The effect of health education program based on Health Belief Model on the performance of Pap smear test among women referring to health care centers in Zarandieh

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Abstract

Introduction:
Despite the fact that cervical cancer is highly preventable, it still continues to occur, even among women who have access to cancer screening and treatment services. This study aimed to determine the effect of health education program based on Health Belief Model on the performance Pap smear test.

Material and Methods:
This random clinical trial was carried out on 120 women in Zarandieh. Data were collected using a valid and reliable questionnaire based on Health Belief Model which was completed by the participants. After the analysis of pre-test results, the educational program was designed and the experimental group participated in 3 educational sessions during one week. Two months after the intervention, a post-test was performed and analyzed using t-test, t-paired and x².

Results:
Our findings indicated that mean scores of HBM Model constructs (self-efficacy, susceptibility, severity, benefit and barriers perceived) were significantly increased in the experimental group compared to the controls after the intervention. Also, performance of pap smear test increased significantly among the experimental group as compared to the controls after the intervention (P<0.01) (before intervention 30%, after intervention 53.9% in the experimental group).

Conclusion:
Health education programs are recommended to use the theories and models of changing of individuals' behavior in organization levels for to Help Plan Effective Programs as the uptake of cervical cancer screening (Pap smear).

Keyword: Papanicolaou Smear, Health, Women

Introduction:
Cancer constitutes the second most common cause of death in developed countries (after cardiovascular diseases) and the third most common cause of death in developing countries (1). Cervical cancer is among the most frequent malignancies of women, especially in those aged 20-39 years (2). The prevalence of cervical cancer has been declining in some developed countries as a
The effect of health education program

Karimy, et al

result of diagnostic tests (Pap smear) performed at early stages (3). The developing world, however, claims 80% of the 440 thousand new cases of cervical cancer diagnosed each year, rendering it the most common feminine malignancy after breast cancer in these countries (4). Previous studies indicate that some 10% of all invasive malignancies in women occur in the uterus, with 30% of them rising in the cervical area (5,6).

Despite the tremendous advances in cancer prevention, especially cervical cancer, it is still commonly thought of as “unpreventable” or “incurable” (7). Cervical cancer, however, is quite preventable due to the presence of a preinvasive stage, availability of cytologic patient screening programs, and efficacy of therapies for preinvasive lesions (8). Pap smear tests decrease the prevalence and mortality of cervical cancer by 90% (5). Pap smear is a low-cost and efficient test for diagnosing cervical cancer in seemingly healthy women (9). Previous studies have indicated that encouraging women to participate in cervical cancer screening programs will result in early diagnosis, timely treatment, and reduction of complications and mortality (9). For instance, cervical cancer used to be the number one cause of cancer-related death in the United States as long as 50 years ago while its mortality raised has declined by two thirds as a result of promoting Pap smear tests (10). Selecting an appropriate model for health education is the first step of planning any health education program (11). An appropriate model will set the plan on the correct path and prevent any deviation (12).

In the Health Belief Model (HBM), an individual’s decision and motivation for adopting a health behavior is related to three factors – personal perceptions, modifying behaviors, and probability of acting upon that particular behavior. Personal perceptions are factors which influence the person’s perception of the disease or disorder as well as the complications of a health behavior. The modifying factors include demographic variables, perceived threats, and cues to action which will appear once the personal perceptions emerge. The probability of a behavior deals with the factors which affect the probability of adopting the appropriate behavior (3, 11-14). In other words, HBM is a comprehensive model which is primarily related to prevention and is based on the individual’s motivation for action (11). Thus, it may be appropriate for education programs dealing with cancer screening. On the other hand, it is widely believed that understanding the attitudes, beliefs, and culture of a society is an essential factor for efficient interventions in the field of cancer screening (3).

The present study aims to evaluate the impact of health education using the Health Belief Model on the performance of Pap smear test.

