RESEARCH ARTICLE

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Impact of an Educational Intervention Based on the BASNEF Model on Skin Cancer Preventive Behavior of College Students

Morad Ali Zareipour[1], Hassan Mahmoodi[2], Rohollah Valizadeh[3,4], Mosa Ghelich Ghorooji[5,6], Monireh Rezaie Moradali[7,8], Fatemeh Zare[8]*

Abstract

Background: Skin cancer is one of the most common cancers in the world but is largely preventable through protective behavior. The aim of this study was to evaluate the impact of an educational intervention based on the BASNEF model on skin cancer prevention and protective behavior in midwifery students in Urmia. **Methods:** In this quasi-experimental study, the subject population comprised 100 midwifery students in two groups, study and control (n = 50 in each). The sample was collected using a stratified random sampling method. The data collection tool was a multi-section questionnaire which included demographic questions, knowledge and structures (attitude, enabling factors, subjective norms, behavior and attitude). The educational intervention was carried out in three 45-minute sessions. Data were collected during face-to-face discussions before the educational intervention and three months thereafter and analyzed using paired t-test and independent t-test statistics. **Results:** The results showed that after intervention, mean score of knowledge was significantly higher in the study group compared to the control group. Significant improvement in mean scores for attitude, enabling factors, mental norms, and intent of behavior was limited to the study group Also, behavior for prevention of skin cancer was significantly better in the intervention group. **Conclusions:** The results of this study showed that the BASNEF model is effective for promotion of skin cancer prevention behavior.

Keywords: BASNEF- cancer- educational- intervention- skin

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Introduction

Skin cancer is rapidly increasing as a general problem around the world (Jacobsen et al., 2016) this type of cancer, includes three main types, melanoma, basal carcinoma and squamous carcinoma (Brunssen et al., 2017). Melanoma is the deadliest form of skin cancer (Roebuck et al., 2015; Vazquez et al., 2012). From 1970 to 2009, the incidence of melanoma has increased in young women up to 80% and 40% among young men. This cancer is the most frequent cancer in women 25 to 29 years old and the second cancer after breast cancer in women 30 to 34 years old. Recently, the incidence of skin cancer has increased as an epidemic more than doubled infection of HIV. Studies show that skin cancer forms 32.7 percent of cancers in Iran. So that the most common type of cancer in men and the second most common cancer in women after breast cancer (Mirzaeiet al., 2012). The reasons of the increases in the rate of skin cancer include Ozone depletion and the increasing the amount of ultraviolet radiation that reaches the earth (Rivas et al., 2012) increasing the amount of an average age of community, an increase in smoking, changing the style of life of the people of the Community (Taghdisi et al., 2011) as well as UV radiation caused by tanning the skin. Other predisposing factors include a family history of skin cancer and light skin (Armstrong and Kricker, 2001; Heckman et al., 2015). Of course the ultraviolet radiation and light skin are the main factor for all types of skin cancer (80% of melanoma cancer caused by damage of UV on sensitive skins) (Vazquez et al., 2012), so that the skin cancer is the most abundant cancer in developed countries that are predominantly white people (Brunssen et al., 2017).

The most important potential environmental risk factor in creating this malignancy is also ultraviolet radiation of the sun in Iran (Sadeghiet al., 2014) The most important truth about skin cancer is that a very large extent is preventable through upgrading health care and

*[1]PhD Student in Health Education and Health Promotion, [6]Graduate of Epidemiology, Urmia Health Center, [3]Student Research Committee, Urmia University of Medical Sciences, [7]School of Nursing and Midwifery, Islamic Azad University Urmia Urmia, [2]School of Health, Tabriz University of Medical Science, Tabriz, [4]Student Research Committee, Department of Epidemiology, Iran University of Medical Sciences, [8]PhD Student in Health Education and Health Promotion, School of Health, Shahid Beheshti University of Medical Science Tehran,[5]Department of Epidemiology, Faculty of Public Health, Shiraz University of Medical Sciences, Iran. *For Correspondence: zare.farima@yahoo.com*

