

Locus of Control and Self-Efficacy Behaviors among Premarital Egyptian Women: Impact of Preconception Educational Interventions

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Abstract

Background: Preconception care interventions are directed toward the promotion of women's health and well-being before pregnancy.

Aim: To evaluate an educational preconception program on empowering the Egyptian premarital women with the concept of self-efficacy and locus of control behaviors.

Methods: A quasi-experimental, quantitative, (pre/ post one group) research design was used with 84 premarital females recruited conveniently from five primary health care centers located at Port- Said City, Egypt.

Data collection: By using 2 main tools which were locus of control scale, and the self-efficacy of diet and physical exercises used to assess self-efficacy of adults for diet (fat, salt) and exercise.

Results: Total mean of women age was 23.26 ± 4.2 , majority were bachelor degree of education, and unemployed. A highly statistical significant difference was reported between pre and post total mean score of internal and external locus of control, self-efficacy of eating healthy foods and motivation behaviour related physical exercises at p-value < 0.000 .

Conclusion: Current study demonstrated that the application of preconception educational intervention had a positive effect on empowering a sense of locus of control and self-efficacy behaviors among studied participants, which evidenced by a statistically significant difference between pre-test and post-test of multi-dimensional locus of control through improving their self-efficacy regarding eating and exercises. Therefore, it is recommended to incorporate these preconception educational programs to be an integral part of the services provided by PMCs. To ensure the dissemination of information related to locus of control behaviors, healthy life styles and motivation behavior of regular physical exercises that warrant the improvement of reproductive health and pregnancy outcomes for future Egyptian mothers.

Keywords: Education program; Locus of control; Preconception; Self-efficacy of eating

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Introduction

Premarital care (PMC) is a worldwide activity aiming to diagnose, treat unrecognized disorders, and reduce transmission of diseases to couples. Premarital care (PMC) is the promotion of the health and well-being of a woman and her partner before marriage. It seems to be very promising in decreasing the burden

of hereditary diseases, STD's, birth defects, and divorce rates. In Egypt, the first premarital care started in mid-2001. Nowadays, PMC became compulsory by law in many Arab countries including Egypt [1].

Women reproductive health status before pregnancy is a pivotal aspect for pregnancy outcomes and for the relative risk for both

maternal and infant complications. Effective preconception care interventions could be offered to improve the health of women, infants and families [2]. Therefore, the potential role of primary health care centers in delivering preconception care is recognized and nurses' practitioners acknowledged that preconception care can improve reproductive health and pregnancy outcomes. In the Middle East and African countries, women health care does not start until the pregnancy is well established and in most low-income settings not until more than half of the pregnancy has passed. The term preconception care (PCC) is widely used for activities intended to address and assess educational programs and strategies used by nurses in educating women during the preconception period.

In most settings worldwide, facilities already exist for antenatal care and well-baby care and could be extended. It would, however, require some reorientation of staff and that primary health care would assume a central position within the system and the community [3]. Nurse-midwives have a suitable education for taking on all the suggested components in preconception care and counselling. The use of tools such as a reproductive life plan or other educational tools adapted to the health literacy of the target group can be helpful in initiating discussions about reproduction health promotion. Despite, this preconception care was not a part of routine practice in the primary care settings [4]. Barriers of implementation include the dilemmas whether female in premarital period never think to go for PHC except for premarital counselling as well it wasn't acceptable culturally. In fact Preconception [5] interventions provided in primary care can truly link with improved pregnancy outcomes as well as concerns over the cost-benefit of the interventions. The current study used health locus of control (HLOC) and self-efficacy as the framework for a health education program. HLOC is defined as the extent to which individuals believe that they can control events and outcomes in their own lives [6].

Locus of control consists of two types: internal and external locus of control. Individuals with a high internal locus of control believe that events in their life are a result of their own actions, while those with a low external locus of control believe that the events in their life are primarily a result of outside forces (e.g., other people, fate, chance) acting upon them. It is relates to the idea that individuals' perceived degree of control over their health is a determinant of their health behaviour. According to Bastani et al. [7] higher internal HLOC is a predictive factor for positive outcomes in health education interventions.

While the self-efficacy is identified as the confidence in person's ability to do specific behaviours in specific situations. It pertains to a sense of control over one's environment and behaviour. Self-efficacy beliefs are cognitions that determine whether health behaviour change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures. The Components of health care during pregnancy such as education about a healthy lifestyle, basic testing for anaemia, good nutrition and regular physical exercises could easily be integrated into comprehensive preconception care and counselling. Better services in preconception health

can lead in improved health outcomes for women in their preconception period. Health education is one of the tools that provide individuals with the knowledge, skills, and motivation to make healthier lifestyle choices.

There are various health problems related to chronic diseases followed by lifestyle alteration, and variation of food intake forms, such as unnecessary calories in everyday meal plan and decline of physical activities [8]. According to Caspersen [9] physical activity has been defined as 'any movement of the body produced by the skeletal muscles that result in energy'. These Bodily movements can be divided into two categories: baseline activity and health-enhancing activity [10]. Light-intensity activities done by people in their daily live, such as walking slowly and standing, are considered baseline activities which have some health benefits.

Moreover, health benefits can be gained by assuming moderate or some heavy physical activity in addition to baseline activity. On the other hand, The Health and Social Care Information Centre [HSCIC] [11-13] indicated that a person would be considered physically inactive if they do not engage in any forms of health-enhancing physical activity or fail to meet physical activity guidelines. In Egypt, nowadays there are many announced campaigns directed to the Egyptian population between 18 to 64 years which were advising them to start healthy life style either by selecting healthy foods or practicing at least 150 minutes of moderate-intensity activity a week (NHS Choices).