Material and Methods:
This is an interventional (quasi-experimental) study on 120 women covered by the urban healthcare centers of Zarandieh in 2009. The sample size of the study was calculated to be 102 participants with assumption of 95% confidence interval, power of 80%, effect size of 0.09 and standard deviation of 3.3 as well as previous similar studies (15). Considering an attrition rate of 15%, the total sample size was calculated to be 120 individuals. The inclusion criteria were urban non-pregnant women with at least 6 months of married life, and the exclusion criterion was disinclination to participate in the study.
We used multistep sampling to recruit our participants. In the first step, Mamunieh healthcare center was randomly selected among 4 healthcare centers of the township. In the second step, 120 individuals were
selected from the list of households covered by the center through regulated sampling. These individuals were subsequently randomized into two groups of 60 participants each: the experiment (intervention) group and the control (without intervention) group. Data collection tools consisted of a questionnaire designed based on the subject of study and the Health Belief Model, comprising 4 sections. The first section contained 5 questions dealing with demographic characteristics; the second section included 12 questions with three response options (Yes, No, I don’t know) dealing with the individual’s awareness and knowledge of the Pap smear test; the third section contained 37 questions regarding the elements of HBM (12 questions for perceived benefits and barriers; 10 questions for perceived susceptibility and severity; 10 questions for self-sufficiency; and 5 questions for the external cues to action); and the fourth section contained 2 questions about the function of Pap smear.

As for scoring, each question in the Awareness section scored 1 if correctly answered and 0 otherwise. In the Perceived Susceptibility, Severity, Benefits and Barriers section, the scoring ranged from 0 through 4 for each question: “I Disagree Completely” scored 0, “I Disagree” scored 1, “No Comment” scored 2, “I Agree” scored 3, and “I Agree Completely” scored 4. Questions in the Self-Sufficiency section could be answered with “Completely Incorrect”, “Hardly Correct”, “Relatively Correct” and “Completely Correct”, which were scored from 0 through 3.

We used content validity to evaluate the validity of the questionnaire. For this purpose, the questionnaire was designed based on HBM and reliable scientific resources and submitted to 10 professors of midwifery and health education with sufficient expertise and experience. Once the modifications were made, the validity of the questionnaire was confirmed. The reliability of the questionnaire was assessed with Cronbach’s α, yielding the internal consistency of Awareness questions as 85% and that of HBM elements as 82%.

Using the data from pretest, an educational program in three sessions was designed and implemented for the experiment group. In the first session, some general issues regarding cancer and particularly cervical cancer were explained to the participants to clarify the notion of the possibility of cancer development and its severity. In the second session, Pap smear and its usefulness for early diagnosis of the disease was explained. The third session consisted of a group discussion on the benefits and barriers of the test. Using the example of a previous study (15), we conducted a posttest two months after the educational sessions using the same questionnaire for both groups (experiment and control); the resulting data were analyzed on SPSS software using paired t-test, independent t-test and chi-square. P values < 0.05 were considered significant.

**Results:**
The mean age of participants in our study was 33.8 ± 6.7 years in the experiment group and 34.1 ± 6.1 years in the control group, indicating no statistically significant difference. The most frequent occupation and education level for both groups were home-maker and high school diploma, respectively. The findings of chi-square indicated no significant relationship in either group in terms of demographic characteristics or status of Pap smear (Table 1). Moreover, chi-square failed to indicate a significant relationship between age and occupation of participants and their awareness; however, a significant relationship was found between education level and awareness and function (P<0.01).
The effect of health education program
Karimy, et al
Journal of Jahrom University of Medical Sciences, Vol. 10, No. 1, Spring 2012

Table 1: Distribution of frequency of individuals for occupation and education level

<table>
<thead>
<tr>
<th>Group Variable</th>
<th>Experiment</th>
<th>Control</th>
<th>Total</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Maker</td>
<td>54</td>
<td>90</td>
<td>56</td>
<td>93</td>
</tr>
<tr>
<td>Employee</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>2</td>
<td>3.3</td>
<td>1</td>
<td>1.66</td>
</tr>
<tr>
<td>Elementary</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Middle School</td>
<td>17</td>
<td>28.33</td>
<td>16</td>
<td>26.66</td>
</tr>
<tr>
<td>High School</td>
<td>23</td>
<td>38.33</td>
<td>25</td>
<td>41.66</td>
</tr>
<tr>
<td>University</td>
<td>6</td>
<td>10</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

The results of independent t-test indicated no significant difference between the two groups in terms of awareness, and perceived susceptibility, severity, benefits and barriers scores or self-sufficiency before education. After the educational intervention, however, significant differences were found in the means cores of awareness and HBM elements of the two groups (Table 2).

