Effect of Health Teaching Program on Promoting the Healthy Lifestyle Behaviors of Women at the Reproductive Age Based on Pender's Model

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Abstract: Women with unhealthy lifestyle will threat their health status in long time and will enter into old age with a set of chronic disease and morbidity. One of the most important periods to be focused on it for promoting women's health, is their reproductive age. Aim of the study: Was to determine the effect of health teaching program on promoting the healthy lifestyle behaviors of women at the reproductive age based on Pender's model. Subjects and method: A quasi-experimental research design was utilized in this study. This study was conducted at maternal and child health (MCH) centers affiliated to the Ministry of Health in Tanta city, El-Gharbeya Governorate, Egypt. Study subjects: A convenient sample of 214 women at the reproductive age were included in the study. Three tools were used in this study. Tool I: Structured interview schedule: included the socio-demographic data and family history. Tool II: Health promoting lifestyle profile II (HPLPII): consisted of six sub-scales which encompassed the six healthy lifestyle dimensions (nutrition, physical activity, health responsibility, stress management, interpersonal relations, and spiritual growth). Tool III: Pender's determinants of healthy behaviors among the studied women: consisted of four constructs of the Pender's HPM (perceived benefits, perceived barriers, interpersonal influences, and perceived self-efficacy). Results: There was a statistically significant improvement in the mean score of the total healthy lifestyle behaviors (HLBs) among the studied women throughout the study phases (P=0.001). Where, the mean score of their total score of HLBs improved from 52.40 ±5.86 pre-program intervention to 70.05±6.28 immediate post and 68.65±7.74 three months post-program intervention. Conclusion and recommendations: The health teaching program based on Pender's model was effective and HLBs of the studied women at the reproductive age were improved. Therefore, health teaching programs based on Pender's model should be planned and offered at regular basis to all women to improve their adherence to healthy lifestyle, particularly during the reproductive years.

Keywords: Healthy lifestyle behaviors -Women - Reproductive age - Pender's model.

1. INTRODUCTION

According to the World Health Organization (WHO), 70–80% of deaths in developed countries and 40–50% of deaths in developing countries are due to diseases associated with lifestyle [1]. It is predicted that, by 2020, non communicable diseases (NCDs) associated with lifestyles lie at the root of seven out of 10 deaths in developing countries[2]. On the contrary, incorporating health promoting behaviors (HPBs) into an individual's lifestyle can improve health and prevent development of chronic NCDs, which are the leading cause of mortality and morbidity worldwide [3-4] .

Currently, health systems have outlined most of their plans based on family health and have paid special attention to women since they are the center of family health. Women's health influences the health status of other family members, including those of children. They also have an important role in training and transitions of healthy lifestyle to the next generation. Women in all age groups comprise a large proportion of the population; however, their burden of disability is high. All over the world in year 2015, women constitute slightly less than half of the total population (49.6%) with NCDs, are the leading cause of death, responsible for over 70 percent of all female deaths[5-9].

Promoting women's health is necessary during the reproductive years, the period when health issues such as pregnancy-related diseases and breastfeeding emerge. Women, who begin HLBs successfully, probably will do these behaviors in the future. HLBs include behaviors through which the woman attempts to follow a proper diet, engages in regular exercise, and pays attention to diverse physical dimensions, controlling emotions, feelings and thoughts, and defending against mental tensions and problems [10-12].

The creation, maintenance, and improvement of HLBs, as well as the complex nature of these behaviors require that behavior change theories or models to be used to identify the factors influencing the concerned behavior. One of the most comprehensive and predictive models used as a guide for investigating the complex bio-psychosocial processes that motivate individuals to engage in HLBs, is Pender's health promotion model (HPM). Pender's HPM is based on the social cognitive theory and the value expectancy theory[13,14].

The Pender's HPM comprises three basic components that influence the HPBs: individual characteristics and experiences (prior related behaviors and personal factors), behavior-specific cognitions and affect (perceived benefits of action, perceived barriers of action, perceived self-efficacy, situational influences, interpersonal influences, and activity-related affect), and behavioral outcome . The final outcome is engagement in health promotion behaviors. Although the individual characteristics cannot be modified, the behavior specific variables within the model can be modified through intervention[15-17].

Community health nurses(CHNs) have a central role in influencing women's beliefs and performance with regard to health promotion and disease prevention through their important role as health educators. They could contribute to increase women's awareness of HLBs through their active participation in planning and conducting structured educational programs with the main goal of promoting their health, motivating them, and overcoming their barriers for adherence to HLBs. The intervention of the CHNs ultimately entails correcting women's harmful habits and accepting beneficial habits affecting health. They can also encourage women to take effective disease prevention and health measures not only for themselves but also for their family [18-20]. So, the aim of this study was to evaluate the effect of health teaching program on promoting the HLBs of women at the reproductive age based on Pender's model.

Aim of the study

The aim of this study was to:

Determine the effect of health teaching program on promoting the HLBs of women at the reproductive age based on Pender's model.

