

Effect of Educational Intervention regarding Phytoestrogen Food on Hot-Flushes among Menopausal Women

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Abstract: Body of evidence for the potential health benefits of phytoestrogen food is increasing, especially in the management of hot-flushes which is the most menopausal vasomotor symptom. **Aim:** This study aimed to evaluate the effect of educational intervention regarding phytoestrogen food on hot-flushes among menopausal women. **Design:** A quasi-experimental research design utilized to conduct this study. **Setting:** The present study conducted at Faculty of Nursing and Technical Institute of Nursing employees' offices, Mansoura University, Egypt. **Sample:** A purposive sample of forty-six menopausal women was included in this study. **Tools:** Data were collected through three tools I: Self-administered questionnaire to assess socio-demographic characteristics and menopausal women's knowledge regarding phytoestrogen and hot-flushes. II: Menopausal Hot-Flushes Index to measure frequency and severity of hot-flushes III: Hot-Flush Related Daily Interference Scale to assess the effect of hot-flushes on a woman's daily activities. **Results:** This study revealed that, there was an improvement in knowledge of menopausal women regarding hot-flushes and phytoestrogen at the follow-up after six months than before educational intervention with highly statistically significant differences. Also, there was a decline in the frequency and severity of hot-flushes after educational intervention than before. **Conclusion:** The present study concluded that educational intervention improved the menopausal women knowledge regarding phytoestrogen food effect on hot-flushes which affect on decreasing the frequency and severity of hot-flushes and lower hot-flushes daily interference scores overtime. **Recommendation:** Raising menopausal women awareness regarding importance of phytoestrogen food by approaching camping in rural and urban areas.

Keywords: potential health benefits, phytoestrogen food, hot-flushes, menopausal women.

1. INTRODUCTION

Menopause is a natural event that most women experience in their lives. Menopause termed as permanent cessation of menstruation for more than twelve consecutive months. It constitutes about one third of their life. Many disruptive physiological symptoms are identified due to fluctuation of the ovarian production of natural estrogen which affect in turn all body systems and functions. These symptoms include being nervous, having hot-flushes, mood swings, and decreased vaginal lubrication during the sexual act and decrease libido (Dunneram et al., 2019).

Hot-flush or hot-flash is considered one of the hall marks signs of menopause. It is usually the first physical manifestation of decreasing ovarian function and decline in the estrogen level. It is one symptom of vasomotor instability during menopause. Hot-flushes are recurrent, transient episodes of flushing, perspiration, and a sensation ranging from warmth to

intense heat on the upper body and face and can be followed by chills. Sometimes, Hot-flushes occur during sleep and are associated with perspiration, so at this time they termed night sweats. Occasional, hot-flushes start several years before actual menopause. Additionally, there are some medical conditions that can cause hot-flushes such as thyroid disease, epilepsy, infection, and the use of certain drugs (*Beckmann et al, 2018*).

Hot-flushes increase when the woman approaches menopause. During the episode of hot-flush, woman experiences a sudden rapid feeling of warmth and flushing at the skin of the face and the anterior chest wall for about 90 seconds. After that a rapid resolution occurs and the menopausal woman feels diaphoretic and cold. Average duration of hot-flush ranges from several seconds to several minutes and rarely last to several hours. Hot-flushes can occur few times at the day and several times at the night (*Kaplan & Mahon, 2014*). Subjective measures of hot-flushes include assessing the frequency, severity, intensity, distress, and interference with daily activities (*Carpenter, Burns & Yu, 2012*).

Phyto is a Greek root word meaning plant. Estrogen is a natural female hormone that regulates functions in both women and men. Phytoestrogens function much like natural estrogen in humans. Recently, a surge in the use of phytoestrogens has been noticed due to its safe use. Phytoestrogen represents the most common alternative for Hormonal Replacement Therapy (HRT) without hormonal adverse effects. Phytoestrogens are non-steroidal compounds derived both from plants and from the in vivo metabolism of precursors contained in several plants which traditionally used as food. Phytochemicals exist in phytoestrogen are quite similar in function to gonadal estrogen hormone (*Girardi et al., 2014*).

