


Comparison of Effects of WhatsApp-based and pamphlet-based learning on awareness, attitude, and self-efficacy of pregnant women about urinary tract infections during COVID-19 pandemic

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ABSTRACT

Introduction: Online and social network-based training and clinical interventions during pregnancy and immediately after pregnancy can be beneficial for women, empowering them in their role as a mother. Nowadays, due to the spread of the COVID-19 accompanied by a reduction in the number of referrals for maternity care, there has been a higher incidence of urinary infections among the pregnant women. Taking these into account, the present study aims to shed light on the effect of the WhatsApp-based learning on awareness, attitude, and self-efficacy in relation to UTIs among pregnant women compared to the pamphlet-based learning.

Material and Methods: This semi-experimental study was conducted on 96 pregnant women at 30 weeks and less than 30 weeks of pregnancy who referred to the government Obstetrics and Gynecology Clinics in Isfahan city in 2021. The participants were simple randomly assigned to one of three independent groups, namely two intervention groups and one control group. Intervention took 6 weeks and the data were collected both before and after the intervention using a standardized questionnaire. SPSS software V21.0 and non-parametric statistical tests, including Wilcoxon, Kruskal-Wallis, and Mann-Whitney were used for data analysis.

Results: The results showed that the mean score of the awareness before and after intervention increased from 11 to 26 and from 11 to 15 ($X^2=36.00$, $p<0.001$) in the WhatsApp-based and the pamphlet-based learning group, respectively. Furthermore, the mean score of the attitude before and after intervention increased from 54 to 82 in the WhatsApp-based and from 53 to 58 ($X^2=60.00$, $p<0.001$) in the pamphlet-based learning group. For self-efficacy, the mean score before and after intervention changed from 47 to 71 in WhatsApp-based and from 46 to 51 ($X^2=62.00$, $p<0.001$) in the pamphlet-based learning group. In the control group, there is no difference in the mean score of the awareness, attitude and self-efficacy before and after the intervention.

Conclusion: Online training and clinical interventions during pregnancy can be beneficial for women. In fact, sharing health information among pregnant women through social networks is related to better pregnancy management. It also increased their awareness, attitude and self-efficacy.

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INTRODUCTION

Urinary tract infections (UTIs) are known as the second most common medical complication in

pregnancy. Hence, if not properly controlled, they can entail an adverse impact on pregnancy outcome. As a result, urinary infection causes premature birth and low birth weight in babies, both of which affect baby's

Intelligence Quotient [1, 2].

Based on the extant literature, online training and clinical interventions during pregnancy and immediately after pregnancy can be beneficial for women [3]. The web-based training interventions during and after pregnancy can enhance maternal and new-born health by promoting training and accessibility [4]. Additionally, these interventions could change the current pattern of prenatal care and provide an opportunity for the physicians to ensure the continuity of care during the perinatal period. Also, one study in USA has reported that 82% of pregnant women tend to participate in online and mobile phone-based weight loss interventions after delivery, with 59% resorting to social networks to search information on pregnancy [5]. Pregnant women prefer to use social networks for information exchange, social support, and increased self-efficacy [6].

WhatsApp is one of the most popular social networks increasingly used in the public health domain so as to help public health workers and improve service provision [7]. Moreover, in accordance with several studies, women's membership in social networks can reduce their stress and empower them in their role as mothers [8]. Social networks are also perceived as a new way to encourage mothers to increase the duration of breastfeeding their children [9].

With the onset of the COVID-19 epidemic in 2020 and the declaration of national quarantines by the states, the telehealth quickly became an important way to manage the healthcare of patients while keeping them safe through social distancing and maintaining quarantine. Furthermore, the patients were encouraged to follow stay-at-home orders on the one hand and clinics were closed to in-person visits on the other. Under such circumstances, telemedicine was promptly transformed into an essential component of non-emergency healthcare [10].

