Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

The Impact of a Self-Care Educational Intervention on Knowledge, Attitudes and Practices Regarding COVID-19 Prevention in Pregnant Women: An Experimental Study

Reza Sadeghi (PhD)[1], Narges Khanjani (PhD)[2], Zohreh Karimiankakolaki (PhD)[3], Sakineh Gerayllo (PhD)[4*], Mohammad Bakhtiyari (PhD)[5]

[1] Associate Professor, Department of Public Health, Student Research Committee, Sirjan School of Medical Sciences, Sirjan, Iran
[2] Professor, Department of Medical Education, Paul L. Foster School of Medicine, Texas Tech Health Sciences Center, El Paso, Texas, USA
[3] Associate Professor, Department of Health, ShK.C., Islamic Azad University, Shahrekord, Iran
[4] Associate Professor, Department of Public Health, Faculty of Health, Golestan University of Medical Sciences, Gorgan, Iran
[5] Assistant Professor, Department of Public Health, Sirjan School of Medical Sciences, Sirjan, Iran

ARTICLE INFO

Article type:
Original article

Article History:
Received: 09-Aug-2023
Accepted: 19-Feb-2024

Key words:
Self-care
Pregnancy
Knowledge
Attitude
Practice
COVID-19

ABSTRACT

Background & aim: COVID-19 is highly contagious, and pregnant women might be at a higher risk of developing severe symptoms. This study aimed to evaluate the impact of a self-care education intervention on knowledge, attitude, and practices (KAP) related to preventing COVID-19 among pregnant women.

Methods: This experimental study was conducted in Sirjan Health Centers from January to March 2021. A total of 60 pregnant women, divided equally into experimental and control groups, participated in this study. The educational intervention included face-to-face training, educational brochures and posters, and text message reminders sent weekly over two months. Data collection was done using validated and reliable researcher-made questionnaires, including demographic and knowledge, attitude, and practice (KAP) questionnaires. Before the intervention and then the months after the intervention. Data analysis was performed by SPSS 23, using t-tests, chi-square, and correlation coefficients.

Results: The experimental group showed significantly higher mean scores of knowledge, attitude, and practice in comparison to the control group after the intervention ($p<0.001$). Additionally, the mean scores of knowledge, attitude, and practice significantly increased after the intervention in the experimental group, compared to before the intervention ($p<0.001$). However, there were no significant changes after two months in the control group.

Conclusion: The effectiveness of the educational intervention in improving KAP is confirmed in this study, and notable enhancements were observed in the intervention group compared to the control group. Such interventions not only support individual health but also contribute to reducing healthcare costs and disease burden at the community level.

▶ Please cite this paper as:
Sadeghi R, Khanjani N, Karimiankakolaki Z, Gerayllo S, Bakhtiyari M. The Impact of a Self-Care Educational Intervention on Knowledge, Attitudes and Practices Regarding COVID-19 Prevention in Pregnant Women: An Experimental Study. Journal of Midwifery and Reproductive Health. 2025; 13(3): 1-8. DOI: 10.22038/JMRH.2024.74239.2174

Introduction

Respiratory infections cause high mortality and morbidity globally (1). COVID-19 is a respiratory and airborne disease with symptoms that range from mild, such as fever and cough, to severe, fatal conditions (2-3).

Pregnant women might be at higher risk of developing severe symptoms when infected with COVID-19 compared to other people (2), and the infection may cause serious adverse health effects among them (4). The CDC states that COVID-19 can make pregnant women critically ill

* *Corresponding author*: Sakineh Gerayllo, Associate Professor , Department of Public Health, Faculty of Health, Golestan University of Medical Sciences, Gorgan, Iran. Tel: 00989119663865, Email: gerayllo65@yahoo.com

and even cause premature delivery or miscarriage (4). During the pandemic, one of the pregnant women's major concerns was protecting themselves from getting COVID-19 (4).

COVID-19 is a highly infectious disease, and pregnant women might be at increased risk for severe illness from COVID-19 compared to non-pregnant people (2). One effective way to improve pregnant women's health against COVID-19 is by enhancing their knowledge, attitude, and practice about it (2). Health education programs play an important role in improving COVID-19 knowledge and are also helpful in encouraging optimistic attitudes and maintaining safe practices (5). The effectiveness of the educational intervention can then be evaluated by measuring the changes in KAP scores (1).

