

An investigation on the effect of gastric cancer education based on Health Belief Model on knowledge, attitude and nutritional practice of housewives

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ABSTRACT

Background: Planning the educational programs and informing people regarding the prevention of widespread diseases like cancers is necessary. With regard to high mortality rate of gastric cancer, the present study was conducted to define the effect of education based on Health Belief Model on knowledge, attitude and nutritional practice of homemakers.

Materials and Methods: In this interventional study, 84 housewives were randomly divided into two groups. The study group underwent seven sessions of education based on Health Belief Model. Control group did not receive the education. Both groups filled valid and reliable questionnaires before and 2 months after program.

Findings: There was no significant difference between the two groups in demographic characteristics. While mean scores of knowledge, attitude and practice were not significantly different before education, the intervention group showed significantly higher scores after education ($p < 0.001$).

Conclusions: Health education based on Health Belief Model increases the knowledge and improves the attitudes and practices of housewives regarding prevention of the gastric cancer. It seems essential to development this sort of educational programs.

Key words: Feeding behaviours, health behaviours, health education, gastric cancer, Iran

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INTRODUCTION

Gastric cancer is a disease of which the primary signs are not clear; it has poor prognosis and high invasion and metastasis.^[1] Based on the report of Cancer Institute and the centre for Disease Control in Ministry of Health and Medical Education, gastric cancer's ranked the first for Iranian men and the third among Iranian women, respectively, while it has been reported the second and the sixth in men and women all over the world, respectively, by Cancer World Organization.^[2] Reduction of gastric cancer incidence as a result of feeding and cooking methods^[3] modification suggests the role of related nutritional and behavioural risk factors.^[4]

MATERIALS AND METHODS

Previous studies have shown the effect of environmental contact on gastric cancer; food carcinogens are believed to be the possible factor.^[5] On the other hand, the association between the diseases with *Helicobacter pylori* has been already proved.^[6] Meta-analysis of cohort studies has shown the patients infected by the above bacteria are

more susceptible to the disease by 2.26 folds.^[7] The source of this infection is human contaminated like hepatitis A (oral – oral or focal – oral contamination due to lack of hygiene).^[8,9] The necessity of educating individuals about health and feeding behaviours associated to gastric cancer is felt more as first, a clear strategy to screen and make early diagnosis of gastric cancer has not been presented yet,^[7] and second, a change in lifestyle and food habits affect the pattern of the disease and related education about women's healthy behaviour such as teaching correct methods of vegetables and fruits disinfection can well prevent contamination.^[10] Individuals and societies need education of appropriate behaviours to recognize and practice appropriate lifestyles and prevent diseases.^[11] In this regard, the researchers have employed behavioural change models. Health Belief Model is an effective one which with its components considers the behaviours as a mathematical function of individuals' knowledge and attitude, which warns them against a health threat and drives their behaviour toward healthy ones.^[12] This model has been already applied for feeding behaviours education.^[13-16] Educational interventions related to diabetes type II,^[17] hepatitis B,^[18] osteoporosis,^[19] dermal leishmaniasis,^[20] AIDS,^[21,22] and cancers^[23] have been already designed and conducted. Health Belief Model was utilized in the present study to draw individuals' attention to their susceptibility to the disease and to handle risk-lowering behaviour since gastric cancer occurs at higher ages, its signs are not clear,^[3] and the individuals do not feel threatened by and exposed to this disease. The individuals first feel threatened (perceive susceptibility) by the problem to attain gastric cancer related health – feeding behaviours; then, they realize the depth of threat (perceived severity), believe in benefit of health – feeding behaviours (perceived benefit) and the obstacles they face (perceived barriers), believe they can overcome those barriers (perceived self-efficacy), and eventually are determined to follow health – feeding behaviours. With regard to all above-mentioned issues and since the men (who are more susceptible to gastric cancer) eat mostly at home, in addition to the important role of women in cooking and low cost of their educational programs, the present study was conducted to investigate the effect of gastric cancer education based on Health Belief Model on knowledge, attitude, and nutritional practice of homemakers, in order to promote public health.

