ORIGINAL ARTICLE

Effect of application of a Health Belief Model on changing mothers' beliefs regarding birth spacing in rural areas

Magda M. Mohsen[1], Amal A. El-Abbassy*[1], Asmaa M. Khalifa[2]

[1] *Community health nursing, Faculty of Nursing/Menoufia University, Egypt*
[2] *Menoufia Health Sector, Menoufia governorate, Egypt*

Received: March 13, 2016 **Accepted:** May 29, 2016 **Online Published:** June 20, 2016
DOI: 10.5430/cns.v4n3p54 **URL:** http://dx.doi.org/10.5430/cns.v4n3p54

ABSTRACT

Objective: A Health Belief Model seems promising as a framework for examining contraceptive behavior. The aim of this study was to examine the effect of application of a Health Belief Model on changing mothers' beliefs regarding birth spacing in rural areas.

Methods: Design: A quasi experimental pre-post-test design was used to evaluate the effectiveness of application of a Health Belief Model on changing mothers' beliefs regarding birth spacing. Subjects: A simple random sample of 150 postpartum women were selected from the Maternal Child Health centers at El Hmoul and Shobra Blola villages, Menouf at Menoufia Governorate, Egypt. Instruments: (1) A Birth Spacing Interview Questionnaire to assess socio demographic data, reproductive history, knowledge about birth spacing, and mothers' practices regarding birth spacing; (2) Perceived Benefits Questionnaire to assess a Health Belief Model constructs such as perceived susceptibility, seriousness, benefits, barriers, health motivation and cues to action.

Results: It was illustrated that regarding the perception of benefits of using contraception, 94% of the subjects agreed that benefits outweighed side effects and 100% of the subjects agreed that using contraceptive improved maternal health. Regarding the perception of barriers of using contraceptives, 90% of the subjects disagreed that using contraceptive increased their susceptibility to cancer.

Conclusions: Application of a Health Belief Model proved to be effective in changing the health beliefs about birth spacing.

Key Words: Birth spacing, Belief, Health Belief Model

1. INTRODUCTION

Poorly spaced pregnancies have been documented worldwide to result in adverse maternal and child health outcomes.[1] Every year, pregnancy complications cause death of more than half a million women worldwide and also cause disability in 120 million women.[2] Birth spacing has been identified as a pertinent life-saving measure for mothers and children. Even though, birth spacing as a concept is the focal point of reproductive health family planning methodology, few countries have policies on birth spacing, and in many developing countries there is an unmet need for birth spacing services.[3]

Women in developing countries have shorter birth intervals than they would prefer. The Egyptian Interim Demographic

*Correspondence: Amal A. El-Abbassy; Email: moley_elabassy@yahoo.com; Address: Community health nursing, Faculty of Nursing/Menoufia University, Egypt.

and Health Survey has shown that "more than half of all non first births occurred less than three years after a previous birth,[4] while one in five births took place less than two years after the previous birth. Birth intervals tend to be shorter among younger women (15-19 years old) and among those who live in rural areas, especially in rural Upper Egypt".[5]

Maternal and child mortality rates remain high in many African countries. Maternal mortality is estimated at 454 deaths per 100,000 live births, while neonatal mortality approximates 26 deaths per 1,000 live births.[6] Unintended pregnancy may also have a profound effect on maternal health. Of the 210 million pregnancies each year, nearly 80 million are unintended, and about half of these end in abortion.[7]

Birth spacing is not a common practice despite the fact that many women are at risk of unwanted pregnancies and use contraceptive methods.[8] Although there is an increase in knowledge about different contraceptive methods, families still lack information about the risks associated with short spaced pregnancies.[9] Manju et al.[10] reported that "sociocultural and religious backgrounds affect on believes, baseless psychological fears and traditional myths and taboos related to contraceptive methods".

A Health Belief Model (HBM) has been used extensively to assess health-related beliefs regarding protective behaviors.[11] It is a cognitive model attempting to identify the patterns of health behaviors. The model can be adapted to contraceptive behavior if one views pregnancy as a state to avoid. Women vary in strength of their desire to avoid conception and in their perception of costs and benefits of using a particular contraception.[12] According to this model, "acting on a health belief is influenced by perceived susceptibility or the risk of developing a disease, perceived threats or severity of a disease, perceived benefits resulting from a health behavior, perceived barriers hindering a health behavior, the individual's overall motivation for health, and finally the individual's self-confidence in adapting a health behavior".[13]

Promotion of family planning in countries with high birth rates has the potential to avert 32% of maternal deaths.[14] Nurses are able to "encourage specific actions such as the initiation and continuation of using contraceptive methods[15] thus helping many women and couples avoid negative health outcomes associated with having babies too close together".[16]

1.1 Aim of the study

The aim of this study was to examine the effect of application of a Health Belief Model on changing mothers' beliefs regarding birth spacing at rural areas.

1.2 Research hypothesis

(1) Women after the application of a Health Belief Model about birth spacing will have better beliefs than women before.
(2) Women after the application of a Health Belief Model will be able to practice optimal birth spacing.

2. METHODS

2.1 Design and settings

This study was conducted at Maternal Child Health centers at El Hmoul and Shobra Blola villages, Menouf at Menoufia Governorate, Egypt. They were chosen because women in those centers did not practice optimal birth spacing. A quasi experimental pre-post-test design was used.

2.2 Sample

A simple random sample of 150 postpartum women from the Maternal Child Health centers at El Hmoul and Shobra Blola villages, Menouf at Menoufia Governorate, Egypt.

2.2.1 *Inclusion criteria*

(1) Women aged 20 years to 45 years; and (2) Birth spacing between children was less than 2 years.

2.2.2 *Sampling technique*

The technique used to select the sample was:

(1) Postpartum women attending the MCH centers were registered in the family planning records and did not practice optimal birth spacing. The researcher used the record of newborn and infants to identify the intended mothers. All the names of mothers of newborn and infants from 1 day – 18 month were registered in birth record. The mothers who did not practice optimal birth spacing were selected.
(2) All the names were put in a bowl and the 150 names were selected randomly.

2.2.3 *Sample size*

It is formed by AP info computerized system (WHO, 2005). The sample size calculation was found to be N < 134 with the following considerations: (1) 95% confidence interval; (2) 90% power of the study; (3) 50%-70% change of the out come before and after the intervention.

2.3 Data collection

2.3.1 *Instruments*

Tool 1: A Birth Spacing Interview Questionnaire was developed by the researcher after reviewing literature related to the model, and birth spacing was utilized in this study. It included:

(1) Socio demographic data include mother name, age, level of education, occupation, etc....

(2) Reproductive history includes age of marriage, number of deliveries, age at birth of first child, spacing period between children, previous feeds, desired family size and number of abortion.

(3) Knowledge about birth spacing used as pre-post test. Definition, source of knowledge about birth spacing, risks of not practicing birth spacing on mother and child, knowledge about contraceptive, complications and the results were categorized as incomplete correct answer (0) and complete correct answer (1).

(4) Practices of mothers regarding birth spacing. Using contraceptives, types of contraceptives and the causes of not using contraceptives. In the case of using contraceptives the results were categorized as incorrect action (0) and correct action (1).

Tool 2: Perceived Benefits Questionnaire to assess Health Belief Model constructs. The researcher used the six constructs of the model as reviewed from the previous studies that used HBM. Health Belief Model constructs were perceived susceptibility, seriousness, benefits, barriers, health motivation and cues to action. The results were categorized as disagree (0), not sure (1) and agree (2).

2.3.2 *Reliability of the tools*

Reliability was applied by the researcher for testing the internal consistency of the instruments, by administration of the same instruments to the same subjects under similar conditions on one or more occasions. Answers from repeated testing were compared (Test-re-test reliability). The reliability of the study instrument was tested using Cronbach Apha. It amounted to be 0.774 indicating good reliability of the instrument. It is acceptable inters the consistency (see Equation 1). They were tested for content validity by jury panel of five experts in the filed of Community Health Nursing and obstetric Specialty to ascertain relevance and completeness.

$$\alpha = \frac{N - C^{-}}{V^{-} + (N-1) \cdot C^{-}} \quad (1)$$

N: number; C: variable corin; V: average varian

2.4 Pilot study

Pilot Study was conducted to test the practicality and applicability of the questionnaire and to detect the problems that may encounter during data collection. Also to help to estimate the time needed to fill the questionnaire. The pilot study was conducted on 15 postpartum women. Postpartum women who participated in the pilot study were not involved in the sample. However, they were given a copy of the educational intervention booklet.

2.5 Ethical consideration

The agreements for participation of the subjects were taken after the aim of the study was explained to them. Before data collection, the women were informed about the aim of the study and what would be done with the results. They were given the opportunity to refuse to participate and they could withdraw at any stage of the research. Also, they were assured that the information would remain confidential and used for the research purpose only. The researcher gave copies from the educational intervention booklet about birth spacing to the postpartum women for achieving the ethical principles of research as well as the principle of beneficence.

The ethics committee approval is in the College of Nursing, Menoufia University, Egypt on the subject of research.

2.6 Procedure and data collection

A reviewing of past and current literature covering the various aspects of the problem was done using books, articles periodicals, magazines and studies related to Health Belief Model and birth spacing.

Approval:

(1) Official letters were issued from Faculty of Nursing, Menoufia University, Egypt, and sent to the directors of MCH centers to get their permission for data collection from the authorized personal. The letters explained the purpose of the study, and sought their cooperation.

(2) Data were collected during the first of July 2014 to the end of November 2014.

- Before starting the data collection, the agreements and the aim of the study were explained to each head of nursing at MCH centers to gain their cooperation. According to the infant immunization and family planning follow-up visits' time schedule, the data were collected from the MCH centers in El- Hamoul and Shobra Belola villages, Menoufia Governorate, Egypt.
- The researcher met the subjects in the waiting room, in each selected MCH center. The researcher introduced herself and explained to the women the aim of the study and their consent to participate was obtained.
- Each woman was personally interviewed and sometimes groups of women (minimum one woman and maximum six women) in the MCH center.
- The interview lasted for from 9:30–11:30 AM, three times per week, in a period of 5 months.
- The researcher distributed the baseline questionnaire to all 150 postpartum women during the period of in-

tervention (minimum one woman and maximum six women) in each interview. The baseline questionnaire was distributed to assess their knowledge and practice regarding birth spacing.

- Filling in the baseline questionnaire related birth spacing knowledge and practices took about 15-20 minutes and application of HBM took about 10-15 minutes. The researcher filled the baseline questionnaire by herself. This took about 20-30 minutes.
- The researcher explained the educational intervention booklet. After that it was based on the results of the baseline questionnaire, the researcher explained the effect of birth spacing based on HBM.
- First post-test was done only for the baseline questionnaire took about 15-20 minutes to evaluate their knowledge and beliefs.
- The researcher explained HBM constructs related to contraceptive use. The researcher explained educational intervention booklet components based on Health Belief Model guided by lecture, group discussion and role playing.
- The evaluation included women who answered questions about susceptibility, seriousness, benefits and barriers constructs to determine the intervention's effectiveness in modifying beliefs, motivations. These steps took about 30 minutes.
- After three months, second post-test was administered took about 35 minutes for assessing their retention of knowledge and practices and assessing the effectiveness of the application of model on knowledge and practices of birth spacing.
- The majority of subjects used contraception, practiced optimal birth spacing and women engaged in contraceptive behavior decision-making process through change their culture values. The data collection phase was completed between 1^{st} of July 2014 to the end of November 2014.

