O R I G I N A L   P A P E R

Effectiveness of a Community-Based Health Education Intervention in Cervical Cancer Prevention in Greece

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 Abstract

Background: Women's beliefs are one of the main reasons for not undergoing Pap-test for cervical cancer prevention. Health education programs could help change these beliefs and motivate women to adopt a preventive health behavior.
Objectives: This study aims to assess the modification in women's beliefs and behavior about cervical cancer prevention after the implementation of a health education intervention.
Methodology: A health education intervention for cervical cancer prevention was implemented to 300 women in two prefectures of southern Greece. The experimental group received a 120-minute health education intervention, based on the Health Beliefs Model (HBM) including a lecture, discussion and leaflets. The hypotheses were a) will this brief intervention change women's beliefs (perceived susceptibility to cervical cancer, benefits and barriers of undergoing the Pap-test)? b) will this change in beliefs sustain in six months follow-up period? and c) will women undergo pap-test in six months period? The women filled in an anonymous questionnaire, based on the Health Belief Model (HBM), before, immediately after and six months after the program.
Results: The health education intervention significantly modified women's beliefs and behaviors towards pap-test. The greater changes in women's beliefs were observed in their sense of susceptibility towards the disease and the benefits of prevention which were sustained or improved after six months. Perceived barriers to undergo the Pap-test, pain, embarrassment, and worry for the results decreased immediately after the program but started relapsing in the six month follow up period. Moreover, 88.1% of the women answered that they had underwent a Pap-test during the following six months.
 Conclusions: This health education intervention modified women's beliefs and behavior about cervical cancer prevention. Short, low cost, health education interventions for breast cancer prevention to women can be effective in changing beliefs and behaviour.

Key words: cervical cancer; HBM; women, beliefs, health education, effectiveness, behavior change

Introduction

In Europe 321,8 million women older than 15 years of age are at risk of developing cervical cancer while every year 59,391 new cases and 29,812 deaths are recorded. In Greece, the population at risk of developing cervical cancer is 4.85 million women. Every year 578 women are diagnosed with cervical cancer and 239 die from the disease. In Greece, cervical cancer ranks as the ninth most frequent cancer in women and the second most frequent cancer among women between 15 and 44 years of age (WHO, 2006).

Nearly, all cervical cancer cases (99%) are linked to genital infection with human papilloma virus (HPV) which is the most common sexually transmitted disease (WHO, 2006). About 10% of women in the general population are estimated to develop cervical lesions due to HPV infection at some point of their life. Seventy point one per cent of invasive cervical cancers in the world are attributed to HPVs 16 or 18 (Castlellsagui et al, 2007). The peak incidence of HPV infection generally occurs between the ages of 16 and 24 years (WHO, 2006, Kjaer et al, 2008, Smith et al, 2008).

According to the literature, socioeconomic status seems to affect both the incidence and the survival from cervical cancer (Jensen et al, 2008, Van der Aa et al, 2008). Moreover, some studies support that women of the lower social status participate in cancer screening less frequently (Ruckinger et al, 2008, Breikopf et al, 2005, Gakidou et al, 2008). The Pap-test is the main tool for early detection and diagnosis of cervical cancer (Paniagua, 2006).

Health education is an important instrument of public health for motivating people to protect themselves from preventable diseases. However, effective health education programs have to be methodically designed and evidence-based. In order to design a potentially successful intervention of health education for the prevention of cervical cancer, it would be valuable to collect information on this subject, level of knowledge, beliefs, attitudes and behavior of women so as to perform a needs assessment. The Health Belief Model (HBM) is an applicable model for needs assessment which is very useful for health promoters to plan for intervention techniques (Simon & Das 1984, Norman & Brain 2005, Abood et al 2003, Yarbrough & Braden, 2001). According to the HBM, health behavior is the result of a series of core beliefs of people concerning their concepts of perceived personal susceptibility, perceived severity of the disease, perceived benefits of the new behavior and perceived barriers for applying a preventive health behavior (Janz & Becker 1984, Ogden 2000, Koelen & Van Den Ban 2004). The aim of the study was to evaluate the effects of a health education program on beliefs and behavior towards cervical cancer prevention and Pap-test. This paper is composed of a three-fold study. During the first phase, its aim was to detect the women's beliefs surrounding cervical cancer using the Health Belief Model for a needs assessment purpose. During the second phase, the aim was to study the effectiveness of a health education program implemented on cervical cancer and concerning beliefs' modification immediately after the program. Finally, during the third phase, the aim was to investigate the sustainability of beliefs' modification and behavior change six months after the end of the program.

