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Research Article

Effect of Nutrition Communication Module on Change in Health and Dietary Practices Among Pregnant Women During Antenatal Period

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Abstract

Antenatal care (ANC) is a critical strategy in reducing maternal mortality as it facilitates the identification and mitigation of risk factors early in pregnancy. It was observed that Nutrition Counselling, a widely used strategy to improve nutritional status of women during pregnancy is lacking in multi strategy community intervention. So, the present study was planned to determine the effectiveness of integrating nutrition counselling during ANC visit. A module was developed and evaluated by maternal nutrition and health experts and frontline workers. It was pretested trimester wise on 45 pregnant women with 15 pregnant women in each trimester. Significant ($p < 0.001$) improvements were observed in all the three knowledge domains i.e. dietary habits (9.49), hygiene and sanitation (8.09) and nutrition knowledge (5.86). Therefore, it can be concluded that imparting nutrition education through trimester specific nutrition communication module supported in achieving considerable improvement in their knowledge, helping the target group to effectively modify their diets during pregnancy and adopt the norms of antenatal care given by Government of India.

Keywords: Antenatal Care; Nutrition Communication; Pregnant Women; Dietary habits; Hygiene and Sanitation; Nutrition Knowledge

Introduction

Role of nutrition is undoubtedly of prime importance in ensuring good health of pregnant mother as well as a healthy pregnancy outcome. "Antenatal care is the routine health control of presumed healthy pregnant women without symptoms (screening), in order to diagnose diseases or complicating obstetric conditions without symptoms, and to provide information about lifestyle, pregnancy and delivery" [3].

Good quality ANC diminishes maternal and neonatal mortality and mends the health consequences, predominantly in low-income countries [6]. A Ministry of health and family welfare guidelines for Antenatal Care and Skilled Attendance at Birth 2010 and Indian Public Health Standards 2011 recommend a minimum of four ANC visits, covering general examination of vitals, iron and folic acid supplementation and tetanus toxoid vaccination. Nutrition component was found missing in the antenatal care package while World Health Organization (WHO) recommends health promotion including nutrition counselling as one of its important elements besides others [5]. However, nutrition which is covered for pregnant mothers and the developing fetus is only in the form of iron and folic Acid (IFA), Calcium and Food supplementation under various government programmes such as Integrated Child Development Scheme (ICDS).

At the national level, the maternal mortality ratio (MMR) decreased from 254 in 2005 to 212 in 2007-09 on all India bases. About two-thirds of maternal deaths occur in only a few states:

Assam, Uttar Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh, Bihar and Odisha (REFERENCE ????). However, these states also showed the most notable decrease in MMR during the early years of NRHM. A significant proportion of maternal, neonatal and infant deaths can be prevented by adopting essential care practices such as rapid care to combat complications of pregnancy, exclusive breastfeeding, hand washing, caring for children, diarrhea etc. A well-implemented behavioral change via communication strategies has the potential to significantly improve these practices and thereby improve reproductive, maternal, and neonatal health and child survival [7].

WHO gave ANC guidelines, 2016 for positive pregnancy experience which placed substantially greater emphasis on maternal nutrition assessment and provision of a set of nutrition interventions during ANC. NC seeks to improve nutrition practices before and during pregnancy to improve maternal nutrition and reduce the risk of poor health outcomes in both mothers and their children [11]. Similarly, NC would also help to improve both mother and child health. The prenatal NC interventions in pregnant adolescents were observed to be positively impacted by the nutrition knowledge and improvement of diet quality. Nutrition education during pregnancy by health care providers could improve knowledge and practice of women during pregnancy. Thus, attention should be given to promote nutrition education at ANC visits for pregnant women to get reliable and accurate information from health professional [12]. Keeping in mind the above facts, this study had been meticulously planned to determine the effectiveness of multiple strategy community intervention along with NC on maternal and child health.

