OPEN PEER REVIEW

Revision (0)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Method Approach

Abstract

Introduction: Nutrition literacy can be defined as the degree to which people have the capacity to obtain process and understand basic nutrition information. The aim of this study is to apply a social marketing model in order to improve nutrition literacy as well as healthy eating behaviors of women in Sanandaj. This is done to empower them, in particular and to boost the public health, in general.

Materials and methods: This study is a mixed method sequential exploratory one. The first phase of the study is the qualitative study conducted based on content analysis within the framework of social marketing model. Based on the extracted concepts from qualitative studies, two questionnaires were obtained. Nutrition literacy questionnaire with public health approach and eating behavior questionnaire based on the structures of social marketing model. The second phase of the study is an experimental trial with control group. The population included 752 married women. The interventions regarding nutrition literacy improvement were administered based on Harvard dietary pyramid and social marketing model application. The data analysis was done using SPSS software, applying Chi-square, paired t-test, t-test, and Pearson's correlation coefficient.

Findings: In qualitative phase of the total interviews and discussion groups, 350 initial codes were obtained which based on the structures of social marketing model, were grouped into two categories during analysis process: four main themes and eight sub-themes. Quantitatively, the results indicated that the difference between the two groups in nutrition literacy score was significant after the intervention ($P<0.05$). Similarly, the difference between the two groups in nutritional behavior was significant after the intervention ($P<0.01$).

Conclusion and Discussion: The concept of exchange in social marketing of healthy diet was a help in reducing barriers of healthy diet as well as increasing the advantages of healthy behavior from customer’s viewpoint. Finally, the studied women were empowered through obtaining healthy diet skills, which led to gaining healthy nutritional behaviors.

Keywords: Nutrition Literacy, Mixed-Method Study, Content Analysis, Social Marketing, Healthy Nutrition Behavior, Healthy Nutrition Pyramid.

34

Introduction

A healthy lifestyle requires a wide range of abilities, competencies, and knowledge in principle. One of these knowledge is “nutrition literacy”. It is the capacity of people for acquiring, processing, and comprehending the dietary information [1]. Given the fact that increased burden of chronic diseases is one of the major challenges of the 21st century, the healthcare systems are facing around the world [2] and that health literacy is a significant social determinant of well-being, it is necessary to promote nutrition literacy. Currently, chronic diseases have been introduced as a serious threat to the health and longevity of people in developing countries[3]. The World Health Organization has estimated that the economic burden of diabetes, stroke, and cardiovascular diseases in five largest developing countries will escalate to 1.25 trillion dollars by 2015. Inappropriate lifestyle [4, 5] along with its changes are one of the most influential factors involved in the incidence of these diseases so that 53% of mortality in people has been associated with their lifestyle. Eating habits are dependent on culture. That is to say, the eating habits of people are a part of their cultural patterns. Beliefs, values, and social norms are factors involved in the formation of eating habit[6]. Numerous qualitative studies have been performed on how eating habits have been formed around the world. However, according to the current studies, there is a substantial lack of knowledge about correct dietary beliefs among various Iranian ethnicities. Although few studies have been carried out in this regard and describing the frequencies and analyzing the correlation between variables by quantitative studies contribute to the development of actual knowledge, quantitative studies by themselves cannot be helpful to detect the relationship between different variables with nutritional beliefs in the socio-cultural context and real world of the current human being. Nevertheless, one of the functions of qualitative approach to research is its ability and capacity to familiarize us with the latent layers of behavior. Since nutritional behavior is a set of beliefs and habits based on the social values and norms, any plan to improve a nutritional behavior requires a deep understanding and recognition of that behavior in a cultural context. Numerous qualitative studies have embarked on the analysis of viewpoints [7-9] experiences and beliefs[10] , management of mothers in nutrition behavior [11] and nutrition education[12], and barriers to healthy dietary behaviors [13]. Since an efficient education needs the knowledge of behaviors and influential factors to

modify or change the current behaviors, the use of educational models and theories is one of the most important tools. Social marketing model is an appropriate framework with a systematic approach in the domain of teaching nutritional behaviors [14, 15]. In the past, many health education programs were designed with top-down approaches, as the health professionals identified the health-related problems and devised objectives and approaches to solve them accordingly. However, social marketing adopts a bottom-up approach to developing the educational programs and concentrates on behavior change. The customer-centric programs lead to favorable behavioral changes in that they are the strongest conceptual basis for social marketing and a framework for understanding and action based on the customer's behavior. Many studies have used social marketing model to analyze the customers' perspectives about the four principles of the model [16, 17]. Considering the diversity of eating behaviors in various cultures as well as the unknown eating behaviors and associated reasons in Sanandaj city and that women's health literacy is vital for the promotion of their children and family health, women are identified as the primary population involved in nutritional health. Hence, the present study was carried out to examine the impact of social marketing model on improving the nutritional knowledge and dietary behaviors of women in Sanandaj city, Iran, in order to empower people and promote health in the society.