Accordingly, there is a significant relationship between the health locus of control and prevention behaviour of women and sense of self efficacy related to eating healthier foods and physical exercises. The concept of the health locus of control is an important factor in individual's perception about their control over health behaviours [14]. In addition, health control beliefs have an important effect on the adoption of healthy and unhealthy behaviours [15-17]. Bastani et al. [7] investigating the effect of preconception health information on the experience of women in preconception period, used self-efficacy and a health locus of control as tools to measure the effect of health education on the reproductive health of women during their preconception period.

Their study revealed that short-term educational interventions affect the psychological determinants of the health and lifestyle determinants of women was evidenced with the change in scores of the health locus of control in groups that had benefited from premarital counselling education before they became pregnant.

Moreover, Bastani et al. [7] findings supported other studies that posited that providing health educational services to women in their preconception period boosted health outcomes [18,19]. It also conformed to the theoretical foundation of self-efficacy, which posited that women who were exposed to educational programs about reproductive health were able to maintain healthy life styles, sense of self efficacy and holding positive internal locus of control. Therefore, the current study was looked at evaluating an educational preconception program on empowering the Egyptian premarital women with the concept of self-efficacy and locus of control behaviours as a primary step toward improving the health of women, infants and families.

Aim of the study

The current study was looked at evaluating the effectiveness of a pre conception educational program on empowering premarital Egyptian women with the concept of self-efficacy and locus of control behaviours.

Significance of the Study

The premarital Egyptian female age group, need to be knowledgeable about healthy life style which include eating healthy foods and practicing physical exercises. They have to be knowledgeable about the impact on their reproductive health and how to access the services before they have their first child. To the best of our knowledge, all training program usually conducted for nurses and health professionals. Very little attention is given to educate population about the reproductive health, genetic and importance of premarital counselling among young women. Despite the wide spread numbers of MCH centre's all over Egypt, there is lack of awareness regarding the services provided by these centre's which involve premarital counselling and human reproductive education. Furthermore, many young females enter marriage with insufficient information on sexuality, reproduction, and family planning even among educated women. Information about healthy life styles, self-efficacy usually reaches the public through either the overemphasis or distortion by the mass media [20]. In fact, Strengthen the premarital women knowledge about locus of control and sense of self efficacy will improve their understanding and cooperation in decreasing the number of diseases affecting children and mothers health. Additionally, corresponding with the new vision of 100 million health initiated by Egyptian Ministry of Health of early discovery of diseases, promotion and protection of their health especially from reproductive health hazards is very essential to maintain healthy life styles and well-being among new generations. It is important

to assess and improve knowledge and motivational behaviours of premarital women in relation to locus of control and self-efficacy since; they are the future mothers in order to ensure safe childhood as well motherhood [21]. Therefore, the researchers thoughts about evaluating the effectiveness of a preconception educational program on strengthening motivation behaviours of locus of control and sense of self efficacy related to eating healthier foods and doing regular exercises among premarital women as a step of promoting and maintain reproductive health of the future Egyptian mothers.

Theoretical frame work

This research addressed three areas of the participant's determinants which are; locus of control, motivational behaviour towards a healthy life style and physical exercises and sense of self efficacy in relation to reproductive health promotion (Figure 1). Bandura [22] defined self-efficacy as "belief in one's capabilities to organize and execute the courses of action required to produce given attainments". He hypothesized that individuals are not simply efficacious (i.e., confident) or not, but the degree of efficacy they have within a specific activity determines their confidence level (1978, 1986). If one assumes that the outcome of one's actions is important, Bandura believes that individuals make two judgments: (a) 'Do I have the skills?' and (b) 'Am I in control of the consequences?' On the other hand, Rotter [6] developed the concept of locus of control, which describes the degree to which people believe they can control the events in their lives. People with an internal locus of control believe that their own behaviour determines the good and bad things that happen to them, whereas those with an external locus believe that forces outside themselves determine what happens. With this theory, it was asserted that an individual's locus of control influences the performance level of them. Therefore, this model was used to evaluate the effectiveness

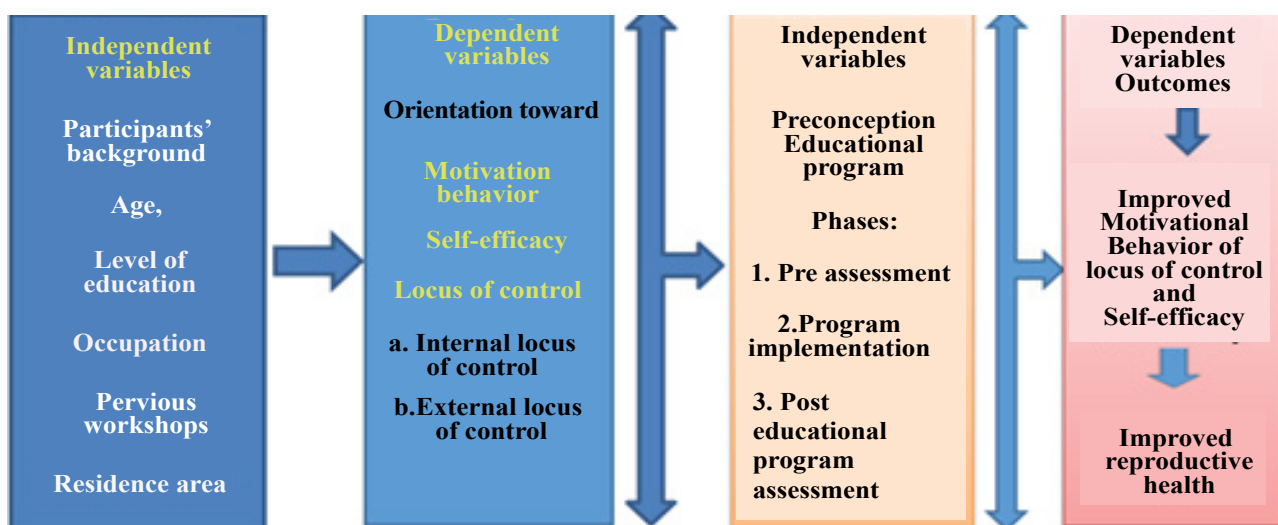


Figure 1 Self-efficacy and locus of control. This model has been adopted to study impact of the independent variable which was implementation of the educational program on strengthening the dependent variables which were locus of control, motivation behaviors, and sense of self efficacy