In the dimension of perceived susceptibility, 26% of individuals in the experiment group and 27% in the control group were worried about developing cervical cancer. After intervention, the rates changed to 61% in the experiment group and 27.6% in the control group. In the dimension of perceived severity, 78% of participants in the experiment group and 76% of those in the control group believed cervical cancer to be a dangerous disease, which rose to 94% in the experiment group after intervention. In the dimension of perceived benefits, both the experiment and control groups mentioned the following as the most important benefits of Pap smear in decreasing order of importance: helping early diagnosis and treatment of cancer, preventing the expansion of the disease, and notifying the person of her health status. In the dimension of perceived barriers, the most important barriers hindering the test were mentioned to be the false belief that cancers are unpreventable and incurable, fearing the result of the test, and fearing pain.

Table 2: Comparing the mean scores of awareness and dimensions of HBM in the experiment and control groups before and after the education intervention

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Experiment</th>
<th>Control</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>Awareness</td>
<td>Before Intervention</td>
<td>7.16</td>
<td>0.36</td>
<td>7.43</td>
</tr>
<tr>
<td></td>
<td>After intervention</td>
<td>11.75</td>
<td>0.41</td>
<td>8.01</td>
</tr>
<tr>
<td>P Value</td>
<td>0.001</td>
<td></td>
<td></td>
<td>0.184</td>
</tr>
<tr>
<td>Perceived</td>
<td>Before Intervention</td>
<td>8.32</td>
<td>1.28</td>
<td>8.13</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>After intervention</td>
<td>15.22</td>
<td>1.33</td>
<td>8.79</td>
</tr>
<tr>
<td>P Value</td>
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<td></td>
<td></td>
<td>0.899</td>
</tr>
<tr>
<td>Perceived</td>
<td>Before Intervention</td>
<td>9.27</td>
<td>0.85</td>
<td>8.43</td>
</tr>
<tr>
<td>Severity</td>
<td>After intervention</td>
<td>14.95</td>
<td>0.70</td>
<td>9.18</td>
</tr>
<tr>
<td>P Value</td>
<td>0.0001</td>
<td></td>
<td></td>
<td>0.156</td>
</tr>
<tr>
<td>Perceived</td>
<td>Before Intervention</td>
<td>11.49</td>
<td>1.11</td>
<td>10.64</td>
</tr>
<tr>
<td>Benefits</td>
<td>After intervention</td>
<td>19.95</td>
<td>0.89</td>
<td>11.05</td>
</tr>
<tr>
<td>P Value</td>
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<td></td>
<td></td>
<td>0.415</td>
</tr>
<tr>
<td>Perceived</td>
<td>Before Intervention</td>
<td>16.35</td>
<td>0.34</td>
<td>17.43</td>
</tr>
<tr>
<td>Barriers</td>
<td>After intervention</td>
<td>12.26</td>
<td>0.27</td>
<td>17.10</td>
</tr>
<tr>
<td>P Value</td>
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<td></td>
<td></td>
<td>0.541</td>
</tr>
<tr>
<td>Self Sufficiency</td>
<td>Before Intervention</td>
<td>17.08</td>
<td>2.35</td>
<td>18.25</td>
</tr>
<tr>
<td></td>
<td>After intervention</td>
<td>23.19</td>
<td>2.23</td>
<td>17.69</td>
</tr>
</tbody>
</table>
Prior to the educational intervention, chi-square indicated no significant difference between the experiment and control groups in terms of performance of Pap smear; after the intervention, however, the two groups were significantly different in their performance ($p<0.001$): the rate of performing Pap smear before intervention was 30% and 32% for the experiment and control groups, respectively, which rose to 53.9% and 33% after the intervention. In addition, the most important external cues to action for the experiment and control groups were healthcare personnel, friends and acquaintances, journals and other press, radio and television. No significant difference was found between the two groups in terms of cues to action.

Discussion:
The findings indicate that the designed program resulted in improved participation of individuals in Pap smear screening from 30% (before intervention) to 53% (after intervention). The improvement in Pap smear after intervention is inconsistent with the findings of Tabeshian who reported a lack of impact for health education in Pap smear performance (5). This inconsistency may be attributed to the impact of correct implementation of theories and models on efficacy of educational programs. The efficiency of HBM used in this study for promotion of screening behaviors has been established by researchers (16).