Promoting health by providing health education is a vital issue of the advanced nursing practices for its importance in maintaining and improving women's health and wellbeing. Providing women with educational intervention empowers them to modify or integrate healthy behaviors into their lifestyles. In addition, the increasing longevity of the population in general, and woman specifically, provides an impetus for early intervention to improve long-term health. Providing educational intervention for menopausal women remains crucial for management of the most common and disturbing vaso-motor symptom during menopause (*WHO,2009*).

Justification of the study:

Hot-flush is the most common and undesirable distressing vasomotor symptom in menopause. It affects from 50% to 85% of women older than 45 years (*Mallhi et al., 2018*). Hot-flushes have negative effects on women's sleep pattern, sexual function, energy, family relationship, mood condition and overall woman's quality of life due to feeling of being non-productive either from the job productivity or from reproduction function. Hormone replacement therapy is the most effective treatment for hot-flushes and other vasomotor condition associated with the natural decline in the estrogen level at menopause. Considering the risk of venous thromboembolism, stroke, ischemic heart disease, breast cancer that may develop from HRT in addition to, contradictions of its use in certain menopausal women medical conditions, there is a new tendency toward utilization of some nutritional complements such as phytoestrogen to treat hot-flushes through natural way. Phytoestrogens are effective in maintaining bone mineral density, prevention of bone loss, and prevention of other health related problems associated with menopause. Egyptian studies which investigated this topic are so limited thus, this study designed to evaluate effect of educational intervention regarding phytoestrogen food on hot-flushes among menopausal women.

Aim of the Study

This study aimed to evaluate the effect of educational intervention regarding phytoestrogen food on hot-flushes among menopausal women.

Research hypothesis:

This study hypothesized that:

1. Menopausal women who receive educational intervention regarding phytoestrogen food, exhibit improvement in knowledge regarding phytoestrogen food post implementation than before.
2. Menopausal women who receive educational intervention regarding phytoestrogen food, experience fewer frequency of hot-flushes and less level of hot-flushes' severity post implementation than before.
3. Menopausal women who receive educational intervention regarding phytoestrogen food experience lower hot- flushes daily interference scores overtime than before.

2. METHOD

Research Design

A quasi-experimental research design was utilized to conduct this study. (pre/post-test) design utilized to achieve the aim of this study.

Setting

This study was conducted at Faculty of Nursing and Technical Institute of Nursing employees' offices, Mansoura University, Egypt.

Sampling

A purposive sample of forty-six menopausal women out of total number of fifty-two working women at the previous mentioned setting. Women included according to the following criteria; complaining from hot-flushes, can read and write, aging from 45 to 59 years old at their first year after menopause. Women who use any medication for hot-flushes or any medication that such as chemotherapy or hormonal therapy or has any current unstable physical or psychological conditions such as thyroid disease, epilepsy, psychosis or infection were excluded.

Instruments:

Four tools for data collection utilized to conduct the present study.

Tool I: Self-administered questionnaire which designed in Arabic by the researchers after reviewing the related Arabic and English literature (*Radtke, Terhorst & Cohen, 2011; Mohamed & Lamadah, 2016*). It consisted of three parts; first part related to the socio-demographic characteristics of the menopausal women such as name, age, education and social income and the second part related to menopausal history, years of menopause. These parts of the tool evaluated at the baseline assessment. The third part related to menopausal women's knowledge regarding hot-flushes and phytoestrogen. It included 19 questions in which the researcher collected and classified them into three categories. Six questions to assess menopausal women's knowledge regarding overview about hot-flushes, nine questions to assess menopausal women's knowledge about food rich in phytoestrogen and four questions to assess menopausal women's knowledge about benefits of phytoestrogen food in reducing hot-flushes. Each question had two levels of responses, score 1 was given for correct answer, score 0 was given to don't know or wrong answer. Maximum knowledge score of the menopausal women was equal 38. Total scoring key for menopausal women knowledge regarding phytoestrogen food was classified as unsatisfactory level of knowledge when the total knowledge score was less than 50% (score less than 19) and satisfactory level of knowledge when the total knowledge score was more than or equal 50% (score more than or equal 19). This part of the first tool evaluated three times; the first one at the baseline assessment, the second time immediately after the second session and the third time after six months of the enrollment in the study and after finishing the educational intervention.