Research Hypothesis:

The research hypothesis was met when the studied women who received health teaching program based on Pender's model had a higher level of adherence to HLBs.

2. SUBJECTS AND METHOD

Study design: A Quasi-experimental research design was used to achieve the aim of this study.

Study setting: The study was conducted in MCH centers affiliated to the Ministry of Health in Tanta city, El-Gharbeya Governorate. They were: MCH 2 (El-Inbaby center), MCH 5(El-Agezy), Medical center (in Sigar), and Medical center (in Boutros).

Study subjects: A convenient sample of 214 women represented approximately 10% of all women who were monthly attending the selected MCH centers. **The inclusion criteria used for selecting the sample was** women at the reproductive age. While, the exclusion criteria were women who had chronic, obstetrical and gynecological diseases.

Tools of the study:-

In order to collect the necessary data, three tools were used in this study:

Tool I: - Structured interview schedule:

It was developed by the researcher after reviewing the recent related literature. It included (16) questions about the age, residence, educational level, occupation, family income, marital status, age at marriage, number of children, spouse's level of education and occupation, type of family, number of family members and rooms (crowding index), and the family history of the studied women.

Tool II: Health promoting lifestyle profile II (HPLPII) [16,21,22]:

This instrument was designed by Walker et al., 1987 based on Pender's HBM to measure health promoting lifestyle behaviors (HPLBs).The original HPLP II included six sub-scales which encompassed six healthy lifestyle dimensions (nutrition, physical activity, health responsibility, stress management, interpersonal relations, and spiritual growth) with a total of 52 items.

Five items of the original HPLP II were omitted for its complexity to be done by the studied subjects, or similarity in meaning, or to suit the studied women's culture and consequently, their total items became 47. It used a four-point rating scale, ranged from one (never), two (sometimes), three (often), and four (routinely), which was attached to each item. The higher scores indicated higher adherence level to HLBs. The overall score was classified as the following:

- Score (82–<117) representing 25–< 50% indicated low level of adherence to HLBs.

- Score (117–<152) representing 50 %–< 75% indicated moderate level of adherence to HLBs.

- Score (152) and more, representing 75%–100% indicated high level of adherence to HLBs.

Tool III: Pender's determinants of healthy behaviors among the studied women[19,21,23,24-35]:

This questionnaire was developed by the researcher after literature review and was based on some variables of the Pender's HPM namely perceived benefits, perceived barriers, interpersonal influences, and perceived self-efficacy. Each one of the previously mentioned variable composed of items with a total number of 52. **Perceived benefits** included (6) items (i.e., "HLBs help to protect from chronic diseases). **Perceived barriers** composed of (18) items (i.e.,time constraints). **Interpersonal influences** (family, peers, and healthcare providers) included (15) items (i.e., getting encouragement from a family member or a friend to change unhealthy habits). **Perceived self-efficacy** composed of (13) items (i.e., having the ability to eat healthy foods instead of junk foods).

These items were scored based on a five-point Likert scale with options ranging from totally disagree= one to totally agree = five, except for the perceived barriers. Where, the score of its items was reversed. The mean score for different parts and total scale was categorized as follows:-

- Good belief: $\geq$ 60 % of the total score.

- Bad belief: 50% - < 60 % of the total score.

Method

The operation of this study was carried out as follows:-

1. Administrative process: Official letter to carry out the study was obtained from Dean of the faculty of Nursing to the directorate of Health Affairs, then from directorate of Health Affairs. Then official letters were directed to directors of the selected MCH and Medical centers in Tanta city.

2. Ethical consideration:

• An approval from the ethical committee in the faculty of Nursing, Tanta university was obtained to carry out the study.

- An informed consent of all the study subjects was obtained after appropriate explanation of the nature and purpose of the study.

- Anonymity and confidentiality of the collected data and the right to withdraw from the study at any time was assured. A code number was used instead of names.

3. Construction of the study tools:

- As regards to tool I and tool III, they were developed by the researcher based on reviewing of the related literature.

- Concerning tool II, it was adapted and translated into Arabic language by the researcher with doing the necessary modifications to be suitable for data collection.

- All tools of data collection were tested before conducting the study for their face and content validity by a Jury of five experts in related field.

- The study tools were tested for their reliability by using Cronbach's alpha test, it was computed and found to be (0.905) for all the study tools, (0.920) for tool II, and (0.888) for tool III.

4. The pilot study was carried out on a sample of 21 women at the childbearing age to test the tools for their applicability, clarity, and feasibility and they were excluded from the study subjects.

5. The study phases:

The study was conducted through the following four phases:

i. Phase 1(assessment phase):

− The data was collected by the previously mentioned tools through interviewing each study subject individually in the pre-determined setting to collect the baseline data as a pre-intervention assessment.

ii. Phase 2 (developing the intervention program):

− A teaching program for promoting the healthy lifestyle behaviors based on Pender's model was planned according to the study subjects' needs and relevant literature review as the follows:

a. Setting the objectives of the program:

− General objective of the program: was to help the studied women to improve their adherence to HLBs after receiving the teaching program.

