Threat appraisal for skin cancer among rural farmers in Ilam, Iran

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Background: Skin cancers are among the most prevalent malignancies in Iran. According to statistics, it is the most common cancer in the population of Ilam, west of Iran. The present study aimed to assess threat appraisal of skin cancer among rural farmers of Ilam in 2013-2014.

Method: In this cross-sectional study, we used multistage random sampling. We collected the data through distribution of a researcher-developed questionnaire among 248 farmers from the rural areas of Ilam in June 2013. The items of the questionnaire were based on the protection motivation theory, and covered components included perceived vulnerability, perceived severity, and rewards.

Result: We found a generally lower perceived vulnerability and severity and higher rewards among the farmers; 14.5 and 30.6 % of the farmers displayed higher perceived vulnerability and severity, respectively. Only 15.7% of the farmers were low in extrinsic and intrinsic rewards for unprotected behaviours. We found 149 people (60.1%) had unacceptable levels of threat appraisal; 2 people (0.8 %) had borderline levels; and 97 people (39.1%) had acceptable levels. Also, there was a significant relationship between perceived vulnerability, severity, income, and education level of the participants (P<0.001), but an insignificant relationship was found between family size, threat appraisal (P<0.747), family size and perceived threat (P<0.247).

Conclusion: The overall findings of the present study indicated unacceptable levels of psychological perception about skin cancer in farmers, which highlights the importance of designing, implementation, and evaluation of educational interventions related to the issue.

Keywords: farmers, protection motivation theory, skin cancer, threat appraisal

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INTRODUCTION

Skin cancer is among the most prevalent cancers around the world. The prevalence of skin cancers has sky rocketed as to become an epidemic in recent decades [1]. Disorders during the cell division and differentiation specify the different types of cancers. Given the different cell types found generally in the dermis and epidermis as potential sources of cancer, a wide spectrum of malignant tumours with origins in the epidermis, melanocytes, hair follicles, sebaceous and sweat glands, connective tissue, blood lymphatics and vessels, and subcutaneous adipose tissue could be discovered [2]. A report by

WHO indicated that in 1985, of 7.6 million new cases of cancer who were detected, 52 percent were diagnosed in developing countries. This number was estimated to be 9 million in 1995 and 10.5 million in 2000, and is estimated to reach 20 million cases in 2020 [3]. The report also estimates that 132000 cases of melanoma (the most dangerous type of skin cancer) occur, and almost half of the patients die of the disease [3].

The rate of cancers has been declining; however, skin cancers do not follow this trend and increase by 3-5 percent annually despite being preventable [4]. According to Iranian national figures about cancer cases in 2005, 2007 and 2008, Ilam has the highest number of cancer cases with 16.97, 16.51, and 14.83 percent, respectively [5]. A research in Ilam reported that skin cancer was the single most prevalent cancer among males and females with 59 (for males) and 35.7 (for females) cases per 100,000 people [6].

Different factors contribute to skin cancer. High levels of exposure to ultraviolet (UV) radiation increase the risk of all three common forms of skin cancer, and approximately 65%-90% of melanomas are caused by exposure to UV radiation [7]. Other risk factors for skin cancer include having fair skin, hair, and eyes (typically correlated with race/ethnicity, albeit imperfectly); and having many moles or nevi [8]. Given the exposure of farmers, cattle-breeders, ship crew, and construction workers to the extreme heat of the sun due to lack of using protective clothing and helmets when working outdoors, the higher rate of skin cancer is expected [9]. Ultraviolet radiation is an important factor in most cases of basal cell carcinoma [3] which is more prevalent in outdoor workers exposed to the sun such as farmers [10]. Providing health education to exposed or susceptible individuals, human factor of prevention, control, treatment and dealing with health issues are pivotal to the control and prevention of the disease [11]. Research indicates that theory-based interventions could motivate the individuals to modify their behaviour when exposed to sunlight [12].

A theory extensively applied to cancer protective behaviour is protection motivation theory (PMT), which was originally developed by Rogers in 1975. Since then, it has been widely accepted as a prediction and intervention framework in health-related behaviours [13]. In this theory, threat appraisal examines the non-adaptive behaviour and factors contributing to the likelihood of engagement in potentially unhealthy behaviours, and includes extrinsic and intrinsic rewards along with unhealthy behaviours and threat perception (the sum of perceived vulnerability and severity). Rewards from unhealthy behaviours raise the likelihood of non-adaptive reactions, while threat diminishes the likelihood of engagement in non-adaptive behaviour [14]. According to the PMT, an individual would engage in skin cancer preventive behaviours only when (s)he believes (s)he is highly susceptible to skin cancer (perceived vulnerability), the disease is severe and dangerous (perceived severity), and (s)he receives little perceived extrinsic and intrinsic rewards from behaviours raising the risk of skin cancer.