Methodology

Participants

Participants included 300 women, who belonged to the local women associations, of Lakonia and Arcadia, two prefectures south of Greece. The sample was selected on a basis of a voluntary participation to the study (convenience sample) and questionnaires were used for data collection.

Questionnaire

The questionnaire was formed by a research team that consisted of a sociologist, a doctor, a nurse, a statistician, a health educator and a health promoter. The relevant literature was reviewed and a questionnaire of 25 items was

composed based on HBM (Attia et al, 1997, Champion 1993).

For the validation of the questionnaire, the Trust's Scientific Advisory Committee process was used (Medical Outcomes Trust, 1997). The resulting version of the questionnaire was tested for cultural adaptation in a pilot sample of five people, in order to validate the questionnaire. The conclusions from this pilot adaptation defined the final form of the Greek version of the questionnaire.

Health beliefs were assessed at baseline, intermediately after and six months post intervention. The questionnaires were anonymous, self-completed and consisted of two sections. The first section is recorded the demographic data (age, family status, number of children, nationality, profession, insurance, education, monthly income, residence and number of people in one household).

The second section included items concerning the HBM domains, describing:

- How susceptible women think they are to the disease (cervical cancer) (4 items)
- The benefits of the adoption of the preventive behavior (Pap-test) (2 items)
- The barriers of undergoing a Pap-test (4 items).

The answers to these items had three choices, agree-disagree-I do not know/answer.

In the last phase (6 months post-intervention) 4 items were added to the questionnaire in order to assess potential behavior changes regarding the Pap-test.

The statistical analysis was implemented by the statistical program SPSS for Windows (version 10.1) statistical software (SPSS Inc., Chicago, IL).

Health education intervention

The HBM was used to develop an educational intervention designed to modify women's health beliefs about cervical cancer and behavior towards Pap-test.

This health education intervention consisted of one 30-minute lecture, which was performed by a female doctor and a female nurse. The content of the lecture consisted of information about cervix anatomy, incidence, mortality risk factors for cervical cancer development, the significance of early detection of cancer and the Pap-test procedure. Information was also disseminated about susceptibility to cervical cancer as well as the perceived benefits and barriers of Pap-test. Moreover, directions were given to women for effortless access to screening services. At the end of the lecture, women were encouraged to ask questions. Afterwards, women were given a leaflet from the Ministry of Health, emphasizing the significance of the Pap-test.

Results

The majority of women were between 45-50 (17%, n=51) and 25-35 (15%, n=45) years old while six women (2%, n=6) were 70-75 years old. The majority of these women (n=132) were married (44%), while 104 women (34,7%) were singles, 27 women (9%) were widows and 37 (12,3%) were divorced. Half of these women had children (n=151) (50,3%). Seven point seven percent did not have Greek nationality. Almost one in two (n=136) were paid workers (45, 4%), 66 women (22%) were housekeepers or unemployed, 61 women (20,3%) were farmers and 36 (11.9%) were free-lancers. All of them had state insurance and only 21 women (7%) also employed a private insurance. Half of these women (n=154) were high school graduates (51,3%), 92 women (30,6%) had graduated from a university or technical college, and 49 women (16,3%) had received primary school education. Half of them (n=149) (49,8%) had an overall monthly family income of over 1000 euros (middle income), 120 women (40%) between 600-1000 euros (low income) and 30 (10%) under 600 euros (very low income).

The perceived susceptibility of women is presented in the first table. The answer "disagree" was considered as the protective belief to item 1 "my health is OK, that's why I do not think at all that I may develop cervical cancer in the future". As we can observe the rate of this answer was doubled immediately after and was more improved in the follow-up period (item 1, table 1).

Table 1: Women's beliefs about their susceptibility towards cervical cancer

Item 1: My health is OK, that's why I do not think at all that I may develop cervical cancer in the future			
	BEFORE INTERVENTION N=300 women	**SHORTLY AFTER INTERVENTION** N=300 women	**6 MONTHS AFTER INTERVENTION** N=270 women
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.151	p=0.578
	N =300 (%)	N=300 (%)	N=270 (%)
AGREE	114 (38)	21 (7)	3 (1.1)
DISAGREE	129 (43)	270 (90)	267 (98.9)
I DO NOT KNOW	57 (19)	9 (3)	-
Item 2: "When I hear that someone I know developed cervical cancer, I think that it may happen to me, at some point, too"			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.202	p=0.002
AGREE	159 (53)	36 (12)	245 (90.8)
DISAGREE	84 (28)	246 (82)	25 (9.2)
I DO NOT KNOW	57 (19)	18 (6)	-
Item 3: "As years pass by, the possibility for women to develop cervical cancer increases"			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=<0.001	p=0.870
AGREE	155 (51.7)	147 (49.3)	242 (89.7)
DISAGREE	45 (15)	99 (33)	28 (10.3)
I DO NOT KNOW	100 (33.3)	54 (18)	-

The percentage of women who agreed (preventive belief) that "when I hear that someone I know developed cervical cancer, I think that it may happen to me at some point, too" decreased a lot immediately after the program but increased dramatically six months post intervention (item 2, table 1).

Getting older made women feel most susceptible towards cervical cancer as seen in item 3 and the rate of women who agreed remained almost stable after the program but increased greatly six months post-intervention.

Regarding their perception to personal risk of getting cervical cancer, the percentage of women who considered that they have the same risk of getting cervical cancer with other women increased greatly during the second phase and even more during the third phase of the study (table 2).

In the first item (table: 3) "the more regularly women undergo the Pap-test the fewer will die" the "agree" answer was considered to be preventive belief. It can be observed that this percentage increased after the program and included the total sample at the six months follow-up period (item 1, table 3). In item 2 of table 2, as preventive belief, were considered to be the "disagree" answer to question "if the Pap-test indicated some disorder/ abnormality, it would be too late". As we can see, this rate was very high immediately after the program and even higher six months post implementation.

Table 2: Women's perceived personal risk of cervical cancer

Item : "My risk of getting cervical cancer is"			
	BEFORE INTERVENTION	**SHORTLY AFTER INTERVENTION**	**6 MONTHS AFTER INTERVENTION**
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		0.020	0.316
	N =300 (%)	N =300 (%)	N =270 (%)
Less than other women	27 (9)	18 (6)	4 (1.5)
Same as other women	113 (38)	252 (84.3)	266 (98.5)
More than other women	20 (6.7)	3 (1)	-
I do not know	140 (47)	27 (9)	-

Table 3: Women's beliefs about the benefits of cervical cancer prevention

Item 1: The more regularly women undergo the Pap-test the fewer will die.			
	BEFORE INTERVENTION	**SHORTLY AFTER INTERVENTION**	**6 MONTHS AFTER INTERVENTION**
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		0.224	No statistics are computed because variable is a constant
	N =300 (%)	N=300 (%)	N=270 (%)
AGREE	213 (71.30)	280 (93.3)	270 (100)
DISAGREE	33 (11)	18 (6)	-
I DO NOT KNOW	54 (18)	2 (0.7)	-
Item 2: If the Pap-test indicated some disorder / abnormality, it would be too late.			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		0.150	0.481
AGREE	101 (33.7)	5 (1.7)	2 (0.7)
DISAGREE	132 (44)	267 (89)	268 (99.3)
I DO NOT KNOW	67 (22.3)	28 (9.3)	-

Table 4: Perceived barriers by women towards the Pap-test

Item 1: "I will experience pain if I undergo a pap- test"			
	BEFORE INTERVENTION	SHORTLY AFTER INTERVENTION	6 MONTHS AFTER INTERVENTION
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.233	p=0.135
	N=300 (%)	N=300 (%)	N=270 (%)
AGREE	71 (23.7)	7 (2.3)	31 (11.4)
DISAGREE	142 (47.3)	278 (92.7)	239 (88.6)
I DO NOT KNOW	87 (29)	15 (5)	-
Item 2: "The Pap-test is a "dangerous" test"			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.698	No statistics are computed because variable is a constant
AGREE	51 (17)	9 (3)	1 (0.3)
DISAGREE	162 (54)	273 (91)	269 (99.7)
I DO NOT KNOW	87 (28.7)	18 (5.7)	-
Item 3: "I feel ashamed to undergo a Pap-test"			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.347	p=0.030
AGREE	147 (49)	33 (11)	61 (22.4)
DISAGREE	144 (48)	264 (88)	209 (77.6)
I DO NOT KNOW	9 (3)	3 (1)	-
Item 4: "If I underwent a Pap-test regularly, I would be worried about the results"			
Pearson chi-square p-value before and shortly after intervention and before and 6 months after intervention		p=0.508	p=0.385
AGREE	144 (48)	6 (2)	43 (15.8)
DISAGREE	135 (45)	279 (93)	227 (84.2)
I DO NOT KNOW	21 (7)	15 (5)	-

Regarding the perceived barriers for undergoing a Pap-test, it seems that pain, embarrassment and worry for the results constituted significant barriers for women who disagree immediately post-intervention, but they tend to relapse during the following six month period (table 4, items 1,2,3,4).

It is worth mentioning that the answer "I do not know" that included a high percentage of the participants at the baseline had disappeared during the six month follow-up period.

Immediately after as well as six months after the program, women who acquired more preventive beliefs were women who had children (p=0.024), higher educational level (p=0.001) and lived in the prefecture of Lakonia (p=0.001).

Regarding behavior change relevant to undergoing the Pap-test six months after the health education program (n=270) (3rd phase), 238 women (88.1%) of women answered that they had underwent a Pap-test and 54 women (19.9%) had not. Half of women (n=139) who underwent the Pap-test did so during the first month after the program, 99 women (36.7%) 2-3 months after and 32 women (12.4%), 5 months after the health education program.

For 28 women (10.6%) who underwent a Pap-test the results indicated that the test and for 236 (87.6%) women had normal Pap-test results. Of those women who did not undergo a Pap-test, 251 women (93%) answered that they did not do so because they felt ashamed and 19 women (7%) just neglected to do it.

Women who underwent the Pap-test were older (p=0.001), married (p=0.001), had children (p=0.001), better educated (p=0.001), higher income (p=0.001), lived in city (not villages) (p=0.001) and mentioned health problems (p=0.001).

Discussion

The majority of women who participated in this study belonged to the age groups of 25-30 and 45-50 years old, while the minority was over 70 years old. The age differences among the participants may be explained by the fact that the younger, child-bearing women and the women at a high risk age of developing cervical cancer had more incentive to participate in the intervention. The small number of older participants could be attributed to their belief that they are not at risk of cervical cancer development. This is a misconception, as data from the USA shows that 10,4% of women are infected with HPV between 65-74 years, 6.8% between 75-84 years and 2.5% over 85 years of age (Ravaioli et al, 1993).

The study results showed that the health education intervention significantly improved the health beliefs and health behavior of women, as almost nine in ten women underwent a Pap-test during the six month-period following the end of the program. It appears that instructional methods such as lectures and the provision of written materials may have affected this finding. Many researchers have emphasized that understanding the beliefs of susceptibility, as well as the benefits and barriers of health behavior, could improve women's participation to prevention tests (Hou et al 2004, Katapodi et al 2004).

