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Education Based on BASNEF Model; an Affective Education on Regular Use of Nutritional Supplements during Pregnancy

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ABSTRACT

Pregnancy is an important period for both mother and fetal. One of the common problems during pregnancy is a deficiency of nutrients like folic acid, iron, vitamins and minerals which shows its side effects on fetal. The aim of this study was to design and implement educational programs on regular uptake of food supplements during pregnancy among pregnant women in the west of Iran. BASNEF model was applied as theoretical framework for this survey. Overall, 88 pregnant women were selected randomly to participate in this survey as intervention and control group. Present study designed to be an intervention-experimental study. Cross-tabulation and t-test through using the SPSS statistical package, version 16, were used for statistical analysis. Our findings indicated that the mean scores of knowledge and BASNEF Model variables were significantly increased in the experimental group immediately compared to the controls two months after intervention. Moreover, supplements behavior usage (81.56% before intervention, 92.17 % after the intervention and 99.24% two months after the intervention in experimental group) improved significantly among experimental group, compared to control group,which was statistically significant (P < 0.05). It seems that designing and implementing educational intervention based on the BASNEF Model to regular uptake of food supplements during pregnancy among pregnant women could be a beneficial result to increase women's health.

Key words: Pregnancy, Nutritional Supplements, BASNEF Model

1. INTRODUCTION

Development and progress of each society depend on the health of mothers living in it and being healthy starts from fetal. Therefore, pregnancy is the most vital time for both mother and fetal. There is much need of some materials such as iron and folic acid during pregnancy (1-3). On the contrary, the evidence showed that some nutrients in food like iron are not enough to supply mothers' needs during pregnancy. Thus, one of the common problems during pregnancy is shortage of nutrients like folic acid, iron, vitamins and minerals. It affects fetal as a consequence of the shortage, some of them include: low weight, anemia, cretinism, damage of nerve pipe, night blindness, congenital damage, placenta early break, prhaklamsy, hipper para-thyroidism, limited growth in uterus, and low body immunity (4, 5). Generally, all around the world, third of pregnant women face shortage of folate and statistics confirm that, fourth of pregnant women in western countries and half of pregnant women in developing countries lack folate (6). Therefore, American Medical Institute suggested women to take nutrients such as iron as supplements during second and third three months of pregnancy (7). In addition, research suggested to take supplements such as folic acid, iron and multi-vitamins and minerals (8). In addition, global studies,

reported disordered use of supplements during pregnancy (9-11), which could lead to damage by itself (12). unfortunately, studies indicate, most women are unaware of the importance of taking food supplements during pregnancy. Results of avoidance of using the supplements, such as, folic acid has its effect on preventing fetus disorders (13-15). Moreover, other studies, showed that less knowledge about the importance of using food supplements during pregnancy is the result of less awareness with medical staff, lack of facilities, placement and training opportunities or time limitations to create a proper relationship between participants and medical staff to offer sanitary services (16). Considering the vulnerability of pregnant women newborns over shortage of food supplements, it is necessary to offer proper services to enhance correct and regular usage of supplements and introduce pregnancy cares (17). In addition, results from studies showed that improving awareness and skills of pregnancy increased sanitary of pregnant mothers. So, better to create the awarness delivery, prevented mortality and side effects of pregnancy (18). Such facts empowered the administration of sanitary interventions. On the contrary, by designing a training course, studies showed that the most effective training programs base on theoretical approaches rooted from behavioral changing patterns, where selecting a proper pattern or theory to sanitary training is the first step in planning a training course. An efficient sanitary training course depends on the skill to choose the best theories and strategies to each event (19). BASNEF model is a practical one in sanitarian field. According to this model, people commit a behavior when they have a positive attitude toward the behavior from different points of view. Equivalently, people written or hidden social rules (subjective norms) intervene accomplishing or avoiding the behavior, where a mixture of attitude to behavior, abstract norms leads to making decisions over the behavior by people (behavior intention). However, other factors (enabling factors) such as facilities can be effective to invert behavior intention to behavior (20-22). Accordingly, the present study aims to evaluate training intervention based on the BASNEF model on regular uptake of food supplements during pregnancy among pregnant women in the west of Iran.