Among the demographic characteristics used in the present study, education level was found to be significantly related to awareness and performance, which is in line with findings of McFarland in Botswana (17) and Baghiany Moghadam in Yazd (18). Previous studies suggest a stronger role for education compared to income with regard to health, and that lower levels of education may be responsible for irresponsibility towards healthcare issues (10). In the present study, the educational program led to improvement of awareness scores, which is consistent with findings of Sedighi et al (19), Tabeshian (5), and Yakhforoushha (15). The mean score of perceived susceptibility before education was 8.32 out of 20 which improved to 15.22 after intervention. Moreover, 26% of participants in the experiment group were worried about cervical cancer before education, indicating a low level of concern among the participants prior to education which may account for the poor rate of performing the test (30%). A review article by Austin et al on studies dealing with HBM demonstrated that low perceived susceptibility is a major challenge for performing Pap smear and breast self examination (3). Perceived susceptibility explains how a person’s concern for a health issue alongside the belief that a disease may exist without symptoms, will lead to screening measures (13) such as Pap smear test.

In the present study, the mean score of perceived severity in the experiment group was 9.27 before education which improved to 14.95 after intervention. This is in line with findings of Yakhforoushha regarding Pap smear in women of Ghazvin (15), the study by Peter among Ghanaian women (20), and the study by Ghaderi using HBM for preventing breast cancer in Egyptian students (1). In the Health Belief Model, perceived severity refers to an individual’s evaluation of the clinical outcomes of the disease. Thus, if an individual understands the seriousness of the disease and its complications, he will adopt the preventive behavior (12, 13). In this study, 94% of participants after the intervention believed cervical cancer to be a dangerous disease. It may be stated that the attitude towards a disease plays a pivotal role in performing or abstaining from a preventing measure (6). The findings of the present study indicated that education improves the mean score of...
perceived benefits and reduces the score of perceived barriers in the experiment group. This is consistent with findings of Sumi et al on Korean women and Pap smear test (21) as well as Fung et al on breast self examination among women in Hong Kong (22). 39% of participants in our study before intervention believed Pap smear test to be useful for timely diagnosis and treatment of cancer, which was raised to 81% after intervention. Su et al conducted a study on Singaporean women to conclude that in order to improve the acceptability of Pap smear test, it is essential to emphasize the appropriate health beliefs and simultaneously attempt to diminish barriers through establishment of a suitable environment (8).

In the Health Belief Model, an individual analyzes the benefits and barriers and thus performs an action or abstains from it (13). In this study, the most important perceived barriers were “unpreventable and incurable nature of cancer, fear of test results, and fear of pain”. Studies by Bakemeier et al (23) and Stromborg et al (24) indicated that a negative opinion of cancer and the belief that cancers are untreatable and fatal constitute the major barriers for women’s participation in Pap smear test. Similarly, studies by Salazar (3) and Chavez (25) demonstrated the fact that fear of the screening result is the primary barrier against the individuals’ participation in breast and cervical cancer screening programs. In the study conducted by Fung (22), perceiving the susceptibility for breast cancer and perceiving the barriers were directly related to self-examination.

Our findings indicate a significant improvement in the self-sufficiency score after intervention in the experiment group. Bandora and Adams believe self-sufficiency to be the most important prerequisite for behavior modification (12,13). It has been demonstrated that self-sufficiency exerts a strong influence on health behaviors and a person with lower self-sufficiency is less likely to attempt to adopt a new health behavior or modify an already existing one (12,13).

This study indicated that healthcare personnel constitute the most important external cues to action for performing Pap smear in the experiment and control groups before intervention. This is consistent with findings of Tabeshian on female teachers of Isphahan (5) and Baghiany Moghaddam in Yazd (16). Richardson states that physicians play a pivotal role in people’s awareness of the benefits of participating in Pap smear screening programs (26). A study by O’Malley on American women indicated that a physician’s recommendation is the most important factor encouraging people to take part in cancer screening programs (27).

**Conclusion:** Since this screening method requires a positive attitude, and considering the findings of this study which indicate an educational program based on HBM improves self-sufficiency, and perceived susceptibility, severity and benefits and decreases perceived barriers, thus enhancing awareness and function of the individuals for performing the Pap smear test, we recommend educational classes which highlight the positive aspects of Pap smear, evaluation of behavior modification over longer periods (more than one year) and conduct of similar studies using other models of behavior modification.
References:


