Enferm Clin. 2019;29(S2):304–309

Enfermería Clínica

www.elsevier.es/enfermeriaclinica

Preparing pregnancy through Preconception Education Training☆

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Received 13 November 2018; accepted 17 April 2019
Available online 16 July 2019

KEYWORDS
Preconception health;
Preconception education;
Preconception care

Abstract
Objective: This study aimed to identify the effectiveness of preconception education on unmarried women in preparing for pregnancy.
Method: A quasi-experimental pre and posttest with control group study included 92 unmarried women in West Java, Indonesia, which were selected by consecutive sampling. Each respondent in the intervention group was provided a preconception education consisting of preconception physical health, nutrition, and lifestyle topic with a booklet.
Results: This study indicated a significant difference in post-intervention scores, with the intervention group scoring higher than the control group in overall preconception health knowledge such as physical health ($p < 0.001$), nutrition ($p < 0.001$), and lifestyle ($p < 0.001$). In terms of intra-group score analysis between pre and post intervention, there were significant changes within the intervention group in the knowledge of physical health ($p < 0.001$), nutrition ($p < 0.001$), and lifestyle ($p < 0.001$). The most significant changes in knowledge occur in preconception nutrition (53.5%) followed by preconception lifestyle (20.1%) and preconception physical health (11.8%). Within the control group, there was no significant change from pre and post intervention in scores for overall preconception health knowledge.
Conclusion: This study recommended to use this preconception education to increase the knowledge related to preconception health of the unmarried women whether they plan to have a child soon or postpone the pregnancy after marriage.

☆ Peer-review under responsibility of the scientific committee of the Second International Nursing Scholar Congress (INSC 2018) of Faculty of Nursing, Universitas Indonesia. Full-text and the content of it is under responsibility of authors of the article.

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https://doi.org/10.1016/j.enfcli.2019.04.140
1130-8621/

Introduction

Healthy mothers and babies are the goals of every family. Women's health status during preconception or before pregnancy plays a vital role in maternal health during pregnancy, childbirth, postpartum, both for mother and baby. The previous studies showed that women's health status before pregnancy or preconception would affect the health and safety of mothers and babies during pregnancy and the childbirth process, and also on postpartum period.[1,2] A lot of women enter the conception period or pregnancies with lacking self-awareness, knowledge, attitudes, and behavior related to preconception health which influenced their overall health. To achieve optimal health conditions during pregnancy and obtain a good pregnancy outcome, women need to maintain their health conditions since the preconception period.

One of the promotive efforts to improve women's health status in the preconception period is preconception care. It is a series of interventions that are carried out to identify and modify biomedical, behavioral and social factors through prevention and intervention in optimizing the health status of women before the conception or early stage of pregnancy.[3] Through preconception care, it is expected that women will be prepared both physically and emotionally when entering the conception period. Preconception care includes conception planning to prevent unwanted or unplanned pregnancies, contraceptive selection, immunization, physical examination, assessment of risk factors and medical history, provision of preconception education, improvement of healthy behaviors (preventing sexually transmitted diseases and management of chronic diseases) and risky behaviors changes such as consumption of alcohol, cigarettes, and drugs.[4]

Providing health education is one of the main components of preconception care. Research shows that the provision of preconception education increase understanding about preconception health,[5,6] increase self-awareness on preconception health,[7] motivate the women to change their behavior, lifestyle, and attitudes in improving their health status during the preconception period.[8] Changes in behavior, lifestyle and attitudes are attempted by increasing consumption of folic acid, doing regular physical activity, maintaining good nutritional status,[9] reducing or change in alcohol consumption, caffeine, and smoking habits,[10] immunizing and opening up through visitation or consultation with health workers regarding preconception health.[11]

Health education about preconception care is delivered to both women and men in the reproductive age as part of reproductive health promotion. In some countries, preconception education is provided as early as possible for adolescents in schools. Studies conducted by Delgado and Charafeddine et al. showed that the provision of preconception health education to adolescents at high school increased self-awareness and knowledge about preconception health.[6,12] Preconception education is also addressed to vulnerable people with specific risks of health problems. Women with health problems and a history of previous chronic diseases tend to have a higher self-awareness on health conditions and show a positive attitude toward preconception care. A study of Fischl et al. on adolescent girls with diabetes mellitus showed that a brief preconception counseling program increased knowledge and fostered self-awareness about the benefits of preconception care and reproductive organ health.[13] Other research conducted by Goossens et al. showed that women with nullipara and women with a history of abortion were more likely to prepare their pregnancies well and change their behavior and lifestyle to improve their health status before pregnancy.[14]

The Ministry of Health issues a policy that regulates preconception health services as regulated in Act No. 97 of the Republic of Indonesia Health Minister in 2014. It is formulated to prepare Indonesian women for healthy and safe pregnancies and deliveries and obtain healthy babies. In its implementation, the Indonesian Ministry of Health cooperates with the Ministry of Religion through the Office of Religious Affairs in providing health education regarding reproductive health. Preliminary studies conducted in the area of the Bandung, showing that in the last two years, the Ministry of Religion of Bandung City Regional Office held Marriage Guidance aim to bride and groom couples. In the Marriage Guidance, the material is about reproductive health in general but is not devoted to health education or education on preconception health. Various situations and conditions have been explained to be the background of the importance of intervention research to see the effectiveness of preconception education on knowledge and attitudes and identify preconception health behaviors of the bride and groom in preparing pregnancy.

Method

This quasi-experimental pre and posttest with control group study was conducted in Bandung, West Java, Indonesia. The sample was 92 females who were never married and had registered their marriage at the Office of Religious Affairs and have attended the Marriages Guidances held by the Ministry of Religious Affairs Bandung Regional Office. The respondents divided into an intervention group and the control group. The intervention group was given a preconception education including preconception physical health, nutrition, and lifestyle, while the control group was not given the intervention but get the booklet of preconception health. Research ethics was applied to protect respondents. The Faculty of Nursing Universitas Indonesia Ethics Committee's approved this study with reference number 136/UN2.F12.D/HKP.01.04/2018 and through administrative procedures at the Ministry of Religious Affairs of The Republic Indonesia, Bandung Regional Office. All respondents in this study signed informed consent after the researcher gave information about the research. Data collection was carried out for a month.

Questionnaires used in this study were the Preconception Health Practice and Behavior Questionnaire developed by Paulsen, the Women's Preconception Health Survey developed by Rodgers and modified by Paulsen and the Reproductive Health Attitudes and Behavior (RHAB) Questionnaire developed by Charron-Prochownik et al.[15,16] The intervention provided is preconception health education including physical health, nutrition, and preconception

Table 1 Respondents' characteristics on intervention group and control group ($n = 92$).

Variables	Intervention group ($n = 46$)		Control group ($n = 46$)	
	F	%	*F*	%
Educational background				
Low	3	6.5	4	8.7
Average	21	45.7	20	43.5
High	22	47.8	22	47.8
Occupational status				
Unemployed	3	6.5	7	15.2
Private employees	41	89.1	31	67.4
Entrepreneur	0	0	3	6.5
Labor	1	2.2	2	4.3
Others	1	2.2	3	6.5
Income				
Low	24	52.2	28	60.9
High	22	47.8	18	39.1
Nutritional status				
Thin	10	21.7	10	21.7
Average	21	45.7	27	58.7
Fat	15	32.6	8	17.4
Obesity			1	2.2
Planning a pregnancy				
Yes	41	89.1	40	87.0
Postpone	5	10.9	6	13.0

healthy lifestyle. In the control group, the Marriage Guidances of the Ministry of Religious Affairs of the Republic of Indonesia were provided as a general program. Data analysis used in this study included univariate and bivariate analyzes. Univariate analysis was used to determine the characteristics of respondents. Chi Square was used to test the respondents' homogen ity. Bivariate analysis was conducted to determine differences in knowledge between the intervention group and the control group after being given a preconception education intervention. The Wilcoxon Signed Rank Test analyzed the mean difference test in both the intervention group and the control group after the intervention. The level of significance was set at 0.05.

Results

The results showed that the intervention group with the average age of 24.24 years and a standard deviation of 1.864, with most of them having high education (47.8%) and working as private employees (89.1%), have low income (52.2%), normal nutritional status (45.7%) and planning a pregnancy (89.1%). The control group with an average age of 23.85 years and standard deviation of 1.738, with most of them having high education (47.8%) and working as private employees (67.4%), had low income (60.9%), normal nutritional (58.7%), and planning a pregnancy (87%). The characteristics of the respondents from the two groups are in Tables 1 and 2.

In the intervention group, there was a significant difference before and after the preconception education was given in every aspect of knowledge, i.e. physical health ($p < 0.001$), nutrition ($p < 0.001$) and preconception lifestyle ($p < 0.001$). The average understanding related to preconception health before being given preconception education was physical health (6.26 ± 0.828), nutrition (3.85 ± 1.520), and lifestyle (5.83 ± 0.851). While after training was physical health (7.00 ± 0.000), food (5.91 ± 0.285) and lifestyle (7.00 ± 0.000). The difference in the average knowledge of health preconception was physical health 0.74 (11.8%), diet 2.06 (53.5%), and lifestyle 1.17 (20.1%). It showed that there is an increase in knowledge about preconception health in the intervention group after being given preconception education with the most significant increase in preconception nutrition knowledge (Table 3).

Table 2 The age of the respondents' on control group and intervention group ($n = 92$).

Variables	Mean	SD	Minimum	Maximum
Age				
Intervention	24.24	1.864	19	29
Control	23.85	1.738	20	28

In control group, there is no significant difference in knowledge before and after the general intervention of Marriage Guidance on every aspect of knowledge, i.e. physical health ($p = 1.000$), nutrition ($p = 0.414$) and preconception lifestyle ($p = 0.564$). The average preconception health knowledge before being given preconception education is physical health (5.76 ± 0.848), nutrition (3.61 ± 0.977), and lifestyle (6.02 ± 0.774). While after being given preconception, education is physical health (5.76 ± 0.848), nutrition

Table 3 Mean differences in knowledge intervention group and control group before and after intervention ($n = 92$).