Given the higher vulnerability of farmers in Ilam to skin cancer and the high prevalence of the diseases in the city, and considering the fact that examination of initial conditions is the first step in any educational intervention planning, implementing, and evaluating, the present study was conducted to survey threat appraisal of skin cancer among rural farmers of Ilam.

PATIENTS AND METHODS

This descriptive-analytical cross-sectional study was carried out on 248 farmers from Ilam rural areas in June 2013 to examine their threat appraisal of skin cancer. Drawing upon the previous body of research in similar cases [4], assuming a 95%confidence interval and 90% power, the sample size was calculated 248 participants which were selected through random sampling. Among the 8 health houses covered by Ilam central health network (two centres in the north, south, east and west of the city), 4 centres were randomly selected (one centre from each side). Then, two health houses from each centre (a sum of 8 houses) were selected and with a review of the family archives of the farmers eligible for the study, 248 individuals were accepted to participate in the research. Male farmers who worked in the spring and summer, had minimum education of grade school, and had no record of cancer in the family were included in the study. Participants were excluded if they were reluctant to participate or had a disease which made them unfit to participate in the research. The data collection tool was a researcher-made questionnaire

prepared based on the available literature. The content validity of the questionnaire was examined by skin specialists and health education experts. To examine the face validity, 10 farmers were used who did not participate in the main research, with reliability being confirmed through Cronbach's alpha in a pilot study on 30 participants. The Cronbach's alpha coefficients for scales of intrinsic and extrinsic rewards, perceived vulnerability and severity were 0.81, 0.88, and 0.78, respectively. The questionnaire consisted of 29 items covering data including demographic information of age, education, income level, and family size of the farmers (4 items); the items about threat appraisal (24 items) were prepared according to a Likert scale. To prevent suggestiveness, a number of items contained negative inclination. Given the 5-point scale, the score of each descriptor ranged from 1 to 5 (from strongly disagree to strongly agree). The scores of perceived vulnerability (5 items) fell in a range of 5-20; perceived severity (7 items) fell in a range of 7-30; and rewards (12 items) fell in a range of 12-60. The score of threat appraisal was calculated according to the following formula:

Threat perception (the sum of perceived vulnerability and severity) minus the sum of rewards

The result was described by three descriptors of unacceptable, borderline, and acceptable. Given the range of the farmers' threat appraisal scores (falling in a range of – 29 to +24), positive scores indicative of higher perceived extrinsic and intrinsic rewards from unprotected behaviours, and lower perceived vulnerability and severity of the farmers about skin cancer were considered as unacceptable, and negative scores indicative of lower perceived rewards from unprotected behaviours and higher perceived vulnerability and severity of the farmers about cancer were considered as acceptable. Farmers with equal scores for perceived threat and rewards (score of zero for threat appraisal) were assigned a descriptor of borderline.

The data was fed into SPSS 18 and analysed for descriptive (frequency, etc.) and analytical statistics (ANOVA). The study was committed to Ilam University of Medical Sciences Codes of Ethics in Research and the farmers were briefed about the research objectives and process before completing the questionnaire. The participants entered the research with their own full consent voluntarily.

RESULTS

Two hundred and forty eight farmers in Ilam rural areas with a mean age of 42.61±10.61 years were studied. The age groups 35-45 and 45-55 had the highest frequency with 32.7 and 25.86%, respectively. Eighty-eight farmers (35.5%) had grade school, 72 farmers (29 %) had middle school, 83 farmers (33.5%) had high school, and 5 farmers (2%) had university education. In terms of family income, 180 farmers (64.9%) had middle income and in terms of family size, 161 farmers (64.9%) had families with 4-7 people. Table 1 gives the frequency of responses to perceived vulnerability, severity, and intrinsic reward.

Our findings indicated that the mean and standard deviation of perceived vulnerability and severity, and intrinsic and extrinsic rewards were 11.87±4.700; 22.69±4.36; and 36.06±6.64, respectively. We also found that 14.5% and 30.6% of the farmers had high perceived vulnerability and severity, respectively, and that only 15.7% of the farmers had low intrinsic and extrinsic rewards from unprotected behaviours. We also found that 149 farmers (60.1%) had unacceptable levels of threat appraisal; 2 farmers (0.8%) had borderline appraisal; and 97 farmers (39.1%) had acceptable levels of threat appraisal (Table 2).

ANOVA showed a significant relationship between threat appraisal, education and income level, but no significant relationship between threat appraisal and family size ($P<0.747$) (Table 3). Also, there was a significant relationship between perceived threat, education ($P<0.001$) and income level ($P<0.001$); but not the family size ($P<0.247$).