2.7 Health Belief Model constructs

These include HBM variables of perceived susceptibility, seriousness, benefits, barriers, health motivation and cues to action. HBM variables were used to predict and enhance change women's health beliefs regarding birth spacing; using the six variables of model as reviewed from previous studies. Assessed women's perception about the seriousness of not practicing birth spacing, her susceptibility to birth spacing, the benefit of birth spacing, the barriers of not practicing birth spacing, her motivation to promote her health, her confidence in her ability to practice birth spacing.

Implementation of Health Belief Model:

- Health Belief Model was implemented for 5 months in the mentioned setting. Participants (postpartum women) who were randomly assigned to groups were interviewed by the researcher maximum, 6 women for each group according to their follow-up time.
- An appointment was made for them to return to MCH centers at the negotiated time and discussion about birth spacing based on HBM that took place. The researcher identified topics for discussion. With this approach, the researcher was able to follow the participant's, gently guiding the interviews to focus on what the individual considered the most important aspect of birth spacing was family planning.
- The researcher distributed the educational intervention booklet developed by the researcher and reviewed by a panel of five experts in fields of community health nursing and obstetric specialty, and was written in Arabic word office and printed out according to the sample size with additional copies. Then, the researcher explained educational intervention booklet about birth spacing and asked questions for encouragement of using family planning methods.
- The researcher used HBM constructs to enhance contraceptive behavior because of this inherent conceptual problem. For instance, interpreting affirmative responses to questions on birth spacing, if it was guided by the model, might be understood as an indication of susceptibility to become pregnant, and promote contraceptive use.
- The researcher argued along similar lines for problems associated with interpreting the perceived severity and benefits/barriers constructs. It took about 60 minutes.
- First post-test for the birth spacing questionnaire about knowledge and the practice related to birth spacing took about 15-20 minutes. After three months, second post-test was done for assessing their retention of knowledge, practices and assessing the effectiveness of the application of model on knowledge and practices of birth spacing took about 35 minutes.

Intervention of Health Belief Model was carried out as follows:

(1) **Perceived susceptibility:** At first, participants were not currently adopting healthy behavior related to practices of birth spacing, but considering the prospect of adopting healthy behavior. When participants entered susceptibility, the positive aspects of their condition started to outweigh the negative aspects of not practicing birth spacing. There was recognition of a problem; the participants perceived as associated with optimal behaviors for birth spacing. The goal of intervention

for individuals in susceptibility was to increase the person's likelihood of steps to adopt healthy behaviors related to birth spacing. Therefore, the educational intervention booklet focused on maximizing healthy behaviors, increasing awareness, gathering more information, and creating a new practice as healthy behaviors related to birth spacing.

(2) **Perceived seriousness:** The researcher simply asked the participants about the seriousness of not practicing birth spacing. For example "What is the seriousness of not practicing birth spacing on mother and infant health?" The researcher started by asking about the negative aspects of their behavior in order to minimize resistance and motivate participants to subsequently talk about the positive aspects of their behavior. Once the participant finished talking about the negative aspects of not practicing birth spacing, the interviewer briefly summarized what had been discussed. The participant was then encouraged to talk about the positive aspects of practicing birth spacing.

(3) **Perceived benefits:** The researcher prompted participants to elaborate on the more positive aspects of practicing birth spacing appropriately by asking questions such as "How does contraceptive affect you?" "What else?" "How do you manage your birth spacing?". Simply by allowing the participants to talk about their willingness and their need to positive behaviors, the researcher was facilitating these positive behaviors. The researcher succinctly summarized the positive and the negative aspects of practicing birth spacing through using contraceptive method. Once the participant finished talking about the positive aspects of benefits of practicing birth spacing through contraception, the interviewer briefly summarized what had been discussed.

(4) **Perceived barriers:** This construct considers a woman's perception of the influences that facilitate or discourage the adoption of the promoted behavior. The negative attributes of health behavior factor that women think negatively will affect her when birth spacing. This dimension includes factors such as perceived side-effects of contraception, physiological risks of contraceptives, inconvenience (i.e. having to remember to take a daily pill), and the limited access to methods (i.e. having to obtain a prescription for oral contraceptive (OC) refills or requiring a medical procedure for intrauterine device (IUD) insertion). All of these potential contraceptive disadvantages had been found to inhibit contraceptive use. The participant was encouraged to overcome these barriers of their practices of birth spacing and use of contraception method. The researcher succinctly summarized the positive and the negative aspects of the participant's practicing of birth spacing. The psychological discomfort created by contrasting the individual's behavior with her attitude was one of the motivators that help participants to practice birth spacing.

(5) **Health motivation:** The participants were ready for practicing birth spacing. The researcher provided practical advice on how to go to health motivation and decision making to change and continue to boost her motivation to change. The researcher's task was to help the participants to determine the best course of action to be taken in order to change their inadequate birth spacing practices. Health Belief Model advocates the replacement of any inadequate behavior with more adequate activities. The interviewer encouraged each participant to improve birth spacing practices. The goal of an intervention for individuals was to increase their adoption of healthy behaviors related to practices of birth spacing. At the end of the interview, participants received personalized educational intervention booklet. Evaluation was applied by comparing knowledge and the practices of birth spacing before and after HBM. This was done through reusing the same instruments after three months from the first HBM application.

(6) **Contents of educational intervention booklet:** (a) Introduction about birth spacing; (b) Effects of birth spacing on mother and child health; (c) Perception of susceptibility of using contraceptives, seriousness of not using contraceptives, benefits of using contraceptives, barriers of using contraceptives and health motivation and cues to action of using contraceptives; (d) Methods of family planning; (e) Advantages and disadvantages of contraceptive methods; (f) Barriers management for women's getting off contraception.