of preconception educational program (independent variables) on the performance of premarital Egyptian women since, the perceived environmental controllability has been found to be related to greater self-efficacy [23-25] it is reasoned that persons with a more internal locus of control will have a higher self-efficacy than individuals with a more external locus of control. Furthermore, studies have shown that self-efficacy has an effect on a person's performance. The way that, premarital women are reacting to the cultural, traditional, and environmental determinants of their performance related to their reproduction health will be influenced by their beliefs and self-efficacy towards these practices (behaviour). That is, even if a person has the ability to perform well on a task, if she does not believe that she is capable of performing well (i.e., low self-efficacy), it is unlikely that high performance goals will be set [24]. But how we think about those things makes all the difference in our lives. It should be apparent that we are most likely to have a high sense of self-efficacy, when we work from our perceived strengths. Additionally, assessment of what are the desired performance level to change the participants outcomes in terms of increasing sense of self efficacy, locus of control and motivational behaviour of using healthy life styles to promote reproductive health of Egyptian women.

Research questions

The questions posed in this study were:

- What are the common self-efficacy beliefs among studied subjects in relation to eating healthy foods and physical exercises?
- What are the common locus of control behaviours practiced by studied group in pre and post interventions?
- What are the factors affecting the locus of control and self-efficacy among studied sample?
- Can demographic and personal characteristics impact the acquisition of more knowledge and thereby potentially decrease healthcare errors and promote safer reproductive health?

Hypothesis

- The females who will attend the educational intervention program will develop a sense of locus of control and self-efficacy.
- The females who will attend the educational intervention program will show no change of locus of control and self-efficacy.

Operational definition

Locus of control is defined as the extent to which individuals believe that they can control events and outcomes in their own lives [6]. The term consists of two types of internal and external locus of control. Individuals with a high internal locus of control believe that events in their life are a result of their own actions, while those with a low external locus of control believe that the events in their life are primarily a result of outside forces (e.g., other people, fate, chance) acting upon them.

Self-efficacy is confidence in the ability to do specific behaviours

in specific situations. It pertains to a sense of control over one's environment and behaviour. Self-efficacy beliefs are cognitions that determine whether health behaviour change will be initiated, how much effort will be expended and how long it will be sustained in the face of obstacles and failures.

Methodology

Design

A quasi-experimental design was used to achieve the objective of the current study.

Setting

The study was carried out at five primary health care centers that provide premarital care at Port Said City namely El-Kabouthy, EL-Monakh, El-Kuwait, Omar Ebn El-Kattab and El-Arab. In each center (PMC), the premarital care is non-profit producing services such as history taking, natal examination and lab investigations for RH and blood type was performed. The PMC services are provided from 08:00 AM to 02:00 PM. All PMC are managed by only six professionals including, 2 nurses who are responsible about taking history and counselling, only one physician, one lab technician and two social workers.

Sampling technique

Cluster Sample technique was applied to recruit study subjects from five districts located in Port- Said City which were (EL-Monakh, El- dawahy, El-Shark, El-Zohor and El-Afrangy) then simple random selection was used to select one center from each previous listed districts. A consecutive sample of Egyptian women who were attending pre-marital counselling center in Port Said city, affiliated to Port said Governorate, Egypt and met the inclusion criteria which were the following: any female of childbearing age (18-35 years); with no identifiable health risk factors (self-reported); intending to conceive in their first year of marriage; literate in Arabic, and accept to participate in the study.

All women met the inclusion criteria were invited to participate in the current study and convenient sampling technique was used to recruit the studied sample. A brief explanation about the study purposes was given to the participants before signing the informed consent.

Tools of data collection

Three main tools were used to achieve the purpose of the current study as following:

1. Socio-demographic and personal information data sheet which is developed by the researchers. The tool was questioned the participants about their age, educational level, residence area, occupation, previous attending workshops and economic state.
2. Health Locus of control scale (HLOC) was assessed by using the Multidimensional Health Locus of Control scale [6]. This scale consists of 18 items, each of which is rated on a 6-point scale from 1=strongly disagree to 6=strongly agree, with adequate internal consistency; 5 items contribute to the internal locus

of control scale (e.g., "People's ill health results from their own carelessness") and 6 items concern the external locus of control scale (e.g., "People who never get sick are just plain lucky"). Ratings are summed so that scores on internal items range from 1-9, with higher scores indicating greater belief in internal HLOC and scores on external items range from 10-18, with higher scores indicating greater belief in external HLOC.

3. The self-efficacy of diet and physical exercise was assessed using the Health-Specific Self-Efficacy Scale [26]. Self-efficacy is confidence in the ability to do specific behaviours in specific situations. These measures were developed to assess self-efficacy of adults for diet (fat, salt) and exercise. Items were developed through formative research. These scales have been adapted for "physical activity". The scale is consisted of 32 statements divided into 2 main scale as following:

A. Eating habits: Survey it consisted of 20 statements rated from: I know I cannot (1-2), maybe I can (3-4), I know I can (5-6), doesn't applicable (7-8). The four factors for the Self-Efficacy and Eating Habits Survey should be scored as follows: Sticking to it: mean items 1-5, Reducing calories: mean items 6 - 10, Reducing salt: mean items 11-15, and Reducing fat: mean items 16-20.

B. Physical exercises: It is consisted of 11 statements concerned with whether the respondents exercise or not, by asking to rate how confident they are could really motivate themselves to do exercises. Similarly to the self-efficacy of eating habits the respondents rate will be: I know I cannot (1-2), maybe I can (3-4), I know I can (5-6), doesn't applicable (7-8). The two factors for the Self-Efficacy and Exercise Habits Survey should be scored as follows: Sticking to it: mean items 22, 23, 25, 26, 28 - 31, Making time for exercise: mean items 21, 24, 27 and 32.