This is an interventional and experimental study conducted in Isfahan, Iran, in year 2009–2010. The subjects comprised 84 homemakers under coverage of health centres. The sampling was random. First, a list was

made containing all health centres in Isfahan, and then, two centres were randomly selected as study and control. Inclusion criteria were women 18–60 years of age, being a homemaker, being under cover of a health centre and literate, and having an available phone number for follow-ups. Exclusion criteria were not being interested in joining the study and subjects' covering centre change. The subjects were invited to join the study by telephone calls and were confirmed that their personal information would be kept secret. Finally, consent was obtained from each subject. The subjects in study and control groups were identical concerning socioeconomic and cultural conditions as well as lack of gastric cancer history in their relatives. The sample size was calculated as 32 subjects in study and control groups. To prevent possible subjects' drop, 48 subjects were employed for study and 48 for the control group. Eventually, some subjects left the study due to various reasons, and the research was finalized by 42 subjects in study and 42 in control group.

The data were collected by a researcher made questionnaire based on Health Belief Model designed through literature review of scientific books, articles, and the materials issued by Iranian Cancer Research Centre and Centre for Disease Control in Ministry of Health. It was filled by the subjects in the study and control groups before and 2 months after education. The questionnaire contained some sections and included seven questions on demographic characteristics, 33 questions on knowledge measurement, 39 questions on attitude in dimensions of Health Belief Model (perceived susceptibility, 17 questions; perceived severity, 5 questions; perceived benefit, 4 question; perceived obstacles, 7 questions; perceived self-efficacy, 6 questions), and 20 questions on practice measurement. Score 1 and 0 were assigned to "correct" and "wrong or no idea" responses in scoring of knowledge. The scoring of various dimensions of Health Belief Model was in Licker's scale (from absolutely agree to absolutely disagree) scored from 0 to 4. Questions on practice were in form of self-report and four choices (no, sometimes, usually, always) which were scored from 0 to 3. Finally, all scores (knowledge, pattern dimensions, and practice) were converted to percentage in range of 0–100. The questionnaire was designed through referring to textbooks and scientific resources and was modified by seven experts in health and nutritional education to confirm scientific validity. The questionnaires were also distributed among another 15 homemakers, not included in the study, and were modified based on meaning and clarity, and finally, were justified to define face validity. The reliability of the questionnaire was obtained through filling the questionnaire by 30 subjects not included in

the study and via internal consistency and Cronbach's alpha: questions of knowledge $\alpha = 0.78$, perceive susceptibility $\alpha = 0.83$, perceived severity $\alpha = 0.84$, perceive benefits $\alpha = 0.74$, perceived obstacles $\alpha = 0.76$, perceived self-efficacy $\alpha = 0.81$ and practice $\alpha = 0.76$.

After completion of the questionnaire by both groups, the educational program was designed based on pre-test results and structures of health belief model. Educational intervention in study group was directly conducted through lecture, collaborative methods, combined with questions and answers, group discussion and brain storming. First, the subjects in study group were divided into two identical groups, and educational program (seven educational 40–50 min sessions at 9–10 and 10–11 a.m.) was administrated for each group with coordination of the head of exam centre in education connector's hall. In the first session at the beginning, lecture method was employed due to low information in most of the subjects to make them familiar with gastric cancer, its pathology, effective risk factors lowering elements, healthy and unhealthy foods in relation with gastric cancer, and health issues in prevention of *Helicobacter pylori* through slides presentation. Then, with regard to adults' education theory which pointed out free discussion as a necessity part of education, the subjects held group discussion. In the second session with regard to perceived severity structure, a person whose father had died of gastric cancer was invited to talk about the severity of gastric cancer complications as he had closely experienced the pain. Next, group members freely discussed about the complications in their relatives with gastric cancer, and later in the session, related complications of low health, and signs of *Helicobacter pylori* infection were discussed by the subjects. In the third session with emphasis on perceived susceptibility structure, the hazards of high intake of fried foods, canned food, fast food, leftovers, and high intake of salt that predisposes the individuals to gastric cancer were mentioned. Then, the importance of following cooked food preservation principles and disinfection of vegetables, washing hands after toilet and before eating and preventing use of a shared glass and spoon at the table were magnified in the session. In the fourth session, the subjects had group discussion on benefits and advantages of healthy point's compliance in prevention of helicobacter infection and gastric cancer related nutritional issues including function of gastric system, having more self-confidence in preservation of health, prevention of other cancers, and cost efficacy of gastric cancer prevention. In the fifth session, in order for activating subjects' brain storming in education, all the