Methodology

The present study was designed to develop a NC module for ANC during pregnancy. The study was conducted in three phases as follows:

- **Phase 1**: Needs Assessment "To identify the key messages"
- **Phase 2:** Module Development "To develop the communication module"
- **Phase 3:** Module Field Testing **"**To test the effectiveness of the developed module"

During phase I of the study, information was collected from both primary (Pre-existing Module) and secondary (Individual interviews with nutrition experts and field functionaries) sources. The empirical material for this study was derived from qualitative, individual interviews with nutrition experts and field functionaries. Based on the findings of phase 1, key nutrition messages were identified and translated into a nutrition communication module in the phase 2. In phase 3, the module was made to evaluate by nutrition experts for correctness of content, artistic element and strategy and it was then pretested by assessing the post knowledge of 45 pregnant women in the age group of 18-30 years (15 in each trimester) using developed module at New Delhi Municipal Corporation (NDMC) antenatal clinic which was in the vicinity of study site i.e. Lady Irwin College, New Delhi.

A Questionnaire was prepared for pretesting of module by assessing pre- and post- communication knowledge and was pretested on 4 subjects. The pruned questionnaires were used for data collection at NDMC antenatal clinic, New Delhi. The quantitative data obtained using the pretested and pre-coded questionnaire was analyzed in the MS Excel 2010. The percentage improvement from baseline was calculated for the subjects, which also indicated the efficacy of module. Statistical analysis was done using frequency, mean, standard deviation, percentages, and paired t-test.

Results and Discussion

General Information of the subjects

The study subjects were largely literate to understand the importance of the study. Major chunk of these women was found to be engaged in household chores only. Delhi was found to be the native place for majority of population as the data is taken from the same state as found. Only 29% of the subjects were graduate. Major portion of the sample i.e. 36 (80%) belonged to families following the Hindu religion while 9 (20%) to the families practicing Muslim religion. Out of 45 pregnant women, 29 women were living in nuclear family. 54% of subject had family income above Rs 11,000/Month.

The pre- and post- knowledge questionnaire was divided into 3 sections namely:

- Dietary habits (DH)
- Hygiene and sanitation (HS)
- Nutrition knowledge (NK)

Percent Improvement in Knowledge from Pre to Post Assessment

A significant change was found among the gathered responses in pre- and post- knowledge for each trimester for every section of the questionnaire. A paired t-test was applied on the mean values of the answers recorded in both pre and post assessment. A significant ($p<0.001$) improvement was observed in DH, HS and NK.

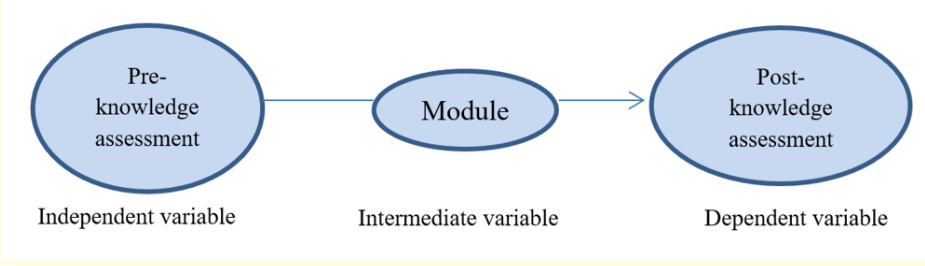

Figure 1: Effect of Intermediate variable on the dependent variable.

Pre and post knowledge assessment

Dietary habits

The data was divided and analyzed according to the knowledge regarding the food groups. Pre and post knowledge comparison was done on the basis of information about balanced diet, sprouting, green leafy vegetables, raw vegetables, fruits, milk and milk products and a significant p< 0.00001, 0.000374, 0.000138) improvement during trimester 1, trimester 2 and trimester 3 in the consumption of all the food groups during pregnancy was reported respectively. Similarly, A study [8] conducted in 2016 reported that knowledge regarding sources of carbohydrates, proteins, iron, zinc, vitamin A and iodine was low among pregnant women of Bilaspur City. Women's diet (without supplements) was insufficient in energy and all nutrients except fat, compared with the Indian recommendations as reported by a study [2]. Participants knew that there is requirement of additional nutrition during pregnancy but they were not aware about the balance diet and right food choices [1].