2.8 Statistical analysis

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 16. Graphics were done using Excel program. For numerical values, the range mean and standard deviations were calculated. For categorical variable, the number and percentage were calculated and differences between subcategories were tested by chi square (χ^2). The relationship between two variables was tested by Pearson's, correlation coefficient. The level of significant was adopted at $p < .05$.

3. RESULTS

Women after the application of a Health Belief Model about birth spacing have better beliefs than women before. Table 1 displayed the distribution of perception of susceptibility of using contraceptives of the sample baseline, first post-test and second post-test. There was no difference during the study period in all the sample's responses.

Table 1. Distribution of perception of susceptibility of using contraceptives of the sample baseline, first post-test and second post-test

Perception of susceptibility of using contraceptives	During the study period					
	Baseline		1st Post-test		2nd Post-test	
	No.	%	No.	%	No.	%
No chance to get a contraceptive						
• Disagree	150	100	150	100	150	100
• Not sure	0	0.0	0	0.0	0	0.0
• Agree	0	0.0	0	0.0	0	0.0
Easy to get a contraceptive						
• Disagree	0	0.0	0	0.0	0	0.0
• Not sure	0	0.0	0	0.0	0	0.0
• Agree	150	100	150	100	150	100
Can get a contraceptive any time						
• Disagree	0	0.0	0	0.0	0	0.0
• Not sure	0	0.0	0	0.0	0	0.0
• Agree	150	100	150	100	150	100
Not ready to get contraceptives						
• Disagree	150	100	150	100	150	100
• Not sure	0	0.0	0	0.0	0	0.0
• Agree	0	0.0	0	0.0	0	0.0

Table 2 indicated the distribution of perception of seriousness of not using contraceptives of the sample baseline, first post-test and second post-test. As indicated, there was a statistical difference during the study period regarding the subjects' opinion of pregnancy is normal event and using contraceptive has drawbacks on menstrual period where $p = .001$.

Table 3 demonstrated the distribution of perception of contraceptives' benefits of the sample baseline, first post-test and second post-test. As demonstrated, regarding the subjects' opinion of using contraceptives improves maternal health at baseline, more than one third of the study sample (54.7%) agreed while 100% agreed at first post-test and second post-test. On the other side, regarding the sample's opinion of using contraceptives does not affect mother's health at first post-test, about all the sample (99.3%) disagreed where as 100% disagreed at first post-test and second post-test. Finally, regarding subjects' opinion of using contraceptives helps deciding desirable family size, 100% agreed during the study period.

Table 4 revealed the distribution of perception of barriers of using contraceptives of the sample baseline, first post-test and second post-test. There was not statistically significant difference between baseline, first post-test and second post-test regarding the sample's perception of barriers of using contraceptives were women can get contraceptives easily any time, didn't have the desire to buy contraceptives, far distance to get contraceptives and the study sample didn't know how to use them where $p = 1.000$, $p = .223$, and $p = .368$ respectively.

Table 5 demonstrated the distribution of perception of self efficacy of using contraceptives of the sample at baseline, first post-test and second post-test. As demonstrated from the table, there was a statistical difference between baseline, first post-test and second post-test regarding the sample's perception of self efficacy of using contraceptives, the subjects' response that, their husbands had the decision of using contraceptives ($p = .005$). Also, there was no statistical significant between baseline, first post-test and second post-test regarding the sample's perception of self efficacy of using contraceptives, the subjects' response; that they had the autonomy to decide using of contraceptives, can use contraceptives successfully and they were not sure that they can use it effectively where $p = .135$, and $p = .368$ respectively.

Table 2. Distribution of the perception of seriousness of not using contraceptives of the sample baseline, first post-test and second post-test

Perception of seriousness of not using contraceptives	During the study period						χ^2	*p*
	Baseline		1st Post-test		2nd Post-test			
	No.	%	No.	%	No.	%		
Pregnancy is normal events for all mothers								
• Disagree	0	0.0	131	87.3	131	87.4	266.01	.001*
• Not sure	0	0.0	3	2.0	2	1.3		
• Agree	150	100	16	10.7	17	11.3		
Use of contraceptive is against human nature								
• Disagree	150	100	150	100	150	100	0.000	1.000
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	0	0.0	0	0.0	0	0.0		
Use of contraceptive has drawbacks on menstrual period								
• Disagree	69	46.0	119	79.3	144	96.0	140.99	.001*
• Not sure	23	15.3	30	20.0	5	3.3		
• Agree	58	38.7	1	0.7	1	0.7		
Multiple pregnancies is not a risk								
• Disagree	147	98.0	149	99.3	149	99.3	4.00	.135
• Not sure	1	0.7	0	0.0	0	0.0		
• Agree	2	1.3	1	0.7	1	0.7		
Many pregnancies is life threatening in case of abortion								
• Disagree	1	0.7	0	0.0	0	0.0	2.00	.368
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	149	99.3	150	100	150	100		

* = significant

Table 6 illustrated the comparison of current practices about family planning of the sample at baseline and at second post-test. As illustrated from the table, regarding the sample's action when forgetting progesterone only pills at baseline, no one (0%) practiced correct action, while at second post-test, the highest percentage (93.9%) practiced correct action. Also, related to the sample's action on vomiting after taking progesterone only pills, no one (0%) of the sample practiced correct action at baseline and the highest percentage of them (93%) reported correct action at second post-test.

Also, regarding the sample's current practice of family planning 14.3% practiced correct action when forgetting compound pills at baseline while all of them (100%) practiced correct action at second post-test. Related to the sample's action on vomiting after taking compound pills, 14.3% practiced correct action at baseline while all of them (100%) practiced correct action at second post-test. Moreover, there was a statistically significant difference between baseline and second post-test regarding the sample's current practices of family planning where $p = .001$.

4. DISCUSSION

HBM was one of the first and remains one of the best known social cognition models.[17] HBM was one of the first models used to predict and explain variations in contraceptive behavior among women.[18,19]

Regarding the distribution of perception of susceptibility of using contraceptives at baseline, first post-test and second post-test, the current study revealed that there was no difference during the study period (see Table 1). These findings are supported by Baa et al.[20] who studied "the perceptions of susceptibility to pregnancy among U.S. women obtaining abortions in Texas, one in a large town in a rural area of Washington State. They found a relatively large portion of their sample stating that they feel invulnerable to pregnancy". Also, the current study findings were in agreement with Mahmoodi et al.[21] who investigated "the impact of education using Health Belief Model on the awareness and attitude of male teachers regarding their participation in family planning in Iran". They reported that the mean awareness scores before and after education were 45.9 $\pm$ 20.38 and

58.6 ± 18.76, respectively. There was a significant difference between awareness scores before and after education ($p < .001$). These may be attributed to the implementation of the educational intervention based on HBM has positive effect on increasing males' awareness of using contraceptives.

Table 3. Distribution of the perception of benefits of using contraceptives of the sample baseline, first post-test and second post-test

Perception of the benefits of using contraceptives	During the study period						χ^2	*p*
	Baseline		1st Post-test		2nd Post-test			
	No.	%	No.	%	No.	%		
Prevents unwanted pregnancies								
• Disagree	0	0.0	0	0.0	0	0.0	0.000	1.000
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	150	100	150	100	150	100		
Regulates menses								
• Disagree	19	12.6	3	2.0	3	2.0	121.6	.001*
• Not sure	67	44.7	31	20.3	10	6.7		
• Agree	64	42.7	116	77.7	137	91.3		
Benefits husbands when mother used								
• Disagree	4	2.6	0	0.0	0	0.0		
• Not sure	25	16.7	4	2.7	0	0.0	53.42	.001*
• Agree	121	80.7	146	97.3	150	100		
Benefits overweight side effects								
• Disagree	9	6.0	0	0.0	0	0.0		
• Not sure	94	62.7	9	6.0	7	4.7	194.1	.001*
• Agree	47	31.3	141	94.0	143	95.3		
Improves maternal health								
• Disagree	4	2.6	0	0.0	0	0.0		
• Not sure	64	42.7	0	0.0	0	0.0	136.0	.001*
• Agree	82	54.7	150	100	150	100		
Does not affect mothers health								
• Disagree	149	99.3	150	100	150	100		
• Not sure	0	0.0	0	0.0	0	0.0	2.000	.368
• Agree	1	0.7	0	0.0	0	0.0		
Helps decide desirable family size								
• Disagree	0	0.0	0	0.0	0	0.0		
• Not sure	0	0.0	0	0.0	0	0.0	0.000	1.000
• Agree	150	100	150	100	150	100		

* = significant

Concerning the distribution of the perception of seriousness of not using contraceptives at baseline, first post-test and second post-test. The current study revealed that all subjects believed that pregnancy is a normal event for all mothers at baseline, while the majority of the subjects do not believe at first post-test and second post-test. Also, regarding the subjects' opinion of using contraceptive is against human nature, all the subjects disagreed during the study period (see Table 2). This finding was consistent with Alamah et al.[22] who assessed "bridging generic and professional care practices for Muslim participants through use of leininger's culture care model in USA. They reported that some forms of contraceptives revealed that birth control is not forbidden, in contrast to nonreversible ones such as tubal ligation, which are considered unlawful".

Related to the sample's perception of seriousness of not using contraceptives, the current study revealed that at baseline, the subjects' opinion of using contraceptive has drawbacks on menstrual period was more than one third of the sample disagreed, while more than two thirds of the sample disagreed at first post-test and the highest percentage of the sample disagreed at second post-test. The findings came in agree-

ment with Mahmoodi et al.[21] They assessed "the impact of education using Health Belief Model on the awareness and attitude of male teachers regarding their participation in family planning in Iran. They reported that the mean perceived threats scores before and after education were 45.38 ± 23.06 and 53.27 ± 1.21, respectively. The results indicated a significant difference between the perceived threats scores before and after education (t = -5.83, p < .001)".

Table 4. Distribution of the perception of barriers of using contraceptives of the sample baseline, first post-test and second post-test

Perception of barriers of using contraceptives	During the study period						χ^2	p
	Baseline		1st Post-test		2nd Post-test			
	No.	%	No.	%	No.	%		
Can get it easily any time								
• Disagree	0	0.0	0	0.0	0	0.0	0.000	1.000
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	150	100	150	100	150	100		
Far distance to get it								
• Disagree	146	97.3	147	98.0	148	98.7	3.00	.223
• Not sure	1	0.7	0	0.0	0	0.0		
• Agree	3	2.0	3	2.0	2	1.3		
Increase liability of cancer								
• Disagree	65	43.3	135	90.0	135	90.0	14.0	.001*
• Not sure	83	55.3	15	10.0	15	10.0		
• Agree	2	1.4	0	0.0	0	0.0		
Don't have the desire to buy it								
• Disagree	150	100	150	100	150	100	0.000	1.000
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	0	0.0	0	0.0	0	0.0		
Don't know how to use								
• Disagree	149	99.3	150	100	150	100	2.00	.368
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	1	0.7	0	0.0	0	0.0		
My husband does not accept								
• Disagree	136	90.7	141	94.0	144	96.0	12.250	.002*
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	14	9.3	9	6.0	6	4.0		

* = significant

Regarding the distribution of perception of benefits of using contraceptives at baseline, first post-test and second post-test, the current study reveled that the subjects' opinion of using contraceptives prevents unwanted pregnancies, all the sample agreed during the study period (see Table 3). The findings of the current study came in consistent with Subbiah et al.[23] who "surveyed health beliefs regarding family planning among economically and educationally disadvantaged women in Chennai, South India". The researcher reported that "nearly two-thirds of the women reported at least one benefit for using contraception". Also, these findings were supported by Tessema et al.[24] who "assessed birth interval and its predictors among married women in Dabat District, Northwest Ethiopia. They reported that women who did not use any of the contraceptive methods were about four times more likely to have subsequent birth after the index child compared to contraceptive users".

Related to the sample's perception of benefits of using contraceptives the current study indicated that the subjects' opinion of using contraceptives regulates menses at baseline was more than one third of the sample were not sure, while more than two thirds of the sample agreed at first post-test and the highest percentage of the sample agreed at second post-test. The findings of the current study were in accordance with Maguire et al.[25] who studied the state of hormonal contraception today in USA. They reported that "some of the immediate benefits include improvement of menorrhagia and dysmenorrheal". Also, the findings came in agreement

with Jones[26] who reported "the beyond birth control: the overlooked benefits of oral contraceptive pills, in New York. Jones reported that more than half of pill users rely on the method at least in part for purposes other than pregnancy prevention". More than quarter uses it for cramps or menstrual pain, about quarter for menstrual regulation. Moreover, these findings were in accordance with Kavanaugh et al.[27] who assessed "contraception and beyond, the health benefits of services provided at family planning centers, in New York. They reported that the most common reasons for using the pill were treatment for cramps or menstrual pain and menstrual regulation".

Table 5. Distribution of the perception of barriers of using contraceptives of the sample baseline, first post-test and second post-test

Perception of self-efficacy of using contraceptives	During the study period						χ^2	*p*
	Baseline		1st Post-test		2nd Post-test			
	No.	%	No.	%	No.	%		
Have the autonomy to decide using it								
• Disagree	1	0.7	0	0.0	0	0.0	4.00	0.135
• Not sure	1	0.7	0	0.0	0	0.0		
• Agree	148	98.6	150	100	150	100		
Can use it successfully								
• Disagree	0	0.0	0	0.0	0	0.0	2.00	0.368
• Not sure	1	0.7	0	0.0	0	0.0		
• Agree	149	99.3	150	100.0	150	100		
Not sure I can use it effectively								
• Disagree	149	99.3	150	100.0	150	100	2.00	0.368
• Not sure	0	0.0	0	0.0	0	0.0		
• Agree	1	0.7	0	0.0	0	0.0		
My husband has the decision to use it								
• Disagree	137	91.3	140	93.3	143	95.3	10.571	0.005*
• Not sure	0	0.0	0	0.0	1	0.7		
• Agree	13	8.7	10	6.7	6	4.0		

* = significant

Table 6. Comparison of current practices about family planning of the sample baseline and second post-test

Current practice of family planning	During the study period						*p*
	Baseline			2nd Post-test			
	Total	Correct action		Total	Correct action		
		No.	%		No.	%	
Action when forgetting Progesterone only pills	17	0	0.0	49	46	93.9	.001*
Action on Vomiting after taking Progesterone only pills	17	0	0.0	49	46	93.9	.001*
Action when forgetting Compound pills	7	1	14.3	11	11	100.0	.001*
Action on Vomiting after taking Compound pills	7	1	14.3	11	11	100.0	.001*

* = significant

Concerning to the distribution of the perception of barriers of using contraceptives at baseline, first post-test and second post-test, the current study revealed that regarding the sample's perception of barriers of using contraceptives was all the sample agreed that they can get contraceptives easily any time during the study period (see Table 4). This finding came in accordance with Frost[28] who assessed "public or private providers, women's use of reproductive health services, in U.S. The researcher reported that the source of health insurance was one of the most important predictors of the use of public family planning clinics. Medicaid recipients and uninsured women were three-four times as likely as women with private insurance to obtain clinic care". Also, the study came in agreement with Frost et al.[29] who identified specialized family planning clinics: "Why women choose them and their role in meeting women's health care needs, in the United States". They reported that "for many women, these publicly funded family planning sites were their only source

of regular medical care".

Related to the study sample's perception of barriers of using contraceptives, the current study revealed that regarding the sample's perception of barriers of using contraceptives was the highest percentage of study sample disagreed about far distance to get contraceptive during the study period. A similar finding was recorded by Yang[30] who investigated health beliefs and contraception use in Leogane, Haiti. Yang reported that, accounting for more than half of participants the nearest health facility was close to their living places and easy to reach if health service needed.

Related to the study sample's perception of barriers of using contraceptives, the current study revealed that regarding the sample's opinion of using contraceptive increases the liability of cancer at baseline, more than one third of the sample was not sure, first post-test and second post-test while the highest percentage of the sample disagreed. This finding came in agreement with Gaffield et al.[31] who assessed "oral contraceptives (OCs) and family history of breast cancer in United States. They reported that, results from ten studies and one pooled analysis of fifty four studies suggested that the use of OCs did not significantly modify the risk of breast cancer among women with a familial history of breast cancer". A similar finding was recorded by Shulman[32] who studied "the state of hormonal contraception today: benefits and risks of hormonal contraceptives in Washington in USA. Shulman reported that women who use oral contraceptives have a lower risk of certain cancers".

Regarding the distribution of the perception of self efficacy of using contraceptives at baseline, first post-test and second post-test, the current study revealed that at baseline, the highest percentage of the sample agreed that they had autonomy to decide using contraceptive, while at first post-test and second post-test all sample agreed. Also, it was illustrated about the sample agreed that they had the autonomy to decide using contraceptives and they can use contraceptives successfully at baseline, while all of them agreed at first post-test and second post-test.