Tool II was Menopausal Hot Flushes Index. This tool adapted from Kupperman Index (*Ehsanpour et al., 2012*) to measure frequency and severity of hot flushes on zero to three scales by using a daily diary in the morning and at the bedtime. The score of the severity was multiplied by daily frequency of hot flushes to estimate the score of the hot-flushes daily. An average for hot-flushes computed for a week period by summing the daily score of severity and frequency and dividing by seven to assess the validity of Menopausal Hot Flushes Index. This tool measured at the baseline assessment and after three months (third session) and after six months (fourth session).

Tool III was Hot-Flush Related Daily Interference Scale (HFRDIS), which was adopted from *Carpenter (2001)* to assess the effect of hot-flushes on a woman's daily activities. It is a 10 self-reported-item questionnaire related to interference with work, social activities, leisure activities, sleep, mood, concentration, relations with others, sexuality, enjoyment of life, and life satisfaction. Each item is rated from 0 (none) to 10 (extremely). A total score computed by summing items. Higher scores indicate higher interference due to hot-flashes. This tool measured at the baseline assessment and after three months (third session) and after six months (fourth session).

Supportive materials: Arabic booklet which developed by the researchers after reviewing Arabic and English literature (*Mohamed & Lamadah, 2016; Mallhi et al., 2018*) and printed in colored copy. It provided after the baseline assessment. It introduced an overview about hot-flushes and some nursing instructions to reduce hot-flushes. It started with nursing

instructions regarding phytoestrogens food as natural replacement of natural decline of estrogen. It illustrated phytoestrogens food benefits in reducing hot-flushes severity and frequency among menopausal women. It contained illustrated colored pictures for examples of food rich in phytoestrogen such as Soya products either soya beans or soya milk, barley, wheat, rice chickpeas, brown bread or leafy vegetables as mulukhya broccoli, cabbage and cauliflower. Additionally, some food and drinks were restricted as hot spices, hot pepper and spicy foods, high sweetened Juices and hot drinks and hot food. Furthermore, some nursing instructions related to wearing wide, and light cotton clothes, frequent changing clothes especially when being sweated, taking a daily shower at the bed time, perform regular simple exercises such as daily walking for half an hour or breathing exercise.

Tools validity and reliability:

Validity of this tool tested by five experts; two experts in maternity nursing, one expert in obstetric medicine and two experts in community health nursing. Their suggested configurations were made. Tools reliability for the adapted tool which was the second tool (HFI) was 0.80 by Alpha Cronbach test. Tools reliability for the adopted tool (HFRDIS) which was the third tool was tested using internal consistency methods (Alpha Cronbach test) Its result was 0.95 which indicates an accepted reliability of the tools (Carpenter, 2001).

Ethical considerations

An ethical approval letter attained from Research Ethics Committee, Faculty of Nursing, Mansoura University to conduct the research. A written consent obtained from every participant involved in the study after clarification the purpose, aim, risks and benefits of the research. All participants reassured about the confidentiality of the collected data and the safety of the intervention. In addition, the right to be withdraw from the study was permitted.

Pilot Study:

Pilot study carried on five menopausal women to test the objectivity and applicability of the research tools and the feasibility of research process. Participants in the pilot study were excluded from the research study.

3. DATA COLLECTION

The required data collected from the beginning of July 2017 to the end of March 2018. The baseline data collected by self-administered questionnaire (Tool I), also both HFI (Tool II) and HFRDIS (Tool III) measured by the researcher as perceived by the menopausal women in their last week before recruitment in the study. The phytoestrogen booklet (supportive material) was provided at the second session and illustrated by the researcher. Then a daily dairy was given and the menopausal women were asked to fill in frequency and severity of hot-flushes which happen in the morning and at the bedtime. Then the Menopausal women's knowledge questionnaire (Tool I) was re-assessed immediately after the second session and after six months of enrollment in the study. HFI (Tool II) and HFRDIS (Tool III) These tools were re-measured after three months and after six months of enrollment in the study and after finishing the educational intervention.

Research process:

The research process was carried out through three phases; preparatory phase, implementation of the phytoestrogen educational sessions, and outcomes evaluation.

1) Preparatory phase

At the preparatory phase, the relevant literature related to the study was collected, the tools were designed, and finally the pilot study was conducted to assess applicability of the study tools.

Development of educational intervention session: educational intervention regarding phytoestrogen food on reduction of hot-flushes among menopausal women was prepared based on the review of literature. A colored booklet was prepared according to the content in a simple Arabic language.

