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Application of Precede-Proceed model in health education intervention of breast cancer screening in community women

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ABSTRACT. Background: *Using the Precede-Proceed health education model to help women establish behaviors of breast cancer screening.* ***Methods:*** *A total of 520 women from four communities were selected, and they were divided into the Precede-Proceed group (270 cases) and the control group (250 cases) by different communities. According to the baseline survey and assessment results, the Precede-Proceed group conducted breast cancer and screening health education for 12 months. The control group only received the traditional health education.* ***Results:*** *Actually, 266 women were treated in Precede-Proceed group and 240 women in control group in this study. 12 months later, the scores of breast cancer and screening knowledge, attitude and behaviors were significantly increased in the Precede -Proceed group, and significantly higher than those of the control group. The differences were statistically significant (P<0.05).****Conclusion:*** *The Precede-Proceed health education improved women's breast cancer and screening knowledge, changed their attitude, and promoted the formation of behaviors of breast cancer screening.*

KEYWORDS: *Precede-Proceed model; Breast cancer; Screening; Health education*

The latest data from National Cancer Center (NCC) show that breast cancer has been the first of malignant tumor in women in our country recently and had trend in young person. [1] Many studies have shown that breast cancer is a malignant tumor which can reduce the mortality rate by early screening. The reason why the mortality rate of breast cancer in western countries is decreasing is related to early screening. [2,3] But the present situation of breast cancer screening in women in our country is not optimistic. [4] So it's very urgent and significant to take effective measures of intervention to promote women to form a good behavior of breast cancer screening. Precede-Proceed model founded by American health education scientist Lawrence WG is not only imparting health knowledge, but also emphasizing the intervention on attitude and behaviors to make health education really play a role in promoting health behaviors. [5] Therefore, this research will apply the theoretical framework of Precede-Proceed model to the health education of the breast cancer screening in women. A series of intervention plans are made to contribute to the formation of breast cancer screening behaviors.

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1. Studies and Methods

1.1 Study Members

A total of 520 women who were over 35 year of age, no history of breast cancer, had reading, listening and speaking ability and were willing to participate in this study were selected from four communities in a city. Two communities were randomly chosen as control group (250 cases) and the other two communities as Precede-Proceed group (270 cases). Compared two groups in age, occupation, degree of education, marriage and family income status, differences were not statistically significant. ($P > 0.05$)

1.2 Study Methods

1.2.1 Theoretical Basis

This research takes Precede-Proceed model as the theoretical framework. This model emphasizes that we should assess the target population from multi-dimensional perspective, look for factors that affect the healthy behavior and classify the influence factors (Predisposing Factors, Reinforcing Factors and Contributing Factors) to provide basis for making targeted health education intervention plans.

1.2.2 Study Tool

The questionnaire includes four parts. [6] (1) The general information questionnaire: including age, occupation, degree of education, marriage and family income status. 5 items in total. (2) The knowledge questionnaire of breast cancer and screening: including high risk factors for breast cancer, early manifestation, screening programs, time and so on.16 items in total. “YES” means 1 score. “NO” or “DO NOT KNOW” means 0 score. The higher the score, the better the cognition of breast cancer and screening. (3) The belief questionnaire of the screening of breast cancer: including Perceived Susceptibility, Perceived Seriousness and so on.14 items in total. The option is graded by Likert5. The higher the score, the more positive the attitude of the screening of breast cancer. (4)The behavior questionnaire of the screening of breast cancer: including whether do breast self-examinations, breast clinical examination, breast X-ray mammography, breast ultrasound or not; and the frequency of them.3 items in total. “YES” means 1 score. “NO” means 0 score. The higher the score, the better the behavior of the screening of breast cancer.

1.3 Health education of the Precede-Proceed group

1.3.1 Train Health Educators

A total of 135 baccalaureate nursing students from a medical school are trained as health educators. And all the nursing students should receive strict knowledge and

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skills training. The contents include the relevant knowledge and skills of breast cancer and screening and how to use Precede-Proceed model to do health education for study members. A health educator is in charge of two study members.

1.3.2 Make and Do Health Education Intervention Plans

Make health education plans according to the results of the baseline survey and affecting factors of breast cancer screening behaviors. The steps are as follows: (1) Directing at predisposing factors of screening behaviors, professional teachers give a lecture of health education. The contents and methods are shown in table 1. At the same time, hand out the material of health education of Prevention and Early Detection in Breast Cancer. (2) Directing at the contributing factors of screening behaviors, researchers make full use of Internet + Health Education platform to do some continuous intervention. A profile, a We Chat group and QQ group are created to get education video uploaded to the platform to let study members watch and learn. At the same time, health educators should go deep into communities and families to make the individual education--- face to face and hand by hand. And the point is to guide the study members to master the skills of breast self-examination and make sure that they could master and do it regularly. (3) Directing at the reinforcing factors of screening behaviors, researchers make full use of the social support resources of study members, including the supervises and encourages from relatives and friends; and professional technical guidance offered by researchers and health educators.(4) Tracking Evaluation: At the 4, 8, 12 months of intervention, the study members are evaluated by means of questionnaires and operating skills to make it easy to evaluate the effect of periodic intervention and adjust the intervention plan in time.