Validity and reliability

The instruments were translated into Arabic and back translated into English, verifying whether the translation covers all aspects of the original English version of the questionnaire or not. To ensure the face validity of the final translated Arabic version of the questionnaires, the tools were evaluated by experts who were selected based on their qualifications and experience in nursing research and education. The reliability of the questionnaires were calculated and Cronbach Alpha for both locus of control questionnaires and self-efficacy of nutrition and physical exercises were reported to be (0.85, 0.79) respectively.

Pilot study

The tools were piloted and tested by 10 participants to identify ambiguities, the time required and any difficulties that might be encountered by the participants in reading or understanding. Those 10 participants were included within the participants of the current study.

Data management

The data were analysed using SPSS 20 version. Data were reported using descriptive statistics in the form of frequencies,

percentages, means and standard deviations. A paired t-test was used to analyse the total scores of the participants responses on the pre-test and the post-test with $P < 0.05$ considered significant. Pearson(r) test and ANOVA were used to test the correlation between respondents' knowledge and socio-demographic variables. The significance level was reported and pre-settled at $p < 0.05$.

Ethical considerations

An official approval was obtained from research committee at Faculty of Nursing, Port Said University. In addition to the approval from the director of the PMC centers. The participants were informed about the purpose of the study, and that their participation was voluntary and they can withdraw from the study at any time. A written consent was obtained from all participants. Anonymity was ensured by using identification codes on the questionnaires that facilitated individual comparison of pre-and post-educational program responses.

Data Collection Procedure

Pre-test administration

An approval to conduct the study was obtained from the director of PMC affiliated to Ministry of health, Port Said city, Egypt. A letter with all details of the educational program was shown for the people working in the center to motivate all women attending for premarital counselling to participate in this study. The Ethical issues were raised by taking verbal and written consent for participation from the female after explaining the aim of the study and confirming confidentiality of their data. The major dependent variables (HLOC and physical exercise self-efficacy) were measured before the program intervention. Participants were asked to fill the questionnaire at the beginning of the first day of data collection (i.e., before the theoretical session starts).

Program description

A preconception health education program for the women was consisted of one day (3 consecutive sessions), each session was 45 minutes to 60 minutes. Group education was selected for the intervention as it is an effective method for the topics intervention and it is considered costs effective than one-to-one teaching. Accordingly, the convenient time and place for the participants were arranged for easily running of the educational interventions. The workshops were presented by the investigators who were qualified in health education and women's health.

The program components

The objectives of the educational program were to:

- Explain knowledge about healthy life style, and its importance in the motherhood future among females.
- Assist participants to recognize different healthy behaviours in relation to nutrition and physical exercises.
- Develop awareness about the non-healthy life styles that may lead to diseases of diabetes and hypertension during pregnancy.

- Empower the participants to understand the future risks of unhealthy lifestyles, the appropriate healthy life style, essential nutrients and physical exercises which can help them to protect their offspring's from physical and mental health problem.

The following topics were covered:

- Introduction to healthy lifestyles, appropriate nutrition and physical activity.
- The benefits of healthy lifestyles for physical, psychological and emotional health in women.
- The relationship of unhealthy and healthy lifestyles (including physical activity) with morbidity and mortality.
- The consequences of overweight and/or underweight on pregnancy and pregnancy outcomes.

Methods of instructions

PowerPoint presentation and videos were used as a primary method of teaching. Booklets, pamphlets and audio-visual materials pointed for healthy and non-healthy life styles were used and distributed to the studied subjects. Active participation and discussion were motivated among participants to ensure the clarity of presenting information.

As regard to the effectiveness of instructional methods that were used throughout the program, many studies suggested that audio-visual materials, video showing, role play and modeling are effective methods in teaching people in at least influencing their knowledge and behaviours. It is considered helpful in maintaining their psychological, physiological and emotional wellbeing during their future pregnancy and motherhood behaviours.

Post-test administration

Questionnaires were fulfilled again by the attending females after implementing the program.

Results

The distribution of studied subjects according to their demographic and personal experiences as it is shown that total mean of age was 23.26 ± 4.2 , majority were bachelor degree of education and live in the south district of Port Said city. More than 2/3rd (62.3) were unemployed and more than half of them didn't attend previous training in workshop (**Figure 2**).

The difference between pre and post total mean score of the studied subjects as regard to locus of control (**Table 1**). The table indicated that there were a significant difference between pre / post total mean score in all scales item except for the items which were 'No matter what precautions I make, it will not prevent me from getting sick, When I am sick, I am responsible for it, Luck plays a big role in determining how fast recovery from the disease is, Good health is the greatest wealth The true meaning of survival is to keep it healthy and If I follow the correct procedure I can stay healthy at $p=0.031, 0.202, 0.877, 0.887, 0.080, 0.018$ respectively. The comparison between pre and post-program assessment of the studied subjects regarding self-efficacy of healthy life style is showed in **Table 2**. The results showed that there were significant differences between pre and post assessment of self-efficacy of eating and physical exercises self-efficacy at $p<0.05$ except for these items "Be sure to eat low-fat foods and salt-rich foods when they are the only snack available"; Cooking smaller portions so there are no left over food"; Avoid adding salt to the table; Cut on the sauce and sauce"; Eat unsalted popcorn" and