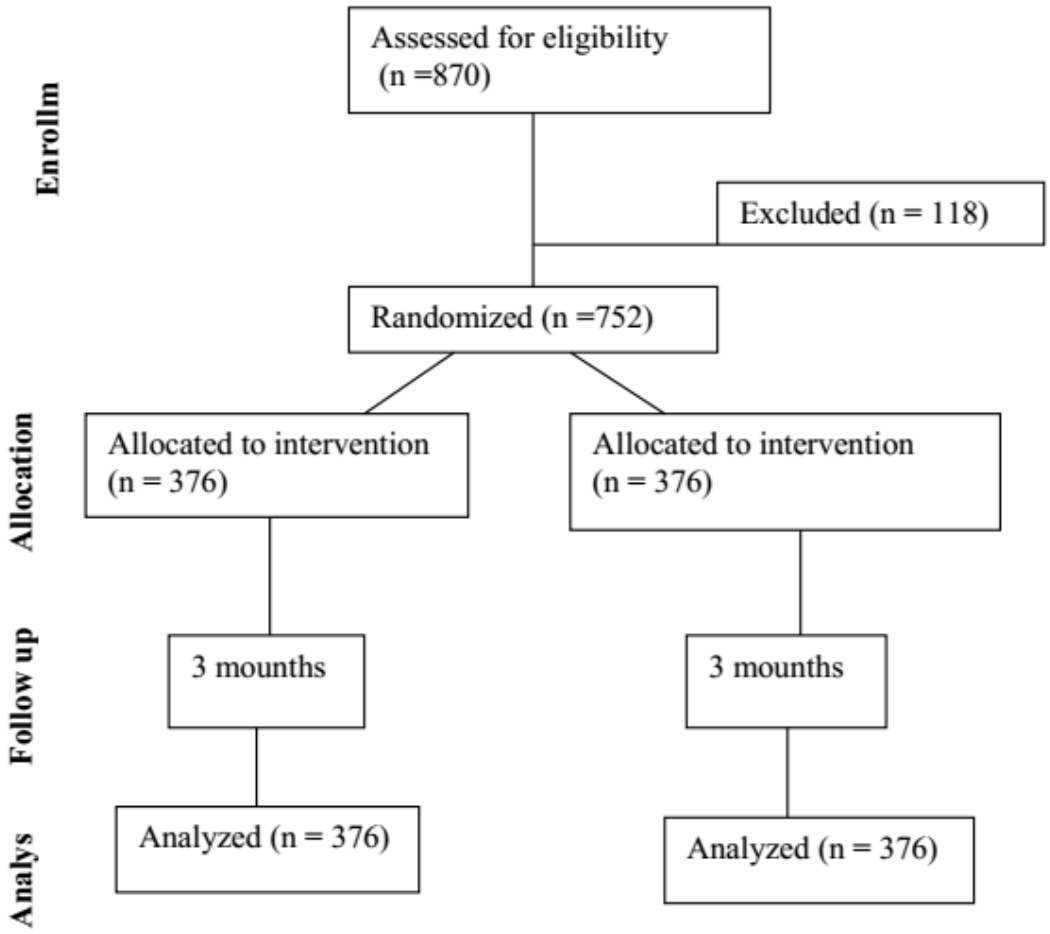
Materials and Methods

This study was performed with a mixed-methods sequential exploratory design in 2016 in Sanandaj. The first phase of the study, qualitative part, was performed via directed content analysis within the framework of four principles of social marketing model. To identify the components of social marketing-based intervention (which product, what price, where, and which promotion method), the perspectives and opinions of the study groups were required to be evaluated. The participants comprised of 50 married women aged 18-50 years referring to four healthcare centers of Sanandaj city who were selected through purposive sampling. They participated in the study voluntarily with informed written consent. For recording interviews, people had been allowed. Data saturation technique was used to ensure the adequacy of the study sample out of which 50 women under healthcare coverage were recruited. Interviews were conducted by the first author who is a qualitative researcher in four healthcare centers. The required data were collected by semi-structured questionnaires using group discussion and

deep personal interviews in the framework of social marketing model. Data were gathered during five group discussion sessions with a minimum of six and maximum of ten participants in each group and eight personal interviews. Considering the conditions of the interview, group discussion lasted 1-2 hours and individual interview took 1-1.5 hours. The interview was initiated by asking general questions based on the constructs of the model. For example, how do you define a healthy diet? Or what do you do to have a healthy diet? Then, deeper follow-up questions in line with the research objectives were asked, e.g. What are the benefits of a healthy diet?, Who is responsible for your healthy diet?, What are the barriers to a healthy diet?, What factors facilitate a healthy diet?, and where and how do you prefer to obtain more information about nutritional behaviors? Having collected the data, directed or theory-oriented content analysis was carried out (Shannon Hsieh, 2005). In directed content analysis, the primary codes originate from a theory or the findings of similar studies. This kind of analysis aims to validate or develop a conceptual framework or a former theory. Operational definitions for each category were determined by the given model. At the end of each session, the interview content was transcribed verbatim. In order to make a general sense of the interview as well as to immerse in the data, the researcher listened to the interview and read the transcription several times to gain a deep and correct understanding of the data. Then, encoding (converting the meaning units to shorter statements that manifested the intended concept) was performed and the obtained codes were reviewed to determine the similarities and differences, to combine the similar codes, and to make subcategories. Next, the subcategories were classified according to similarity, fitness and difference, and categories were extracted. Finally, categories, subcategories, codes, and data were reviewed and major themes of the study, social marketing constructs (product, place, price, and promotion), were extracted. MAXQDA-10 software was used for grouping, encoding, and classification of the texts obtained from the interviews. To ensure the validity and reliability of the qualitative data , prolonged engagement in the field helped to establish some trust and rapport with participants, providing an opportunity to collect the data. To make sure that the analysis reveals perspectives and opinions of the study groups, member checking was performed during data collection, and where needed, some changes were done. To confirm dependability and conformability of the data, the interviews and results of the analyses, that is, the initial codes, subcategories and the categories of social marketing model, were audited by some experts, the external check method using two authors (the first and

second author) expertise in health education and familiar with social marketing model were used. Maximum variation of sampling also confirmed the conformability and credibility of data. Sampling strategies allowed for maximum variation to occur and a vast range of views and perspectives to be considered (Polite and Hunger, 1999). Based on the concepts obtained from the qualitative study, two questionnaires were extracted: nutritional literacy scale with a public health approach and dietary behavior questionnaire. The nutritional literacy scale included 23 multiple-choice items. It was structured based on Harvard Healthy Food Pyramid. The dietary behavior questionnaire was based on the social marketing constructs and comprised of 53 items scored based on five-point Likert scale from 1 to 5, “completely agree” to “completely disagree”. Content Validity Ratio (CVR) and Content Validity Index (CVI) were used to analyze proportionality, clarity, and relevance of items to the purpose of the study. The questionnaire was given to fourteen experts in the field to evaluate. The reliability of the nutritional literacy scale was evaluated by test-retest method and the reliability of the dietary behavior questionnaire was confirmed by Spearman Brown formula, which was found to be larger than 7.0 for all indices. The quantitative phase of the study was an experimental trial with control group. The sample size of the current study was calculated to be 752 participants. The study population comprised of the married women aged 18-50 years under the coverage of four healthcare centers in Sanandaj city, Iran. Inclusion criteria were the following: physical and psychological readiness and ability to participate in the study, and age between 18 and 50. Lack of desire to participate in the study and significant psychological problems, hearing loss, were set as the exclusion criteria. The participants were allocated to the intervention and control groups using randomized block design. In randomized block method, blocks with six sub-groups were used. Among 15 possible cases and by using random number table, 63 blocks were selected. Then, based on the order of blocks, the subjects were placed in intervention groups and control groups, respectively. The process continued until it reached the sample size of 376 people. Regarding the blinding method, the subjects and the statistical processor were not aware of their own belonging to the intervention and control groups. The components of nutritional literacy interventions based on social marketing model (which product, what price, where, and which promotion method) were designed according to the concepts extracted from the qualitative study. The interventions of nutritional literacy promotion were carried out by focusing on Harvard healthy eating pyramid. Some concepts such as customers' demands were