2. MATERIALS AND METHODS

It is an intervention-experimental study of pregnant women at their third month of pregnancy, who attended certain clinics (north part of Hamadan) in 2012. Considering the type of the study and similar studies (16), samples were selected to be 88 people based on test power 85%, confidence rate 95% and likeliness of losing the samples. The samples were divided into two equal groups of 44 as intervention and control groups. Four clinics in the northern part of Hamadan were selected randomly which were randomly divided to two control centers and two

intervention centers. Names of women in their third month of pregnancy were randomly taken from 4 centers of continuous care of mother and baby and 22 of them were selected randomly, which counted to be 44 women in the intervention group and 44 in the control group. Training classes had the capacity of 22 people, which were hold in one of the rooms of the centers on Sundays and Tuesdays weekly. This study was conducted with approval from Hamadan University of Medical Sciences' institutional review board. Furthermore, this study was registered by the Iranian Registry of Clinical Trials (IRCT2014022316701N1).

2.1. Measure
2.1.1. Questionnaire included two sections
First part of the questionnaire included demographic information and the second part included questions about awareness and other structures of the BASNEF model variable.

BASNEF model scale was designed based on a Hubley guideline for design questionnaire (20), and prior to conducting the main project, a pilot study was conducted to assess the content validity of the questionnaires. The pilot study was conducted in order to obtain feedback about the clarity, length, comprehensiveness, and required completion time of the study questionnaire as well as to collect data to estimate the internal consistency of the questionnaires.

2.1.2. Demographic variables questionnaire
A researcher prepared questionnaire and included information about age, education, spouse education, mother working condition, spouse job and current pregnancy rank.

2.1.3. Awareness questionnaire
It included 15 questions (Cronbach alpha 0.72) with zero or one score for each question (one point for a correct answer and zero for wrong answers), and total 15 scores, where the higher the score the more the knowledge.

2.1.4. Believes questionnaire
It includes 7 items (Cronbach alpha 0.72) in Likert scale 1 to 6 (1 score for choosing 'strongly disagree' to 6 for choosing 'strongly agree'), where the maximum and minimum total score were 42 and 7, respectively. The higher the score, the more the belief in using supplements during pregnancy.

2.1.5. Attitude to Behavior Questionnaire
It included 3 items (Cronbach alpha 0.8) with Likert scale 1 to 4 (1 score for choosing 'strongly disagree' to 4 scores for 'strongly agree'), where maximum and minimum total score were 12 and 3, respectively. The higher the score, the more positive the attitude to using supplements during pregnancy.

2.1.6. Normative Believe Questionnaire

It includes 12 items (Cronbach alpha 0.76) with Likert scale 1 to 3, which was scored as 1 for choosing 'it is not necessary to have the pills', 2 for 'no idea' and 3 for 'regular use'. Maximum and minimum total scores were 36 and 12, respectively. The higher the score, the more effective the normative believes in using supplements in pregnant women.

2.1.7. Subjective Norms Questionnaire

It included 12 items (Cronbach alpha 0.92) with Likert scale 1 to 3 (1 score for 'it is not necessary to take the pills', 2 for 'no idea' and 3 for 'regular use'). Maximum and minimum total scores were 36 and 12 respectively. The higher the score, the more affective the subjective norms were on women to use supplements.

2.1.8. Behavioral Intention Questionnaire

It has 6 items (Cronbach alpha 0.84) with Likert scale of 1 to 4, where 1 score for choosing 'never' to 4 for 'very much'. Maximum and minimum total scores were 24 and 6, respectively. The higher the score, the stronger the intention was in women to use supplements.

2.1.9. Enabling Factors Questionnaire

It had 4 items (Cronbach alpha 0.75) with Likert scale of 1 to 3 (1 score for choosing 'no', 2 for 'to some extend' and 3 for 'yes'). Maximum and minimum total scores were 12 and 4, respectively. The higher the score, the stronger the effect of enabling factors on using supplements during pregnancy.

2.1.10. Behavior Questionnaire

It included 3 items (Cronbach alpha 0.86) with Linkert scale 1 to 3, where 1 score for choosing 'no', 2 for 'to some extend' and 3 for 'yes'. Maximum and minimum total scores were 9 and 6, respectively. The higher the score, the more regular was the usage of supplements during pregnancy. Present study made use of Cronbach alpha coefficient as its final evaluation tool, and results were reported separately. Total Cronbach alpha was evaluated to be 0.86.