Self-care is an essential principle for improving health (6). It can decrease stress, improve life quality, reduce the cost of healthcare, and decrease mortality (4). During pregnancy, self-care can be learned through care programs (7). Self-care for COVID-19 includes social distancing, covering the face when sneezing and coughing, washing hands, and using face masks (8).

Promoting sanitation and health education are key tools for disease control and improving COVID-19-related knowledge and practices (2,9); pregnant women, as a vulnerable group, require focused prevention and management through targeted self-care interventions (4,10). Healthcare centers can be suitable places for educating pregnant women about self-care activities (11). Given the importance of the topic and the emergency situation that had gripped the entire world for several years, this intervention study was conducted with two objectives: first, an applied study to prevent infection in pregnant women through combined educational interventions; second, designing an educational package for pregnant women during the pandemic crisis. This package was used by the covered women until the end of the crisis.

Therefore, this study was conducted to investigate the effect of self-care education on KAP variables for preventing COVID-19 infection among pregnant women visiting health centers. The results of this study can help authorities implement the necessary educational interventions for protecting pregnant women.

Materials and Methods

This experimental study was conducted in Sirjan, Iran, from January to March 2021.

The statistical sample consisted of 60 participants. The sample size was determined according to a similar study conducted by Taqdisi et al.(12), and considering the significance level of 0.05, power of 0.20, the standard deviation of practice equal to 4, and the difference in means between the two groups equal to 3. The minimum sample size was estimated to be 27 persons in each group. Nonetheless, we increased the sample size to 30 persons per group to compensate for any loss to follow-up (Figure 1).

Two centers from the health and treatment centers of Sirjan were selected as the research sites. Then, 30 pregnant women from each center were conveniently recruited into the study and randomly assigned to the intervention and control groups.

Two centers from the health and treatment centers of Sirjan were randomly selected as the intervention and control sites. Then, from each health center, 30 pregnant women entered the study on a convenience basis.

The explicit nature of the intervention made blinding impractical. The inclusion criteria were being pregnant, willingness to participate in the study, and residing in Sirjan; and the exclusion criteria were having a specific disease such as thyroid disorders, diabetes, hypertension needing special care, termination of pregnancy, or unwillingness to participate.

Data collection was performed using a researcher-made questionnaire. The questionnaire used in this study consisted of demographic questions and questions related to knowledge, attitude, and practice, as well as health behaviour and information sources that were assessed by the questionnaire after the intervention.

Knowledge was assessed with 15 questions and was scored as Yes = 2, and “I don't know” or “No” =1, and its score ranged from 15 to 30. The questionnaire also included 10 questions related to attitude, which were answered on a 5-point Likert scale. The score was from strongly agree = 5 to strongly disagree = 1, and the range of the

questionnaire's score was 10-50. The last section of the questionnaire included 10 questions about practice, which were also on a 5-point Likert scale, from very much = 5 to not at all or none = 1, and the total score ranged from 10 to 50. In addition, questions alongside the KAP questionnaire were used to assess the educational resources of the target group.

The questionnaires were sent to ten experts (including five health education specialists, two obstetricians, and three academics in the field of public health) to evaluate their content and face validity. The questionnaire was edited after researchers received comments about the necessity, relevance, clarity, and comprehensiveness of the questions. Also, 30 pregnant women not participating in the study were asked to complete the questionnaire, and the Cronbach's alpha was calculated, with 0.7 or higher considered acceptable. A retest was done two weeks after to examine test-retest reliability.

The Cronbach's alpha was 0.91, 0.90, and 0.91 for knowledge, attitude, and practice, respectively. Also, the correlation coefficient (r) of test–retest was 0.90, 0.89, and 0.88 for knowledge, attitude, and practice, respectively.

The content of the educational program was designed by the researchers and then reviewed by experts in the fields of health education and health promotion. It was later approved after researchers made revisions according to the comments of the expert panel. The content of the intervention included providing information about teaching self-care methods to prevent coronavirus infection during pregnancy, and educating participants on maintaining hygiene.

The educational intervention was an educational package aimed at improving COVID-19 preventive behaviors among pregnant women. It included a 15-minute face-to-face session by the health center team covering key topics such as virus transmission, hand hygiene, mask use, social distancing, and pregnancy-specific precautions. Participants also received an educational pamphlet and posters reinforcing these messages. Additionally, weekly text message reminders were sent for two months to help retain and apply the learned information. The control group received standard care without additional education. The questionnaires were collected before and two months after the educational intervention, and then compared between the control and intervention groups.