by early detection. With early detection of Melanoma, the survival rate for people is 98%, while the survival rate with advanced disease detection is 15% (Roebuck et al., 2015). Despite having the capability of prevention and treatment of skin cancer, the rate of skin cancer is increasing about 3 to 5 percent in each year (Mirzaei et al., 2012). Kyle et al., (2008) reported that every dollar spent on training programs for protection against sunlight makes to save almost four dollars in costs related to health care and treatment of skin cancer. The importance of the prevention is that, it has expressed the objectives of healthy people to 2020 that supports every planned preventive effort in this regard (Roebuck et al., 2015). However, protection against sunburn, which greatly reduces the harmful effects of sunlight exposures but many people are still exposed to strong sunlight without any protection. Maybe the reason is that people believe that the risk of skin cancer is very low. This is a serious concern (Vazquez et al., 2012), especially the invasive skin cancer is the second leading cancer diagnosed among young people (Heckman et al., 2015). The reason of the existence of such beliefs is seeing a lot of people who are exposed without any protection, but they are not suffering from cancer (Vazquez et al., 2012). One of the strategies to influence and change people's behavior towards the protective behaviors is using the models and theories of behavior change. The BASNEF model is one of the comprehensive models for the study of the behavior, identification of factors affecting it and to change the behavior in society. This model is focused on the impact of the knowledge; attitude and individual skills on behavior changes (Zareipour et al., 2011). BASNEF model was conducted by John Hubble in 1988 (Rahaei, Heshmati et al., 2011). Structures of BASNEF model include behavioral beliefs, attitudes, norms, abstract norms, enabling factors (Arefi et al., 2015). This model consists of a combination of the two models, PRECEDE model and behavioral intention model (Hassani et al., 2016) and it is used for the study of the behavior and planning for its change and to determine the factors that influence on the decision of individuals to perform the behavior (Rahaei et al., 2011) Behavioral beliefs are the same with the beliefs of a person about the good and bad results of a certain behavior. If these beliefs consolidate in one's mind that has a positive view about it, the attitude will take shape. Abstract norms mean that others, especially people who are important to people, how they think about their behavior. If they have a positive view on the behavior and there are enabling factors, the person will attempt to perform the desired behavior (Taghdisi et al., 2011). Youth between the ages of 18 to 25 are staying on sunlight without adequate protection of their skin (Heckman et al., 2015). However, few studies have been conducted in the field of skin cancer prevention behaviors in Iran. So the study of effects of interventions in preventing skin cancer is needed in youth. The aim of this study was to investigate the effects of educational intervention based on BASNEF model on preventive behaviors of skin cancer in midwifery students in Urmia, in order to considerate the interventions by determining the extent of its effectiveness in the formulation of skin cancer prevention interventions.

Materials and Methods

This study was a quasi-experimental study that aims to use BASNEF model on the prevention of skin cancer in the midwifery students in 2016. According to previous studies (Nadrian et al., 2014), this study was considered with $\alpha = 5\%$, confidence level = 95% and $p = 0.6$, sample size 100 people (50 people in the intervention group and 50 people in the control group). Samples were selected through stratified random sampling method, which there were 4 categories (students which are entranced in 2016, 2015, 2014, and 2013) and each category contains 25 midwifery students who were randomly selected. Data collection tool was a polychotomy questionnaire including demographic characteristics, awareness and model structures (attitude, enabling factors, subjective norms, intent of behavior and behavior). The numbers of Demographic questions were 8. The number of awareness questions included 12 three-option multiple choice question which two points were for "correct" answers, one points were for "do not know" answers and Zero points were for wrong answers. The numbers of attitude questions were 10, subjective norms questions were 8, enabling factors questions were 5, behavioral intention questions were 7 ,which all questions included five-option multiple choice that the score range was between 5 points for "totally agree" option and 1 points for "quite disagree" option. The number of behavior questions included 9 three-option multiple choice question that the score range was between 2 points for "always" option and 0 points for "never" option. For the validity and reliability of the questionnaire, respectively, content validity test methods of the validity of the content and Cronbach's alpha test was used. The questionnaire was sent to 10 health education specialists and dermatologists, In order to determine the validity of the questionnaire. According to the comments of the experts, the questionnaires were reformed. The validity of questionnaires was higher than 80%. To confirm reliability, the questionnaire was filled by 20 midwifery students and by using Cronbach's alpha, the reliability coefficient of knowledge questions , attitudes, subjective norms , enabling factors behavioral intention and behavior were respectively calculated 0.71 , 0.75, 0.85, 0.83, 0.80 and 0.79.

Educational intervention was done only in experimental group. At first, the pre-test questionnaire was completed by the researcher during the interview. Then, the educational programs were carried out in three 45-minute sessions based on the structures of the BASNEF model.

Educational intervention was done in two ways: 1- Direct method (in group using lecture, question and answer, whiteboard and power point). 2- Indirect method (educational pamphlet and booklet). Educational content was based on valid sources, model structure and pre-test results. In direct method, three 45 minutes sessions was done to train the following subjects:

• the first session about knowledge (familiar with the disease, the causes of the disease, prevention methods

of disease) and attitudes toward skin cancer (one's belief about skin cancer prevention)

• the second session about subjective norms (the effect of friends and classmates, family members, medical staff) and the enabling factors (the effect of costs, access, immensity)

• the third session about behavioral intent (the individual's intent and decision in skin cancer prevention in future) and the behavior of skin cancer prevention.

