RESEARCH ARTICLE

Development of an Educational Program to Prevent Cervical Cancer among Immigrants in Korea

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Abstract

Background: This study developed and measured the effects of a cervical cancer prevention program for married women immigrants. Materials and Methods: A nonequivalent control group pre-test/post-test design was used with a group of married women immigrants registered at the multi-cultural center in the city of "J." Data on for 30 participants in the intervention group and 27 participants in the control group (N=57) were used for analysis. The intervention group attended a 4-session cervical cancer prevention program. Results: The knowledge of the intervention and control groups about cervical cancer post-intervention was significantly different (F=12.55, p<0.001). The perceived susceptibility score before and after the experiment, for the intervention group, and 29.4 and 28 for the control group, was significantly different (t=2.063, p=0.043). After the program, cancer prevention behavior was significantly different in the intervention group (t=2.646, p=0.010). Conclusions: The results obtained in this study indicate that the cervical cancer preventive program was effective in increasing cervical cancer knowledge, perceived susceptibility, and cancer prevention behavior.

Keywords: Cervical cancer - prevention - women immigrants - Korea

Introduction

Cervical cancer is the most-commonly occurring form of female genital cancer (Getahun, 2013) and is mainly caused by the human papilloma virus (HPV). Developing and undeveloped countries accounted for 80% of cervical cancer occurrence, while 85% of deaths caused by cervical cancer occur in developing countries (Pisani et al., 2002). While cervical cancer was once the most prevalent female cancer, it accounted for less than 10% of cancers in women in 2002, and its occurrence significantly reduced to 4.5% in 2008 (National Cancer Information Center, 2010; http://www.cancer.go.kr).

The incidence of cervical cancer in Korea has been significantly reduced because of increasing public understanding of the benefits of early examination, higher examination rates, and more accurate cervical cell appraisals. In addition, the human papillomavirus (HPV) test has been widely implemented, potential patients who could require secondary or tertiary care have been found earlier through cervical intraepithelial neoplasia (CIN), which accounts for the increasing numbers of patients who have been successfully treated (Korean Society of Obstetrics and Gynecology, 2008).

However, this increase in the Pap test rate to screen for cervical cancer and a reduction of infiltrating cervical cancer due to early examination is limited to ethnic Korean women. The cancer rates of married women immigrants, now rapidly increasing in number in Korea,

have not been reported (Choi and Bak, 2012). There were 220,687 married immigrants in Korea as of 2012. The number of married women immigrants from Southeast Asia, including Vietnam and Cambodia, has increased every year and these women currently account for 31.8% of the population (Ministry of Public Administration and Security, 2012). However, policy insufficiencies have been exposed as Korea rapidly changes from a single-ethnicity state into a multi-cultural society (Kim et al., 2011).

Many married women immigrants are financially vulnerable and were married at a younger age, in their late teens or early 20s, than is typical among Korean women. Moreover, they are also vulnerable to sexually transmitted diseases (Kim et al., 2008). Vietnamese women have the highest occurrence of cervical cancer (Korean Oncology Nursing Society, 2012). The inflow of these women into Korea is a factor that may cause a rise in the incidence of cancer.

It is important to provide a variety of reproductive health for married women immigrants from underdeveloped and developing countries, but there has been little research on the types and effects of intervention approaches for this population. Previous research on cervical cancer awareness in married women immigrants reported an average score of 11.42 on a 23-point scale (Choi and Bak, 2012). This score was lower by 13.8 points than that found in female college students in Korea (Yi and Bak, 2011). In addition, the screening rate of the Pap test for early detection of cervical cancer was lower for married

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women immigrants than for Korean women (Kim and Choi, 2010). Thus, the development of a cervical cancer prevention program, focused on the specific needs of these individuals, is necessary.

The aim of this study was to develop a cervical cancer prevention program for married women immigrants and assess its effectiveness on knowledge of cervical cancer, health beliefs related to cervical cancer, and behaviors for preventing cancer.

Materials and Methods

Participants

Participants were recruited from a multi-cultural center from May to June 2012. A poster, placed on a notice board, described the purpose of the study and requested married women immigrant volunteers. Sixty women were selected to join the research. Inclusion criteria were: *i*) ability to communicate in Korean; *ii*) no previous history of health education related to cervical cancer; *iii*) ability to understand the purposes of this research; and *iv*) provision of written consent.