Below, the results are analyzed separately.

should be repeated within 6 months, for 5 (1.8%) that further tests should be taken

Susceptibility

In the present study, it seems that women feel more susceptible after the program and in the follow up period. Perhaps, this susceptibility influenced their decision to undergo a preventive test, an assumption mentioned by others studies too (Fulton et al 1991, Aarts et al 2011). It appears that knowledge increased these women's sense of susceptibility. Previous researchers have already pointed out that the perceptions of susceptibility can be modified after effective implementation of a health education program (Brodersen et al 2011, Feldstein et al 2001, Azaiza et al 2006, Holloway et al 2003).

However, other studies have suggested that an increase in knowledge and a change in beliefs after a health education program does not predict positively that women will have a Pap smear test (Yucel et al, 2009).

Women seemed to be confused immediately after the intervention, while less women than the baseline answered that "when they hear that someone they know developed cervical cancer, they think that it may happen to them too".

A possible explanation would be that health educators did not communicate well that piece of information. The important increase of the percentage of these answers in the follow up period probably occurred as a result of women's social interactions.

Time passing makes women feel more susceptible and this feeling seems to be strengthened by the program, an encouraging finding as older women do not take part easily in cervical screening (Ravaioli et al, 1993).

In table 2, the preventive belief "I have the same risk of getting cervical cancer with other women" improved immediately post intervention and six months after the end of the program. As other studies have demonstrated good risk communication improves accuracy of risk perceptions (Holloway et al, 2003).

Benefits

Six months after completion of the program, all women believed that the Pap-test saved women's life. It can be assumed that the program helped women to believe in early detection of cervical cancer. This belief comes from the right piece of knowledge as suggested by other studies too (Holloway et al, 2003). Also, the fatalistic attitude towards cervical cancer was modified immediately after program completion and further improved in the follow up period. Fatalistic attitudes such as these and their modification after a health education program have been reported in other studies too (Ackerson & Gretebeck, 2007, Abdullahi et al, 2009, Mosavel et al, 2009, Yu & Rymer 1998).

Barriers

The section of items, concerns the perceived barriers of women towards the Pap-test. At the baseline, almost one in two women mentioned pain, embarrassment and worry for the results as barriers for undergoing a Pap-test. Fear of pain has been reported by other researchers too as a very deterrent factor in undergoing the Pap-test (Abdullahi et al, 2009, Byrd et al, 2009, Moreira et al, 2006, Wright et al, 2005, Crombie et al, 1995, Jubelirer 1996, Kahn et al, 1999, Fylan 1998, Guilfoyle et al, 2007, Yu & Rymer 1998). This may indicate, that pain is a deep obstacle which may stem from lack of information about the Pap test or negative previous experiences (Blomberg et al, 2008, Perry 2001, Crombie et al 1995). Women's fear of pain appears to be the dominant factor as compared with new knowledge and beliefs acquired during the intervention and these women tend to revert to past beliefs during the follow up period.

A high rate of women at the baseline believed that the Pap-test is a dangerous test. This belief changed completely after the program and improved in six months time.

Embarrassment constitutes a psychological obstacle for many women in other countries too (Abdullahi et al, 2009, Byrd et al 2009, Moreira et al 2006, Wright et al 2005, Kahn et al 1999, Fylan 1998, Jubelirer 1996, Crombie et al 1995, Guilfoyle et al 2007, Yu & Rymer 1998, Waller et al 2009). In our study, this belief was modified significantly for many women after the end of the health education program but started relapsing after six months. Perhaps, embarrassment coping skills should be enhanced by other techniques of health education (more empowerment models) in order to sustain this attitude.

Another belief that presents the same fluctuation, concerns worry for the results. It appears that the method of health education used (lectures, leaflets) did not relieve permanently the anxiety of women compared to other more visual material (Holloway et al 2003, Papa et al 2009, Crombie et al 1995, Guilfoyle et al 2007, Kahn et al 1999, Fylan 1998, Jubelirer 1996, Greimel et al 1997, Ronco et al 1994, Waller et al 2009).