extracted from the qualitative research. The demands were categorized as a sub-category of product/demand. The interventions of nutrition literacy were planned based on the demands of women who are the customers of social marketing themselves. For instance, the demands of the customers included the need to increase information about the properties of nutrients, body's need for food groups and familiarity with healthy food pyramid. Regarding intervention, the duration of formal educational sessions for the intervention group was three months. The aforementioned sessions were held twice a week and at least for two hours. Since the acquisition of nutritional skills is required for improving nutritional literacy, techniques such as discussion in small groups, brainstorming, role-play and play were employed. Educational content was given to the intervention group in the form of a pamphlet. Regarding healthy nutrition, the interventions of health literacy promotions were conducted based on applicable and available cases. The contents of educational interventions included familiarity with Harvard's food pyramid, it's levels, the main characteristics and differences between Harvard's healthy pyramid and the pyramid of USDA, familiarity with all kinds of whole grains, their cooking and use, the role of whole grains in health, familiarity with the role and importance of fruits and vegetables consumption, familiarity with the way to use proteins correctly, the emphasis on increasing the consumption of plant proteins, and decreasing the consumption of red meat. At the end of each session, practical recommendations and healthy nutritional skills were explained. Control group received only common nutritional education which were offered in health centers. The obtained data were analyzed by SPSS software using chi-square test, paired t-test, independent t-test, Pearson correlation coefficient, and ANOVA test.



177

178 **Figure 1: Flowchart of the phase of the trial**

179 **Results**

180 **Qualitative Section**

181 Out of the total number of interviews and discussion groups, during the analysis process, 350
182 initial codes were obtained, and were categorized into 4 main themes within the framework of
183 structures of social marketing model (product, place, price, and promotion).

184 **Product**

To determine the best product to design interventions for nutritional literacy promotion based on social marketing model, Participants were asked to explain their nutritional behavior, habits and their demands in this area. In this regard, 3 categories were formed. Product/behavior, .product/demand, and product/benefit

Product/Behavior: Nutritional habits and behaviors of participants were classified into two categories: "*representation of nutritional behavior based on consumption pattern*" and "*representation of nutritional behavior based on consumption methods.*" For the former, 8 consumption patterns subcategories were formed. They include meat, dairies, fast food, local foods, fruits and vegetables, coca-cola, and oils consumption patterns. The majority of participants mentioned that most of their meals contain meat. They believed that imagining non-meat meals is nearly impossible for them and there are a few number of non-meat foods they can cook for their meals. One of them told, "All our meals contain meat, even if the amount is little; to us, meat adds flavor to the food. Meat makes a food tasty and a free-meat food would be almost tasteless". Regarding diaries consumption pattern, most participants consume them inadequately. Half mentioned that they consume buttermilk and yoghurt with their meals. However, low consumption of milk and the curd mentioned by them. "As doctors tell us, 3 to 4 glasses of milk should be drunk daily. I think it is impossible. First, who can drink that much; second, it is expensive". In response to the way of consuming fruits and vegetables, low consumption of them, especially among children mentioned by most participants and only a small number of them mentioned that they consume fruit with cake and other refreshments as their snacks. When asked about fast food, most participants stated that fast food consumption is harmful and the cause of cancer. Therefore, most participants mentioned that they consume fast food once a month in the diets. For instance, one of them told, "I know that nutritional value of sausages is very low and it is believed that they make anemia and cause cancer. Yet, once a month we eat it". Asking about cereals consumption, most participants' replies were daily consumption of rice. They believed that meals should be accompanied by rice (rice is the Iranian staple food) and there are a few food meals without rice. "We consume rice almost every day and I don't think it is unhealthy. We are used to eating it every day. Since we are not diabetics, eating it won't cause a problem. We do check-ups annually and we have no serious problem, so there is no need to reduce the amount of rice". Another category was the representation of nutritional behaviors based on consumption method which contained two subcategories: healthy and unhealthy ways of consumption. In terms of healthy way of consumption, cooked meal instead of fried one, more consumption of white meat rather than the red one, consumption of less fatty. Dishes, and fresh food consumption were mentioned by participants. A participant suggested that, "we used to consume fried foods a lot. Due to the increased number of diseases, however, over the last years I have either cooked the meals or steamed them."On the other hand, for unhealthy way of consumption, the participants mentioned the following: beverage drinking along, high consumption of coca cola, high consumption of junk food such as crisps and cheese puff, eating too fast, drinking tea immediately after the meal, and excessive consumption of fried and high calorie foods. In our family, a participant, told, "After finishing the meal, we drink tea

without delay although it is believed that it is better to be delayed due to anemia. That is due to ".the fact that a delay in drinking tea, gives us a headache

Product/Demands

The participants' demands were classified into 6 sub-themes. They wanted to increase their knowledge in terms of "*nutritional values of foods", "nutrition and children", "healthy cooking", "the effects of food on health and disease", "beneficial and harmful foods", and "nutritional requirements of the body*. "A participant said: "I suppose women should be taught the ways to cook healthy foods with the ingredients they buy so that we don't get sick. We either fry foods or microwave them. The reason is that we are not able to cook non-meat dishes."

Product/Benefit

Although it is stating the obvious, due to the importance of the issue, participants were asked to express their perception of the benefits of healthy nutrition. Product/benefit, as a main theme, was divided into 4 subcategories including "*physiological benefits", "general benefits", "individual facilitator factors", and "social facilitator factors*." Most participants mentioned the general benefits of healthy diet. They believed that a healthy body is the result of a healthy diet. In physiological benefits, as a sub-theme, the role of fish in brain growth and heart health, the role of spinach and parsley in improving anemia, the role of milk in bone health, and the effect of consuming garlic on health were mentioned by participants. Most participants held the belief that awareness is the most important individual facilitator factor of a healthy diet. One of the participants told, "Most people are a little aware about health issues. All know salt and fat are harmful for body, but they are still consumed a lot. I think due to the lack of awareness, disease numbers are a lot. If I am well-aware, both I and my family will be healthy."

Price: In order to see the relationship between price and healthy diet, participants were asked to express their experiences and beliefs about barriers which were classified into two subthemes called *individual and social barriers*.

Individual Barriers: lack of awareness, lack of healthy cooking skills, unhealthy diet of parents as a negative role model, laziness of wives and women, lack of time, lack of mental relaxation, and illiteracy were all mentioned by participants. Among them, lack of awareness were reported with increasing frequency.

Social Barriers: Some subcategories of social barriers such as economic issues and inflation, fertilizers, the role of government in putting people's health in danger, and lack of raising awareness by physicians were mentioned by participants. The most noticeable barriers mentioned by participants were inflation and economic problems.