The purposes of research and the survey method were explained to the participants before the study began. After the pre-intervention test, the participants were randomly divided into an intervention group (n=30) and control group (n=30). Each participant drew a number; those with odd numbers were assigned to the intervention group and those with even numbers were assigned to the control group. The number drawn by each participant was not disclosed to secure the privacy of each participant.

The sample size was determined using G*Power 3.1.5. Power analysis showed that to identify a difference between groups, the desirable sample size was 26 participants per group for adequate statistical power (1-ined by the G*Power 3.1.5 program=0.05; effect size d=0.80). Therefore, 52 participants were needed, and 60 were selected to compensate for potential dropouts. Three participants from the control group dropped out before the study was completed; there were no dropouts from the intervention group. Therefore, the data of 57 participants (30 in in the intervention group and 27 in the control group) were used for analysis.

Knowledge of cervical cancer

This study validated a set of 25 questions related to HPV knowledge developed by Kim and An (2007) and Yi and Bak (2011) that measures knowledge about cervical cancer. The version used in this study had 23 questions (two were eliminated from the original due to poor validity); Cronbach's alpha in this study was 0.905. Correct answers were scored "1" and incorrect or no answer was scored "0." Thus, the scores ranged from 0 to 23, with higher scores representing more knowledge about cervical cancer

Health beliefs related to cervical cancer

The HPV Health Belief questionnaire consists of 15 health belief questions from the Awareness of HPV and Cervical Cancer Questionnaire developed by Ingledue, Cottrell, and Bernard (2004). Perceived susceptibility and perceived seriousness were measured on a 5-point scale from 1 "low" to 5 "high." Its test-retest reliability (r=0.95) in the present study was higher than reported by Ingledue et al. (2004). Cronbach's alpha was 0.774 for perceived susceptibility and 0.609 for perceived seriousness.

Cancer prevention behaviors

This study used the 20-item Cancer Prevention and Health Improvement Behaviors scale developed by Suh et al. (1998). Responses are made on a 5-point Likert scale; higher scores represent performance of more cancer prevention behaviors. Cronbach's alpha of this measure was 0.86 in the research by Suh and colleagues (1998) and 0.882 in the present study.

Cervical cancer prevention program

The cervical cancer prevention program for married women immigrants was developed using the results of a preliminary survey on the health education needs of married women immigrants. The questionnaire consisting of 20 question, assessed: *i*) General cancer knowledge; *ii*) Reasons for and symptoms of cervical cancer; *iii*) The examination and treatment of cervical cancer; *iv*) Prevention of cancer through lifestyle behaviors; *v*) Understanding of HPV; and *vi*) Knowledge of the relationship between cervical cancer and HPV. The survey was completed by 50 married women immigrants from China, Vietnam, Cambodia, and the Philippines, recruited at the same multi-cultural support center as this study's participants, during July and August 2011. The average score indicated a large gap in knowledge about cervical cancer, particularly in the reasons for and symptoms of cervical cancer, examination, and treatment of cervical cancer, and understanding of HPV. In addition, literature reviews were conducted and insights from previous studies incorporated during the development of the program (Jaegap, 2007; Korean Society of Obstetrics and Gynecology, 2008; National Cancer Information Center, 2010; Women's Health and Care Textbook Research Society, 2012).

The cervical cancer prevention program is a 4-week program, presented in 50-minute sessions once a week. To avoid language difficulties, the video data and textbook were translated into Vietnamese, Khmer, Tagalog, and Chinese and distributed to the married women immigrants. In addition, one interpreter was designated for each language group to help the participants. To ensure validity, the program was reviewed and supplemented by an obstetrician, two professors in women's health and nursing departments, and one nurse who had over 10 years of clinical experience in obstetrics and gynecology clinics. Moreover, specialists capable of simultaneous interpretation in each language group verified the soundness of the translated program materials.

Table 1 presents the educational contents and method per session. The first session, titled "Understanding Cancer," focused on general information about cancer, such as benign and malignant tumors, cancer prevalence, and cancer death rates. The second session, "Understanding the Reproductive Organs," was about the structure and functions of the female external and internal reproductive

organs. The third session, "Cervical Cancer," was focused on the symptoms, examinations, treatment, and prevention of cervical cancer. The final session, "Understanding HPV," introduced HPV, the relationship between cervical cancer and HPV, vaccines against cervical cancer, and behaviors that prevent cervical cancer.