The normality of quantitative variables was checked by the Kolmogorov-Smirnov test before statistical analysis. Data were analyzed using the independent t-test to compare the average scores of knowledge, attitude, and Practice between groups separately before and after the intervention; the paired t-test to compare the average scores before and after the intervention within the intervention and control groups; and the chi-square test to compare behaviors and resource usage separately between the intervention and control groups. Statistical analysis was conducted using SPSS V21, with a significance level of 0.05.

Results

The participants of this study were 60 pregnant women. The intervention and control groups were similar in terms of demographic characteristics such as age, education, and occupation, with no statistically significant differences. The mean age in the intervention group was 29.17±3.01, and in the control group was 28.79±2.67 years, which was not significantly different.

Table 1 presents the frequency distribution of demographic characteristics of the participants.

Comparison of the mean scores of knowledge, attitude, and practice between the intervention and control groups showed significantly higher scores in the experimental group after the intervention. Also, paired t-tests showed that the mean scores of knowledge, attitude, and practice significantly increased after the intervention in the experimental group (Table 2).

Table 1. Demographic characteristics of the pregnant women participating in this study

Group	Number (%)		P-Value
	intervention group (N=30)	control group(N=30)	
Age			
17 to 27 years old	16(53.3)	19(63.3)	0.514*
27 to 37 years old	14(46.7)	11(36.7)	
Employed			
Yes	24(80)	26(86.7)	0.625*
No	6(20)	4(13.3)	
Education			
Elementary school education	1(3.4)	5(16.6)	
Intermediate School education	-	2(6.7)	**0.423
High School diploma	7(23.3)	8(26.7)	
University degree	22(73.3)	15(50)	

* Chi-square test: ** Fisher exact test

Table 2. Comparison of mean scores of knowledge, attitude, and practice before and two months after the intervention

Constructs	Participants in the study (n=60)		P-Value*
	Before Intervention Mean± SD	After intervention Mean± SD	
Knowledge			
Intervention	2.24±21.07	1.52±28.12	<0.001
Control	2.37±22.11	2.51±23.01	0.14
p-value**	0.292	<0.001	
Attitude			
Intervention	3.27±37.12	3.36±44.78	<0.001
Control	2.43±37.45	2.57±37.96	0.25
p-value**	0.378	<0.001	
Practice			
Intervention	4.62±36.41	4.32±46.11	<0.001
Control	3.99±37.75	3.66±38.03	0.094
P-Value**	0.08	<0.001	

* Paired t-tests; **Independent t-tests

The results of the chi-square test indicated that some health behaviors, including regular hand washing, not touching face (nose, eyes, and mouth), using personal protective equipment, and using hand sanitizers, significantly increased after the intervention in the experimental group (Table 3).

The most common sources of information among the participants were social media (such as WhatsApp, Telegram, and Instagram) (p<0.001), family (P=0.412), and health workers (P=0.009), respectively (Table 4).