Place: In order to identify the best place for interventions to improve women's nutritional literacy, participants were asked to give their opinion. Most of them held this belief that for educational interventions, healthcare center is the best one. Some recognized places such as schools, community centers, workplaces, and mosques as appropriate ones. For example, a participant told, "As I come to healthcare center frequently, I prefer to attend classes here providing that the time is appropriate for us because I have 3 children."

Promotion: In order to promote healthy nutritional behaviors, participants were asked to put forward some solutions to overcome possible barriers they may face. They led to three sub-themes including *overcoming individual barriers, social ones and the best way to communicate messages.*

Overcoming Individual Barriers: The most important healthy nutritional behavior mentioned by participants has to do with learning required skills in terms of healthy diet/nutrition. One of them who believed in learning such skills told, "We don't know much about the nutrition of adults and children; even if we know something, we don't know how to implement them. If we develop the proper cooking skills, the diseases will decrease."

Overcoming Social Barriers: Monitoring the contaminated foods by the government, providing public information and training through media, reducing inflation, and solving economic problems were all stated by the participants. An interviewee mentioned, "Media such as TV and newspaper can play a very significant role. For example, television should show the negative effects of fast food so that people's awareness will increase and they will choose healthy food except those who don't care about their health."

Best Way to Communicate Messages: Interviewees were asked to suggest an approach to send and release messages related to healthy nutrition. Most agreed upon holding classes in healthcare centers. Also, informing people through written materials, television, and mosques was extracted from the content of interviews.

Quantitative Section

The mean age of the participants was 35.18 years old. Most of the women (46.3%) were aged 18-29 years. 34.3% had diploma degree, 65% of the case group and 52% of the control group had fewer than three children. The mean nutritional literacy score of the case group increased from 8.68 before intervention to 13.52 after intervention, and that of the control group increased from 8.95 to 9.58, indicating a significant difference between groups after intervention ($p=0.002$) not before intervention ($p=0.1$). The mean dietary behavior score increased from 61.32 to 77.37 after intervention in the case group and reduced from 62.84 to 62.55 in the control group, revealing a

significant difference between groups after intervention (p=0.002) not before intervention (p=0.05). Moreover, there was a positive correlation between the nutritional literacy scores of women and product/behavior, i.e. the healthy dietary behaviors of women in both the case and control groups before and after intervention. There was also a statistically significant difference between the two groups (p=0.002).

Table 1: difference between the two groups after and before intervention in .nutritional literacy score

variable	intervention			control			Independent Sample Test	
	before	after	Paired Samples Test	before	after	Paired Samples Test	before	after
	Mean SD	Mean SD		Mean SD	Mean SD			
Nutrition literacy	68/8 61/2	52/13 25/3	03/0	95/8 61/2	58/9 69/2	05/0	1/0	002/0

Table 2: difference between the two groups after and before intervention in nutrition behavior score

variable	intervention	control	Independent Sample Test

	before	after	Paired Samples Test	before	after	Paired Samples Test	before	after
	Mean SD	Mean SD		Mean SD	Mean SD			
Nutrition behavior	32/61 89/10	37/77 26/7	001/0	84/62 61/9	55/62 54/9	05/0	05/0	002/0

315

316**Discussion**

317The main objective of the qualitative study was finding the best product through group 318discussions and individual interviews. Social marketing aimes to modify the attitude of the 319audience in the health domain in order to establish a behavioral change for maintaining the 320health of the individual and the society. The main responsibility of social marketers in the realm 321of health is ensuring that intervention fulfills the health demands of the customer. The nutritional 322behaviors of women in this study appeared in the form of dietary patterns and consumption style. 323Nowadays, the nutritionists make use of eating patterns to evaluate the overall effect of diet on 324health outcomes [18, 19]. Analysis of dietary patterns helps us to provide people with dietary 325suggestions because it is easier for people to understand the dietary patterns rather than 326understanding the nutritional materials translated for them [20]. Researchers have identified two 327major dietary patterns, namely “healthy” and “western”. So far, only one national study has 328investigated the dominant dietary patterns among the female teachers of Tehran [21]. The 329dominant dietary patterns were identified by factor analysis on the data derived from the Food 330Frequency Questionnaire (FFQ) completed by the female teachers of Tehran. The results 331introduced three major dietary patterns. The findings of the present study indicated that dietary 332behaviors of most of the participants were based on the western dietary pattern. The dietary 333pattern of the participants involved high consumption of red meat, refined grains like rice, high-334calorie snacks and sweets, processed meat products, and low consumption of fruits, vegetables 335and whole grains. The similarity of Iranian’s dietary patterns to that of the western countries is 336not surprising because dramatic changes are occurring in Iran, including lifestyle, physical 337activity, and diet, which can be due to increased urbanization and improved economic conditions

in the recent years[22, 23] . The results of previous studies about dietary patterns also show a change in the dietary pattern of people, avoidance of a healthy dietary pattern and its association with the incidence of complications like obesity[24], hyperactivity and lack of attention and concentration in children [21], and incidence of metabolic syndrome and its constituents as well as some inflammatory biomarkers[25, 26]. Social marketing programs achieve the highest level of success when they are initiated according to the needs and demands of the customers. Studies have assessed the participants' demands in line with nutritional programs, including learning nutritional strategies to prevent chronic diseases, especially diabetes[8], trying new dishes[7] , and mastery of food preparation skills using the easily available foodstuff[27]. The results of these studies were in line with some demands of the participants in the present study. A behavior is internalized only when it has an intrinsic reward; that is only when the needs and demands of a person or a group are fulfilled. That is why the latest possibility is that the logic of customers create programs that are ethical not only in terms of objectives but also in terms of means, and are eventually honest, fair, reliable, and respectful of the individual's rights[28]. The central notion in social marketing is called exchange theory. It refers to transferring or exchanging something valuable between two persons or groups. What a marketer should do is performing a top exchange that is socially desirable and easily achieved. The findings of the current study showed the participants' perception of the benefits and advantages of a healthy diet. Benefits are positive outcomes that target consumers believe will occur upon compliance with performing the behavior. The participants' opinion about the benefits of a healthy diet involved such concepts as the effect of healthy diet on mood, bone, prevention of anemia, and heart. They generally believed that a healthy body was the result of a healthy diet. These findings were in agreement with those of previous studies[29, 30] .Undoubtedly, recognition of factors facilitating a healthy behavior from the viewpoint of the customers will help to formulate appropriate intervention strategies. The participants of the present study considered education as one of the most important factors facilitating a healthy diet and believed that practical trainings could increase their understanding of the benefits of a healthy diet, leading to a sustainable and healthy eating behavior. It is quite clear that education improves healthy behaviors, and there is ample evidence to support this issue. However, there are many studies indicating that education alone cannot bring about a sustainable behavior and other factors and components are necessary along with it. In this respect, the results of this study are indicative of the impact of social determinants and