− Specific objectives of the program: by the end of the teaching program, the studied women were able to:

1. Follow a healthy eating pattern.

2. Practice physical activity regularly.

3. Make proper decisions for their own health.

4. Show better stress management techniques.

5. Promote their spiritual growth.

6. Improve their interpersonal relations.

b. Preparing and organizing the content of the program:

− The health teaching program was developed by the researcher based on the results obtained from the interviewing sheet, as well as literature review.

− Organizing content of the program was done to achieve the previously mentioned objectives.

− The content of the program was organized in seven sessions to be provided for the studied women. **The sessions were as follow:**

First session: Program orientation and expectation(45-60 minutes).

The aim of this session was to orient the studied women with the program, its objectives, and the expectation after its implementation as well as to conduct the pre-intervention assessment.

Second session: Health promoting behaviors (45 minutes).

The aim of this session was to encourage the studied women to follow health promoting behaviors by discussing their importance and the most important obstacles affecting their follow-up.

Third session: Healthy nutrition(60 minutes).

The aim of this session was to improve the studied women's awareness of the dimensions of healthy lifestyle and help them to understand the first dimension of it, which is healthy nutrition.

Fourth session: Physical activity(60 minutes).

The aim of this session was to inform the studied women about the importance and recommendations of physical activity as well as encourage them to follow appropriate physical activity programs.

Fifth session: Health responsibility(60 minutes).

The aim of this session was to increase the studied women own health responsibility and encourage them to conduct periodic and self-examinations for early detection of diseases.

Sixth session: Stress management and spiritual growth (60 minutes).

The aim of this session was to inform the studied women about the factors affecting the individual's stress level as well as to improve their ability to control it and promote their spiritual growth.

Seventh session: Interpersonal relations (45-60 minutes).

The aim of this session was to provide the studied women with information related to improving their social communication skills and strengthening their relationships with others and to conduct the post-test.

c. Preparing the teaching materials (Power Point presentation, videos, posters, pictures, and a guiding booklet) in a simple Arabic language.

d. Selecting the teaching strategies: included lecture, brain storming, and individual/ group discussion.

iii. Phase 3 (program implementation):

– The field work of this study was done in (10) months starting from March 2018 to January 2019.

– The program was totally carried out by the researcher either individually or as a group ranged from (3-5) of the studied women, according to their choice.

– The program sessions were carried out with the duration of each session approximately 45- 60 minutes and a total of (375-405) minutes for all sessions.

iv. Phase 4 (program evaluation):

– The studied women data was collected three times to evaluate the effectiveness of health teaching program as the following:

1. First time: before implementation of the intervention using the three tools of the study.

2. Second time: immediately after the implementation of intervention using tools II and III.

3. Third time: three month after implementation of the intervention using tools II and III.

6. Statistical analysis

The collected data were organized, tabulated, and statistically analyzed using SPSS version 19 (Statistical Package for Social Studies) created by IBM, Illinois, Chicago, USA. For numerical values, the range means and standard deviations were calculated. For categorical variable, the number and percentage were calculated and differences between

subcategories were tested by chi square test (X^2). If chi square was not convenient, Monte Carlo exact test was used. The correlation between two variables was calculated using Pearson's correlation coefficient. The level of significance was adopted at p <0.05.

3. RESULTS

Table (I): Distribution of the studied women according to their socio-demographic characteristics

Socio-characteristics	Studied sample (N=214)	
	n	%
Age in years:		
< 20	26	12.1
20-	**116**	**54.2**
30-	62	29.0
40-	10	4.7
Range **Mean +SD**	15-43 27.14+6.74	
Residence:		
Rural	27	12.6
Urban	**187**	**87.4**
Educational level:		
Illiterate	12	5.6

Table (I): Continue.

Socio-characteristics	Studied sample (N=214)	
	n	%
Educational level:		
Primary	17	7.9
Secondary	68	31.8
University	**117**	**54.7**
Job:		
Student	47	22.0
Employee	**67**	**31.3**
Housewife	**67**	**31.3**
Worker	17	7.9
Professional	16	7.5
Marital status:		
Single	47	22.0
Married	**125**	**58.4**
Divorced	30	14.0
Widow	12	5.6
Age at marriage:		
<20	43	25.7
20-	**91**	**54.5**
25-	22	13.8
30-	10	6.0
Range **Mean ±SD**	16-32 21.86±3.37	
Number of children (n=167)		
0	22	13.2
1	31	18.6
2	**53**	**31.7**
3	37	22.2
4+	24	14.3
Range **Median**	0-6 2	

Table (I) shows the distribution of the studied women according to their socio-demographic characteristics. As regards to the age of the studied women ranged from 15 to 43 years with a mean of 27.14±6.74 years. More than half (54.2%) of the studied women aged 20 to less than 30 years. The majority (87.4%) of the studied women were resident in urban areas and more than half (54.7%) of them had university education. Slightly less than one-third (31.3%) of the studied women were housewives and employees respectively. More than half (58.4%) of the studied women were married and more than half (54.5 %) married at age of 20 to less than 25 years with a mean of 21.86±3.37 years. Furthermore, less than one-third (31.7%) of the studied women had two children.