2.2. Training Content

A descriptive-analytical study was needed to prepare training content in relation to recognizing effective structures in training, which was a pilot study as taking care of pregnant women throughout their pregnancy in Hamadan, Iran. According to the results, awareness and score of all structures of the BASNEF model on using supplements during pregnancy among pregnant women at their period of second third-month of pregnancy, attending clinics in northern part of Hamadan was lower than other pregnant women. Four under study behaviors was observed: 1) attending clinics to get pregnancy care services, 2) accomplishing tests during pregnancy, 3) taking ultrasounds during pregnancy, and 4) using supplements during pregnancy. In addition, variables such as awareness, believes in results of behaviors, intention

and enabling factors were the strongest predictive of using supplements among pregnant women under study (P<0.05). Therefore, present study considered a training intervention among pregnant women in their third month of pregnancy to study the effect of training on using supplements based on the BASNEF pattern. Proving the study and coordinating with university staff in charge, intervention proceeded with the choosing clinics in the northern part of Hamadan. Then, in accordance with clinic staff, a proper weekday was considered for intervention. To accomplish the intervention, researchers used famous scientific books to create a booklet which was verified by medical education experts and delivered to selected participants (out of experimental and control groups) a week before starting the intervention for the possible editing process. Necessary changes were applied under the supervision of health education experts. On intervention day, training program was offered through the speech in a question and answer session at a class in choosing clinics. Four training sessions were held for 18 to 45 minutes (average 30 minutes) for the intervention group through four weeks. During the fourth week, according to pilot study samples were asked to take their best friend, who could be their husband.

2.3. Study Evaluation

To evaluate and recognize current condition of participants, samples in both experiment and control groups were pretested primarily and, then, planned intervention was introduced to experiment group and immediately after the fourth intervention training session, both groups took the first posttest; second post test was conducted two month later to both experiment and control group. Note that a review session was held for experiment group 30 days after their first posttest to remind the taught material and answer participants' questions and investigate their possible problems. One of the researchers did the teaching during the study. Finally, data were analyzed by SPSS version 16 using cross-tabulation and t-test, at 95% significant level.

3. RESULTS AND DISCUSSION

Mean and standard deviation of participants age was 25 ± 4.804. There were no significant differences between demographic variables between two groups. Table 1 & Table 2 shows the results.

Table 1: Pretest Equivalency results for Intervention and Control groups

		Intervention		Control		Total		P
		Number	Percent	Number	Percent	Number	Percent	
Mother occupation	Housewife	36	81.8	39	88.6	75	85.2	0.367
	Employee	8	18.2	5	11.4	11	14.8	
Husband occupation	Jobless	2	4.5	1	2.3	3	3.4	0.202
	Employee	5	11.4	13	29.5	18	20.5	
	Worker	32	72.7	26	59.1	58	65.9	
	Retired	5	11.4	4	9.1	9	10.2	

Mother education	High school	13	29.5	12	27.3	25	28.4	0.927
	Diploma	27	61.4	27	61.4	54	61.4	
	University	4	9.1	5	11.4	9	10.2	
Husband education	Illiterate	3	6.8	2	4.5	5	5.7	0.866
	High school	16	36.4	17	38.6	33	37.5	
	Diploma	21	47.7	19	43.2	40	45.5	
	University	4	9.1	6	13.6	10	11.4	
Number of pregnancy	First	18	40.9	13	29.5	31	35.2	0.414
	Second	17	38.6	23	52.3	40	45.5	
	Third or more	9	20.5	8	18.2	17	19.3	

Table 2. Average Responses for BASNEF variables between Participants Before and After Educational Program

	Before invention		After Intervention		2 Month After Intervention	
	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Awareness						
Intervention	4.30 (1.39)	0.364	13.32 (1.25)	0.001	14.32 (0.87)	0.001
Control	3.98 (1.84)		4.64 (1.90)		5.11 (2.50)	
Believes						
Intervention	36.89 (3.27)	0.975	40.02 (1.84)	0.001	41.70 (0.50)	0.002
Control	36.86 (3.56)		37.07 (3.33)		37.27 (3.75)	
Attitude						
Intervention	16.82 (1.67)	0.347	17.39 (1.22)	0.001	17.82 (0.44)	0.002
Control	16.39 (2.52)		16.55 (2.34)		16.57 (2.07)	
Normative believes						
Intervention	34.61 (1.22)	0.504	35.84 (0.37)	0.001	35.91 (0.29)	0.083
Control	34.43 (1.31)		34.61 (1.35)		34.68 (1.51)	
Subjective norms						
Intervention	31.89 (2.74)	0.350	34.82 (1.46)	0.001	35.84 (0.42)	0.001
Control	31.41 (1.95)		31.45 (2.73)		31.59 (2.74)	
Behavior intention						
Intervention	19.73 (2.81)	0.315	22.73 (0.89)	0.001	23.64 (0.48)	0.001
Control	19.43 (1.45)		19.50 (1.99)		19.68 (2.91)	
Enabling factors						
Intervention	11.34 (0.74)	0.556	11.82 (0.44)	0.001	11.91 (0.29)	0.103
Control	11.43 (0.69)		11.34 (0.88)		11.45 (0.69)	
Behavior						
Intervention	7.34 (1.32)	0.930	8.30 (0.95)	0.001	8.93 (0.25)	0.001
Control	7.36 (1.08)		7.43 (0.99)		7.05 (1.34)	