1.3.3 Health education of the control group

Professional teachers give a lecture of health education. The contents and methods are shown in table 1. At the same time, hand out the material of health education of Prevention and Early Detection in Breast Cancer.

Table 1 The Lecture of Health Education in Breast Cancer and Screening

Unit	Content	Method
Ⅰ	The present situation, risk factors and the clinical feature of breast cancer	Multimedia courseware teaching, the demonstration of breast silicone model, the case analysis and video
Ⅱ	A breast disease that needs to be identified with breast cancer	Multimedia courseware teaching, the demonstration of breast silicone model, the case analysis
Ⅲ	The meaning of breast cancer screening and screening programs	Multimedia courseware teaching, the demonstration of breast silicone model, the case analysis
Ⅳ	Breast self-examination skills and announcements	Multimedia courseware teaching, the demonstration of breast silicone model, video and the group guidance
Ⅴ	The prevention of breast cancer	Multimedia courseware teaching, video and the group discussion

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1.3.4 Data Collection

(1) Baseline survey: The questionnaires were handed out and collected in 520 copies. The effective rate is 100%. (2) The survey after 12 months: 266 effective questionnaires were collected by the Precede-Proceed group and the effective rate is 98.5%. 240 effective questionnaires were collected by the control group and the effective rate is 96.0%.

1.3.4 Statistical Methods

The results were statistically analyzed using SPSS 17.0. The metering data is expressed in ($\bar{x}\pm s$). And the results between two groups were compared with t test. The differences were statistically significant ($P<0.05$).

2. Results

2.1 The scores comparison between two groups in breast cancer and screening knowledge before and after the intervention

After the intervention of 12 months, the single scores and total scores of breast cancer and screening knowledge in the Precede-Proceed group were significantly higher than the intervention before ($P<0.01$) and also significantly higher than the control group ($P<0.01$). There was no statistically significant difference between single scores and total scores of breast cancer and screening knowledge in the control group compared with the intervention before($P>0.05$). See table 2.

Table 2 The Score Comparison Between Two Groups in Breast Cancer and Screening Knowledge Before and After The Intervention ($\bar{x}\pm s$, Scores)

Program	Before Intervention		*t*	*P*	After Intervention		*t*	*P*
	The Precede -Proceed Group (n=266)	The Control Group (n=240)			The Precede -Proceed Group (n=266)	The Control Group (n=240)		
Breast cancer knowledge	4.44±0.55	4.50±0.56	1.096	0.274	6.17±0.50 *	4.65±0.54	25.377	<0.01
Breast cancer screening Knowledge	4.14±0.44	4.09±0.44	-0.172	0.864	5.12±0.47 *	4.12±0.57	20.841	<0.01
Total scores	8.58±0.73	8.59±0.68	0.637	0.524	11.29±0.73*	8.67±0.80	32.167	<0.01

*$P<0.01$ compared with the intervention before.

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2.2 The scores comparison between two groups in breast cancer screening beliefs before and after the intervention

After the intervention of 12 months, the single scores and total scores of breast cancer screening beliefs in the Precede-Proceed group were significantly higher than the intervention before (P<0.01) and also significantly higher than the control group (P<0.01). There was no statistically significant difference between single scores and total scores of breast cancer screening beliefs in the control group compared with the intervention before (P>0.05). See table 3.

Table 3 The Score Comparison Between Two Groups in Breast Cancer Screening Beliefs Before and After The Intervention ($\bar{x}\pm s$, Scores)

Program	Before Intervention		*t*	*P*	After Intervention		*t*	*P*
	The Precede -Proceed Group (n=266)	The Control Group (n=240)			The Precede -Proceed Group (n=266)	The Control Group (n=240)		
Perceived Susceptibi-lity	5.20±0.60	5.28±0.61	-1.656	0.098	7.19±0.54*	5.43±0.63	33.543	<0.01
Perceived Seriousne-ss	12.00±0.33	11.96±0.34	0.957	0.339	13.20±0.43*	12.06±0.40	30.331	<0.01
Perceived Benefits	12.07±0.42	12.10±0.49	-1.896	0.059	13.31±0.46*	12.26±0.53	24.191	<0.01
Perceived Obstacles	9.11±0.42	9.08±0.73	0.536	0.592	10.60±0.96*	9.27±1.24	13.606	<0.01
Self-efficiency	7.21±0.41	7.22±0.42	-1.311	0.190	8.36±0.49*	7.34±0.50	23.580	<0.01
Total scores	45.58±0.98	45.64±0.21	-1.666	0.096	52.66±1.36*	46.34±1.59	48.016	<0.01

* P＜0.01 compared with the intervention before.