Table (II): Distribution of the studied women according to their family characteristics

Family characteristics	Studied women (N=214)	
	n	%
Educational level of husband: (n=167)		
Illiterate	7	4.2
Primary	14	8.4
Secondary	**84**	**50.3**
University	62	37.1
Husband's job: (n=167)		
Unskilled worker	8	4.8
Skilled worker	19	11.4
Employee	38	22.7
Professional	30	18.0
Private work	**72**	**43.1**
Family income:		
Enough and saving	6	2.8
Enough	**112**	**52.3**
Not enough	96	44.9
Family type:		
Nuclear	**151**	**70.6**
Extended	40	18.7
Single parent	23	10.7
Having health insurance	**58.9**	**126**

Table (II): Continue.

Family characteristics	Studied women (N=214)	
	n	%
Family history of diseases:		
Hypertension	**80**	**37.4**
Diabetes	70	32.7
Cancer	59	27.6
Heart diseases	42	19.6
Musculoskeletal	31	14.5
Osteoporosis	9	4.2
Renal diseases	8	3.7
Crowding index:		
<1	13	6.1
1>2	**183**	**85.5**
> 3	18	8.4
Range	0.5-4.0	
Median	1.67	

Table (II) represents the distribution of the studied women according to their family characteristics. Slightly more than half (50.3%) of the studied women's husband had secondary education. Less than half (43.1%) of the studied women's husbands had private work. More than half (52.3%) of the studied women mentioned that their families income was enough. More than two thirds (70.6%) of the studied women had a nuclear family. It is clearly observed that more than half (58.9%) of the studied women had health insurance. Also, more than one third (37.4%) of the studied women had family history of hypertension. Moreover, the table illustrates that, the majority (85.5%) of the studied women had a crowding index of one to less than two persons per room.

Table (IX): Distribution of the studied women according to their adherence level to healthy lifestyle behaviors throughout the study phases

Variables	Studied women (N=214)						X^2	P
	Pre		Immediate post		Three months post			
	N	%	n	%	n	%		
Nutrition								
Low	117	54.7	3	1.4	3	1.4		
Moderate	95	44.4	77	36.0	64	29.9	312.37	**0.001***
High	2	0.9	134	62.6	147	68.7		
Physical activity								
Low	100	46.7	6	2.8	35	16.4		
Moderate	113	52.8	168	78.5	153	71.5	145.35	**0.001***
High	1	0.5	40	18.7	26	12.1		
Health responsibility								
Low	167	78.0	11	5.1	17	7.6		
Moderate	44	20.6	192	89.7	193	90.2	281.51	**0.001***
High	3	1.4	11	5.1	4	1.9		
Stress management								
Low	137	64.0	3	1.4	2	0.9		
Moderate	76	35.5	172	80.4	163	76.2	283.22	**0.001***
High	1	0.5	39	18.2	49	22.9		
Interpersonal relations								
Low	14	6.5	1	0.5	2	0.9		
Moderate	172	80.4	147	68.7	158	73.8	47.62	**0.001***
High	28	13.1	66	30.8	54	25.2		

Table (IX): continue.

Variables	Studied women (N=214)						X^2	P
	Pre		Immediate post		Three months post			
	N	%	n	%	n	%		
Spiritual growth								
Low	20	9.3	1	0.5	3	1.4		
Moderate	171	79.9	117	54.7	134	62.6	113.83	**0.001***
High	23	10.7	96	44.9	77	36.0		
All health promoting behaviors:								
Low	81	37.9	3	1.4	1	0.5		
Moderate	132	61.7	171	79.9	163	76.2	191.26	**0.001***
High	1	0.5	40	18.7	50	23.4		
Total health promoting lifestyle score:								**0.001***
Range	41-78		47-87		49-89			
Mean ±SD	**52.40±5.86**		**70.05±6.28**		**68.65±7.74**			

*Significant (P < 0.001)

Table (IX) represents the distribution of the studied women according to their adherence level to health promoting lifestyle throughout the study phases. The table reveals that, there was statistically significant difference among the studied women in relation to their adherence level to both health promoting lifestyle as a whole and to each dimension of it separately (nutrition, physical activity, health responsibility, stress management, interpersonal relations, and spiritual

growth), pre, immediate post, and three months post-program intervention (P=0.001). Finally, there was statistically significant improvement in the mean score of the total health promoting lifestyle among the studied women throughout the study phases (P=0.001). Where, the mean scores of their total score of the health promoting lifestyle improved from 52.40±5.86 pre-program intervention to 70.05±6.28 immediate post and 68.65±7.74 three months post-program intervention.