inhibiting obstacles in subjects' compliance of health and nutritional issues were indicated and related strategies were mentioned. For instance, the subjects were informed that they could wash their hands with a travel soap bar while travelling.

The sixth session focused on promotion of subjects' self-efficacy so that the subjects discussed about their potentiality in distinguishing inducing and inhibiting nutrients in gastric cancer, warning the others about risk factors of gastric cancer, knowing health issues in prevention of *Helicobacter pylori*, and their ability in compliance of these behaviours in any condition. The last session with regard to subjects' practice was devoted to disinfection of vegetables and fruits, and the homemakers were asked to cook a healthy food at home with help of their learned issues. Finally, the mothers expressed their opinions and experiences about cooking a healthy food, which positively affected their promotion of practice. The subjects in study group were also given a booklet and two educational researcher made pamphlets for indirect education. Two months after administration of educational program, the data related to subjects' knowledge, attitudes (Health Belief Model dimensions), and practice were collected by the same questionnaire. The data were analysed by SPSS software version 18. Paired t-test and independent t-test were employed to compare studied variable mean scores before intervention and 2 months after in each group and mean scores differences at an identical time in two groups respectively. Mann-Whitney and independent t-test were utilized to compare women's education in both groups and mean age of the subjects respectively. Chi-square test was employed to compare the history of cancer in subjects' relatives and history of dietary education. $p < 0.05$ was considered significant.

FINDINGS

In the present study, subjects' mean age was 34.1 (6.2) years in the study group and 34.2 (6.5) years in the control group showing no significant difference. About 57% of the subjects in study and 55% in control group as well as 43% of subjects' spouses in study and 45% of subjects' spouses in control group had high school education, with no significant difference. About 83.3% of the subjects in study and 85.7% in control group had no history of dietary education. Chi-square test showed no history of dietary education no significant difference in both groups ($p < 0.763$). With regard to the history of gastric cancer in subjects' relatives, there was no significant difference between study and control groups

($p < 0.776$). Comparisons of the scores of knowledge, attitude (susceptibility, severity, obstacles, benefits, and perceived self-efficacy), and practice before and after education in both groups have been presented in table 1, showing no significant difference in education mean scores in control group, but a significant difference in study group ($p < 0.001$). As presented in table 2, mean scores of knowledge, attitude (Health Belief Model dimensions), and practice before education showed no significant difference in both groups, but a significant difference 2 months after that ($p < 0.001$).

DISCUSSION

The present study is the first one about gastric cancer in its type, which concluded that application of Health Belief Model in education of gastric cancer related health and feeding behaviours results in promotion of level of knowledge and practice among homemakers. Preparation of the people to follow appropriate life styles to prevent diseases necessitates behaviour formation^[22] with priority of their knowledge promotion. The obtained results show

that level of knowledge before intervention was low in both groups and the subjects had low information about gastric cancer, its pathology, healthy and hazardous nutrients, risk factor lowering elements, disease signs and symptoms, safe way of cooked materials preservation, disinfection of vegetables, and appropriate technique of washing hands. Mean score of knowledge significantly increased after education in study group. Park et al. in his study on cervical cancer showed that there was a significant difference in knowledge after educational intervention between two groups of study and control so that knowledge significantly increased in study group.^[24] In other studies an increase in knowledge after educational intervention is also reported. Increase of knowledge is a prerequisite for attaining an appropriate attitude and related behaviour.^[23,25,26]

Low public knowledge before education can be associated to poor mass media function which ignores preventive issues and focuses on just treatment. It can be also due to holding very few educational sessions by health providers.

