group and experimental group and the responses were recorded for further comparison. After the first, second, and third sessions of educational intervention, the same questionnaire was filled up by the respondents of the control group (n=50) and experimental group E1 (n=25) and E2 (n=25) to assess the extent of awareness level increased of the respondents after each session. Post-exposure knowledge was evaluated and compared to the data before providing the educational intervention among the respondents of experimental groups E1 and E2 to examine the desirable changes in knowledge. The control group filled out the questionnaire just before the educational session they were not involved in the educational intervention. Their responses were only recorded to compare with the data of the experimental group. For the assessment of the total knowledge gain by the exposure of educational video on hygiene and sanitation, 10 questions regarding hygiene and sanitation were asked again and the respondents who scored above 50 percent were considered as the respondents that gain knowledge successfully.

## STATISTICAL ANALYSIS

The data was analysed manually by using Analysis of variance technique (ANOVA), Critical difference correlation coefficient, p-value, other appropriate statistical analytical methods and T test to check its significance and interpret the data [14].

## RESULTS

**Demographic characteristics of the selected respondents:** [Table/Fig-1] shows the general information on the pregnant and nursing women participating in the study gathered. The ratio of pregnant women and lactating women was similar. Most of them belong to the Hindu community. The mean age of maternal age group women was 22 years. Most of the maternal age group women have nuclear families with vegetarian habits. The educational status of the respondents was found low as most of the respondents were uneducated and had primary education. All respondents belonged to the income group of Rs.1000 to Rs. 33, 000 [15].

[Table/Fig-2] has shown the data regarding the assessment of knowledge level after educational intervention regarding maternal

S. No.	Particulars	Control group (n=50) N (%)	Experimental group (n=50) N (%)	p-value
<b>Respondent's status</b>				
a.	Pregnant	25 (50%)	25 (50%)	1
b.	Lactating	25 (50%)	25 (50%)	1
<b>Religion</b>				
a.	Hinduism	48 (86%)	49 (98%)	0.5577
b.	Islam	2 (4%)	1 (2%)	1
<b>Age</b>				
a.	15-25 y	38 (76%)	43 (86%)	0.2024
b.	25-35 y	12 (24%)	7 (14%)	0.3079
<b>Type of family</b>				
a.	Joint family	23 (46%)	19 (38%)	0.4176
b.	Nuclear family	27 (54%)	31 (62%)	0.5433
<b>Food habits</b>				
a.	Vegetarian	32 (64%)	40 (80%)	0.0747
b.	Non vegetarian	18 (36%)	10 (20%)	0.1189
<b>Education of the respondent</b>				
a.	Uneducated	23 (46%)	32(64%)	0.9415
b.	Primary	22 (44%)	10 (20%)	0.9016
c.	Intermediate	4 (8%)	6 (12%)	0.8091
d.	Graduation	1 (2%)	2 (4%)	0.9410
<b>Total income of family</b>				
d.	Rs.33001- Rs. 55000	2 (4%)	3 (6%)	0.6463
e.	Rs.1000- Rs 33000	48 (96%)	47 (94%)	1

**[Table/Fig-1]:** Socio-demographic profile of the selected participants. There were no participants from christainity/other religion; None belonged to 35-49 years of age

care and hygiene and sanitation of selected respondents aged 15-49 years. From the recorded data, the results were found those experimental groups gain much knowledge after having educational intervention as compared to the control group (who didn't have educational intervention). Before the nutrition education program, there was no significant difference control group and the experimental group in terms of the knowledge of the respondents regarding the different aspects of hygiene and sanitation. However, there was a significant difference between the two groups regarding the knowledge of viral diseases. Pre-intervention data of the experimental group shows a non significant correlation to each other in different aspects.

On the other hand, the data were also compared among the experimental group after each session of intervention and it was found that there was a significant difference (<0.00001) between the pre and post-intervention data of the respondents among the experimental group while comparing different aspects of hygiene and sanitation. It can conclude that after each intervention, the extent of awareness level increased which significantly reflects the importance of educational video among the targeted group.