facilitators of a healthy behavior. The participants believed that in a wider perspective social factors like affordable and accessible foodstuff could facilitate their healthy diet. Kumpel examined the effect of personal and social determinants on the acceptance of a healthy eating behavior and reported factors like correct knowledge and attitude toward health, price of foodstuff, peer pressure, and healthy food as the determinants which affect the acceptance of a healthy dietary behavior[31]. In the study of Macdiarmid, the participants reported the correct understanding of food portions as a significant factor involved in performing a healthy eating behavior[32]. Considering the important role of personal and social facilitators in a healthy dietary behavior, the health professionals should provide the healthcare personnel with the required trainings in order to supply the necessary facilities for following a healthy diet. In addition, organizational and social strategies in line with such factors as the cost of foodstuff and their availability are needed to be taken into account. Costs are another aspect of exchange for customers. For anyone in any situation, any action has a cost. In the present study, the participants reported obstacles like lack of knowledge, lack of healthy cooking skills, children’s imitation of their parents’ unhealthy diet, women’s laziness, and shortage of time, mental problem, and illiteracy affecting a healthy dietary behavior. Lack of knowledge was a concept that was frequently repeated by the participants. Regarding social barriers' subcategory, notions such as economic problems and inflation, chemical fertilizers, government role in health risks, and unavailability of physicians and their lack of notification were detected. Inflation and economic problems were a notion that the majority of participants reported as the most important barrier to a healthy diet. In the study of Parker, most of the study participants reported lack of social support and conflict among dietary preferences of the family members. Other factors included the price of foodstuff, their unavailability, and lack of time[8] .

Considering the role of environmental and social factors as barriers to a healthy diet, the health policymakers should design programs to promote the environmental and social conditions by applying health promotion strategies along with appropriate trainings tailored to the needs of the target group and based on the economic, social and cultural conditions of the society. In social marketing, location is a concept which involves a place and time in which the audience performs the intended behavior, gets access to the given product or service, and thinks about or listens to the intended subject[34]. In the current study, the majority of the participants believed that the health centers were the best place for participation in educational interventions. Some of the

participants considered places like schools, neighborhoods, workplaces, and mosques as appropriate places. In the study of Parker, the women asserted that the best place for implementation of nutritional interventions was where the services related to the subject were available. They also believed that the time of interventions had to be planned in a way not to interfere with their daily activities. These findings were also in line with those of previous studies. Promotion refers to communications and trainings that describe the advantages of programs, products, price, and place[34], and includes messages, materials, tools, channels, stimulants, and activities. In social marketing campaigns, which are designed for a wide range of audience, the mass media are used based on specific strategies to transfer the messages of the program[28, 35]. For instance, Beaudoin et al. used the media like commercials to encourage walking among the target group[36]. In social marketing, it is not always necessary to use media communications. Interaction among small groups, training, and other promotion techniques can be influential too. In the current research, most of the participants unanimously agreed on running training courses at health centers. Notification through written materials and television and trainings presented in mosques were other concepts extracted from the interviews. The results of quantitative study showed that implementation of nutritional literacy promotion interventions resulted in a significant increase in nutritional literacy mean score in the case group. A study was conducted in Canada to assess a society-oriented nutritional literacy called (Cook it up" for the young people at risk. The results indicated that their practical nutritional literacy, cooking skills, and self-efficacy were improved[37]. These results confirmed the findings of the present research, emphasizing a healthy diet and practical points of making a healthy food. Another quasi-experimental study evaluated the effect of nutritional interventions and media on the students and their parents. It was aimed to increase the consumption of fruits and vegetables in the case group and to change the dietary environment of home through access to vegetables and fruits as well as parents' social support[16]. In the current study, interventions were designed based on access to foodstuff principle. For example, in health food pyramid the emphasis is on the consumption of whole grains, including brown rice and bulgur. Since the use of brown rice is not pervasive in the culture of Iranian society as well as the diet of Kurdistan region, and its price is a social barrier to healthy diet marketing, bulgur, which is common in the diet of Kurdistan region and is easily accessible, is highly recommended to be consumed.

Conclusion: Once designing structured intervention, which is based on the needs and the understanding of cultural roots of a society, behavior change is expected. Conducting qualitative research in this study, the following findings were discovered: women nutritional behaviors, the barriers they face, their understanding of the benefits of healthy diet, and also the most proper place and ways of learning healthy behaviors within the framework of social marketing model. Lack of knowledge and simple but important skills revealed gaps in the field of education and health promotion. These gaps need to be filled by empowering people in different areas. In this study, the concept of exchange in social marketing of healthy diet was a help in reducing barriers of healthy diet as well as increasing the advantages of healthy behavior from customer's viewpoint. Finally, the studied women were empowered through obtaining healthy diet skills, which led to gaining healthy nutritional behaviors.

Acknowledgments:
This paper describes the results of research performed for a PhD degree in health education and health promotion. We hereby thank all people who contributed to this research.

References

1. Zoellner, J., et al., *Peer reviewed: nutrition literacy status and preferred nutrition communication channels among adults in the lower Mississippi Delta.* Preventing chronic disease, 2009. **6**(4).
2. Nasmith, L., et al., *Achieving care goals for people with chronic health conditions.* Canadian Family Physician, 2013. **59**(1): p. 11-13.
3. Nugent, R., *Chronic diseases in developing countries.* Annals of the New York Academy of Sciences, 2008. **1136**(1): p. 70-79.
4. Delaun, S. and P. Ladner, *Fundamental of nursing standard and practice.* New York: Delmar Thomson Learning, 1998. **75**.
5. Park, J., *Health services principals.* Trans. Shojaee Tehrani H. Tehran: Samat Publication, 2004: p. 42.
6. Kavosi, E., et al., *Prevalence and determinants of under-nutrition among children under six: a cross-sectional survey in Fars province, Iran.* Int J Health Policy Manag, 2014. **3**: p. 71-76.
7. Sylvetsky, A.C., et al., *Youth understanding of healthy eating and obesity: a focus group study.* Journal of obesity, 2013. **2013**.
8. Parker, S., et al., *Formative assessment using social marketing principles to identify health and nutrition perspectives of Native American women living within the Chickasaw Nation boundaries in Oklahoma.* Journal of nutrition education and behavior, 2011. **43**(1): p. 55-62.
9. Coveney, J., *A qualitative study exploring socio-economic differences in parental lay knowledge of food and health: implications for public health nutrition.* Public Health Nutrition, 2005. **8**(03): p. 290-297.
10. Dibsdall, L.A., N. Lambert, and L.J. Frewer, *Using interpretative phenomenology to understand the food-related experiences and beliefs of a select group of low-income UK women.* Journal of nutrition education and behavior, 2002. **34**(6): p. 298-309.