Table (XIV): Distribution of the studied women according to their total score of Pender's determinants of healthy behaviors throughout the study phases

Pender's determinants	Studied women (N=214)						X^2	P
	Pre		immediate post		Three months post			
	N	%	n	%	n	%		
Perceived benefits:								
Bad	2	0.9	0	0.0	0	0.0	4.000	0.135
Good	**212**	**99.1**	**214**	**100.0**	**214**	**100.0**		
Perceived barriers:								
Bad	81	37.9	2	0.9	2	0.9	152.22	**0.001***
Good	**133**	**62.1**	**212**	**99.1**	**212**	**99.1**		
Interpersonal influences								
Bad	80	37.4	102	47.7	92	43.0	9.58	**0.008***
Good	**134**	**62.6**	**112**	**52.3**	**122**	**57.0**		
Perceived self-efficacy:								
Bad	42	19.6	2	0.9	6	2.8	64.71	**0.001***
Good	**172**	**80.4**	**212**	**99.1**	**208**	**97.2**		
Total score:								
Bad	18	8.4	0	0.0	1	0.5	32.32	**0.001***
Good	**196**	**91.6**	**214**	**100.0**	**213**	**99.5**		

∗ Significant (P < 0.001)

Table (XIV) represents the distribution of the studied women according to their total score of Pender's determinants of healthy behaviors throughout the study phases. There was a statistically significant difference of the total perceived barriers score among the studied women pre, immediate, and three months post- program intervention (P=0.001). There was a statistically significant difference in the studied women's total interpersonal influences score during the three phases of the study (P=0.008). There was statistically significant difference in relation to the total perceived self-efficacy score among the studied women throughout the study phases (P=0.001). As well as, there was a statistically significant difference of the total score of Pender's determinants of healthy behaviors of the studied women during pre, immediate, and three months post-program intervention (P=0.001).

Table (XV): Correlation between age of the studied women and their age at marriage with health promoting lifestyle and Pender determinants of healthy behaviors throughout the study phase

Variable	Studied women (N=214)			
	Age in years		Age in years at marriage	
	r	P	r	P
Health promoting lifestyle:				
Pre	-0.034	0.616	-0.009	0.909
Immediate post	-0.357	**0.001***	0.019	0.809
Three months post	-0.358	**0.001***	-0.013	0.093
Pender determinants:				
Pre	-0.173	**0.011***	-0.130	0093
Immediate post	-0.459	**0.001***	-0.092	0.235
Three months post	-0.457	**0.001***	-0.069	0.167

∗ Significant (P < 0.001)

Table (XV): represents the correlation between age of the studied women, their age at marriage with health promoting lifestyle and Pender's determinants of healthy behaviors throughout the study phases. It is observed that, there was a significant negative correlation between age of the studied women and their health promoting lifestyle during immediate and three months post- program intervention as (P= 0.001 and 0.001 respectively). As regards to Pender's determinants of healthy behaviors among the studied women, they were negatively correlated with the age of the studied women in pre, immediate post, and three months post- program intervention as (P= 0.011, 0.001, and 0.001 respectively).

Table (XVI): Relationship between residence of the studied women, their health promoting lifestyle, and their Pender determinants of healthy behaviors

Variables	Studied women (N=214)				P
	Rural		Urban		
	n	%	n	%	
Health promoting lifestyle:					
Before					
Low	14	51.9	67	35.8	
Moderate	13	48.1	119	63.6	0.248
High	0	0.0	1	0.5	
Immediately after					
Low	0	0.0	3	1.6	
Moderate	24	88.9	147	78.6	0.393
High	3	11.1	37	19.8	
After three months					
Low	0	0.0	1	0.5	
Moderate	25	92.6	138	73.8	0.150
High	2	7.4	48	25.7	
Pender determinants :					
Pre					
Bad	8	29.6	10	5.3	**0.001***
Good	**19**	**70.4**	**177**	**94.7**	
Immediate post					
Bad	0	0.0	0	0.00	1.000
Good	27	100.0	187	100.0	
Three months post					
Bad	0	0.0	1	0.5	1.000
Good	27	100.0	186	0.995	

∗ Significant (P < 0.001)

Table (XVI) shows the relationship between residence of the studied women, their health promoting lifestyle, and their Pender determinants of healthy behaviors. There was no statistically significant relationship between residence of the studied women and their health promoting lifestyle. On the contrast, there was a statistically significant relationship between urban residence of the studied women and their Pender determinants of healthy behaviors pre intervention (P=0.001).