Distribution of Studied Subjects by their Sociodemographic Characteristics

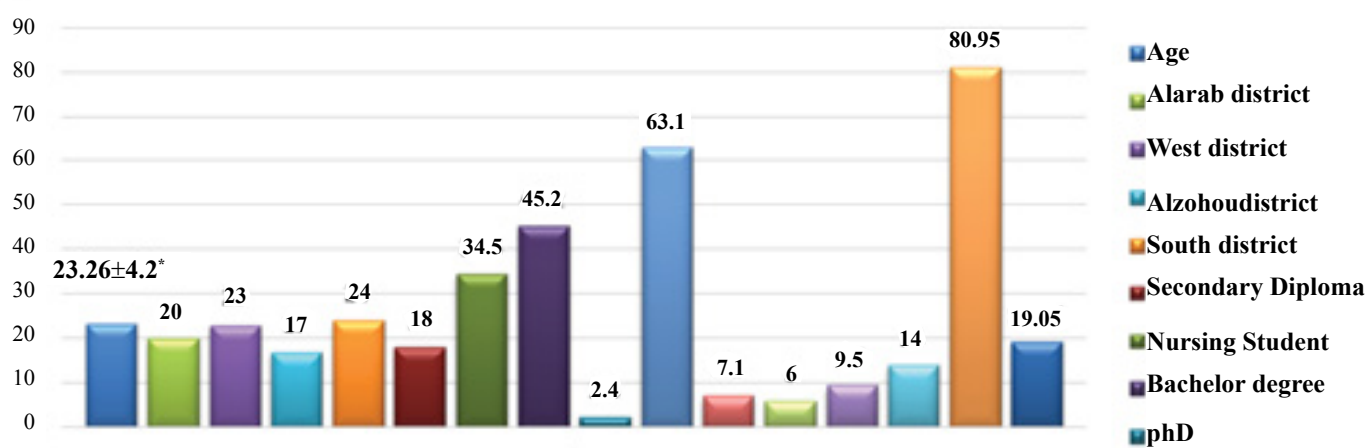


Figure 2 Distribution of studied subjects according to their demographic and personal experiences.

Table 1 Comparison between Pre and post-program of the participants' Locus of control (N=84).

S.No	Studied subjects	Paired Differences		t	Sig. (2-tailed)
		Mean	Std.		
1	My own behavior towards the disease determines how quickly it is cured?	-0.524	± 1.08	-4.442	0.000
2	No matter what precautions I make, it will not prevent me from getting sick?	-0.405	± 1.687	-2.199	0.031
3	Regular review with my doctor is the best way for me to avoid the disease?	-0.488	± 1.367	-3.274	0.002
4	Most things that affect my health happen to me by chance?	-0.250	± 1.783	-1.285	0.202
5	When I do not feel that I am not in good condition, I should consult a specialist with experience	-0.571	± 1.245	-4.208	0.000
6	I feel that I can control my health	0.405	± 1.243	2.984	0.004
7	My family do a lot with me when I get sick to help me keep a good health	-0.488	± 1.092	-4.096	.000
8	When I am sick, I am responsible for it -	0.405	± 1.424	2.606	0.011
9	Luck plays a big role in determining how fast recovery from the disease is	-0.024	± 1.405	-0.155	0.877
10	Good health is the greatest wealth	0.286	± 1.168	2.243	0.877
11	The main thing that affects my health is what I do in myself	-0.452	± 1.196	-3.465	0.001
12	If I look after myself, I can avoid the disease	0.476	± 1.156	3.775	0.000
13	When I recover from a common illness it is because others have given me good care	-0.607	± 1.172	-4.747	0.000
14	Health workers can control their health -	-0.357	± 1.580	-2.071	0.041
15	Regardless of what I'm likely to do -	0.369	± 1.351	2.503	0.014
16	The true meaning of survival is to keep it healthy.	-0.262	± 1.354	-1.772	0.08
17	If I follow the correct procedure I can stay healthy	-0.298	± 1.128	-2.419	0.018
18	As for my health I can only do what my doctor tells me to do	0.500	± 1.393	3.29	0.001

Table 2 Comparison between Pre and post-program regarding participants Self-Efficacy of healthy life style- Food (n=84).

S.No	Scales items	Paired Differences		
		M ± SD	t	P. value
1	Eat low-fat foods and low-salt foods when feeling depressed, bored, or stressed	2.46 ± 0.98	-1.000	0.00
2	Be sure to eat low-fat foods and salty foods when there is a large amount of foods rich in salt and margarine available at parties	2.56 ± 0.62	-1.813	0.02
3	Be sure to eat low-fat foods and low-salt foods when eating with friends	2.43 ± 0.86	0.49	0.00
4	Be sure to eat low-fat foods and salt-rich foods when they are the only snack available	2.80 ± 0.87	-3.914	0.16
5	Make sure to eat low-fat foods and salt-rich foods when you are alone and no one is watching you	2.55 ± 0.96	-0.076	0.05
6	Eat small amounts at dinner	2.74 ± 0.67	-3.914	0.04
7	Cooking smaller portions so there are no left over food	2.86 ± .83	-0.076	0.41
8	Eat lunch as a main meal a day instead of having dinner	2.64 ± 1.01	-2.262	0.78
9	Eat small amounts of food at his party	2.81 ± 0.78	1.485	0.03
10	Take the salad for lunch	2.85 ± 2.4	-0.809	0.05
11	Add less salt than recipes	2.44 ± 0.91	2.25	0.09
12	Eat unsalted peanuts, potato chips, nuts and biscuits	2.71 ± 0.73	-2.463	0.05
13	Avoid adding salt to the table	2.71 ± 0.83	2.643	0.17
14	Eat unsalted popcorn	2.61 ± 1.01	-0.679	1.04
15	Keep salt in the kitchen table	2.58 ± 1.05	3.675	0.01
16	Eat fried meat (vegetarian) for dinner	2.50 ± 1.87	0.28	0.02
17	Replace low fat milk with whole-fat milk at dinner	2.93 ± 0.83	-0.412	0.01
18	Cut on the sauce and sauce	2.85 ± 0.93	-1.014	0.09
19	Eat poultry and fish instead of red meat at dinner	2.74 ± 0.97	2.866	0.03
20	Avoid ordering red meat from restaurant	2.89 ± 0.90	-1.733	0.31

“Avoid ordering red meat from restaurant” with $t=-3.914$, -0.076 , 2.643 , -0.679 , -1.014 and -1.733 respectively at $p=0.16$, 0.41 , 0.17 , 0.09 , 1.04 and 0.31 respectively.