46911. Chapman, K. and J. Ogden, *A qualitative study exploring how mothers manage their teenage*
470 *children's diets.* Vulnerable Children and Youth Studies, 2009. **4**(1): p. 90-100.
47112. Gans, K.M., et al., *Implications of qualitative research for nutrition education geared to selected*
472 *Hispanic audiences.* Journal of Nutrition Education, 1999. **31**(6): p. 331-338.
47313. Farooqi, A., et al., *Attitudes to lifestyle risk factors for coronary heart disease amongst South*
474 *Asians in Leicester: a focus group study.* Family practice, 2000. **17**(4): p. 293-297.
47514. McGuire, W.J., *Personality and attitude change: An information-processing theory.* Psychological
476 foundations of attitudes, 1968: p. 171-196.
47715. Grier, S. and C.A. Bryant, *Social marketing in public health.* Annu. Rev. Public Health, 2005. **26**: p.
478 319-339.
47916. Evans, A.E., et al., *Changing the home nutrition environment: effects of a nutrition and media*
480 *literacy pilot intervention.* Family & community health, 2006. **29**(1): p. 43-54.
48117. Saegert, J. and E.A. Young, *Nutrition knowledge and health food consumption.* Nutrition &
482 Behavior, 1983.
48318. Sacks, F.M., et al., *Rationale and design of the Dietary Approaches to Stop Hypertension trial*
484 *(DASH): a multicenter controlled-feeding study of dietary patterns to lower blood pressure.*
485 Annals of epidemiology, 1995. **5**(2): p. 108-118.
48619. Appel, L.J., et al., *A clinical trial of the effects of dietary patterns on blood pressure.* New England
487 Journal of Medicine, 1997. **336**(16): p. 1117-1124.
48820. Allowances, N.R.C.C.o.D., N.R.C. Food, and N. Board, *Recommended dietary allowances*. Vol.
489 2941. 1980: National Academies.
49021. Azadbakht, L. and A. Esmaillzadeh, *Dietary patterns and attention deficit hyperactivity disorder*
491 *among Iranian children.* Nutrition, 2012. **28**(3): p. 242-249.
49222. Ghassemi, H., G. Harrison, and K. Mohammad, *An accelerated nutrition transition in Iran.* Public
493 Health Nutrition, 2002. **5**(1a): p. 149-155.
49423. Galal, O., *Nutrition-related health patterns in the Middle East.* Asia Pacific journal of clinical
495 nutrition, 2003. **12**(3).
49624. Aghapour, B., et al., *The association between major dietary patterns and overweight or obesity*
497 *among Iranian adolescent girls.* Iranian Journal of Nutrition Sciences & Food Technology,
498 2013. **7**(5): p. 289-299.
49925. Esmaillzadeh, A., et al., *Dietary patterns, insulin resistance, and prevalence of the metabolic*
500 *syndrome in women.* The American journal of clinical nutrition, 2007. **85**(3): p. 910-918.
50126. Sonnenberg, L., et al., *Dietary patterns and the metabolic syndrome in obese and non‐obese*
502 *Framingham women.* Obesity research, 2005. **13**(1): p. 153-162.
50327. Jelliffe, D.B., et al., *Community nutritional assessment with special reference to less technically*
504 *developed countries.* 1989.
50528. Andreasen, A.R., *Marketing social change*. 1995: Jossey-Bass.
50629. Pawlak, R. and S. Colby, *Benefits, barriers, self-efficacy and knowledge regarding healthy foods;*
507 *perception of African Americans living in eastern North Carolina.* Nutrition Research and Practice,
508 2009. **3**(1): p. 56-63.
50930. Keshavarz, Z., M. Simbar, and A. Ramezankhani, *EFFECTIVE FACTORS ON NUTRITIONAL*
510 *BEHAVIOR OF FEMALE WORKERS BASED ON.* 2010.
51131. Nørgaard, M.K., B.T. Sørensen, and K.G. Grunert, *Social and individual determinants of*
512 *adolescents' acceptance of novel healthy and cool snack products.* Appetite, 2014. **83**: p. 226-
513 235.
51432. Macdiarmid, J.I., et al., *"It was an education in portion size". Experience of eating a healthy diet*
515 *and barriers to long term dietary change.* Appetite, 2013. **71**: p. 411-419.

51633. Sabzmakan, L., et al., *Behavioral determinants of cardiovascular diseases risk factors: A*
517 *qualitative directed content analysis.* ARYA atherosclerosis, 2014. **10**(2): p. 71.
51834. Basics, C.S.M., *Social Marketing for Nutrition and Physical Activity Web Course: Introduction*.
51935. Randolph, W. and K. Viswanath, *Lessons learned from public health mass media campaigns:*
520 *Marketing health in a crowded media world**. Annu. Rev. Public Health, 2004. **25**: p. 419-437.
52136. Beaudoin, C.E., et al., *Promoting healthy eating and physical activity: short-term effects of a*
522 *mass media campaign.* American journal of preventive medicine, 2007. **32**(3): p. 217-223.
52337. Thomas, H.M. and J.D. Irwin, *Cook It Up! A community-based cooking program for at-risk youth:*
524 *overview of a food literacy intervention.* BMC research notes, 2011. **4**(1): p. 1.

525

526

OPEN PEER REVIEW

Open Peer Review (OPR)

As a new feature for progressing towards transparency, we decided to open a new window for all of our editors as well as authors titled "**Open Peer Review**". We hope by this new facility, our reviewers will be more motivated and authors will be more satisfied with the review process. We believe that publishing our peer review reports could make a transparent and clear environment for all our efforts within a journal, but not all reviewers tend to publish their comments.

What is "Open Peer Review" process?

An "Open Peer Review" process is making the details of all review process (including reviewers, associate editors, and EICs comments) as "Public" as it is agreed by EIC, Authors, and reviewers.