On the other hand, the spread of COVID-19 has heightened the importance of the social networking in ensuring the interactivity of pregnant women, creating social support, and empowering them in their role as mothers. As discussed earlier, there has also been an increase in the incidence of UTIs among pregnant women as a result of COVID-19 pandemic. Despite the high importance of these issues, not much research has been done in this domain in Iran. Accordingly, the present study was designed to investigate the effect of WhatsApp-based learning on pregnant women's awareness, attitude and self-efficacy regarding the UTIs compared to the pamphlet-based learning during the COVID-19 pandemic.

MATERIAL AND METHODS

This is a semi-experimental study that was conducted

on the pregnant women in 2021 during the COVID-19 pandemic. The study lasted for 4 months from April 9 to July 11. The research population included pregnant women who referred to the maternity and gynecology clinics of Al-Zahra, Isa Ibn Maryam, Shahid Beheshti, and Hazrat Zahra hospitals in Iran. The list of all the public hospitals of Isfahan city in Iran sponsored by Isfahan university of medical sciences (n=12) was extracted by referring to its website, field represented by "Medical Centers". In the next phase, the hospitals having a maternity and gynecology clinic were also identified by referring to the websites of hospitals. In this way, four hospitals of Al-Zahra, Isa Ibn Maryam, Shahid Beheshti, and Hazrat Zahra operating an active maternity and gynecology clinic were chosen as the research population.

The pregnant women were randomly divided into three independent groups, including two intervention groups and one control group using the random number table. To allow the comparison of the mean scores of three groups, the sample size was estimated drawing upon the previous research [11] and using the following sample size formula with 90% power assuming a 5% significance level ($\alpha=0.05$). Considering a dropout rate of 20%, the sample size for each group was found to be 32. In total, 96 pregnant women referring to the foregoing hospitals were included in the study.

As inclusion criteria for the pregnant women, willingness to participate in the research, having reading and writing literacy, having a social network on a cell phone or computer, and non-membership in the social networks related to urinary infections were considered. Moreover, the inclusion criteria consisted of the pregnant women at 30 weeks and less than 30 weeks of pregnancy. Based on a similar study conducted in a mobile-based support group service for pregnant women, the gestational age of less than 30 weeks was assumed to be appropriate for this research as it gives sufficient time to pregnant women to communicate in support groups [12]. The exclusion criteria included the pregnant women who were referred to the emergency departments as well as unwillingness to continue cooperating in the research.

To conduct the study, one group received a social network-based training while another group received traditional pamphlet-based training. The control group received routine training. To design training content, Persian and English texts were used. The educational content included symptoms of UTI, complications of UTI, ways to prevent UTI, treatment of UTI, eating habits, the way of dressing, urinary habits, and habits related to sexual issues. After compiling and designing the training content, the intervention was carried out for 6 weeks. In the social network-based training group, a group was created

in WhatsApp where the training content was posted twice a week. It is notable that communication in WhatsApp group was of interactive nature allowing the members to interact with each other. The pregnant women were also informed of training content posts on the WhatsApp group using SMS services in the traditional pamphlet-based training group, training content was presented to the participants in the form of pamphlets while the control group received routine training. Before the intervention, a standardized questionnaire was administered to the participants. 6 weeks after the intervention, the questionnaires were completed again by the participants to allow final evaluation. The researcher visited selected hospitals daily to collect samples. Before the intervention, questionnaires were completed by pregnant women in writing. After the intervention, in cases where participants were not accessible, the questionnaire was completed by the researcher over the phone. Data were collected by a standardized questionnaire developed by Taghdisi et al. [11]. The validity and reliability of the questionnaire were evaluated by content validity and test-retest methods, respectively. This standardized questionnaire was administered to the participants twice i.e. before the start of the intervention and 6 weeks after the start of the intervention. As a multi-part questionnaire, it included demographic information (12 items), awareness (30 items), attitude (18 items), and self-efficacy (19 items). Awareness was measured by four-choice items. A correct answer was given a score of 1 and a wrong answer was given a score of 0. Further, to measure attitude, a 5-point Likert scale, including “strongly agree”, “agree”, “neither agree or disagree”, “disagree”, and “strongly disagree” was employed. These responses were scored 4, 3, 2, 1, and 0, respectively. Self-efficacy items were measured by a 3-point scale ranging from “always” scoring 3, “sometimes” scoring 2, “rarely” scoring 1, and “never” scoring 0.