2) Implementation

Implementation of the study conducted by three sessions for each menopausal woman individually. Each session lasts for about 20-25 minutes. At the first session, the aim of the research explained, the informed consent obtained and a baseline assessment performed. The baseline assessment included assessment of women's knowledge regarding hot-flushes and

phytoestrogen, hot-flushes frequency and severity and the impact of hot-flushes on daily activity on the preceding week pre-enrollment in the study. The second session conducted on the next day. The objective of the second session was to provide the phytoestrogen booklet (the supportive material) to the menopausal women and to discuss with the woman about the booklet content and to answer any question. Immediately after the second session, the women’ knowledge regarding phytoestrogen was reassessed. The third session, conducted after three months after enrolment in the study. The objective of this session was to reassess hot-flushes frequency and severity and the interference of hot-flushes based on daily activity based on the daily dairy.

3) Outcomes evaluation

The outcome evaluation conducted after six months after the enrollment at the study by the fourth session. The objective of the fourth session was to reassess women’ knowledge regarding phytoestrogen, hot-flushes frequency and severity and also reassess the interference of hot-flushes on daily activity by using the same tools used pre the educational intervention sessions.

Statistical analysis:

Statistical Package for Social Sciences (SPSS) version 21.0 used for the statistical analysis of the obtained data. Data presented using descriptive statistics in the form of frequencies, percentages, means and standard deviations for quantitative variables. Chi-square test used for non-continuous variables such as the HFI and HFRDIS Pre and post intervention differences. The Cronbach's alpha was used to assess the reliability of a set of components of the HFI and HFRDIS. Statistical significance was considered at p-value < 0.05, a highly significant difference obtained at p <0.0001 and non-significant difference obtained at P >0.05.

4. RESULTS

Table 1 shows that more than two-thirds (67.4%) of the menopausal women their age were more than 50 years and the mean of age was 51.86±3.87 while, the mean of menopausal age was 49.82±2.94. It is obvious that more than three-fifths (60.9% &63.0%) respectively of them were married and hadn't enough income. Also, table one presents that half (50%) of them had middle level of education.

Table (1): Frequency and percentage distribution of menopausal women according to their demographic characteristics and menopausal history (n=46)

Item	Menopausal women (n=46)	
	No	%
Age (years)		
▪ <50	15	32.6
▪ ≥ 50	31	67.4
Mean±SD	51.86±3.87	
Menopausal age		
Mean±SD	49.82±2.94	
Menstrual year		
Mean±SD	2.21±1.45	
Marital status		
▪ Married	28	60.9
▪ Divorced	7	15.2
▪ Widow	11	23.9
Income		
▪ Enough	17	37.0
▪ Not enough	29	63.0
Residence		
▪ Rural	19	41.3
▪ Urban	27	58.7

Level of education		
▪ Read and write	6	13.0
▪ Middle	23	50.0
▪ High	17	37.0

Table 2 Shows an improvement in the knowledge of the menopausal women regarding overview about hot-flushes immediately post second session and at the follow-up after six months than pre-educational sessions with a highly statistically significant differences between the three assessments.

Table (2): Comparison between menopausal women correct knowledge about overview regarding hot-flushes pre and post educational intervention

Knowledge about overview regarding hot-flashes	Menopausal women n=46							
	Pre- educational sessions		Post educational sessions				χ^2	P
	Baseline		Immediate after second session		Follow-up After 6 months			
	No.	%	No.	%	No.	%		
Definition of estrogen	17	37.0	46	100.0	40	86.9	73.43	0.001**
Function of natural estrogen	16	34.8	46	100.0	35	70	76.66	0.001**
Definition of hot-flushes	13	28.3	46	100.0	42	91.3	86.74	0.001**
Causes of hot-flushes	9	19.6	44	95.7	40	86.9	92.85	0.001**
Drinks increased hot -flushes	8	17.4	42	91.3	39	84.7	85.60	0.001**
Food increase hot-flushes	9	19.6	43	93.5	42	91.3	81.52	0.001**

P ≤ 0.001 highly statistically significant

Table 3: denotes an improvement in knowledge of menopausal women regarding food rich in phytoestrogen immediately post second session and at the follow-up after six months than pre-educational sessions with highly statistically significant differences between the three assessments.