Advantages of "Open Peer Review" process

- More transparency, constructiveness and tactful comments of the peer review process: leads to an increase in the quality of reviews
- More motivations for all involved roles in the review process
- Authors' satisfactions from the review process: Increases honesty between authors and reviewers
- Education of both authors and new students
- Prevents reviewers from following their individual agendas and leading to the detection of reviewers' conflicts of interests

You can find out more at:
https://sites.kowsarpub.com/kowsar/knowledgebase/category/tree.html#opr.html

Health Scope
Article DOI: 10.5812/jhealthscope.62753
Published in: Health Scope: 9(1); e62753

Peer Review Report for "The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Methods Approach"

Author(s): Nasrin Abdi, Roya Sadeghi, Fereshteh Zamani-Alavijeh, Davood Shojaee Zadeh, Siroos Shahsavari, Mohamad Hosein Taghdisi

Review Timeline:

Submit Date: 11 Oct 2017
Revised Date: 4 Dec 2019
Accepted Date: 20 Dec 2019

Revision (0)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (0)

5 Jan 2018

The study is innovative and valuable. So, it has the potential of being accepted for publication. However, it needs to be modified contently and structurally. Find my comments as below:

1- "A mixed-method approach" in the title is not compatible. Designing a "formative Research" to access the materials and products, can be qualitative, quantitative, or mixed-method. But, the authors showed the effect of a field trial. So, the title needs to be modified.
2- Measuring both "Nutrition Literacy" and "Healthy Dietary Behaviors" for showing the effects of the intervention was not needed, and even will be confusing. I think nutritional literacy, as the innovative part of the study, covers the potential nutrition behaviors and plays the role of the outcome. The intervention must focus on is better to remove the findings related to "Dietary Behaviors".
3- In the abstract, there is no explanation for the validity and reliability of the collecting data instrument, and the intervention used to promote nutritional literacy. I suggest revising the

whole materials and method in the abstract.
4- In the abstract, the findings of the formative research have not been included. We need to know about the data which have been used to design the intervention.
5- Introduction is not structured. Authors must write the explanations of the main parts like "the importance of nutrition", "concept of nutritional literacy", "social marketing" and so on, in separate paragraphs. Additionally, similar studies and telling about the differences of the current study is absent.
6- in Materials & Methods, the authors explained the developed tool for measuring nutritional literacy. But, they must bring their reasons that this questionnaire measures Nutritional Literacy NOT another thing. The tool must include the definition of Nutritional Literacy, but we do not know how? Authors must explain.
7- The most important part of a study in the field of HEP is intervention. Unfortunately, the authors have written this part briefly. We cannot understand the intervention package which has been developed based on social marketing. The main question as "How the changes have occurred?" has not been answered clearly.

8- Is it possible for authors to split the manuscript to separate and independent papers: one, "Formative research for designing an intervention based on social marketing model", and second, "The effect of a tailored intervention to improve nutritional literacy"? In this way, there was enough space to discuss the study. Of course, it depends on the authors.

REFEREE: Associate Editor | **Revision** (0) 26 Jan 2018

The study is innovative and valuable. So, it has the potential of being accepted for publication. However, it needs to be modified contently and structurally.

REFEREE: EIC | **Revision** (0) 31 Jan 2018

The study is innovative and valuable. So, it has the potential of being accepted for publication. However, it needs to be modified contently and structurally. Find my comments as below:

1- "A mixed-method approach" in the title is not compatible. Designing a "formative Research" to access the materials and products, can be qualitative, quantitative, or mixed-method. But, the authors showed the effect of a field trial. So, the title needs to be modified.
2- Measuring both "Nutrition Literacy" and "Healthy Dietary Behaviors" for showing the effects of the intervention was not needed, and even will be confusing. I think nutritional literacy, as the innovative part of the study, covers the potential nutrition behaviors and plays the role of the outcome. The intervention must focus on is better to remove the findings related to "Dietary Behaviors".
3- In the abstract, there is no explanation for the validity and reliability of the collecting data instrument, and the intervention used to promote nutritional literacy. I suggest revising the whole materials and method in the abstract.
4- In the abstract, the findings of the formative research have not been included. We need to know about the data which have been used to design the intervention.
5- Introduction is not structured. Authors must write the explanations of the main parts like

"the importance of nutrition", "concept of nutritional literacy", "social marketing" and so on, in separate paragraphs. Additionally, similar studies and telling about the differences of the current study is absent.

6- in Materials & Methods, the authors explained the developed tool for measuring nutritional literacy. But, they must bring their reasons that this questionnaire measures Nutritional Literacy NOT another thing. The tool must include the definition of Nutritional Literacy, but we do not know how? Authors must explain.

7- The most important part of a study in the field of HEP is intervention. Unfortunately, the authors have written this part briefly. We cannot understand the intervention package which has been developed based on social marketing. The main question as "How the changes occurred?" has not been answered clearly.

8- Is it possible for authors to split the manuscript to separate and independent papers: one, "Formative research for designing an intervention based on social marketing model", and second, "The effect of a tailored intervention to improve nutritional literacy"? In this way, there was enough space to discuss the study. Of course, it depends on the authors.

OPEN PEER REVIEW

Revision (1)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Associate Editor | **Revision** (1) 14 Sep 2018

Dear editor in chief,
The manuscript entitled "The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Method Approach" needs more revision. The comments are as follows;
1- Report content validity ratio and content validity index of the questionnaires.
2- Trial registration number be mentioned.
3- In qualitative studies, there is no validity and reliability. Please correct.
4- Did the participants have informed consent to participate in the study?
5- Describe the interview environment and the duration of the interview. Also, explain the interview guide.
6- Explain the intervention method. What is educational content in each group, it is necessary researchers explain it in material and method.

REFEREE: EIC | **Revision** (1) 14 Sep 2018

Dear
The manuscript entitled "The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Method Approach" needs more revision. The comments are as follows;
1- Report content validity ratio and content validity index of the questionnaires.
2- Trial registration number be mentioned.
3- In qualitative studies, there is no validity and reliability. Please correct.
4- Did the participants have informed consent to participate in the study?
5- Describe the interview environment and the duration of the interview. Also, explain the interview guide.
6- Explain the intervention method. What is educational content in each group, it is necessary researchers explain it in material and method.

OPEN PEER REVIEW

Revision (2)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

Q: Ethical and Legal Considerations

The authors should state the following at the end of the manuscript.

R: Ethical and Legal Considerations is added at the end of the manuscript

The present paper is extracted from PhD thesis which was done in Tehran University. Since It has not been turned into a research project, no financial budget has been awarded by the university.

Q: Manuscript title on journal website is different from the full manuscript file.

R: Since one of the reviewers asked the researchers to revise the title and change it, we made the required changes.

Q: The list of authors in the current revision is different from Revision 0. Please note that any "Authorship Changes" (i.e., order, addition, and deletion of authors) after initial submission should be approved by all authors. Any such changes made after a manuscript has been submitted should be explained to the journal. For more information about the journal policy regarding "Authorship Changes" see the following link.

R:. All the authors have confirmed the aforementioned change. Attached is the discussed form.