Figure 1. CONSORT Flowchart of the study

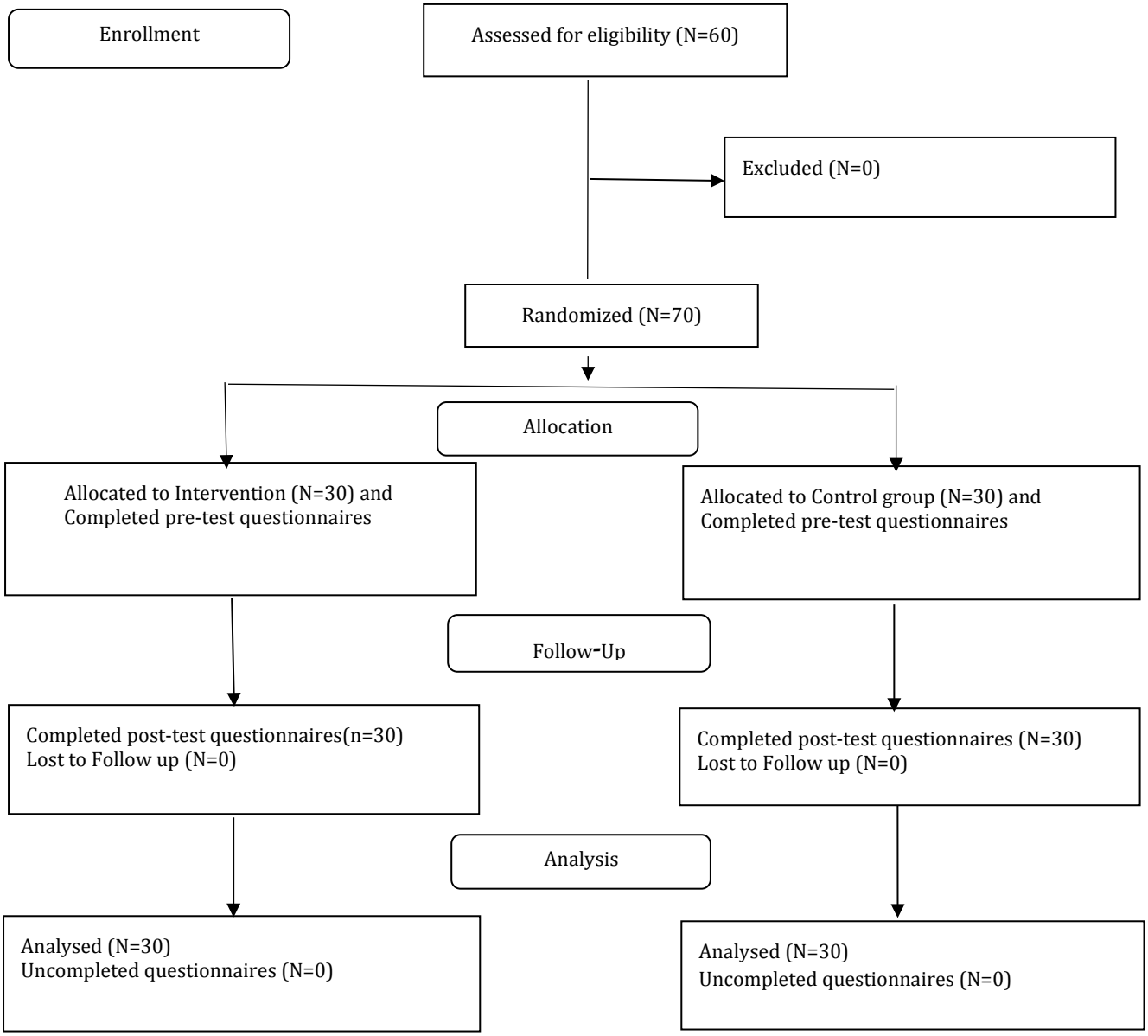

Table 3. The comparison of practice before and two months after the intervention

Health behaviors	Before Intervention Number (%)	After intervention Number (%)	P-Value (chi-square)
Regular hand washing			
Intervention	24(80)	28(93.3)	<0.001
Control	22(73.3)	22(73.3)	0.452
Not touching their face (nose, eyes, and mouth)			
Intervention	17(56.7)	27(90)	<0.001
Control	19(73.3)	20(66.7)	0.574
Using personal protective equipment			
Intervention	23(76.7)	29(96.7)	<0.001
Control	15(50)	22(73.3)	<0.001
Using hand sanitizers			
Intervention	18(60)	27(90)	<0.001
Control	16(53.3)	17(76.7)	0.871
Keeping their distance from people			
Intervention	28(93.3)	29(96.7)	0517
Control	26(86.7)	27(90)	0.546

Table 4. The information sources of participants

Information resources	Total n = 60 N (%)	Intervention N = 30	Control N = 30	P-Value (chi-square)
Social media such as WhatsApp .Messenger, Telegram, Instagram, etc	56 (93.3)	30 (100)	26 (86.7)	<0.001
Radio and TV	35 (58.3)	22 (73.3)	13 (43.3)	<0.001
Acquaintances & Friends	41 (68.3)	25 (83.3)	16 (53.3)	<0.001
Banners and Billboards	36 (60)	19 (63.3)	17 (56.7)	0.03
Family	55 (91.6)	28 (93.3)	27 (90)	0.412
Health workers	54 (90)	28 (93.3)	26 (86.7)	0.009
Others	27 (45)	15 (50)	12 (40)	0.007

Discussion

This research was designed to evaluate the impact of a self-care education intervention on KAP related to preventing COVID-19 among pregnant women.