DISCUSSION

The present study was in the first of its kind on rural farmers in Iran. The farmers' awareness of threat appraisal about skin cancer, their vulnerability to the disease, its mortality rate, economic, social, psychological burdens, and decreasing intrinsic and extrinsic rewards from unprotected behaviours significantly contribute to the curbing the disease and decreasing the mortality rate due to this cancer. Our results regarding the farmers' perceived vulnerability to skin cancer indicated lower scores, consistent with the results reported by Gillespie et al [15], Glanz et al [16], and

Table 1. Frequency of responses to perceived vulnerability, severity, and intrinsic and extrinsic rewards by 248 farmers

Component	Items	Strongly disagree		Disagree		No idea		Agree		Strongly agree	
		Number	percent	Number	percent	Number	percent	Number	percent	Number	percent
Perceived vulnerability	It is possible that I get skin cancer in the future	49	19.8	114	46	39	15.7	41	16.5	5	2
	I feel that I am at risk of skin cancer	48	19.4	90	36.3	39	15.7	65	26.2	6	2.4
	I am susceptible to skin cancer because of my job	41	16.5	77	31	59	23.8	65	26.2	6	2.4
	I have healthy skin and I would not probably get skin cancer	2	0.8	41	16.5	8	3.2	129	52	68	27.4
	My health is quite good and I am not concerned with getting skin cancer	2	0.8	38	15.3	7	2.8	134	54	67	27
Perceived severity	Skin cancer would kill the person	16	6.5	70	28.2	63	25.4	90	36.3	9	3.6
	Skin cancer would cost the individual his job	12	4.8	113	45.6	40	16.1	78	31.5	5	2
	If someone gets skin cancer, he would be engaged in the related issues for long	12	4.8	35	14.1	29	11.7	163	65.7	9	3.6
	Skin cancer imposes heavy economic costs on the family	5	2	25	10.1	30	12.1	175	70.6	13	5.2
	No one would die of skin cancer	10	4	83	33.5	66	26.6	78	31.5	11	4.4
	Skin cancer is treated easily	6	2.4	76	30.6	96	38.7	63	25.4	7	2.8
	Skin cancer makes patients ugly and horrible	6	2.4	34	13.7	23	9.3	162	65.3	23	9.3
Extrinsic & intrinsic rewards	I feel comfortable when under sunlight	32	12.9	121	48.8	0	0	91	36.7	4	1.6
	Being exposed to sunlight is enjoyable	31	12.5	205	82.7	0	0	11	4.4	1	0.4
	I feel comfortable when wearing short-sleeved shirts	4	1.6	33	13.3	5	2	180	72.6	26	10.5
	Wearing short sleeves makes me more acceptable to others	14	5.6	204	82.3	5	2	25	10.1	0	0
	When my skin becomes dark, I feel good, since I believe a hardworking man has darker skin	14	5.6	101	40.7	12	4.8	117	47.2	4	1.6
	Wearing short-sleeved shirts makes me more self-confident	13	5.2	199	80.2	1	0.4	35	14.1	0	0
	I can focus when I do not wear a covering on my head	3	1.2	89	35.9	1	0.4	147	59.3	8	3.2
	I do the job more effectively when I do not have a covering on my head	5	2	80	32.3	0	0	152	61.3	11	4.4
	I feel cool when I do not wear a covering on my head	5	2	82	33.1	1	0.4	146	58.9	14	5.6
	People adore workers who work incessantly and relax in the sunlight	7	2.8	62	25	5	2	165	66.5	9	3.6
	People adore workers who work incessantly and relax in the sunlight in the farm	6	2.4	77	31	5	2	150	60.5	10	4
	I believe to appear more attractive when I wear short-sleeved shirts	3	1.2	47	19	18	7.3	163	65.7	17	6.9

Table 2. Different levels of perceived vulnerability, severity, and rewards

	low		Medium		High		
	Number	percent	Number	percent	Number	percent	SD ± Mean
Perceived vulnerability	142	57.3	70	28.2	36	14.5	700.4 ± 87.11
Perceived severity	27	10.9	145	58.5	76	30.6	36.4 ± 69.22
Extrinsic and intrinsic rewards	39	15.7	188	75.8	21	8.5	64.6 ± 06.36
Threat Appraisal	Unacceptable		Borderline		Acceptable		
	Number	percent	Number	percent	Number	percent	SD ± Mean
	149	60.1	2	0.8	97	39.1	88.10 ± 58.1

Table 3. Relationship between perceived threat, threat appraisal, and demographic variables