2.3 The scores comparison between two groups in breast cancer screening behaviors before and after the intervention

After the intervention of 12 months, the single scores and total scores of breast cancer screening behaviors in the Precede-Proceed group were significantly higher than the intervention before (P<0.01) and also significantly higher than the control group (P<0.05). There was no statistically significant difference between single scores and total scores of breast cancer screening behaviors in the control group compared with the intervention before (P>0.05). See table 4.

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Table 4 The Score Comparison Between Two Groups in Breast Cancer Screening Behaviors Before and After The Intervention ($\bar{x}\pm s$, Scores)

Program	Before Intervention		*t*	*P*	After Intervention		*t*	*P*
	The Precede-Proceed Group (n=266)	The Control Group (n=240)			The Precede-Proceed Group (n=266)	The Control Group (n=240)		
Self-examinati-on	0.41±0.49	0.38±0.49	0.962	0.337	0.95±0.22*	0.42±0.49	13.737	<0.01
Clinical examinati-on	0.33±0.47	0.30±0.46	0.679	0.498	0.46±0.50*	0.36±0.48	3.405	<0.05
X-ray mammogr-aphy or ultrasoun-d	0.22±0.41	0.24±0.43	1.251	0.211	0.40±0.49*	0.27±0.45	4.129	<0.05
Total scores	0.95±0.79	0.91±0.85	1.602	0.110	1.81±0.68*	1.04±0.84	11.665	<0.01

* $P<0.01$ compared with the intervention before.

3. Discussions

3.1 The health education intervention in the Precede-Proceed has improved the level of breast cancer and screening knowledge in women

The Precede-Proceed model has a strict framework guide. It helps researchers to do health education schematically and foreseeingly. The researchers build the Internet + Health Education platform to do some continuous intervention and make full use of the students from a medical school to make the individual education---face to face after the lecture of health education. It has changed a state that traditional health education accept the knowledge passively and motivated the study members' interest and enthusiasm in learning breast cancer and screening knowledge. The results show that the single scores and total scores of breast cancer and screening knowledge in the Precede-Proceed group were significantly higher than the intervention before ($P<0.01$) and also significantly higher than the control group ($P<0.01$) after the intervention of 12 months. Although the control group received the relevant health education lecture, it was hard to form a systematic knowledge structure for lack of the continuous strengthening supervision and the individual education. It results in the low level of breast cancer and screening knowledge.

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3.2 The health education intervention in the Precede-Proceed has helped the women build breast cancer screening beliefs

Health beliefs are the key for people to changing bad behaviors and adopting healthy behaviors. The Precede-Proceed model emphasizes the intervention of beliefs while imparting health knowledge. The results show that the scores of breast cancer screening beliefs in the Precede-Proceed group were significantly higher than the intervention before and also significantly higher than the control group (P<0.01) after the intervention of 12 months. In particular, the scores of Perceived Susceptibility, Perceived Seriousness and other aspects were significantly increased compared with the control group. Rosenstock, an American psychologist, thinks that Perceived Susceptibility and seriousness really provide the impetus for the change in behaviors. [7] The teachers in the research explained the present situation and high risk factors of breast cancer in our country by big data and cases to make study members really feel threatened by breast cancer and feel the possibility of breast cancer. It will push study members to build screening beliefs in early detection of breast cancer.

3.3 The health education intervention in the Precede-Proceed has promoted the formation of breast cancer screening behaviors in women

The establishment of healthy behaviors requires a process of accepting health knowledge, building health beliefs and changing attitudes. Therefore, the research emphasizes the improvement of screening skills on the basis of improving breast cancer screening knowledge and building screening beliefs. Health educators guide the study members to have a good command of breast self-examination skills through face to face and hand by hand to make them feel humanistic care and enhance the confidence and motivation of breast self-examination. The more positive the attitude towards breast self-examination, the higher compliance with breast clinical examination, breast X-ray mammography or breast ultrasound. It will lay the foundation of the formation of screening behaviors. The single scores and total scores of breast cancer screening behaviors in the Precede-Proceed group were significantly higher than the intervention before (P<0.01) and also significantly higher than the control group (P<0.05) after the intervention of 12 months. The author thinks that individualized health education in the research could influence the family members and the supervision, encouragement and support from relatives will have an enhanced effect on the formation of individual breast cancer screening behaviors. [8]

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