Many researchers have recommended the use of self-care interventions for pregnant women, considering them a sensitive target group (13,14). According to the findings of a study by Mohamed et al. (2020), educational intervention was effective in increasing the KAP of pregnant women regarding the prevention of COVID-19. Their educational intervention consisted of two scheduled sessions, and different teaching methods, including videos and demonstrations, were utilized (2).

In another study conducted in Egypt by Mahmoud et al. (2020), the educational program, including lectures, meetings, and handing out brochures, was held three days a week, 4 hours a day. This program significantly improved pregnant women's knowledge about preventing COVID-19(16) In the study of Elmordy et al. (2021), knowledge, overall compliance with preventive measures, and all components of the health belief model increased both immediately after the program and three months post-implementation, compared to baseline, among Pregnant Women (17).

People's knowledge and attitudes predict disease preventive behavior and adherence to health guidelines (15).

Previous research also suggests that individuals can delay or prevent many exposure-related health problems by self-care (10), and this study confirmed the benefit of teaching self-care activities to pregnant women as well. Results of the study conducted by Hashemzahi et al. (2022)

showed the effectiveness of COVID-19 self-care training in reducing stress and anxiety among pregnant women and Rostami et al study's (2023) about the effect of educational intervention with mobile health technology on the COVID-19 imposed stress among pregnant women, that the results of these studies also indicated the effect of educational intervention in reducing the risks of COVID-19 (13-14) .

The current study showed that pregnant women acquired information mostly from social media, family, and health workers, and this point should be taken into account when implementing community-based educational programs. In the Sayed and Sarhan (2022) study, pregnant women gathered their information mainly through health workers, booklets, media, and family(18) Of course, it is important to note that readable and appropriate content (information) using scientific methods plays an important role in the effectiveness of educational materials (19).

The main strength of this study was the utilization of diverse educational methods (lectures, posters, pamphlets, and text messages), which aimed to provide multimedia self-care education during the COVID-19 pandemic for pregnant women.

A limitation of this study was the use of self-administered questionnaires and self-reporting, lack of blinding, and non-randomization of the samples. Also, since only pregnant women who visited health centers entered this study, the results are not generalizable to all pregnant women. Another limitation was the fact that both intervention and control groups had access to other routes of information during the intervention, which could have affected their knowledge, attitude, or practice.

Conclusion

The findings of this study demonstrate the effectiveness of educational interventions in improving knowledge, attitude, and practice among pregnant women regarding preventive behaviors. Enhancing knowledge during pregnancy remains crucial due to the vulnerability of this period and its impact on maternal and fetal health. Strengthening comprehensive and continuous educational programs using health education models can empower pregnant women to better manage various health risks, including infectious diseases; ultimately improving pregnancy outcomes and promoting long-term well-being for mothers and infants. Such interventions not only support individual health but also contribute to reducing healthcare costs and disease burden at the community level.

Declarations

Acknowledgements

The authors of the study wish to thank all individuals who helped us sincerely in conducting this study, particularly participants who collaborated in the implementation of the project.

Conflicts of interest

The authors declared no conflicts of interest.

Ethical approval

Informed consent forms were completed by all participants. Participants were informed about their right to withdraw from the research. Participants' information was kept confidential.

Code of Ethics

This study was approved by the Ethics Committee of Sirjan School of Medical Sciences (Ethics Code: IR.SIRUMS.REC.1399.004

Use of Artificial Intelligence (AI)

No artificial intelligence was used.

Funding

The financial support is from Sirjan School of Medical Sciences.

Authors' contribution

The study was designed by SG, RS. RS, MB, ZK were responsible for collecting the data and educational intervention. Statistical analysis was performed by NKH. Also, SG and ZK wrote the first draft of the manuscript. All authors provided feedback on previous versions of the manuscript and approved the final version.

References

1. Hashemi M, Sadeghi R, Shamsi M. An investigation of Educational Intervention impact on pregnant women for promote preventive behaviors of influenza H1N1: using health belief model. Koomesh. 2017; 19(3): 603-610.