OPEN PEER REVIEW

Revision (2)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (2) 23 May 2019

In the introduction, line 49; please mention the reference (s) of the following text.

In method & materials; how many health centers are there in Sanandaj city? why 4 health centers have been selected? Why participants were 50 women married? Please explain clearly.

Would you please the attached a file of a questionnaire used in the evaluation of nutrition literacy and healthy dietary behavior in the participants before and after the intervention, briefly?

Please write the code and date of the ethical committee of Tehran University which approved this research.

REFEREE: Reviewer | **Revision** (2) 26 May 2019

Dear Editor in Chief
The authors have revised the manuscript according to reviewers' comments.

REFEREE: Reviewer | **Revision** (2) 26 May 2019

Dear Editor in Chief

The authors have resolved many of the bugs, although the article still needs to be reviewed in terms of grammar. In addition, a few comments were mentioned in the STROBE Statement—Checklist.

REFEREE: Associate Editor | **Revision** (2) 8 Jun 2019

In the introduction, line 49; please mention the reference (s) of the following text.

In method & materials; how many health centers are there in Sanandaj city? why 4 health centers have been selected? Why participants were 50 women married? Please explain clearly.

Would you please the attached a file of a questionnaire used in the evaluation of nutrition literacy and healthy dietary behavior in the participants before and after the intervention, briefly?

Please write the code and date of the ethical committee of Tehran University which approved this research.

REFEREE: EIC | **Revision** (2) 8 Jun 2019

Dear author
The authors have resolved many of the bugs, although the article still needs to be reviewed in terms of grammar. In addition, a few comment mentioned in the STROBE Statement—Checklist.
In introduction, line 49; please mention the reference (s) of following text.

In method & materials; how many health centers are there in Sanandaj city? why 4 health centers have been selected? Why participants were 50 women married? Please explain clearly.

Would you please attached file of questionnaire which used in evaluation of nutrition literacy and healthy dietary behavior in the participants in before and after intervention, briefly?

Please write the code and date of ethical committee of the Tehran University which approved this research.

OPEN PEER REVIEW

Revision (3)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Method Approach

Respond TO COMMENTS:

1. *The authors have resolved many of the bugs, although the article still needs to be reviewed in terms of grammar.*
   The article reviewed in terms of grammar

2. *In introduction, line 49; please mention the reference (s) of following text.*

   Line 49 elucidates both the reason and the necessity to do the present research. After doing a comprehensive research, the researcher came up with the conclusion that a few study on peoples' nutritional beliefs have been conducted so far.

3. *. In method & materials; how many health centers are there in Sanandaj city? why 4 health centers have been selected? Why participants were 50 women married? Please explain clearly.*

   There are 32 health centers in Sanandaj city. Since the present study aimed at doing intervention among low socioeconomic classes, four health centers among the low classes of the city were selected. The reason that married women were selected was mainly due to the fact that in comparison with single women, they play more significant roles in nutritional and health affairs of their families.

4. *Would you please attached file of questionnaire which used in evaluation of nutrition literacy and healthy dietary behavior in the participants in before and after intervention, briefly?*
   Nutrition literacy and healthy dietary behavior questionnaires are attached.

5. *Please write the code and date of ethical committee of the Tehran University which approved this research.*

   At the time of conducting the present study, the Ethical Committee of Tehran University of Medical Sciences used to assign the term "admitted" only and it didn't use to assign codes of ethics to the studies.The image of the research assitant's page and the code of ethical approval are attached.

OPEN PEER REVIEW

Revision (3)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (3) — 30 Oct 2019

Please attention to the comments cited in the manuscript.

REFEREE: Reviewer | **Revision** (3) — 4 Nov 2019

The authors have revised the manuscript based on the reviewers' comments

REFEREE: Reviewer | **Revision** (3) — 9 Nov 2019

All of the revision has been done by the respected author. Meanwhile, It is recommended to present the important findings of the study in the first discussion section,

REFEREE: Associate Editor | **Revision** (3) — 3 Dec 2019

Dear editor in chief
This article has an author removal. That is, Dr. Vafa was on the author's list in the second revision, but was eliminated in the third revision. Authors must submit the consent form. Otherwise, the article will not be published.
The authors have not been careful about the COMMENTS and suggestions of the reviewers, Therefore, there are some comments in the text of the article that need to be reviewed by respected authors.
Please attention to the comments cited in the manuscript.

REFEREE: EIC | **Revision** (3) — 3 Dec 2019

Dear author

This article has an author removal. That is, Dr. Vafa was on the author's list in the second revision, but was eliminated in the third revision. Authors must submit the consent form. Otherwise, the article will not be published.
The authors have not been careful about the COMMENTS and suggestions of the reviewers, Therefore, there are some comments in the text of the article that need to be reviewed by respected authors.
Please attention to the comments cited in the manuscript.

OPEN PEER REVIEW

Revision (4)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

Paper no: 62753

1. **The two sentences are better to be merged:**

Quantitatively, the results indicated that the difference between the two groups in nutrition literacy score (P<0.05) and nutritional behavior (P<0.01) were significant after the intervention.

It is done(highlighted with green color in paper)

2. Agreement form was attached at 18.3.2019.also was emailed for Miss nakhaee to raise in journal convention as she requested due on phone call. I send this form again.
3.
4. Modify as above (title).

The Effect of Social Marketing Model on Promoting Nutrition Literacy and Healthy Dietary Behaviors of Women in Sanandaj City: A Mixed-Method Approach.

5. **Figure 1: Flowchart of the phase of the trial**
   It is corrected

6. Please correct in all cases to: intervention group
   It is done

7. The decimal places of the numbers in the tables must be corrected (replaced / with .)
   It is done
8. Study limitations were not mentioned

   It is done

(All responds and corrections are highlighted with green color in main paper)

OPEN PEER REVIEW

Revision (4)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (4) 13 Dec 2019

Dear Editor
The authors have revised the manuscript based on the reviewers' comments

REFEREE: Reviewer | **Revision** (4) 18 Dec 2019

Thanks to the respected author (s) for the revision of the article, but the following suggestions have not been answered yet.

In method & materials; how many health centers are there in Sanandaj city? Why 4 health centers have been selected? Why participants were 50 women married? Please explain clearly.

Would you please attach a file of a questionnaire that was used in the evaluation of nutrition literacy and healthy dietary behavior in the participants?

REFEREE: Associate Editor | **Revision** (4) 20 Dec 2019

Dear Editor in chief
The authors have revised the manuscript based on the reviewers' comments

REFEREE: EIC | **Revision** (4) 20 Dec 2019

Dear Editor
The authors have revised the manuscript based on the reviewers' comments