The sample distribution of subjects based on gain in knowledge prior and after to the educational intervention through exposure to educational video is summarised in [Table/Fig-3] shows that before providing the nutrition educational intervention, 9 respondents from the control group, 8 respondents from experimental group E1 (n-25) and 10 respondents from E2 (n-25) were found to have adequate knowledge regarding hygiene and sanitation. However, after the final intervention (after the 30 days) results depicted those 21 (42 percent) respondents from experimental Group-1 and 19 (38 percent) respondents from experimental Group-2 showed adequate knowledge from the educational video.

S No.	Particulars	Responses	Control Group	Pre Data	p-value (between Control group and Pre data of experimental group)	Postdata after first time education period	Postdata (after 15 Days ) after second time education period	Postdata (after 30 Day) after third time education period	P value (between Pre and post intervention data of experimental group)
			N=50	N=50		N=50	N=50	N=50	
			No. (%)	No. (%)		No. (%)	No. (%)	No. (%)	
1.	Knowledge regarding the discardation of household garbage	Yes	11 (22.00)	11 (22.00)	1	19 (38.00)	37 (74.00)	49 (98.00)	0.00001
		No	39 (78.00)	39 (78.00)		31 (62.00)	13 (26.00)	01 (02.00)	
2.	Knowledge regarding the safe drinking water during maternal period	Yes	10 (20.00)	13 (26.00)	0.48	17 (34.00)	35 (70.00)	42 (84.00)	0.00001
		No	40 (80.00)	37 (74.00)		33 (66.00)	15 (30.00)	8 (16.00)	
3.	Knowledge regarding the viral disease	Yes	8 (16.00)	20 (40.00)	0.007	20 (40.00)	43 (86.00)	48 (96.00)	0.00001
		No	42 (84.00)	30 (60.00)		30 (60.00)	07 (14.00)	2 (4.00)	
4.	Knowledge regarding the protection measures of COVID-19.	Yes	8 16.00	11 (22.00)	0.44	22 44.00	35 70.00	47 94.00	0.00001
		No	42 (84.00)	39 (78.00)		28 (56.00)	15 (30.00)	3 (06.00)	
5.	Diseased caused due to deficiency of vitamin-D	Yes	5 (10.00)	8 (16.00)	0.37	18 (36.00)	37 (74.00)	46 (92.00)	0.00001
		No	45 (90.00)	42 (84.00)		32 (64.00)	13 (26.00)	4 (08.00)	
6.	Knowledge regarding the hand wash before and after having the food	Yes	7 (14.00)	12 (24.00)	0.20	25 (50.00)	40 (80.00)	49 (98.00)	0.00001
		No	43 (92.00)	38 (76.00)		25 (50.00)	10 (20.00)	1 (02.00)	
7.	Knowledge regarding the Disposal of used pad during menstruation period	Yes	8 (16.00)	12 (24.00)	0.37	22 (44.00)	32 (64.00)	45 (90.00)	0.00001
		No	42 (84.00)	38 (76.00)		28 (56.00)	18 (36.00)	5 (10.00)	
8.	Protective measures performed for the safe maternal hood	Yes	7 (14.00)	10 (20.00)	0.42	19 (38.00)	34 (78.00)	44 (88.00)	0.00001
		No	43 (86.00)	40 (80.00)		38 (76.00)	16 (36.00)	6 (12.00)	
9.	Knowledge regarding the personal hygiene	Yes	9 (18.00)	10 (20.00)	0.79	18 (36.00)	34 (68.00)	48 (96.00)	0.00001
		No	41 (82.00)	40 (80.00)		32 (64.00)	16 (32.00)	02 (04.00)	
10.	Knowledge regarding the Kitchen and toilet cleanliness	Yes	7 (14.00)	14 (28.00)	0.85	19 (38.00)	37 (74.00)	44 (88.00)	0.00001
		No	43 (86.00)	36 (72.00)		31 (62.00)	13 (26.00)	6 (12.00)	