Table 1. Comparing studied variable mean scores before intervention and 2 months after in each group

Variable	Group	Before education		After education		Paired t-test	
		Mean	SD	Mean	SD	P	t
Knowledge	control	34.78	14.72	34.98	13.78	0.74	0.33
	study	33.12	12.77	85.50	5.57	< 0.001	29.77
Perceived susceptibility	control	37.25	8.18	37.85	7.54	0.2	1.30
	study	36.62	6.35	79.16	5.80	< 0.001	41.35
Perceived severity	control	67.26	12.64	67.50	9.83	0.82	0.22
	study	66.90	10.05	87.38	5.20	< 0.001	15.28
Perceived benefits	control	47.17	11.14	46.27	9.86	0.27	1.09
	study	47.61	12.57	69.94	10.07	< 0.001	21.78
Perceived barriers	control	66.58	6.95	68.19	7.39	0.14	1.47
	study	67.00	7.99	39.45	6.91	< 0.001	26.44
Perceived self-efficacy	control	35.71	6.51	34.62	6.27	0.1	1.67
	study	35.21	5.61	68.15	8.32	< 0.001	31.33
Function	control	41.66	7.54	41.74	8.89	0.76	0.3
	study	40.71	5.38	71.66	5.76	< 0.001	27.44

SD: Standard deviation

Table 2. Comparing studied variable mean scores between control and study groups before intervention and 2 months after

Variable	Time test	Control		Study		Student's t-test	
		Mean	SD	Mean	SD	P	t
Knowledge	Before education	34.78	14.72	33.12	12.77	0.58	0.55
	After education	34.98	13.78	85.50	5.57	< 0.001	22.02
Perceived susceptibility	Before education	37.25	8.18	36.62	6.35	0.69	0.39
	After education	37.85	7.54	79.16	5.80	< 0.001	28.1
Perceived severity	Before education	67.26	12.64	66.90	10.05	0.88	0.14
	After education	67.50	9.83	87.38	5.20	< 0.001	11.58
Perceived benefits	Before education	47.17	11.14	47.61	12.57	0.86	0.17
	After education	46.27	9.86	69.94	10.07	< 0.001	10.87
Perceived barriers	Before education	66.58	6.95	67.00	7.99	0.79	0.26
	After education	68.19	7.39	39.45	6.91	< 0.001	18.39
Perceived self-efficacy	Before education	35.71	6.51	35.12	5.61	0.71	0.37
	After education	34.62	6.27	68.15	8.32	< 0.001	20.84
Function	Before education	41.66	7.54	40.71	5.38	0.50	0.66
	After education	41.74	7.89	71.66	5.76	< 0.001	19.84

SD: Standard deviation

The findings of perceived susceptibility showed that most of the subjects did not feel predisposed to *Helicobacter pylori* infection and gastric cancer before educational intervention and did not care their lack of healthy and feeding behaviours as a risk factor. Whereas, if individuals are aware of a problem and believe that lack of compliance of some issues can predispose them to a disease, they will follow healthy behaviour with more motivation. The obtained results concerning perceived susceptibility by the present study are consistent.^[12,28,27] But in studies by Rahmati Najarkolaei et al.^[21] prevention of AIDS and Park et al.^[24] in screening of cervical cancer, perceived susceptibility was high before educational intervention, which can be due to more mass media education and warnings about cervical cancer and AIDS. With regard to the mean scores of perceived severity in the present study in both groups, it was so that the subjects had acceptable perception on the risk and irreversibility of gastric cancer. This component significantly increased after educations so that the subjects in study group knew about the risk of ignoring health and nutritional issues and perceived that they were at a higher risk without following these points. These results concord with those of Tavassoli et al.,^[13] Sharifirad et al.,^[15] Ghaffari et al.,^[16] and Karimi et al.^[22] while they are inconsistent with those of park et al.^[24] concluding that after educational intervention, there was no significant difference between study and control group concerning perceived severity and that mean scores of perceived severity were high before intervention in both groups. The mean scores of perceived susceptibility were relatively high before education, possibly due to the fact that cancer is always believed to be an acute not treatable and end-stage disease in the society.