Data collection

After assignment to the experimental or control group, the women completed the pre-intervention questionnaire. The experimental group attended the cervical cancer prevention program from July 1 to August 10, 2012. The program took place during the holidays at the multi-cultural center. The control group received no intervention beyond the preliminary meeting and the survey.

Ethical considerations

This study received prior approval from the Institutional Review board at G University (No. GIRB-G2011-0008). The research process was explained to the director of the institution where the data were collected. The research was conducted only after receiving approval from the director.

The cover letter of the questionnaire assured participants that participation was voluntary, anonymity was guaranteed, they could withdraw from the study at any time, and the data collected would not be used for any other purposes except the purposes of the research. The purposes of the research were explained to the participants and their written consent was obtained.

Data analysis

This study used a nonequivalent control group pretest–posttest design, and the data were analyzed using PASW (ver 18.0, Chicago, IL). Homogeneity between the intervention and control groups was examined using a χ^2 test, t-test, and Fisher's exact test. The main variables followed a normal distribution, as confirmed using the Kolmogorov-Smirnov test.

An ANCOVA was used when pre-intervention variables value were not homogeneous; t-tests were conducted when variable values were homogeneous, and paired t-tests were used to compare pre-post intervention changes in each group. The statistical significance was set at α=.05.
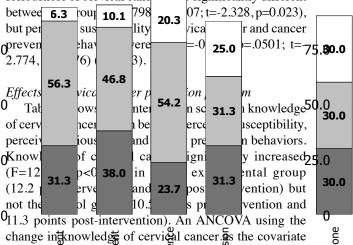
Results

Homogeneity test of subjects

There were no significant differences between experimental and control groups for any demographic variable, including ages of participants, spouses' ages, educational background of participants and their spouses, religion, jobs, nationality before marriage, acquisition of Korean nationality, length of stay in Korea, income, and sociodemographics (Table 2). There were no statistically significant between-groups differences in health-related features, including fertility, abortion, medical insurance, HPV vaccination status, venereal infection, Pap test usage, and age of first sexual activity (Table 2).

Knowledge of cervical cancer and perceived seriousness of cervical cancer were significantly different between groups (7.98 vs 11.07; t=-2.328, p=0.023), but perceived susceptibility of cervical cancer and cancer prevention behaviors were (...=0.0501; t=-2.774, ...76) (...3).

Effects of cervical cancer prevention program

Table shows intervention scores in knowledge of cervical cancer, perceived susceptibility, perceived seriousness, and cancer prevention behaviors. Knowledge of cervical cancer significantly increased (F=12... p<0.0...) in the experimental group (12.2 preintervention and ... post-intervention) but not the control group (10.5 preintervention and 11.3 points post-intervention). An ANCOVA using the change in knowledge of cervical cancer as the covariate showed that post-intervention knowledge of cervical cancer significantly differed between groups (F=12.550, p<0.001).

Perceived susceptibility scores were 30.5 points and 31.4 points pre- and post-experiment, respectively, for the experimental group, and 29.4 points and 28 points for the control group; the between-groups difference was significant (t=2.063, p=0.043). Mean perceived seriousness scores increased from 19.9 points to 20.8 points for the experimental group, but this increase was not significant. There was a significant different in the results of the control group, with scores decreasing from 21.8 to 19.6 However, changes in perceived seriousness did not significantly differ between the experimental and control groups, as shown by an ANCOVA with perceived seriousness as a covariate (F=2.290, p=0.088).

The increase in cancer prevention behavior scores was significant for the experimental group (from 63.7 points pre-intervention to 77 points post-intervention) but not for the control group (66.5 pre-experiment and 66.9 post-experiment). The post-intervention cancer prevention behavior points were significantly different between the experimental group and the control group (t=2.646, p=0.010).

Table 1. Cervical Cancer Prevention Program

Sessions	Topics	Contents	Teaching tools
1	Understanding Cancer	-Definition of Cancer Benign tumor and malignant tumors -Incidence of cancer and Death rate by cancer	-PPT -Lecture -Picture book -Discuss
2	Understanding the Female Reproductive organ	-The structure and functions of the female external reproductive organs	-PPT -Model -Lecture -Picture book -Discussion
3	Understanding Cervix cancer	-Cervical cancer Symptoms of cervical cancer -Diagnosis -Treatment -Preventing cervical cancer	-PPT -Lecture -Picture book -Discussion
4	Understanding HPV	-HPV -The correlation between cervical cancer and HPV Vaccines preventing cervical cancer Lifestyles conducive to the prevention of cervical cancer	-PPT -Lecture -Picture book -Discussion