The mean score for pre- knowledge was 11.47 and it increased to 17.73 in post- evaluation. Maximum improvement was observed in trimester 1, though noteworthy increment was seen in other two trimesters as shown in table 1.

Knowledge about hygiene and sanitation

The data was analyzed according to the hygiene and sanitation practices which were being followed by the subjects. Key areas included were handwashing practices, washing of drinking water container and other general hygiene habits. Sanitation is a very significant aspect for women who are about to deliver a baby as there is an association between sanitation and adverse pregnancy outcome. Education on sanitation practices is needed of the hour as much as it needs to be followed [10].

Significant improvement in knowledge was perceived in post knowledge test as t-value was significant in all trimesters at 0.05 level of significance. Similar changes were observed in all trimesters (Table 2).

	Pre	Post	t value	p value
Dietary Habits				
T1	11.47	17.73	-6.678	0.00001
T2	12.67	17.8	-4.652	0.000374
T3	13.2	17.93	-5.186	0.000138
Total	12.44	17.82	9.49	0

Table 1: Paired t-test for knowledge related the Dietary habits during pregnancy.

	Pre	Post	t value	p value
Hygiene and sanitation				
Trimester 1	5.67	7.2	-3.944	0.001468
Trimester 2	5.53	7.87	-5.857	0.001475
Trimester 3	6.27	8	-4.25	0.000808
Total	5.82	7.69	8.09	0

Table 2: Paired t-test results for knowledge about hygiene and sanitation.

Knowledge about nutrition

This part included questions regarding importance of body assessments during pregnancy, supplementation of iron folic acid tablets, increment in food intake, addiction during pregnancy, institutional delivery and infant and young child feeding practices. Significant ($t = 5.86$, $p < 0.00001$) improvement was observed in post nutrition knowledge. Intensive counseling and motivation of pregnant women to consume iron and folic acid and ensuring its adequate supply to them, intensive de-worming, provision of toilet facilities to all households would help in reducing the incidence of anemia in pregnant women [9]. Maximum change was gauged in trimester 3 and a substantial improvement in knowledge was also mapped in other 2 trimesters (Table 3).

	Pre	Post	t value	p value
Nutrition knowledge				
Trimester 1	15.33	20.8	-3.24	0.005927
Trimester 2	16.47	23.13	-4.385	0.000622
Trimester 3	15.73	35.2	-2.541	0.023518
Total	15.84	21.36	5.86	0.00005

Table 3: Paired t-test results for knowledge about nutrition.

Overall improvement

Overall change in knowledge was marked in all sections as t-value improved significantly at 95% confidence interval. The change in mean score in post knowledge is represented in figure 2.

Similarly, A study [4] reported behavioral modification among pregnant women which was evident as pregnant women started practicing a minimum of 3 meals or more during pregnancy, with consumption of vegetables, lentils, and greens in their daily diet along with cereals. Regular hand washing before the meals and after using the toilet were self-reported by the women.

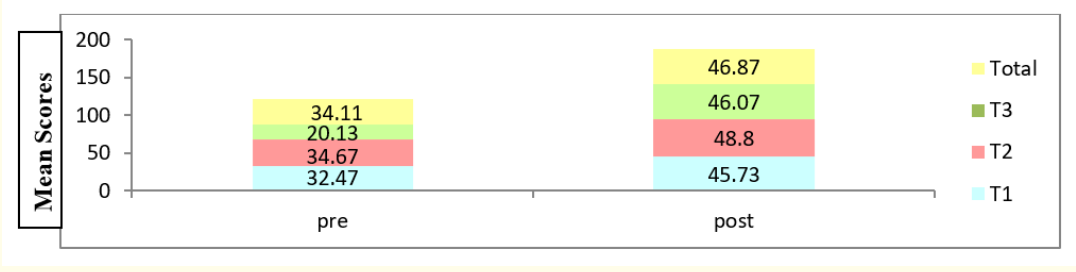

Figure 2: Overall pre-and post-knowledge assessment.