Table (3): Comparison between menopausal women correct knowledge about food rich in phytoestrogen pre and post educational intervention

knowledge about food rich in phytoestrogen	Menopausal women n=46							
	Pre educational sessions		Post educational sessions				χ^2	P
	Baseline		Immediate after second session		Follow-up After 6 months			
	No.	%	No.	%	No.	%		
Soya products are rich in phytoestrogen	5	10.9	46	100.0	43	93.4	116.66	0.001**
Brown bread is rich in phytoestrogen elements	5	10.9	46	100.0	40	86.9	116.66	0.001**
Leafy vegetables are from the phytoestrogen elements	5	10.9	46	100.0	38	82.6	116.66	0.001**
Fruits such as Kaka, Guava, and Apple are rich in phytoestrogen	6	13.0	46	100.0	35	76	112.65	0.001**
Chickpeas is rich in phytoestrogen	4	8.7	46	100.0	40	86.9	120.75	0.001**

Garlic is rich in phytoestrogen	3	6.5	46	100.0	42	91.3	124.92	0.001**
Dried fruits are rich in phytoestrogen	3	6.5	38	82.6	43	93.4	86.70	0.001**
Food rich in Calcium and Magnesium such as olive oil contains phytoestrogen	3	6.5	42	91.3	44	95.7	101.45	0.001**
Flax seed is rich in phytoestrogen	3	6.5	41	89.1	43	93.5	94.79	0.001**

P ≤ 0.001 highly statistically significant

Table 4. Presents an improvement in knowledge of menopausal women regarding benefits of phytoestrogen immediately post second session and at the follow-up after six months than pre-educational sessions with a highly statistically significant differences between the three assessments.

Table (4) Comparison between menopausal women correct knowledge about benefits of phytoestrogen pre and post intervention

knowledge about benefits of phytoestrogen	Menopausal women n=46							χ ²	P
	Pre first educational session		Post educational sessions						
	Baseline		Immediate after second session		Follow-up After 6 months				
	No.	%	No.	%	No.	%			
Definition of phytoestrogen	7	15.2	46	100	43	93.5	96.72	0.000**	
phytoestrogen can be used to decrease the frequency and severity of hot flushes	5	.10.9	46	100	42	91.3	116.66	0.000**	
phytoestrogen can be used instead of hormonal replacement therapy	4	8.7	46	100	44	95.7	97.36	0.000**	
phytoestrogen has no adverse effects on body	46	100.0	46	100	43	93.5	6.13	0.05*	