Table (XVII): Relationship between educational level of the studied women and their health promoting lifestyle and Pender's determinants of healthy behaviors

Variables	Studied women (N=214)						P
	Below secondary		Secondary		University		
	n	%	n	%	n	%	
Health promoting lifestyle: **Pre:**							
Low	15	51.7	24	35.3	42	35.9	0.477
Moderate	14	48.3	44	64.7	74	63.2	
High	0	0.0	0	0.0	1	0.9	
Immediate post:							
Low	1	3.4	0	0.0	2	1.7	0.752
Moderate	23	79.3	56	82.4	92	78.6	
High	5	17.2	12	17.6	23	19.7	
Three months post:							
Low	0	0.0	0	0.0	1	0.9	0.393
Moderate	26	89.7	51	75.0	86	73.5	
High	3	10.3	17	25.0	30	25.6	

*Significant (P < 0.001)

Table (XVII): continue.

Variables	Studied women (N=214)						P
	Below secondary		Secondary		University		
	n	%	n	%	n	%	
Pender determinants: **Pre:**							
Bad	4	13.8	6	8.8	8	6.8	0.481
Good	25	86.2	62	91.2	109	93.2	
Immediate post:							
Bad	0	0.0	0	0.0	0	0.0	1.000
Good	29	100.0	68	100.0	117	100.0	
Three months post:							
Bad	0	0.0	0	0.0	1	0.5	1.000
Good	29	100.0	68	100.0	116	99.1	

*Significant(P < 0.001)

Table (XVII) illustrates the relationship between educational level of the studied women and their health promoting lifestyle and Pender determinants of healthy behaviors. The table reveals that, there was no statistically significant relationship between educational level of the studied women and neither their health promoting lifestyle nor their Pender's determinants of healthy behaviors throughout the study phases.

Table (XVIII): Correlation between health promoting lifestyle of the studied women and their Pender determinants of healthy behaviors throughout the study phases

Pender determinants	Health promoting lifestyle					
	Pre		Immediate post		Three months post	
	r	P	r	P	r	P
Pre	0.355	**0.001***				
Immediate post			0.612	**0.001***		
Three months post					0.713	**0.001***

∗ Significant (P < 0.001)

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 3, pp: (630-647), Month: September - December 2019, Available at: **www.noveltyjournals.com**

Table (XVIII) represents the correlation between health promoting lifestyle of the studied women and their Pender's determinants of healthy behaviors throughout the study phases. The table shows that, there was a significant positive correlation between health promoting lifestyle of the studied women and their Pender's determinants of healthy behaviors during the three phases of the study as (P= 0.001).

4. DISCUSSION

Women's health is one of the indicators of development because women due to physiological conditions associated with reproduction and its complications, are more vulnerable than men. Therefore, promotion of healthy lifestyle in this group is very important, because they can promote the health enhancing issues associated to themselves, family, and community [36-38].

Generally, the present study revealed that, the Pender's HPM based educational program was effective in improving HLBs among the studied women. From the current study researcher's point of view, this effect could be related to the changes occurred in the Pender's constructs included in the present study after implementation of the program and then founding a positive correlation between Pender's determinants of the studied women's healthy behaviors and their HLBs (**table XIV** and **XVIII**).

This finding is similar to finding from a study conducted by **Askarian M et al.,(2019)**, to determine the impact of HBM on preventive behaviors of osteoporosis among the employed women aged 30 to 45 years at Shiraz university of Medical Sciences (Iran), and a study conducted by **Khosravan S et al., (2016)**, who evaluated the effect of an intervention based on Pender model on health promoting behaviors (HPBs) in women who are at the head of their household in Gonabad (Iran). Both studies concluded that, the Pender model based intervention significantly improved the HPBs in the intervention group[35,39].

The results of the current study illustrated that, there was a statistically significant improvement in the mean total score of HLBs among the studied women throughout the present study (P=0.001) (**table IX**). From the present study researcher's point of view, this may be referred to the employment of major concepts from the HPM as a framework for this study. This indicates the effectiveness of the intervention based on Pender model in improving the adoption of healthy lifestyles among the studied women. This opinion is also supported by **Eshah N et al., (2010)** [40].

These findings agree with **Radmehr M et al.,(2013),** who studied the effect of an educational program based Pender's model on health promotion of patients with obsessive-compulsive disorder, and illustrated a statistically significant difference (p<0.05) between their mean scores of HLBs before and after intervention (from 111.37 ± 21 to 139.57 ± 14) [41]. This is partly in line with **Mirhadyan L et al., (2019),** who conducted a study based on Pender's model to compare the health promoting behaviors in at risk groups of type 2 diabetes in women referred to health centers of Rasht city, Iran and reported that, there was a statistically significant difference (P<0.05) in HLBs score in the five groups according to the risk of type 2 diabetes, but differs from the current study in that, the interpersonal relations dimension did not displayed significant difference after the intervention[42].

Also, in **Khosravan S et al., (2016),** the scores of nutrition and health responsibility significantly increased (P< 0.001) two months after the intervention among the intervention group. Although, the mean score of physical activity increased in the intervention group similar to the present study findings but differs in that, the difference was not statistically significant between the two groups (P = 0.393) [19]. Moreover, a study had been done by **Eshah N et al., (2010),** to evaluate the effectiveness of Pender's model based intervention on Jordanian working adults' adoption of healthy lifestyle, showed that the total HPLP-II scores for the experimental group were significantly higher than those of the control group. That study support the current study in having significant improvement in health responsibility, nutritional behaviors and interpersonal relations dimensions among the experimental group. While, it contradicts with it in having no significant difference in physical activity, spiritual growth, and stress management dimensions between the control and experimental groups [40].