The differences between total mean \pm SD among study participants on pre and post assessment of self-efficacy of motivation behaviour is illustrated in **Table 3**. The results revealed that there were no significant differences between all items of the self-motivation behaviour except for only two items which were “Avoid ordering red meat from restaurants and “Exercise

though you feel depressed” at $t=-2.866$ and -4.229 , $p=0.005$ and 0.000 respectively.

The Comparison between pre and post measurement scales. The results indicated the presence of highly significant difference between total pre and post scales of locus of control, self-efficacy of health life styles and motivation behaviours at $p=0.000$ (**Table 4**). While there was no significant relation between internal and external locus of control at $t=0.018$ and -0.097 and $P=0.379$ and 0.870 respectively.

Table 3 Comparison between study participants on pre and post assessment of self-motivation behaviour- physical exercises (n=84).

S.No	Study participants	Paired Differences	t	Sig. (2-tailed)
		M ± SD		
1	Avoid ordering red meat from restaurants	-0.440 ± 1.409	-2.87	0.005
2	Wake up early; even at weekend break; to practice sports	-0.226 ± 1.196	-1.73	0.087
3	Exercise though you feel depressed	-0.524 ± 1.135	-4.23	0.000
4	Allocate time for physical activity program; this is walking, jogging, swimming, cycling or other continuous activities for 30 minutes or more; 3 times a week.	0.095 ± 1.238	0.71	0.483
5	Continue to practice sports with others even though they seem too fast or too slow for you -	-0.095 ± 1.199	-0.73	0.469
6	Be committed to your exercise program as you go through a life-changing stressful phase -	0.071 ± 1.487	0.44	0.661
7	Be committed to the exercise program when your family demands more time from you -	0.071 ± 1.259	0.52	0.604
8	Be committed to your exercise program when you have a home business -	0.321 ± 1.506	1.96	0.054
9	Be committed to the exercise program even when you have excessive demands at work -	-0.143 ± 1.584	-0.83	0.411
10	Be committed to the exercise program even when you have excessive demands at work -	-0.060 ± 1.638	-0.33	0.74
11	Attend party only after practicing sport.	-0.226 ± 1.374	-1.51	0.135

Table 4 Comparison between total mean score of participants' pre and post measurement scales (N=84).

Variables	M ± SD		t	P. Value
	Pre	Post		
Internal Locus control	30.17 ± 3.59	33.73 ± 3.859	0.018	0.87
External Locus control	32.46 ± 3.88	36.27 ± 4.00	-0.097	0.379
Total Locus control	62.64 ± 6.26	68.73 ± 5.30	0.54	0.000
Self –efficacy healthy life style	44.58 ± 11.04	50.55 ± 9.22	3.721	0.000
Self- efficacy motivation physical exercises	24.10 ± 8.35	46.91 ± 11.50	0.749	0.000

The comparison between pre and post total mean score of the studied subjects on their measurement on locus of control, self-efficacy of healthy life style of eating and selection of food and self-efficacy of physical exercises is exhibited (**Figure 3**). The figure showed the significance difference between pre and post interventions at $p < 0.05$.

The correlation between locus of control, self-efficacy of healthy life styles and motivation behaviour pre and post (**Table 5**). The results reported that there were a highly significant correlation between pre and post locus of control, self-efficacy pre and post at $p = 0.000$, 0.002 respectively. The correlation between total mean of age of the studied subjects with their pre and post locus of control, self-efficacy life styles and self-motivation behaviours (**Table 6**). The results revealed the presence of significant relationship between participants' age and their self-efficacy of health life style pre and pre and post assessment ($r = 0.757$, 0.997 at $p = 0.000$.) of self-motivation behaviour. Additionally, a significant correlation was reported between age and participants' self-efficacy motivation behaviours pre and post as $r = 0.749$ and $p = 0.000$. Therefore, the younger the age the higher the self-efficacy of healthy life styles and motivation behaviour toward healthy life styles. The Relationship between scales measurements and studied subjects are demographic characteristics. The table indicated the presence of correlation between participants' locus of control in pre assessment and their occupation at $p = 0.002$. While, significant correlation was found between subjects' post locus of control and their pervious training in workshops and their occupation at $p = 0.000$ and 0.008 (**Table 7**). As regard to the pre assessment of participants self-efficacy of healthy life style there was significant relationship with their level of education and their living area, pervious

training and their occupation at $p = 0.000$, 0.041 , 0.009 and 0.001 respectively. While there was no significant correlation between post assessment of healthy life style and participant demographic background. On the other hand, a significant relationship was reported between participants' self-efficacy of motivation behaviours and their demographic back ground at $p \leq 0.05$.

Discussion

Initiating of preconception care possibly will be theoretically effective to enhance maternal health and reproductive outcomes for females during reproductive age to reduce risks that potentially affect reproductive outcomes [2]. Therefore, changes in behaviour will improve health and healthy lifestyle which is one of the priorities [27,28]. Consequently, the current study aimed at investigating the effectiveness of an educational intervention program in empowering the sense of locus of control and self-efficacy behaviours among premarital Egyptian females. To the best of knowledge, our study, target population has the prevailed to be among graduated, employed population which gave it a variety not only students like previous studies done in Egypt.