**[Table/Fig-2]:** Assessment of knowledge level after educational intervention regarding the maternal care and hygiene & sanitation of selected respondents aged 15-49 years. bold p-values are significant

Groups	Distribution of samples								Gain in knowledge		Actual gain in knowledge (exp gr-control gr)	Total gain in knowledge
	Pre-exposure		Post-exposure		Post-exposure After 15 Days		Post-exposure After 30 Days		N=50	Percentage (%)		
	N=50	Percentage (%)	N=50	Percentage (%)	N=50	Percentage (%)	N=50	Percentage (%)				
Control Group (n=50)	9	18	9	18	8	16	10	20	1	2	-	20
Experimental Group E1 (n=25)	8	16	14	28	17	34	21	42	13	26	12	
Experimental Group E2 (n=25)	10	20	12	24	14	28	19	38	9	18	8	

**[Table/Fig-3]:** Sample distribution of subjects based on gain in knowledge prior and after to the educational intervention.

## DISCUSSION

Maternal malnutrition is a condition that is associated with heterogeneous aetiology and factors contributed among the maternal aged group. The rate of maternal malnutrition decreased from 37.6 percent to 17.9 percent in India specified from 2000 to 2019 [15,16], but the current prevalence of maternal malnutrition also raised the serious question to all the health agencies and Non Government Organisation because the funds and schemes applied for economic assistance, pre-natal and anti-natal care did not efficiently prevent the maternal morbidity and mortality cases [17,18].

In this study, the majority of maternal age group respondents belonged to 18-25 years. Numerous studies have demonstrated that there is a larger likelihood that a pregnancy occurring at a young age may have unfavorable pregnancy outcomes [19,20].

In this study, it was hypothesised that implementing a nutrition education program will effectively improve the awareness level among the maternal-aged group women and the hypothesis was supported as there was significant improvement in the awareness level of the participants in the experimental group, postintervention. Similar results were obtained from a study by Lewa AF et al., where nutritional education using a video-based intervention effectively improved the knowledge about nutritional status among pregnant women [21]. Another study by Permatasari TAE et al., from Indonesia concluded that nutrition and reproductive health education can help in effectively increasing the knowledge in pregnant women [11]. Another study by Peris RD et al., from Sri Lanka used mobile intervention in the form of messages to educate pregnant and nursing women about nutrition. The authors concluded that the mobile intervention helped in effectively improving the knowledge, attitude and practice of the participating mothers [22].

The results showed that using educational videos directly and favorably impacts mothers' participation. Video intervention helps in respondents' active engagement in the educational session by their questions, comments, and discussions on the subject matter [23]. Several studies have strongly supported the importance of educational intervention because in providing education for various topics such as nutrition, maternal health, fertility awareness etc., [11,24-26]. This study offers important knowledge on the advantages of educational intervention as a workable alternative. Providing education to a mother but educating the whole family which directly contributed to the changes in attitude and practices from one generation to another generation.

Through informative lectures and routine screening, healthcare professionals can play a significant part in addressing these issues at the primary and secondary levels of prevention.

## Limitation(s)

First off, because the subjects were selected from a single city. Thus, the study's conclusions cannot be generalised. Second, it's possible that self-reported questionnaires contain response biases. Finally, because the intervention was only in place for a short time,

the results of the study may not be comprehensive. Therefore, we advise conducting research with large and representative samples for a longer period of time.

## CONCLUSION(S)

Within the limitations, this study concludes that there was significant increase in the pregnant women's knowledge by the current intervention. The educational messages given to expectant mothers utilising a comprehensive strategy that targeted all the important factors throughout time greatly increased their understanding of nutrition and hygiene during pregnancy. Governments and development partners should adopt various programmatic solutions. Additional, well-targeted treatments that are nutrition-sensitive are needed, especially in the weeks and months leading up to and during the first 1000 days for India's most vulnerable mothers and children. In order to survive, grow, and thrive, mothers and children both require fundamental WASH provisions and behaviours.

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