Table 2. Homogeneity Test for General Characteristics and Health Related Characteristics

Characteristics		Experimental (n=30) M±SD (%)	Control (n=27) M±SD (%)	χ^2 or t	p
Age (years)		28.83±7.16	29.65±5.16	-0.142	0.887
Age of husband (years)		42.41±7.75	42.77±5.21	-0.211	0.883
Education				2.39	0.495
	<Elementary	2 (6.5)	3 (9.7)		
	Middle School	13 (41.9)	8 (25.7)		
	High school	10 (32.3)	10 (32.3)		
	≥College	6 (19.4)	10 (32.3)		
Husband's education				1.39	0.499
	<Elementary				
	Middle school	6 (19.4)	3 (9.7)		
	High school	15 (48.3)	15 (48.4)		
	≥College	10 (32.3)	13 (41.9)		
Religion	Yes	25 (80.6)	24 (77.4)	0.097	0.755
	No	6 (19.4)	7 (22.6)		
Job	Employed	9 (29.0)	16 (51.6)	3.28	0.12
	Unemployed	22 (71.0)	15 (48.4)		
Country of origin				0.631	0.889
	Vietnam	15 (48.4)	13 (41.9)		
	China	4 (12.9)	5 (16.1)		
	Philippines	6 (19.4)	8 (25.8)		
	Cambodia	6 (19.4)	5 (16.1)		
Korean nationality				3.718	0.097
	Yes	6 (19.4)	13 (41.9)		
	No	25 (80.6)	18 (58.1)		
Length of time in Korea (years)				6.971	0.073
	<1	12 (38.7)	6 (19.4)		
	1~<3	12 (38.7)	8 (25.8)		
	3~<5	3 (9.7)	7 (22.6)		
	≥5	4 (12.9)	10 (32.3)		
Income (10,000 won)				0.629	0.96
	<100	3 (9.7)	2 (6.5)		
	100~<150	8 (25.8)	8 (25.8)		
	150~<200	6 (19.4)	8 (25.8)		
	200~<250	10 (32.3)	10 (32.3)		
	≥250	4 (12.9)	3 (9.7)		
Gravidity	0	9 (29.0)	5 (16.1)	7.069	0.07
	1	16 (51.6)	11 (35.5)		
	2	6 (19.4)	12 (38.7)		
	≥ 3	0	3 (9.7)		
Abortion	Yes	4 (12.9)	8 (25.8)	0.335	0.168
	No	27 (87.1)	23 (74.2)		
National health insurance				0.78	0.39
	Yes	23 (74.2)	21 (67.7)		
	No	8 (25.8)	10 (32.3)		
HPV vaccine	Yes	2 (6.5)	2 (6.5)	0.2	1
	No	29 (93.5)	29 (93.5)		
Sexually transmitted disease				1.016	1
	Yes	1 (3.2)	0		
	No	30 (96.8)	31 (100)		
Pap smear	Yes	13 (41.9)	14 (45.2)	0.066	1
	No	18 (58.1)	17 (54.8)		
Age at first intercourse		23.41±3.51	23.22±4.09	0.78	0.39

Table 3. Homogeneity Test for Knowledge, Health Beliefs, and Cervical Cancer Preventive Behaviors between Two Groups

Variable	Experimental (n=30) M	SD	Control (n=26) M	SD	t	p
Knowledge of cervical cancer	12.2	2.54	10.5	1.67	2.798	0.007
Health beliefs:						
Perceived susceptibility	30.5	7.08	29.4	5.98	0.677	0.501
Perceived seriousness	19.9	3.39	21.8	3.02	-2.328	0.023
Cancer Preventive Behavior	63.7	15.7	66.5	14.6	-2.774	0.476

Table 4. Effects of the Cervical Cancer Prevention Program

	Pre	Post	$F^§$ or $T^†$	p
Knowledge of cervical cancer				
Experimental	12.2±2.54	14.6±1.69**	12.550§	<0.001
Control	10.5±1.67	11.3±1.46		
Health beliefs				
Perceived susceptibility				
Experimental	30.5±7.08	31.4±6.59	2.063†	0.043
Control	29.4±5.98	28.0±6.28		
Perceived seriousness				
Experimental	19.9±3.39	20.8±4.29	2.290§	0.088
Control	21.8±3.02	19.6±4.30**		
Cancer Preventive Behavior				
Experimental	63.7±15.7	77.0±13.5**	2.646†	0.01
Control	66.5±14.6	66.9±16.0		