The current study illustrated that, throughout the study phases, there was no statistically significant difference in the perceived benefits among the studied women. On the contrary, there was a statistically significant difference in their perceived barriers, interpersonal influences, and perceived self-efficacy. In addition, there was a statistically significant difference in their total score of Pender's determinants of healthy behaviors (P=0.001) (**table XIV**).

From the researcher's point of view, having no statistically significant difference in the perceived benefits throughout the study phases may be attributed to that; almost all of the studied women already had a good level of perceived benefits pre-intervention (**table XIV**). That high percentage of women who were perceiving the benefits of HLBs may be relate to their characteristics; as the majority of them were urban residents (table I) which found later to be positively correlated with their Pender's determinants of healthy behaviors (**table XVI**).

The findings of the current study agree with **Lari H et al., (2018),** study's findings that showed a significant increase in mean scores of self-efficacy (P=0.001) and significant decrease in the perceived barriers (P< 0.001) in the intervention group compared to the control group after training, and the same was for **Sadeghi R et al., (2015a),** study[43,44]. Also, these findings are partly in agreement with **Sadegh R et al., (2017),** and **Khodaveisi M et al., (2018)** studies, who reported that, the mean scores of perceived benefits, perceived self-efficacy, interpersonal influences, and perceived barriers were significantly different among the experimental group throughout the intervention phases (P<0.001) [45,46].

Partial agreement is found also with **Dehdari T et al., (2013),** who stated that, the experimental group of female Iranian students had higher self-efficacy and perceived benefits and significant decrease in their perceived barriers for regular breakfast consumption compared to the control group[47]. Furthermore, **Naserpoor F et al., (2018),** study findings support the findings of the present study in the significant increase in self-efficacy and significant decrease in the perceived barriers in the test group. But it differs in that, there was a significant increase in their perceived benefits and interpersonal influences[48].

On the other hand, these findings of the present study are contradicted by **Haerens L et al., (2007),** who conducted a study to reduce the fat in the diet of adolescent girls and revealed no effect on their perceived benefits, barriers, or self-efficacy[49]. Also, **Dehdari T et al., (2016),** found that there was no significant difference in the perceived barriers between the intervention and the control groups following the intervention[50]. These differences in the obtained results can be primarily attributed to the differences in the objective of the study and perhaps some model structures may not be effective in the case of changing the targeted behavior.

The present study illustrated that, there was a significant negative correlation between HLBs of the studied women and their age immediate post and three months post intervention (**table XV**). This negative correlation may be attributed to that; the women's responsibilities for family and society usually increase with increasing their age (within the reproductive age period). They prioritize them over their own needs which consequently, decrease their opportunity for giving more attention to themselves. The women in the current study aged 15 to 43 years, and those who are 15 years are mostly students who are usually occupied with their study duties only. While, those older than them, usually have more different roles and responsibilities (more than half had children and slightly less than one-third were employees (**table I**)).

This finding is supported by **Shaheen A et al., (2015),** who mentioned that, the younger students tended to practice healthier lifestyle than the older and concluded that more studies are needed to understand the effect of age on health promoting behaviors[51]. Also, the findings of the studies carried out by **Kamali A et al., (2017), Mirghafourvand M et al, (2014),** and **Hanan A** and **Sahar M et al., (2011),** are in the same line. They reported that, younger age was among the predictors of commitment to exercise, where increasing age decreased the physical activity among the study participants [52-54].

On the contrary, it is contradicted by **Khosravan S et al., (2016), Jorfi M et al., (2015),** and **Bahar Z et al., (2013),** studies, who found that, there was no significant association between HLBs of the study subjects and their age [19,55,56]. Also, **Pirincci E et al., (2008)** study, contradict this finding in illustrating that, the studied academic staff had higher scores of health-promoting behaviors with increasing their age. The conflicting findings suggest that nurses have to thoroughly assess health promotion needs of the population to determine which age groups are high risk target groups to be dealt with first, second, third, and so on[1].

The results of the present study revealed that, Pender's determinants of healthy behaviors among the studied women had positive relationship with their residence (urban) in the pre-intervention phase (P=0.001) (**table XVI**). This positive correlation may explained by the expected difference in cultural and societal issues between urban and rural areas and also having more available facilitating resources in the city which mean fewer barriers for healthy lifestyle. Rural women are more likely to be cared for by health care providers with less skills and are more likely to spend more money and time in any effort to seek health care from skilled health professionals in bigger towns, these contribute to higher vulnerability in the context of access to appropriate health information, quality care, and high QoL.