There was a significant difference between mean scores of perceived benefits in study and control group after education and the subjects in study group had a better perception of health and nutritional issues compliance. They also got more positive toward compliance of health and nutritional issues through amendment of digestive system function, decrease of gastric diseases (nausea, vomiting, diarrhea, etc.), and having better self-confidence in their health preservation, prevention of other types of cancer such as breast cancer as well as cost effectiveness of consuming vegetables and fruits.

The results of studies showed that mean scores of perceived benefit increased by education.^[13,16,22,29,30] It should be noted that personal perception of benefits facilitates interventions so that there is a tight association between perceived benefits and having preventive

behaviour.^[31] With regard to mean scores of perceived obstacles, the findings showed that there was a significant difference between study and control groups so that they had decreased in study group. The obstacle of "lack of awareness" was deleted by recognition of gastric cancer related healthy and hazardous foods, appropriate disinfection of vegetables, and food preservation. The women managed to convince the family members about the hazards of some foods through increase of knowledge and they could remove the obstacles of "limited food options" and "tasteless food" by lowering amount of salt consumption through time. They also managed to remove the obstacle of "lack of liquid soap" while travelling by recommending them to take a travel soap bar. In other studies mean scores of perceived obstacles decreased in study group after education, which is consistent with the present study.^[13,24,32,33] These results showed the effect of education on decrease of perceived obstacles in subjects' behaviour.

Meanwhile, in study of Sharifirad et al.^[34] the difference in mean scores of perceived obstacles was not significant after intervention, possibly since most of the people disagreed with smoking; there was no obstacle in smoking prevention from the very beginning. With regard to perceived self-efficacy, the women in both groups had equal perception of their potentiality to follow gastric cancer related to health and nutritional behaviour. After educational intervention, mean scores of perceived self-efficacy significantly increased in study group so that the group managed to follow health and nutritional issues: appropriate method of food preservation and disinfection of vegetables.

The subjects also felt that they could distinguish the foods inducing and preventing gastric cancer, and that they could inform others about the gastric cancer related risk factors. In other studies level of self-efficacy increased in study group after educational intervention, possibly due to subjects' encouragement and their step by step education until attaining the expected ability.^[19,24,35] With regard to practice, mean scores of practice significantly increased and subjects were reported to pay more attention to basic principles of vegetables and fruit disinfection, appropriate method of food preservation, washing hands before food preparation and eating. The amount of consumed fruits and vegetables, beans, and dairy increased while consumption of pickles and salty ingredients decreased among households. The homemakers had more compliance concerning taking canned foods, sausage, bologna, high amount of salt, and cooking methods of steaming and boiling instead of

frying. In study by Tavassoli et al., women's practice in consumption of cardiovascular disease preventive foods increased after education in study group.^[13] Sharifirad et al.^[15] and Ghaffari et al.^[16] reported no significant difference in the level of nutritional practice in both groups before intervention while there was a significant difference in study group compared to control after intervention, showing that application of Health Belief Model in education of nutritional issues resulted in an increase in level of knowledge and nutritional practice.

In Manios et al.^[29] study it showed that after educational intervention based on healthy nutrition index, consumption of milk, calcium, and vitamin D increased while consumption of fats had decreased. The reason for inappropriate practice of women before educational intervention could be due to their low level of knowledge and shortage of information about the necessity of health and feeding behaviours compliance. Public health education induced an increase in knowledge, positivity in behaviour and eventually, fixation of appropriate behavioural pattern. The results of the study showed that designed educational programs based on Health Belief Model enhanced homemakers' practice in compliance of gastric cancer related to health and nutritional issues through promoting their knowledge and affecting their beliefs. Therefore, with regard to the important role of women in foundation of a family and the cost effectiveness of educational programs compared to treatment services, utilizing health education patterns by the experts in health centres is highly recommended to promote public health.

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