P ≤ 0.05 statistically significant

P ≤ 0.001 highly statistically significant

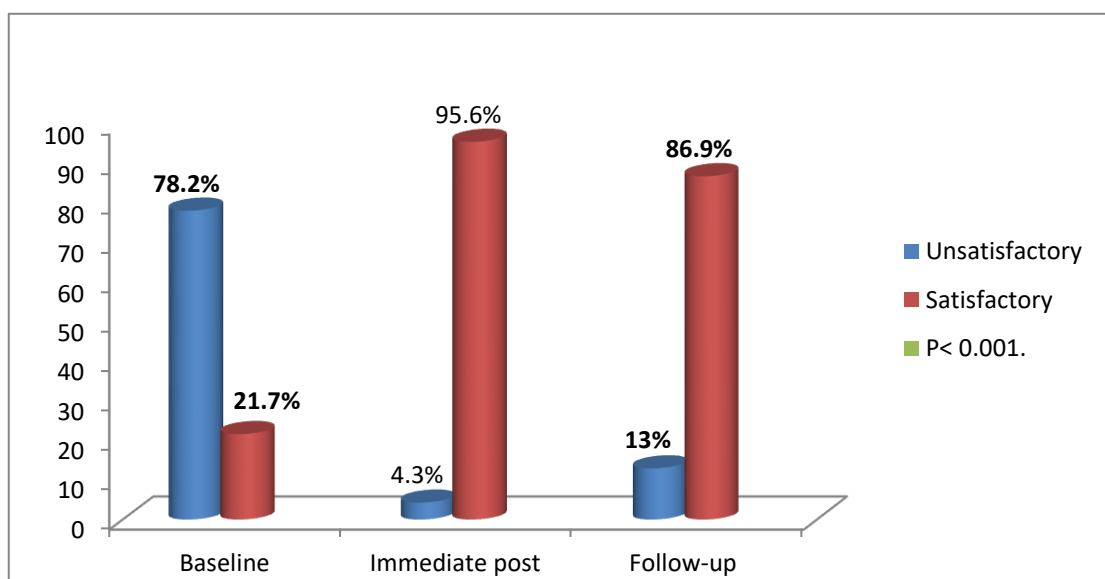


Figure (1) Total knowledge score regarding phytoestrogen

Figure 1. Shows that at the baseline assessment pre implementation of the educational intervention, more than three-quarters (78.2%) of the menopausal women had total unsatisfactory knowledge score regarding phytoestrogen and slightly more than one-fifth (21.7 %) of them had total satisfactory knowledge score regarding phytoestrogen. While, immediately after the second session, most menopausal women (95.6%) had total satisfactory knowledge score and only 4.3% had total unsatisfactory knowledge score. Additionally, at the follow-up after 6 months majority of them (86.9%) had total satisfactory knowledge score and only 13 % had total unsatisfactory knowledge score with highly statistically significant differences between the three assessment < 0.001.

Table 5. Illustrates that perceived daily hot-flushes frequency and severity reduced from baseline, 1st follow-up and 2nd follow-up with statistical and highly statistically significant differences.

Table (5): Comparison between mean score of perceived daily frequency and severity of hot-flushes at baseline, 1st follow -up and 2nd follow-up (n=46)

Hot-flushes	Menopausal women n=46					
	Pre- educational sessions	Post educational sessions			P1	P2
	Baseline	1 st follow-up After 3 months	2 nd follow-up After 6 months			
	Mean±SD	Mean±SD	Mean±SD			
Daily Frequency	5.30±0.95	2.65±0.33	1.09±0.10	0.001**	0.001**	
Severity	14.70±3.46	3.41±0.60	1.17±0.15	0.001**	0.001**	

P1: Comparison between baseline & first follow-up

P2: Comparison between baseline & second follow-up

P ≤ 0.001 highly statistically significant

Table 6 denotes that perceived hot-flushes interference on activities reduced from the baseline, to 1st follow-up and 2nd follow-up with highly statistically significant differences (P1& P2< 0.001).

Table (6): Comparison between effect of hot-flushes on daily activities pre, after three and six months of intervention (no= 46).

Hot-flushes interfered with	Menopausal women n=46					
	Pre- educational sessions	Post educational sessions			P1	P2
	Baseline	1 st follow-up After 3 months	2 nd follow-up After 6 months			
	Work outside or inside home	7.84±0.36	3.91±0.28	1.82±0.38		
Social activities with family and friends	5.93±0.24	2.95±0.20	1.00±0.00	0.001**	0.001**	
Sexuality	4.10±0.31	2.91±0.28	1.82±0.38	0.001**	0.001**	
Sleep	7.91±0.25	3.93±0.24	1.00±0.00	0.001**	0.001**	
Mood	7.95±0.29	3.91±0.28	1.84±0.36	0.001**	0.001**	
Concentration	7.89±0.37	3.97±0.14	1.91±0.28	0.001**	0.001**	
Relations with others	6.06±0.24	3.93±0.24	1.80±0.40	0.001**	0.001**	
Leisure activities	7.93±0.32	2.97±0.14	1.00±0.00	0.001**	0.001**	
Enjoyment of life	7.84±0.46	3.86±0.40	1.00±0.00	0.001**	0.001**	
Quality of life	7.84±0.46	3.89±0.31	1.00±0.00	0.001**	0.001**	
Total	71.34±1.07	36.28±1.06	14.21±0.89	0.001**	0.001**	

P1: Comparison between baseline & first follow- up

P2: Comparison between baseline & after second follow- up

P ≤ 0.001 highly statistically significant

5. DISCUSSION

Menopause is a global natural phenomenon. More than 80% of women complain from menopause related symptoms especially hot-flushes with different degrees of severity. Hot-flushes affect women quality of life and disturb women's normal pattern of activities (*Freedman, 2014*). Hormonal replacement therapy has become the common way to deal with hot-flushes and other menopausal symptoms to replace the natural decline in estrogen hormone during menopause, but unfortunately, HRT is associated with various side effects (*Krause & Nakajima, 2015*). Therefore, there is a great need to replace the natural decline in estrogen level during menopause by natural estrogen which found in phytoestrogen food.