Before the educational intervention in two groups of case and control the information collected through the questionnaire and then training intervention was held for the control group, and it was completed again three months after training and before the implementation of the goals of the plan, methods of research, and confidentiality of information was explained for the study group and consent forms was filled by participants in the program. The questionnaire was filled anonymously and only with the registration code. The obtained results were analyzed by independent t-test, paired t-test through SPSS version 16.

Results

The mean (SD) ages of the control and study group

Table 1. Characteristics of the Participants in Two Groups of the Study

Variables	Control group (N=50) Mean (SD)	Study group (N=50) Mean (SD)	P-value
Age	20.74 (1.89)	20.56 (1.21)	0.362
Marital status			
Married	46 (92%)	39 (78%)	0.112
Single	4 (8%)	11 (22%)	
History of skin burn			
Yes	26 (52%)	17 (34%)	0.069
No	24 (48%)	33 (57%)	
Family level income			
Low	12 (24%)	18 (36%)	0.412
Moderate	36 (72%)	30 (60%)	
High	2 (4%)	2 (4%)	
Awareness	18.62 (2.66)	18.32 (2.66)	0.113
Attitude	36.28 (4.44)	36.28 (4.44)	0.480
Subjective norms	29.44 (5.44)	29.44 (5.44)	0.16
Enabling factors	12.59 (3.83)	12.56 (3.83)	0.285
Behavioral intention	25.52 (3.43)	25.52 (3.43)	0.819
behavior	15.72 (3.09)	15.72 (3.09)	0.136

P-vale reported based on T-test*

Table 2. Distribution Mean (SD) of Study Variables, Post-intervention, by Group

Structures	study groups	before intervention Mean (SD)	after intervention Mean (SD)	**P-value
	Control	18.62 (2.48)	18.28 (2.94)	0.111
awareness	Intervention (study)	18.32 (2.66)	22.28 (2.2)	0.001
	*P-vale	P=0.113	P=0.003	
Attitude	Control	36.92 (4.58)	36.62 (3.83)	0.639
	Intervention (study)	36.28 (4.44)	42.52 (4.37)	0.001
		P=0.48	P=0.001	
Subjective norms	Control	30.28 (3.67)	29.66 (3.1)	0.14
	Intervention (study)	29.44 (5.41)	34.2 (3.61)	0.001
		P=0.13	P=0.001	
Enabling factors	Control	13.3 (2.99)	13.28 (3.65)	0.24
	Intervention (study)	12.56 (3.83)	15.88 (4.17)	0.001
		P=0.285	P=0.001	
Behavioral intention	Control	25.66 (2.6)	26.86 (3.4)	0.115
	Intervention (study)	25.52 (3.43)	28.64 (3.4)	0.007
		P=0.819	P=0.007	
	Control	15.6 (2.74)	15.48 (2.94)	0.148
behavior	Intervention (study)	15.72 (3.09)	18 (2.54)	0.001
		P=0.136*	P=0.001	

*P-value in column-wise based on T-test, ** P-value in row-wise based on Paired t-test

Table 3. Mean Scores in Basic Mode and after the Intervention in Two Groups of the Studies

Constructs	Study groups	SE	The mean of differences	95%CI	p-value
Attitude	Control – Intervention (study)	0.837	6.54	4.87-8.2	0.001
Subjective norms	Control – Intervention (study)	0.871	6.38	4.65-8.1	0.001
Enabling factors	Control – Intervention (study)	1.03	2.52	463-4.57	0.017
Behavioral intention	Control – Intervention (study)	0.541	1.92	.0844-2.99	0.007
behavior	Control – Intervention (study)	0.341	-1.64	-0.963-(-2.31)	0.001

were 20.74 (1.89) and 20.56 (1.21), respectively. More than 50 percent of students had history of skin burn. 66 percent of students were at the moderate level income. Only 15 percent of the students were married. The result of the analysis of t-test indicated that there were not statistically significant differences between study and control group at baseline in terms of age, awareness, attitude, subjective norms, enabling factors, behavioral intention and behavior and it indicated that the allocation procedure has been effective (Table 1).

The results of the study after 3 months intervention in both groups showed that the study group in all BASNEF model's structures have significant difference with the control group. (p>0/001) (Table 2).