	Mean	SD	Difference	Min	Maks	p^*	
Intervention group							
Physical health							
Pretest	6.26	0.828	0.74	11.8%	4	7	0.001
Postest	7.00	0.000			7	7	
Nutrition							
Pretest	3.85	1.520	2.06	53.5%	0	6	0.001
Postest	5.91	0.285			5	6	
Lifestyle							
Pretest	5.83	0.851	1.17	20.1%	4	7	0.001
Postest	7.00	0.000			7	7	
Control group							
Physical health							
Pretest	5.76	0.848	0.00	0%	4	7	1.000
Postest	5.76	0.848			4	7	
Nutrition							
Pretest	3.61	0.977	0.04	1.1%	1	5	0.414
Postest	3.65	1.079			1	6	
Lifestyle							
Pretest	6.02	0.774	−0.02	0.3%	4	7	0.564
Postest	6.00	0.760			4	7	

* Significant test use Wilcoxon Signed Rank Test.

(3.65 ± 1.079), and lifestyle (6.00 ± 0.760). The difference in the average knowledge of health preconception were physical health 0.00 (0%), nutrition 0.04 (1.1%), and lifestyle −0.02 (0.03%). Based on these results, there is an increase in knowledge about preconception health in the control group following the general intervention of Marriage Guidance with the greatest increase in preconception knowledge about nutrition. However, statistically, it can be concluded that there is no significant difference before and after going through the general intervention of Marriage Guidance in the control group. The mean differences of knowledge from intervention and control groups are in Table 3 and Table 4.

Discussion

Preconception education in this study increased the understanding related to physical health, nutrition, and preconception lifestyle. There is a significant difference in preconception health knowledge between the intervention groups before and after the training of preconception education. These results indicated that the intervention is effective in improving preconception health knowledge. These findings are in line with the previous study by DeJoy whose outcome reported that preconception education stimulates understanding about preconception health.[17] This study shows that there is a significant difference before and after the intervention.

Interesting findings in this study are on intervention groups following the training of preconception education. The increase in knowledge on preconception nutrition is more significant than physical health knowledge and preconception lifestyle. One of the aspects that have risen is the knowledge of the benefits of folic acid. Before preconception education, most respondents of the intervention group (69.5%) knew the benefits of folic acid. However, after preconception education, all respondents (100%) identified the benefits of folic acid to reduce the risk of congenital disabilities in infants. Another study conducted by Bitzer et al. found that 40% of 22.925 women in their reproductive age who was the research respondents knew the benefits of folic acid to reduce the risk of birth defects in infants but only 17% of them understood what diseases were able to be being prevented by consuming folic acid, i.e., neural tube defects in infants.[18]

Another interesting finding in this study is the knowledge of preconception nutrition in intervention group before intervention showed the lowest value compared to the understanding of physical health and preconception lifestyle. The nutritional intake during the preconceptions period affects the health of the mother and the baby in the future. The most frequent nutrient-related issue in women in the preconception period is chronic energy deficiency (CED). Chronic energy deficiency that occurs during the preconception period will adversely affect maternal health during pregnancy, fetal growth and development, pregnancy outcomes, and future child growth and development.[19] Pregnant women with chronic energy deficiency (CED) are at risk of abortion, giving birth to babies with Low Birth Weight (LBW), congenital disorders, stunting in childhood, shorter height in adulthood, low intellectual, and reduced economic productivity.[20]

The findings indicate that the training of preconception education for unmarried women effectively increases

Table 4 Mean differences of knowledge on intervention group and control group after intervention ($n = 92$).

	Mean	SD	Difference	Min	Maks	p^*
Physical health						
Intervention	7.00	0.000	1.24	7	7	0.001
Control	5.76	0.848		4	7	
Nutrition						
Intervention	5.91	0.285	2.26	5	6	0.001
Control	3.65	1.079		1	6	
Lifestyle						
Intervention	7.00	0.000	1.00	7	7	0.001
Control	6.00	0.760		4	7	

* Significant test use Wilcoxon Signed Rank Test.

the knowledge and attitudes of the couple in pregnancy preparation. This training is suitable for the couple not only in the preconceptional period but also when the women are pregnant, or they delay the pregnancy after marriage. The study is limited among the couples who will marry at the Office of Religious Affairs which is one of the offices at the Ministry of Religion Affairs. It means all the respondents are muslims. Future studies are needed in the broader population including the couples who marry at the Civil Registry Office. Cultural and religious aspects are also need to consider to enhance the content of the Preconception Education Training.

Conflict of interests

The authors declare no conflict of interest.

Acknowledgement

This work is supported by Hibah PITTA 2018 funded by DRPM Universitas Indonesia no: 1860/UN2.R3.1/HKP.05.00/2018.

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