Demographic information	Perceived vulnerability	P value	Threat appraisal	P value
	SD ± Mean		SD ± Mean	
Education				
Grade school	60.31 ± 83.5		44.3 ± 94.8	
Middle school	55.32 ± 40.6		37.5 ± 61.8	
High school diploma	33.38 ± 53.8		-71.2 ± 48.12	
University degree	80.48 ± 58.2	P<0.001	-4.14 ± 41.5	P<0.001
Family income				
Well-off	02.41 ± 34.8		-20.5 ± 12.13	
Mid-income	43.33 ± 21.7		02.3 ± 0.10	
Lower-income	30.32 ± 54.6	P<0.001	90.1 ± 77.9	P<0.001
Household members				
1-3 people	50.34 ± 94.4		-3 ± 72.12	
4-7 people	08.35 ± 94.7		86.1 ± 91.10	
More than 8 people	32.33 ± 59.7	P<0.247	16.1 ± 90.10	P<0.747

Marlenga et al [17]. A study by Wright et al [18] in 2001, which was carried out to examine the health beliefs of the elderly about skin cancer, showed that the perceived vulnerability to skin cancer was low in the elderly people since they had insufficient information about skin cancer, believing that they were not exposed to the threat if their general health was satisfactory and there was no history of skin cancer in their families. The results of the present study and similar studies indicate that the perceived vulnerability to skin cancer is low in farmers, as a vulnerable and susceptible group to skin cancer. These findings also suggest that if a person believes in a health threat (skin cancer and sunlight) and his vulnerability, he would act more protectively against it. Thus, any intervention program to improve the preventive behaviours of skin cancer should take into consideration the perceived vulnerability.

Our findings showed that the perceived severity about skin cancer was low in farmers, which is consistent with the findings of similar studies [18-20]. Working in Hawaii on recreational centre employees, Glanz et al [16] found low perceived severity and a general mentality that skin cancer could easily be treated, which was similar to our results. Hawaiian employees only perceived the undesirable effects such as headaches, fatigue, faintness, and being sun-burned due to sunlight. Unlike our findings, Gerbert et al [21] who conducted a study in California on adults found higher perceived severity about skin cancer, which was indicative of the higher awareness of cancer unfavourable effects. We believe that in regions where people are exposed to sunlight and perceived vulnerability and severity of the disease is low, people should be cautious since the probability of skin cancer is high.

With farmers' responses to questions measuring rewards from un-adaptive behaviours, our results indicated that the mean and standard deviation of rewards from unprotected behaviour and failure to act preventively were in an average level, and that more than half of the farmers cited good appearance, convenience of working with short-sleeved shirts without a protective headscarf, and more focus on doing the job as reasons for their avoiding using protective covering and clothing. This is probably attributed to the farmers' lack of information about the dangers of sunlight. The

majority of the studies have reported that many US citizens believe that being suntan would make their skin more attractive [22, 23]. Many teens desire suntan [24]. Late in 1970s, people believed that suntan gave their skin beauty and health [25], which is consistent with our findings in present studies.

In our study, one third of the farmers were scored as unacceptable in their threat appraisal and considering protective and adaptive behaviours. Our survey also showed that threat appraisal scores were low and unacceptable when compared to other protective behaviours. Milne et al [13] conducted a study on sport enhancements, Plotnikoff et al [26] performed a research on Canadian youth physical activity, and Boer et al [27] evaluated mammography, and they all reported similar results. This could be explained by the fact that vulnerability and severity perceived by individuals about their exposure to risks and related complications are low and their extrinsic and intrinsic rewards from unprotected behaviours are high.

Our findings also indicated that with the rise in the education level of the farmers, their mean score of threat appraisal (unprotected behaviour) decreased, which is consistent with findings reported by Baghiani Moghadam et al [28]. In other words, farmers with higher education levels had acceptable levels of threat appraisal, their perceived vulnerability and severity were high, and their perceived rewards from unprotected behaviours was low. These findings highlight the necessity of health education programs about the severity and vulnerability, and mortality rate of the farmers with focus on decreasing the extrinsic and intrinsic rewards of the farmers with lower levels of education to improve their threat appraisal scores.

The mean threat appraisal of the farmers with higher income was higher which showed that farmers with higher income were scored as acceptable in threat appraisal. A study by Forghani et al [29] on Yazd participants showed a significant relationship between physical protection and higher income. We found that farmers with higher income and education scored higher in perceived threat (the sum of perceived vulnerability and severity) about the risk, consistent with findings of Shelestak et al [19]. These findings show that individuals with higher education display higher vulnerability about skin cancer and related effects and are naturally less susceptible to cancer.

A limitation of the study is related to its data collection method using self-report by farmers, which possibly induces bias in the evaluation of the results. Further research on the examination of protected behaviours of the farmers seems necessary. Also, the present study was carried out on male farmers, which makes comparison of gender-related differences in using related protections and research on female farmers necessary. We recommend that the future studies take into consideration the educational interventions on farmers about skin cancer, and also the fact that protected behaviours against sunlight are effective in preventing skin cancers if they are accurately practiced since young ages.

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