The independent t-test showed a significant difference in intervention group compared with the control group according to the calculations of the mean difference scores before and after the intervention of two groups and comparing the mean difference in the two groups. (To assess the genuine effect of intervention) (Table 3).

Discussion

The results of this study showed that three months after the educational intervention, all structures of BASNEF model had increased in the intervention group, and this increase was statistically significant. In addition, skin cancer preventive behaviors that were our ultimate goal were also significantly changed. The results of the study of Zareban et al., (2016); Hazavehei (et al., (2013); Solhi et al., (2012); Yarmohammadi et al., (2015) also showed that, if educational intervention carries out properly based on BASNEF model, it can significantly increase all the model structures. The structure of attitude has the most change among all the structures that were increased (2/6). The study of Zareban et al also showed dramatically increase in structure of attitude and they stated its reason as a using of prolific techniques of changing the attitude such as make people involved in training sessions and encourage them to provide their own comments and opinions (Zareban et al., 2016) Unfortunately, attitudes is ignored in most of the training provided for preventive behaviors, and training providers in health centers only pay attention to increase the awareness of its people due to being unfamiliar with the structures and advanced theories of behavioral change. Another significant deficiency in the studies are cited in the view of educational interventions (Mazloumi, 2006; Nadrian et al., 2014) Nadrian et al (2014) stated that the change of attitude towards other structures is more important to change preventive behaviors of skin cancer. Different ways, such as group discussion, role playing, providing tangible examples, providing clear information, expressing an interest by participants toward learning based on problem solving method and etc, can be used to improve the attitude of the people. One of the most appropriate methods for changing the attitude is that people talk about their beliefs. In fact, the process of putting ideas into words and perceiving the reactions of others is one of the strong changes in attitude. Taghdisi et al., (2011) have mentioned to this as an effective method in changing the attitude of the participants in their study. Also the results of this study showed that the structures of consciousness had a significant increase after the intervention. Various studies have shown that the theory-based training in increasing awareness of the subjects is more effective than traditional methods (Zareban et al., 2016). Hazavehei et al., (2013), Sharifirad et al., (2012), Taghdisi et al., (2011), Amiri et al., (2014) studies also have confirmed the effectiveness of BASNEF model in raising awareness. Regarding to the increase abstract norms in students, it seems that friends have the most impact on the students because most students are away from their family, so peers can be used to change the direction of abstract norms in students. The study of Sharifi-Rad et al., (2012) also indicated that the most important factor for predicting of smoking behavior is Friends Group and 76% of students become smoker after entering the University. The results also showed that the structures of enabling factors had a significant increase after the intervention. This study identified that the enabling factors are the most important predictive factor of protective behaviors. The study of Moeni et al also indicated that structures of enabling factors and behavioral intention are the most important factors (Moeini et al., 2011) and it is recommended in strengthening of the agents, designing educational programs for health care providers and the public. Health care providers, doctors and nurses by informing their patients can greatly empower them to take care of themselves (Robinson et al., 1998). Reducing the price of sunscreen and sunglasses are good policies through being included these cases in health insurance. According BASNEF model all expressed structures influence on behavioral intention. Therefore, due to a significant increase in all of these structures is quite natural to change the behavioral intention after the educational intervention. In the study of Mrmlstyn et al, behavioral intentions did not change significantly after school-based educational intervention. This study showed that the behavioral intentions to protective behaviors by factors such as perceived susceptibility to skin cancer, attitudes about the benefits of exposure to

sunlight, skin type and gender was associated. So that girls are more likely to have protective behaviors to prevent skin cancer (Mermelstein and Riesenberg, 1992). Skin cancer is the most common cancer among men in Iran, (Mirzaei et al., 2012) because women in Iran are wearing hijabs so that they are putting less themselves at risk of explosion of the direct rays of the Sun and men more are at risk. In addition because of cultural reasons, the use of sunscreen in men can be considered as the anti-value so it is recommended that studies should be upgrade on protective behaviors in men. Also, according to the early detection of skin cancer , the survival rate is greatly increased, however, few studies in the field of skin cancer screening has been done, it is recommended that studies should be carried out in order to change behavior in this area.

In conclusion, the results of this study showed that BASNEF model can be a good pattern in order to promote skin cancer prevention behaviors. So all elements of this model and in particular the emphasis on enabling factors can be used to more effectiveness of educational interventions to prevent the trend of rising skin cancer.

Limitations of the study

The small sample size of include studies are potential limitation of this study. There is still need to further studies to access additional information about the skin cancer using BASNEF model. Another limitation of the current study was the method of sampling (quasi-experimental), so that affects the generablility of our study.

Conflict Of Interest

The authors declared that there was no conflict of interest in this study.

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