As observed in results, average awareness score in intervention group increased from 28.63 percent to 88.78 percent immediately after last intervention and to 95.45 two month later, which was significant according to statistics. The results of the present study on increase of awareness after the training intervention corresponded to results from and Watson (16). As the results show average, believe the score for intervention group increased from 87.82 to 95.29 percent immediately after last intervention and to 99.29 percent two months later, which was statistically meaningful. In addition, positive attitude about using supplements during pregnancy increased from 93.43 to 96.59 immediately after last intervention and to 98.98 two months later in intervention group, which was statistically meaningful. If mothers perceived a positive evaluation over the results of a behavior (positive effect of using supplements on their own and their fetus health), they would be further motivated to use supplements during pregnancy. It means that training courses should be planned to first introduce positive effects of using supplements and then make mothers sensitive to it to result in their usage. In this regard, several studies reported the effective role of attitude on the behavior and effectiveness of intervention on increasing positive attitude after educational intervention (23-29). Normative believes are defined as understanding social pressures to make or avoid a decision. It is believed that certain people prove or deny doing given behavior. When someone understands that those who are important to him or her expect him or her to accomplish a behavior, they decide to act for it. These important people could be their spouse, close friends, family members and others (30). As the results showed that the average score of normative beliefs, which motivated using supplements during pregnancy, increased from 96.14 before intervention in 99.55 immediately after that, which was statistically meaningful, and to 99.74 two month later. However, it was not statistically meaningful, though there was an increase. This result is similar to the results reported by other studies (27,31). For example, Jalilian *et al*., reported that training intervention did not have a meaningful effect on decreasing anabolic steroid use (27). It could be understood from the results that more time was needed to increase normative believes in using supplements during pregnancy through training and justification and that such training should be incessant. Behavior intention showed how hard people aimed to accomplish a behavior and as a general rule, the harder the willing to act a behavior, the higher the possibility to act it (30). The results of the study for an average score of behavior intention showed that intention rate of intervention group increased from 82.19 before the intervention increased to 94.69 immediately after last intervention and to 98.48 two month later, which was statistically meaningful. It agreed Mirzaei Alavijeh *et al* in their study reported increase of average scores of intention to regular Pap smear among women after educational program (23). Studies showed that behavior which included problem solving in conditions such as having social and environmental sources are less likely to be acted out (30). For example, in present study, women should consider the distance from their houses to clinics they attend, the price of the supplements and knowing about side effects of not using them during pregnancy. As all these need of resources, self-efficacy of women decreases and it makes women feel that they do not have the chance to take supplements; as a result, it stops following the behavior. As mentioned in the results, average scores on enabling factors for intervention group increased from 82.19 before training in 94.69 immediately after training and to 98.48 after two months. This change was statistically meaningful for the immediate phase, however not for the results after two months. Note that enabling factors in the present study included having training booklet and enough information about benefits to use supplements, holding training courses and participation of

husbands or mothers' best friends in using supplements during pregnancy. Meaningless increase of average scores of enabling scores during the two months after last intervention in relation to immediately after the last intervention suggested that more training classes should be hold to support mothers and help solve their possible problems or questions on using supplements during pregnancy. Average score of behavior of intervention group showed that acting the behavior increased from 81.56 before training to 92.17 immediately after the last intervention and to 99.24 two months after last intervention which was statistically meaningful. Results from the present study corresponded to Yungve and Sjostorm study on the effect of health training programs on breast-feeding in Europe (31,32). Some limitations of the present study included a time limitation in interventions, problems with increasing pursuit and final evaluation of intervention efficiency on mother and baby health. Considering presented results, it is suggested to evaluate presented a training program in similar settings, to include studies base on other models of behavior change and compare the results with present study, to include a more homogenous intervention group and to use proper equipments in training.

4. CONCLUSION

Results from the present study, showed a meaningful increase of the average score of all the understudy variables based on the BASENF model on using supplements immediately after intervention sessions and two months after the last intervention session (except for normative believes and enabling factors though there was increase in scores after two months, while it was not meaningful). Therefore, it seems that training courses based on the BASENF model and suggested training context in the present study could positively affect using supplements during pregnancy, which can be used in similar settings.

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AUTHORS CONTRIBUTION

This work was carried out in collaboration between all authors.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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