The findings of the scales dimensions pre and post application of the study educational program, revealed a statistical significant relationship between internal-external locus of control of health; pre and post self-efficacy health life style; pre and post self-efficacy motivation behaviour. In addition, the relationships between these dimensions related to each other revealed a statistical significant relationship between pre self-efficacy health life style and pre self-efficacy motivation and pre-external Locus of control of health and pre self-efficacy Motivation. This is in line with the findings of previous study of Rotter [6] and who suggested that the participants reflected a significant difference

COMPARISON BETWEEN PRE AND POST TOTAL MEAN OF PARTICIPANTS' ON MEASUREMENT SCALES (N=84)

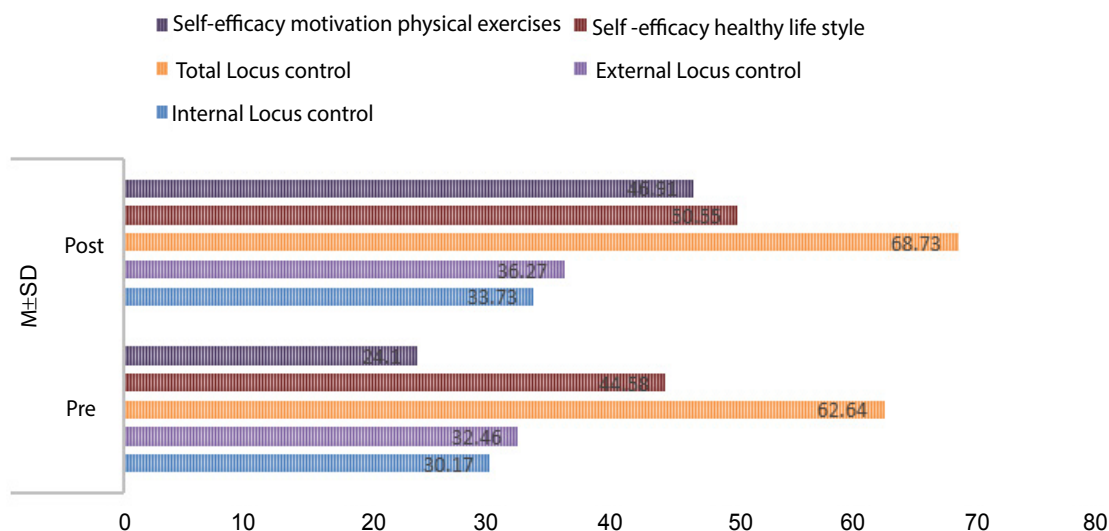


Figure 3 The comparison between pre and post total mean score of the studied subjects on their measurement on locus of control, self-efficacy of healthy life style of eating and selection of food and self-efficacy of physical exercises.

Table 5 Correlation between locus of control, self-efficacy of healthy life styles and motivation behavior pre and post (n= 84).

		Locus Total Post	Self-efficacy Post	Self-efficacy Pre	Locus Total Pre
Locus Total Post	Pearson Correlation	1	-0.062	0.016	0.540**
	Sig. (2-tailed)		0.574	0.884	0.000
	N	84	84	84	84
Self-efficacy Post	Pearson Correlation	-0.062	1	0.002	-0.083
	Sig. (2-tailed)	0.574		0.983	0.453
	N	84	84	84	84
Self-efficacy Pre	Pearson Correlation	0.016	0.002	1	0.151
	Sig. (2-tailed)	0.884	0.983		0.172
	N	84	84	84	84
Locus Total Pre	Pearson Correlation	0.540**	-0.083	0.151	1
	Sig. (2-tailed)	0.000	0.453	0.172	
	N	84	84	84	84

****Correlation is significant at the 0.01 level (2-tailed).**

regarding positive psychological aspects of behaviours of locus of control after receiving the intervention of health locus of control. Moreover, other studies by Bergvik et al. and Janowski et al. [29,30] was compatible with the findings. In the same line, a study by Helmer [31] who reported a statistical significant difference between internal and external Locus of control, but the study subdivided the external locus into two dimensions: control by chance (CLOC) and control by “powerful others (PLOC).

Dissimilarly, a study done by Pourhoseinzadeh et al. [32] who reported no much statistically difference between internal and external locus of control and the participants had the same belief in internal and external locus of control which is compatible with the findings of many studies [33-35]. This difference may be related to different culture of the studied populations in all these previous studies.

While, the Self-efficacy, which concerned of eating and physical exercises, there is a statistically significant difference between pre and post intervention program. This finding supported by Bastani et al. [7] which involved preconception education addressing multifactorial reproductive health risks and reported a significant improvement in exercise self-efficacy. Similarly, Hillemeier et al. and Morowatisharifabad et al. [36,37] who is reported a significant improvement in self-efficacy; eating healthier food and physical activity.

Accordingly, two studies reported on self-efficacy and health locus of control [7] and Hillemeier et al. [36], They indicated that Health locus of control (HLOC) is related to the idea that women’s reinforcement towards preconception health related to their behaviour, for example in physical activity. Interventions in both studies involved preconception education addressing

Table 6 Correlations between studied subjects age and pre /post measurements scale (N=84).

Variables		age	Locus Total Post	Locus Total Pre	Self-efficacy Health Life Style Pre	Self-efficacy Health Life Style Post	Self-efficacy Motivation Behavior Pre	Self-efficacy Motivation Behavior Post
Age	Pearson Correlation	1	0.064	0.173	0.046	-0.158	-0.013	0.06
	Sig. (2-tailed)		0.563	0.116	0.677	0.152	0.909	0.589
	N	84	84	84	84	84	84	84
Locus Total Post	Pearson Correlation	0.064	1	0.540**	-0.056	-0.086	0.138	-0.074
	Sig. (2-tailed)	0.563		0.000	0.614	0.439	0.211	0.503
	N	84	84	84	84	84	84	84
Locus Total Pre	Pearson Correlation	0.173	0.540**	1	0.103	-0.048	0.223*	0.082
	Sig. (2-tailed)	0.116	0.000		0.352	0.665	0.042	0.46
	N	84	84	84	84	84	84	84
Self-efficacy Health Life Style Pre	Pearson Correlation	0.046	-0.056	0.103	1	-0.047	0.757**	0.997**
	Sig. (2-tailed)	0.677	0.614	0.352		0.669	0.000	0.000
	N	84	84	84	84	84	84	84
Self-efficacy Health Life Style Post	Pearson Correlation	-0.158	-0.086	-0.048	-0.047	1	-0.062	-0.06
	Sig. (2-tailed)	0.152	0.439	0.665	0.669		0.578	0.589
	N	84	84	84	84	84	84	84
Self-efficacy Motivation Behavior Pre	Pearson Correlation	-0.013	0.138	0.223*	0.757**	-0.062	1	0.749**
	Sig. (2-tailed)	0.909	0.211	0.042	0.000	0.578		0.000
	N	84	84	84	84	84	84	84
Self-efficacy Motivation Behavior Post	Pearson Correlation	0.06	-0.074	0.082	0.997**	-0.06	0.749**	1
	Sig. (2-tailed)	0.589	0.503	0.46	0.000	0.589	0.000	
	N	84	84	84	84	84	84	84