*p<0.05 by paired t-test; **: p<0.01 by paired t-test; §Comparison by ANCOVA test; †Comparison by Student's t-test

Discussion

This study was suggested by research (Montgomery et al., 2010; Choi and Park, 2012) that proposed married immigrant women had less knowledge about cervical cancer and HPV than that of Korean women (Lee and Park, 2011). Therefore, a cervical cancer prevention program for this population was developed and its effects were examined by measuring knowledge of cervical cancer, health beliefs related to cervical cancer, and changes in cancer prevention behaviors before and after the program.

Research examining the effects of education in preventing cervical cancer or HPV education among female college students in Korea has been recently implemented, but this does not target married women immigrants. The findings of Kim and Park (2010), who documented the positive effects of education about preventing cervical cancer in female college students, and by Perkin (2007), who provided community-based education as a preventive intervention for cervical cancer and measured the knowledge of women regarding cervical cancer, showed that the knowledge of women who received community-based education regarding cervical cancer was greater than those who did not attend a program.

The present interventions, including preventive programs and health education, has been successful in improving knowledge of the disease and health behaviors in this study. The knowledge of the intervention group regarding cervical cancer after attending the cervical cancer prevention program was significantly improved compared to the control group. The cervical cancer prevention program developed in this study addressed understanding cancer, especially the causes, symptoms, examination, and treatment of cervical cancer, and its relationship with HPV. Moreover, after the cervical cancer prevention program, participants' perceived susceptibility significantly differed between the intervention group and the control group.

There is almost no research measuring health beliefs in participants of cervical cancer prevention programs. While it is difficult to directly compare the results of interventions, the results of this study supported existing research showing that insufficient knowledge of cervical cancer could increase participants' perceived susceptibility

and seriousness of cervical cancer (Ingledue et al., 2004; Montgomery et al., 2010). Neither the intervention group nor the control group displayed any significant difference in perceived seriousness of cervical cancer. The results are similar to those of Kim and Choi (2007), who concluded that nursing interventions to encourage participant in medical examinations could not change health beliefs. However, the health belief questionnaire used by Kim and Choi (2007) assessed health beliefs by summing susceptibility, seriousness, benefit, and disorder scores. Thus, a comparison of the results from the two studies should be done cautiously because the measurement tools were different.

Moreover, the reliability of the seriousness measurement tool for health beliefs in this study was relatively low (Cronbach's alpha=0.609). The development of a reliable health belief tool for married women immigrants is important for the comparison of results and the investigation of these beliefs in future research.

The amount of cancer prevention behaviors was significantly different between the intervention group and the control group after the program. While implementation of cancer prevention behaviors was not directly examined after the cervical cancer prevention program, the results were similar to those of Kim and Park (2010), who reported that adoption of cervical cancer prevention behaviors increased after participation in a cervical cancer preventive education among a group of college students. Cervical cancer prevention education was also effective in improving preventive behaviors against cancers in a study by Perkin (2007), which reported an improvement in preventive behaviors post-education. Oh et al. (2010) found that an early cancer screening of married women was related to knowledge about cervical cancer. The scale of cancer prevention behaviors was developed for this study to measure the level of preventive health behaviors. Therefore, because the cervical cancer prevention program developed in this study improved the knowledge of participants on the disease, it is expected that such knowledge influenced the practice of preventive behaviors.

Married women immigrants in Korean society have been the subjects of recent research due to their increasing numbers and, for this reason, surveys have been the most widely used research method. There is a need for studies that provide information about interventions. In this regard, this study makes a meaningful contribution to existing knowledge. The participants of this study required educational materials in their native language and those supplemented by photos and images due to their lack of proficiency in Korean. Education using such materials would be also helpful in improving the general knowledge base of this population. However, a further limitation of this study was the small sample size. Further studies in a larger sample size will be required for the results to be generalized. Further research is necessary to develop a health belief tool suitable for married women immigrants.

In conclusion, the present results indicate that the cervical cancer preventive program was effective in increasing cervical cancer knowledge, perceived susceptibility, and cancer prevention behaviors. Consequently, this program should be used as an intervention program targeting immigrant women..

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