The very essence of imparting health education concentrates on wellness, prevention of diseases and disorders and promotion of overall health. It can effectively be used to empower the pregnant women by enhancing their food and nutrition knowledge. This enables the women to be a crucial part of the care process they need during pregnancy. The advantages of nutrition/health education are what motivated the researcher to use a nutrition communication module as a medium to provide an interactive yet effective nutrition education and to check the efficacy of this module in knowledge enhancement.

There were striking lacunae seen in the knowledge levels of the subjects regarding their understanding of modification of diets during pregnancy. Hence, to fill up this gap a nutrition communication module was designed which could sensitively cater to the gaps in knowledge. The post- knowledge test resulted in considerable improvement among the subjects in terms of knowledge. This indicates the efficacy of the nutrition communication module, which stands as the primordial objective of the present study.

Conclusion

Imparting nutrition education through the trimester specific nutrition communication module supported in achieving considerable improvement in their dietary habits, sanitation practices and food and nutrition knowledge. This helped the target group to effectively modify their diets during pregnancy to achieve better post pregnancy outcomes and adopt the norms of antenatal care given by Government of India. As the module was planned trimester wise, the results showed the significant improvement in post knowledge even when calculated after each trimester.

Bibliography

1. Ajantha Singh AK., *et al*. "Evaluation of Dietary Choices, Preferences, Knowledge and Related Practices Among Pregnant Women Living in An Indian Setting". *Journal of Clinical and Diagnostic Research : JCDR* 9.8 (2015): LC04-LC10.

2. Andersen LT., *et al*. "Food and nutrient intakes among pregnant women in rural Tamil Nadu, South India". *Public Health Nutrition* 6.2 (2003): 131-137.

3. Backe, B., *et al*. "Antenatal care" (2014).

4. Daniel S., *et al*. "Effect of nutrition education among pregnant women with low body mass index: a community based intervention". *International Journal Of Community Medicine And Public Health* 3.11 (2016): 3135-3139.

5. Ghosh-Jerath S., *et al*. "Ante natal care (ANC) utilization, dietary practices and nutritional outcomes in pregnant and recently delivered women in urban slums of Delhi, India: an exploratory cross-sectional study". *Reproductive Health* 12.1 (2015): 20.

6. Joshi C., *et al*. "Factors associated with the use and quality of antenatal care in Nepal: a population-based study using the demographic and health survey data". *BMC Pregnancy and Childbirth* 14.1 (2014): 94.

7. Ministry of Family and Health Welfare. "Preeclampsia". National Health Portal, *Ministry of Family And Health Welfare*, India (2013).

8. Nagi R., *et al*. "Oral health, nutritional knowledge, and practices among pregnant women and their awareness relating to adverse pregnancy outcomes". *Journal of Indian Academy of Oral Medicine and Radiology* 28.4 (2016): 396.

9. Nivedita K and Shanthini FN. "Knowledge, attitude and practices of pregnant women regarding anemia, iron rich diet and iron supplements and its impact on their hemoglobin levels". *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 5.2 (2016): 425-431.

10. Patel R., *et al*. "Effects of sanitation practices on adverse pregnancy outcomes in India: a conducive finding from recent Indian demographic health survey". *BMC Pregnancy and Childbirth* 19.1 (2019): 378.

11. Rush D. "Nutrition and maternal mortality in the developing world". *The American Journal of Clinical Nutrition* 72.1 (2000): 212S-240S.

12. Zelalem A., *et al*. "Effect of nutrition education on pregnancy specific nutrition knowledge and healthy dietary practice among pregnant women in Addis Ababa". *Clinics in Mother and Child Health* 14.3 (2017): 265.