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

multifactorial reproductive health risks. The study by Hillemeier et al. [36] reported a significant improvement on self-efficacy; eating healthier food, physically active and perceived higher preconception control of birth outcomes. The current study reported a significant improvement in participants' exercise self-efficacy (difference in score and internal health locus of control (HLOC) scores (difference in score between pre and post) (Tables 1-3). The results of Bastani et al. [7] study also indicated that health education intervention positively affected the psychological aspects that promote healthy behaviours among women during their preconception period. Moreover, Bastani et al. [7] findings supported other studies that posited that providing health educational services to women in their preconception period boosted health outcomes [18,19]. Bastani et al. [7] findings also conformed to the theoretical foundation of self-efficacy, which posited that women who were exposed to educational programs about reproductive health will be at lower risk during their pregnancy and will enjoy healthy safe motherhood.

As regard to the relationship of demographic characteristics and the scale dimensions, reflected a significant relationship between pre Locus of control and occupation; post Locus of control and educational level, previous workshops and Occupation. Pre Self-efficacy life style and participant residence area; pre and post self-motivation had a significant relationship with all dimensions-occupation, educational level, previous workshops and residence area. More specifically, the participants' age, level of education and occupation" had a significant correlation with their health Locus of control as compared to their post Locus control, which reflected a statistical significant relationship regarding the studied group level of education, previous workshop attendance and occupation. This significant relationship can be linked to the fact of scientific back ground of the participants as most of them have nursing background and high level of education and also city of the data recruitment is an urban area. This is consistent with other studies showing a positive and significant relationship between health locus of control and demographic characteristics [34,35]. The inconsistency might be due to the age is for one

Table 7 Relationship between pre and post scales measurements and participants demographic characteristics (N=84).

Scales pre/post		Educational level	Previous workshops	Occupation	Residence area
Locus of control pre	Mean SQ	2.072	0.097	7.397	4.06
	F	1.079	0.546	2.611	1.029
	P. Value	0.393	0.942	0.002	0.446
Locus of control post	Mean SQ	3.229	0.331	6.972	5.584
	F	2.073	3.297	2.24	1.611
	p. value	0.015	.000	0.008	0.078
Self-efficacy life style pre	Mean SQ	3.585	0.218	6.283	7.036
	F	3.047	1.733	2.121	2.813
	p. value	0.000	0.042	0.009	0.001
Self-efficacy life style post	Mean SQ	2.123	0.148	3.221	3.483
	F	1.128	0.929	0.725	0.826
	p. value	0.344	0.572	0.817	0.701
Self-motivation pre	Mean SQ	3.585	0.218	6.283	7.036
	F	3.047	1.733	2.121	2.813
	p. value	0.000	0.042	0.009	0.001
Self-motivation post	Mean SQ	3.227	0.288	6.306	8.035
	F	2.596	3.548	2.283	4.787
	p. value	0.001	0.000	0.004	0.000

group tested pre and post so there is no variations can cause a significant relationship.

On the other hand, these findings inconsistent with Bastani et al. [7] findings who reported no significant relationship between health demographic "age" and health locus of control. From Wiles and Stern et al. [38,39] who found no significant differences between the studied groups in any of variables of education level, employment or self-rated economic status. Likewise, Pourhoseinzadeh et al. and Helmer et al. [31,32] studies who found no positive and significant relationship between the locus of control (internal and external), participants age and their job experiences.

Conclusion

The application of preconception educational intervention had a positive effect on strengthen the sense of locus of control and self-efficacy behaviours among females' participants, which evidenced by a statistically significant difference between pre-test and post-test of multi-dimensional locus of control. The participants responded shortly through improving their self-efficacy regarding eating and exercises while the self-motivation improved partially after the intervention. The association between Locus of control either internal or external and self-efficacy related eating and exercises in addition to self-motivation, had a positive relationship as the higher internal and external locus of control the higher the self-efficacy and self-motivation behaviours. There were significant relationship between participants' age and their self-efficacy of health life style pre and post assessment of self-motivation behaviour. The younger the age, and the higher the level of education the higher the self-efficacy of healthy life styles of eating healthy foods and motivation behaviour toward practicing regular physical exercises.

Recommendation

- Premarital Women should be provided with the necessary education to increase their belief that they have to control over their health, which may lead to positive healthier preconception period and healthier pregnancies in the future.
- Incorporating these preconception educational programs should be an integral part of the services provided by Egyptian PMCs to ensure the dissemination of information related to locus of control behaviours, healthy life styles and motivation behaviour of regular physical exercises that ensure improve reproductive health and pregnancy outcomes for future Egyptian mothers.
- Guide the nurses in preconception or maternity care centers (PMC) to extend and apply these educational programs not only with pre-marital women but also to the women who attended to the antenatal and postnatal period as well evaluate the impact of their application by using regular follow up techniques.
- Further research for measuring the impact of locus control application on long term basis rather than short term with larger sample including follow up.

Limitations

The sample was not representative for all women in Egypt because it is done with urban population which will be different from rural population regarding their life style and related health behaviour.

More than fifty percentages of participants were unemployed which may effect on the findings of self-motivation based on the income level variables.

Implications

- The positive outcome of the study findings will lead to feasibility of application of this research through distinct area of maternal care in Egypt.
- The findings could provide a basis for future national health educational strategy targeting all women in Arab Republic of Egypt.

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