Pain, embarrassment and worry for the results may show that the specific health education program failed to produce a sustainable effect on perceived barriers. A possible explanation might be that they are influenced by cultural factors. This indicates that an empowering health education intervention that considers cultural barriers to the Pap-test in addition to health beliefs, may be more appropriate for this population.

Behavior

Concerning behavior modification, six months after the end of the program almost nine out of ten women underwent a Pap-test, a higher number than that obtained by other European screening programs (Billette de Villemeur et al, 2007). This rate is also higher than that of previous studies in Greece, pointing out that the percentage of the Greek population receiving screening services is low and seriously affected by social factors (Dimitrakaki et al 2009). The majority of women undergoing the Pap-test in the present study is consistent with other studies assessing the role of health education in women's willingness to take the test (Papa et al 2009, Byrd et al 2007, Arevian et al, 2006, Park et al 2005). Sufficiently informed women, who had their questions answered, were more likely to participate in Pap-test screening (Hall et al 2008, Peate, 1999).

Understanding the process and diagnosis of cervical cancer can counter negative attitudes and experiences and convince women to undergo Pap smear tests (Baileff, 2000).

Also, the high rates of women answering "I do not know" at the baseline disappeared in the follow up period, a finding confirming once again that lack of knowledge is a barrier for taking a Pap-test (Perry 2001).

Statistical significance regarding undergoing a Pap-test was observed among elder, married women, with children and a higher level of education and income who lived in the prefecture of Lakonia. In a previous study in Greece, age, education and marital status were important factors when considering to take a Pap smear test (Dimitrakaki et al 2009). In other countries, married women in their forties, with a high family income, and higher education were more likely to take a Pap smear test (Pavia et al, 1999, Seidel et al 2009, Sabates & Feinstein 2006).

These findings are evidenced-based by other studies also, and show that poor, unmarried, unemployed, older (over 65 years old) women with a lower level of education were under-users of screening (Arrosi et al, 2008).

Women do not receive information about HPV and cervical cancer routinely by their physicians, especially older physicians (Cermak et al 2010). Female doctors do not have regular cervical cancer tests although they do breast self-examination (Rosvold et al 2001). Training of health professionals would increase the uptake of screening (Schwartz et al 1989, Lundgren et al, 2000, Abdullahi et al 2009, Goldsmith et al 2008, Baay et al 2006). Fylan (1998) concludes that the quality of cervical screening services can be enhanced by providing additional information, improved quality of communication and by considering women's health beliefs. This may result in increased participation in the screening programs, and satisfaction with the services, which is also confirmed by other studies (Yu & Rymer 1998, McAvoy & Raza 1991). Reminding with an invitation letter seems to be very effective in motivating women to undergo a Pap-test (Forss et al, 2001, Eaker et al 2004). Also, mass advertising and health promotion campaigns,

such as smoking cessation, can be used to increase women's regular attending to cervical screening (Perry 2001). Many studies also suggest better education of public and health care practitioners about the Pap smear test, HPV and cervical cancer with methods using in-depth education about the Pap smear test and addressing barriers such as embarrassment, pain, fear of finding a problem, fear of the unknown, etc (Moreira et al 2006).

The limitations, of this study were that it was carried out on a small sample of women in two semi-rural regions in South Greece and therefore the results cannot be generalized. Also, a substantial limitation is the one-off brief nature of the program and the methods used. Moreover, the role of culture on health beliefs and behavior was not assessed in the present study as these are not included in HBM. Of course, there may be other salient factors operating to influence perceived barriers that may not be revealed by HBM.

Conclusions

The results of the present study indicate that a health education program using lecture, discussion and leaflets as methods, was effective in modifying health beliefs and behavior about cervical cancer. The HBM was an appropriate tool to assess needs, increase knowledge and change beliefs and behaviors. Our findings suggest that the percentage of women taking the Pap-test can be increased after one health education encounter. The health education program may be useful for other populations sharing similar demographic characteristics. However, it is not a strong enough intervention to overcome and sustain internal barriers to undergoing the Pap-test as these barriers may be influenced by cultural factors.

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