Phytoestrogens have accumulated sufficient evidence to control vasomotor symptoms especially hot-flushes. Although phytoestrogen is a natural product containing estrogen but is not known to all women even educated one. So, improving menopausal women's knowledge about phytoestrogen is very important to decrease hot-flushes frequency and severity. Based on the previous issue, the present study aimed to evaluate the effect of educational intervention regarding phytoestrogen food on hot-flushes among menopausal women.

The present study finding showed that the menopausal women had poor knowledge regarding phytoestrogen, phytoestrogen food and its benefits in reducing hot-flushes frequency and severity before implementation of phytoestrogen educational sessions. This study finding may be contributed to the novelty of the concept of caring of menopausal women with hot-flushes only as the most previous Egyptian studies were related to the overall menopausal vasomotor symptoms without concentrating on natural elements related to management of hot-flushes.

Also, the present study finding revealed that at the immediate and at the follow-up, there was improvement of menopausal women's knowledge regarding phytoestrogen overview and benefits for reducing hot-flushes after implementation phytoestrogen educational sessions with highly statistical significance differences. This study finding may be due to the simplest of language used in the educational session, readiness of the menopausal women to know about phytoestrogen which they did not hear about it before and also the quality of the educational materials used. This study finding is consistent with a previous experimental study conducted by *Mohamed & Lamadah, (2015)* on 150 menopausal women at Elminia to improve menopausal women's knowledge and practices for reducing severity of menopausal symptoms by applying educational program. They reported that overall knowledge of menopausal women was poor before the educational program and there was improvement at the level of knowledge after implementation the program.

Menopausal women's knowledge regarding phytoestrogen overview, food rich in phytoestrogen and benefits for relieving hot-flushes evaluated before and after implementing the educational sessions. The present study revealed that, majority of women had better knowledge after phytoestrogen educational intervention than before with highly statistically significant differences $P \leq 0.001$. Accordingly, the first study hypothesis is confirmed.

The present study finding showed that, at the first and the second follow-up, the mean frequency and severity of daily hot-flushes were decreased after implementation of phytoestrogen educational intervention than before with highly statistically significant differences. The present study finding was in agreement with a systemic review conducted by *Anouk et al., (2008)* to assess effect of educational interventional on menopausal hot-flushes. They founded that fourteen studies involving 475 menopausal women who had educational program had improvement in frequency and severity of hot-flushes than before the intervention. Also, the present study finding is supported by another quasi-experimental study conducted by *Rotem et al., (2005)* on Eighty-two menopausal women. They found that participation in a program about menopausal symptoms including hot-flushes improve the women knowledge and decrease their perceived severity of symptoms. Thus, the second hypothesis is accepted.

Finally, the present study finding revealed that, at the first and second follow-up, the hot-flushes interference on daily activities reduced after implementing the phytoestrogen educational sessions than before with highly statistically significant differences. This study finding may be contributed to the decreased number and the less severity of hot-flushes after following the instruction provided to the menopausal women in our phytoestrogen educational sessions.

The present study finding is consistent with a study conducted by *Forouhari, (2010)* to investigate the effect of education on the quality of menopausal women life. They concluded that an appropriate education to menopausal women can improve their overall quality of life. In addition, the present study finding is confirmed by *Keefer & Blanchard (2005)*

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who evaluated the effectiveness of educational intervention for menopausal women hot-flashes on quality of life. They concluded that quality of menopausal woman life is improved following education than before. So, the third hypothesis is confirmed.

Thus, the aim of the present study was achieved through the present study findings which revealed that majority of menopausal women who attended educational phytoestrogen sessions had less frequency and severity of hot-flashes post educational sessions than before and had lower interference on daily living activities.

6. CONCLUSION

The present study concluded that educational intervention improved the menopausal women knowledge regarding effect of phytoestrogen food on hot-flashes which affect on decreasing the frequency and severity of hot-flashes and lower hot-flashes daily interference scores overtime.

7. RECOMMENDATIONS

1. Raising menopausal women awareness about phytoestrogen food importance to manage hot-flashes via mass media.
2. Provide educational sessions for menopausal women about phytoestrogen food by approaching camping in rural and urban areas.
3. Educational flyers regarding natural estrogen "phytoestrogen" sources should be printed and distributed in maternity and gynecological clinics.

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