On the other side at baseline about the sample disagreed that they were not sure to use contraceptives effectively, while first post-test and second post-test all the sample disagreed. Finally the highest percentage of the study sample' disagreed that their husbands had the decision to use contraceptive during the study period (see Table 5). The present study findings were supported by Brown et al.[33] They studied "breaking the barrier: Health Belief Model and patient perceptions regarding contraception in North Dakota State in USA". They reported that "there was a positive correlation between the perceived benefit regarding the ease of use as educational level increased and perceived barriers due to side effects as income level decreased immerged. Special counseling by practitioners to improve patient's self-efficacy, ultimately enhancing contraceptive adherence, are warranted. Ease of use ranked the most important for contraception as patients' education levels increased (p = .001). As household income increased, emphasis on potential side effects became less (p = .02). Patients with private insurance ranked 'ease of use' most frequently (p = .01)". These may be attributed to the implementation of the educational intervention based on HBM has positive effect on improvement of self efficacy of using contraceptives. These may be attributed to the implementation of the educational intervention based on HBM has positive effect on increasing women's self efficacy of using contraceptives.

Regarding the comparison of current practices about family planning at baseline and second post-test, there was a statistically significant difference during the study period regarding the sample's current practices of family planning (see Table 6). This finding was supported with Halpern et al.[34] in Europe. They evaluated "the strategies used to improve adherence and acceptability of hormonal methods of contraception and reported that their study showed better results with special counseling". Also, the researcher indicated that "to prevent pregnancy, women should use birth control as planned and should keep using it. More attempts of good quality are needed to learn how to help women to use their birth control method. High-quality with adequate power and well-designed interventions should identify ways to improve adherence to, and continuation of hormonal contraceptive methods". Also, this finding came in agreement with Grossman et al.[35] who identified "Interest in over-the-counter access to oral contraceptives among women in the United States". They reported that among all respondents were likely to use oral contraceptive pills (OCPs). These may be attributed to the implementation of the educational intervention has positive effect on increasing mother's current practices about family planning.

5. Conclusions

Application of Health Belief Model proved to be effective in raising the women's awareness of birth spacing. Hence, it can lead to changing the health beliefs about birth spacing.

Recommendation

Distribute copies of educational intervention booklet at different Maternal Child Health centers at Menoufia governorate, Egypt.

Conflicts of Interest Disclosure

The authors declare they have no conflict of interest.

REFERENCES

[1] Davanzo J, Razzaque A, Rahman M, et al. The Effects of Birth Spacing on Infant and Child Mortality, Pregnancy Outcomes, and Maternal Morbidity and Mortality in Matlab, Bangladesh. Labour and Population. 2011. Available from: http://www.eldis.org/go/home&id=23232&type=Document#.VcxQ3bWJJKo

[2] Belfield T. Principles of contraceptive care, choice acceptability and access. Best Pract Res Clin Obstet Gynaecol. 2009; 23(2): 177-85. PMid: 19144571. http://dx.doi.org/10.1016/j.bpobgyn.2008.11.006

[3] Marston C. Report of a WHO Technical Consultation on Birth Spacing, Geneva, Switzerland, 13-15 June. Geneva, Switzerland, World Health Organization [WHO]. 2005; 37. Available from: http://www.who.int/making_pregnancy_safer/documents/birth_spacing.pdf

[4] Bdel-Tawab N, Loza S, Zaki A. Helping Egyptian women achieve optimal birth spacing intervals through maximizing opportunities in antenatal and postpartum care. no. 9. Cairo, Egypt, Population Council. 2008. Available from: http://pdf.usaid.gov/pdf_docs/PNADN580.pdf

[5] El-Zanaty F, Way A. Egypt Demographic and Health Survey. Cairo, Egypt, Ministry of Health and Population, National Population Council. 2006. Available from: http://www.dhsprogram.com/pubs/pdf/FR176/FR176.pdf

[6] National Bureau of Statistics (NBS). Tanzania Demographic and Health Survey. Dar es Salaam, Tanzania, NBS and ICF Macro. 2010. Available from: http://dhsprogram.com/pubs/pdf/FR243/FR243%255B24June2011%255D.pdf

[7] WHO. Report of a WHO technical consultation on birth spacing. Geneva, Switzerland. 2007. Available from: http://www.who.int/reproductivehealth/publications/family_planning/WHO_RHR_07_1/en/

[8] Whitaker A, Johnson L, Harwood B, et al. Adolescent and young adult women's knowledge of and attitudes toward the intrauterine device. Contraception. 2008; 78(3): 211-7. PMid: 18692611. http://dx.doi.org/10.1016/j.contraception.2008.04.119

[9] International Institute for Population Sciences (IIPS). Macro International. National Family Health Survey (NFHS-3). India, Uttar Pradesh. Mumbai. 2005. Available from: http://dhsprogram.com/pubs/pdf/SR128/SR128.pdf

[10] Manju K. Sex it is a changing. Indian Express. 2005; 24-09-2005. Available from: http://www.krepublishers.com/02-Journals/JHE/JHE-30-0-000-10-Web/JHE-30-1-000-2010-Abst-PDF/JHE-30-1-063-10-1692-Dhingra-R/JHE-30-1-063-10-1692-Dhingra-R-Tt.pdf

[11] Champion V. Instrument development for the health belief model constructs. ANS Adv Nurs Sci. 1984; 6(3): 73-85. Available from: http://www.ncbi.nlm.nih.gov/pubmed/6426380

[12] Condelli L. Social and attitudinal determinants of contraceptive choice: using the health belief model. The journal of sex research. 1986; 22(4): 478-491. http://dx.doi.org/10.1080/00224498609551328

[13] Rosenstock I. Why people use health services, Milbank Memorial Fund Quarterly. 1966; 44(3): 94-127. PMid: 5967464. http://dx.doi.org/10.2307/3348967