2. Mohamed AI, Elsayed DMS, Abosree TH, Eltohamy NAE. Pregnant Women's Knowledge, Attitude and Self-Protective Measures Practice

regarding Corona virus prevention: Health Educational Intervention. Egyptian Journal of Health Care. 2020; 11(4): 260-278.
3. Sadeghi R, Masoudi MR, Mohammadi A, Asadikaram G, Beigzadeh A, Karbalaei M, Moqaddasi Amiri M. COVID-19 Caring Behaviors: A Cross-sectional Study in the East of Iran. Journal of Research and Health. 2023; 13(5): 373-380.
4. Moulaei K, Sheikhtaheri A, Ghafaripour Z, Bahaadinbeigy K. The development and usability assessment of an mHealth application to encourage self-care in pregnant women against COVID-19. Journal of Healthcare Engineering. 2021: 1-14
5. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International journal of biological sciences. 2020, 16(10): 1745-1752.
6. Gharibi F, Kokhaei P, Kassaeian SS, Kahouei M, Moshiri E. The Impact of "Each Home as a Health Post" Program on Community Self-Care Based on a Knowledge, Attitudes, and Practice Survey: A Study Protocol. Middle East Journal of Rehabilitation and Health Studies. 2022; 9(2): 1-6.
7. Haghighi NB, Sharifzadeh M, Delir R H, Alizadeh N, Ebrahimi M H, Garkaz O. Investigating the Effectiveness of Self-care Training on Improving the Physical Health Status of Pregnant Women. Fertility, Gynecology and Andrology. 2023: 3: 1-7.
8. Johora F, Abbasy AA, Jeenia FT, Bhowmik MC, Aktar M, Choudhury NA, et al. COVID-19 Pandemic and Prevalence of Self-care Practices among the Future Physicians: A Bangladesh Study. Medrxiv. 2021; 20(2): 1-11.
9. Dastras M, Damani E, Damani E. Intervention on Self-care in Reproductive Health in Reducing the Risk of Novel Coronavirus Disease (COVID-19) in Pregnancy: A Mini Review. International Journal of Medical Reviews. 2021; 8(4): 158-162.
10. Zhizhpon-Quinde TC, Mesa-Cano IC, Ramírez-Coronel AA. Prevention of COVID-19 through Dorothea Orem's Self-Care Theory. International Journal of Innovative Science and Research Technology. 2021; 6(3): 809-815.
11. Rezaei F, Masaeli Z, Atighechian G. Information Needs of Pregnant Women in the COVID-19 Pandemic from Experts' Point of View: A Qualitative Study. International Journal of Community Based Nursing and Midwifery. 2021; 9(2): 139-151.
12. Taghdisi MH, Nejadsadeghi E. The effect of health education based on health belief model on behavioral promotion of urinary infection prevention in pregnant women. Journal of Research & Health.2012 ; 2(1): 44-54.
13. Hashemzahi M, Khayat S, Khazayan S. Effect of COVID-19 Self-care Training via Telemedicine on Perceived Stress and Corona Disease Anxiety in Pregnant Women: A Quasi-experimental Study. Journal of Midwifery and Reproductive Health. 2022; 10(1): 3066-3074.
14. Rostami Kia Z, Khajavian N, Rahmani R, Askari F. The effect of educational intervention with mobile healthtechnology on the covid-19 imposed stress among pregnant women: a randomized controlled trial. Journal of Midwifery and Reproductive Health. 2023; 11(3): 3782-3793.
15. Yoshany N, Gerayllo S, Mihanpour H, Karimiankakolaki Z. Investigating the Effect of the Educational Intervention Based on the Protection Motivation Theory on Preventive Behaviors against Contracting COVID-19 among Police Station Employees in Yazd, Iran. Journal of Health System Research. 2024; 19(4): 316-324.
16. Mahmoud GA, Mohamed HM, Abbas AM, Ahmed NFJASNJ. Educational program for pregnant women about Coronavirus (COVID-19) at Assiut University Hospitals. Assiut Scientific Nursing Journal .2022; 10(30): 173-187.
17. Abd Elmordy ZR, Hassan MM, Mohammed WA, Eldein Ibraheim S G. An educational intervention utilizing Health Belief Model for Pregnant Women's compliance with preventive measures regarding COVID-19. Egyptian Journal of Health Care. 2021; 12(4): 883-898.
18. EL Sayed, H. A., & Sarhan, A. E.. Effect of health belief model-based educational intervention on COVID-19 preventive behaviors among pregnant women. Tanta Scientific Nursing Journal. 2022; 24(1): 305-335.
19. Sadeghi R, Mahmoodabad SSM, Fallahzadeh H, Rezaeian M, Bidaki & Khanjani N. Readability and suitability assessment of adolescent education material in preventing hookah smoking. International Journal of High Risk Behaviors and Addiction. 2019; 8(1): e83117.