ISSN 2394-7330

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The current study found that, Pender's determinants of healthy behaviors among the studied women had negative correlation with their age in pre, immediate post, and three months post-intervention (**table XV**). This negative correlation may be referred to that, the barriers for adopting health lifestyle may be increased with increasing the age, that is supported by **Karman A et al., (2015),** study who illustrated that there was an inverse correlation between age of the hypertensive rural residents and their self-efficacy, perceived benefits, and interpersonal influences[57].

The last variable in the HPM is health-promoting behavior, which is the outcome of this entire process and is the ultimate goal of it. When people of any age develop and integrate health-promoting behaviors into their lifestyle then, they have a better QoL. The present study showed that, HLBs of the studied women had significantly positive correlation with their Pender's determinants of healthy behaviors during the three phases of the study (**table XVIII**). This finding is due to that, the significant improvement of HLBs among the studied women was associated with significant reduction in their perceived barriers and significant increase in their self-efficacy (**table XIV**). This finding indicate the strong effect of Pender model specifically perceived barriers and self-efficacy in adopting health promoting behaviors among the studied women. This explanation is supported by **Lovell G et al., (2010),** who showed that, perceived benefits among non-exercising female university students in the UK were significantly greater than the perceived barriers to exercise and assumed that the perceived barriers could be more influential on behavior than perceived benefits[58].

This finding is consistent with **Mohsenipoua H et al., (2016),** who stated that, all Pender HPM variables were significant predictors of health-promoting behaviors and explained 69% of the variance in health-promoting behaviors and concluded that, Pender HPM based intervention can help to identify and predict cardiac surgery patients' lifestyle in Iran[59]. **Bahmanpour K et al, study (2011),** illustrated that, all the HPM variables were statistically significant predictors of oral health behavior, explaining 42.2% of the variance[60]. Likewise, a study by **Mehrabeik A et al., (2016),** concluded that Pender's HPM is a good predictive model for breakfast consumption among female high school students of Yazd province, Iran[61].

This is partly in line with **Jedd M et al., (2016),** who conducted a study in Azad University, Payame Noor University and Sarab Faculty of Medical Sciences, Iran to assess the cognitive-behavioral determinants of oral health in students using Pender's HPM and reported that, oral health behaviors had statistically significant correlations with all of the HPM structures except for situational influences(r=0.048)[62]. While, **Wittayapun Y et al.,(2010),** who assessed the factors affecting health-promoting behaviors in nursing students of the Faculty of Nursing, Srinakharinwirot University, Thailand found statistically significant positive relationships between their perceived self-efficacy and perceived benefits and their health-promoting behaviors (p<0.001) and negative relationship (p< 0.001) with their perceived barriers. The statistically significant predictor of health promoting behaviors was perceived self-efficacy, accounting for 79.0% of the variance in health promoting behaviors of nursing students (p< 0.001).The results suggested that, nursing students with decreasing scores of perceived barriers had a higher level of practicing health-promoting behaviors [63].

The present study findings are in harmony with **Chenary R et al., (2017),** who conducted a study to examine the direct and indirect effects of the factors of HPM on health-promoting behaviors in chemical veterans from Ilam province in Iran, and mentioned that all structures except perceived barriers had positive effects on health-promoting behaviors[64]. In addition, among the model constructs, perceived benefits had no effect on health-promoting behaviors. Furthermore, **Hanan A** and **Sahar M, (2011),** found that, the self-efficacy is a major influential factor associated with commitment to exercise in both osteoporosis and osteoarthritis patients and also the patient's scores of commitment to exercise, self-efficacy, perception of lack of barriers, and benefits from exercise are positively intercorrelated[54]. Although, the studies mentioned may differs from this study in term of sample under study, but all of them indicate that Pender model affect the lifestyle.

5. CONCLUSION

Based on the findings of the present study; it can be concluded that, the health teaching program based on Pender's model was effective and the HLBs of the studied women were improved significantly. Where, the mean scores of their total score was improved in the immediate post-program and three months post-program in comparison to that in pre-program. Also, there was a significant improvement among the studied women in relation to their adherence level to HLBs as a whole and to each dimension of it throughout the study phases.

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6. RECOMMENDATIONS

Based on the results of the present study the following recommendations were suggested:-

1. Health teaching programs based on Pender's model should be established at each MCH centers for improving the adherence to healthy lifestyle among women, particularly during their reproductive years.

2. Health care providers can utilize strategies of empowering women, reinforcing social and family support, increasing self-efficacy through motivational counseling, and overcoming their perceived barriers as an integral component of health-promotion interventions to facilitate women' long-term behavioral change.

3. More emphasis on ensuring cost effective health services, making structural changes in the environment as construction of sports facilities with appropriate costs and schedules in convenient places for all women, and improving their time management skills to overcome their common barriers for adopting healthy lifestyle.

4. More research studies to thoroughly explore the negative correlation found between age of the studied women and their adherence to healthy lifestyle and consequently, determine which age group at a higher risk to be dealt with first.

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