[14] Cleland J, Bernstein S, Ezeh A, et al. Family planning, the unfinished agenda. Lancet. 2006; 368: 1810-1827. Available from: http://dx.doi.org/10.1016/S0140-6736(06)69480-4

[15] Hall K, White K, Reame N, et al. Studying Use of Oral Contraception, A Systematic Review of Measurement Approaches, J Women's Health. 2010; 19(12): 2203-2210. PMid: 21034277. http://dx.doi.org/10.1089/jwh.2010.1963

[16] Yeakey PM, Muntifering JC, Ramachandran VD, et al. How Contraceptive Use Affects Birth Intervals: Results of a Literature Review. Studies in Family Planning. 2009; 40(3): 205-214. PMid: 19852410. http://dx.doi.org/10.1111/j.1728-4465.2009.00203.x

[17] Janz N, Becker M. The Health Belief Model, A Decade Later. Health Education & Behavior. 1984; 11(1): 1-47. Available from from: http://deepblue.lib.umich.edu/bitstream/handle/2027.42/66877/10.1177_109019818401100101.pdf%20?sequence=2

[18] Nathanson C, Becker M. Contraceptive behavior among unmarried young women. A theoretical framework for research. Pop Environ. 1983; 6(1): 39-58. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3790325

[19] Eisen M, Zellman G, McAlister A. A health belief model approach to adolescents' fertility control: some pilot program findings.Health Educ Q. 1985; 12(2): 185-210. PMid: 3997538. http://dx.doi.org/10.1177/109019818501200205

[20] Baa L, Moore A, Maniaci R. Perceptions of susceptibility to pregnancy among U.S. women obtaining abortions. Guttmacher Institute, 125 Maiden Ln, 7 Fl, New York, NY 10038. 2008. Available from: http://dx.doi.org/10.1016/j.socscimed.2013.10.010

[21] Mahmoodi A, Kohan M, Azar F, et al. The impact of education using Health Belief Model on awareness and attitude of male teachers regarding their participation in family planning. Journal of Jahrom University of Medical Sciences. 2011; 9(3). Available from: http://jmj.jums.ac.ir/files/site1/user_files_204932/eng/admin-A-10-1-80-a0edd8a.pdf

[22] Alamah H. Bridging generic and professional care practices for Muslim patients through use of leininger's culture care model. Contemporary Nurse. 2008; 28(1-2): 83-97. Available from: https://www.questia.com/library/journal/1P3-1591143541/bridging-generic-and-professional-care-practices-for

[23] Subbiah K. Reproductive Health Behavior of Economically Disadvantaged Women in South India. Center for communications, health and the environment. 2000. Available from: http://www.ceche.org/communications/sindpsa/sindiaReproductiveHlth.html

[24] Tessema G, Zeleke B, Ayele TA. Birth interval and its predictors among married women in Dabat District, Northwest Ethiopia: A retrospective follow up study. Afr J Reprod Health. 2013; 17(2): 39-45. PMid: 24069750. Available from: http://www.bioline.org.br/pdf%3Frh13021

[25] Maguire K, Westhoff C. The state of hormonal contraception today: established and emerging non contraceptive health benefits. American Journal of Obstetrics and Gynecology. 2011; 205: S4-S8. PMid: 21961824. http://dx.doi.org/10.1016/j.ajog.2011.06.056

[26] Jones R. Beyond Birth Control: The Overlooked Benefits of Oral Contraceptive Pills, New York: Guttmacher Institute, Beyond Birth Control: The Overlooked Benefits of Oral Contraceptive Pills, New York: Guttmacher Institute; 2011. Available from: https://www.guttmacher.org/pubs/Beyond-Birth-Control.pdf

[27] Kavanaugh M, Anderson R. Contraception and Beyond: The Health Benefits of Services Provided at Family Planning Centers, New York: Guttmacher Institute. 2013. Available from: http://www.guttmacher.org/pubs/health-benefits.pdf

[28] Frost J. Public or private providers? U.S. women's use of reproductive health services, Perspectives on Sexual and Reproductive Health. 2001; 33(1): 4-12. http://dx.doi.org/10.2307/2673736

[29] Frost J, Duberstein L, Finer L. Young adults' contraceptive norms and attitudes: associations with risk of unintended pregnancy. Perspectives on Sexual and Reproductive Health. 2012; 44(2): 107-116. PMid: 22681426. http://dx.doi.org/10.1363/4410712

[30] Yang F. Health Beliefs and Contraception Use in Leogane, Haiti: A Qualitative Study. Duke Global Health Institute. 2013. Available from: http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/7326/Yang_duke_0066N_11986.pdf%3Fsequence%3D1

[31] Gaffield M, Culwell K, Ravi A. oral contraceptives and family history of breast cancer. J women health. 2009; 80(4): 372-80. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19751860

[32] Shulman L. The state of hormonal contraception today: benefits and risks of hormonal contraceptives. American Journal of Obstetrics & Gynecology. 2011; 205(4). Available from: http://www.tandfonline.com/doi/abs/10.1080/01609513.2010.529596

[33] Brown W, Ottney A, Nguyen S. Breaking the barrier: the Health Belief Model and patient perceptions regarding contraception. International reproductive health jornal. 2011; 83(5): 453-458. Available from: http://www.Contraceptionjournal.org/article/S0010-7824%2810%2900539-1/abstract

[34] Halpern V, Lopez L, Grimes D, et al. Strategies to improve adherence and acceptability of hormonal methods of contraception. Cochrane Database of Systematic Reviews. 2013; 10(4). http://dx.doi.org/10.1002/14651858.CD004317.pub4

[35] Grossman D, GrindlayK, Rick L, et al. Interest in over-the-counter access to oral contraceptives among women in the United States. 2013; 88(4): 544-552. Available from: http://www.contraceptionjournal.org/article/S0010 7824%2813%2900129-7/abstract