Data analysis was performed by SPSS software (ver 21.0). The normality of the data was also controlled by Kolmogorov-Smirnov test. Since $p < 0.05$, non-parametric statistical tests such as Wilcoxon, Kruskal-Wallis and Mann-Whitney were used.

RESULTS

Out of 96 participants, 94 (97.91%) were eligible to participate in the study, including 31 in the WhatsApp group, 31 in the pamphlet group, and 32 in the control group. 2 participants (2.08%) were excluded from the study due to lack of cooperation during the

research. The research sample consisted of 94 pregnant women who referred to the maternity and gynecology clinics of Al-Zahra, Isa Ibn Maryam, Shahid Beheshti, and Hazrat Zahra hospitals during the COVID-19 pandemic.

The mean age of the participants was 28(3) with an age range of 18 to 35 years. In addition, the mean week of pregnancy in the range of 10 to 30 weeks was 21(5). 54 (57%) of the participants were employed while 40 (42%) were housewives. Also, the percentage of education level of the participants in Diploma, Associate of Science (AS), BSc and MSc degrees were found to be 24%, 25%, 37% and 12%, respectively.

In the intra-group comparison using the Wilcoxon test, a statistically significant difference was observed between the WhatsApp-based learning group and pamphlet-based learning group before and after the intervention in terms of the mean scores obtained for the awareness, attitude, and self-efficacy of participants ($p < 0.001$). However, in the control group, there was no significant difference in the mean scores obtained for the awareness, attitude, and self-efficacy before and after the intervention (Table 1).

Table 1: The intra-group comparison using the Wilcoxon test obtained for awareness, attitude, and efficacy at each interval

Groups	Interval	Mean (SD)	Test statistics and p-value
WhatsApp	Awareness at base line	11 (3)	$z = -4.00$
	After 1 month	26 (2)	$p < 0.001$
	Attitude at base line	54 (5)	$z = -4.00$
Pamphlet	After 1 month	82 (7)	$p < 0.001$
	Self-Efficacy at base line	47 (5)	$z = -4.00$
	After 1 month	71 (4)	$p < 0.001$
Control	Awareness at base line	11 (2)	$z = -3.00$
	After 1 month	15 (5)	$p < 0.001$
	Attitude at base line	53 (6)	$z = -4.02$
Control	After 1 month	58 (8)	$p < 0.001$
	Self-Efficacy at base line	46 (4)	$z = -4.00$
	After 1 month	51 (7)	$p < 0.001$
Control	Awareness at base line	11 (2)	$z = -1.00$
	After 1 month	12.03 (2)	$p < 0.001$
	Attitude at base line	53 (6)	$z = -1.00$
Control	After 1 month	54 (6)	$p < 0.001$
	Self-Efficacy at base line	45 (4)	$z = -1.00$
	After 1 month	46 (4)	$p < 0.001$

Comparing the WhatsApp, pamphlet, and control groups using the Kruskal-Wallis test showed that the mean awareness, attitude and self-efficacy in the WhatsApp group has increased significantly compared to other groups with no significant difference observed between the control and pamphlet groups (Table 2).

Table 2: Comparing the WhatsApp, pamphlet, and control groups using the Kruskal-Wallis test

Groups	Awareness Test Statistics	Attitude Test Statistics	Self-Efficacy Test Statistics
WhatsApp with Pamphlet	$X^2(1)=36.00, p<0.001^*$	$X^2(1)=39.00, p<0.001$	$X^2(1)=40.03, p<0.001$
WhatsApp with Control	$X^2(2)=61.00, p<0.001$	$X^2(2)=60.00, p<0.001$	$X^2(2)=62.00, p<0.001$
Pamphlet with Control	$X^2(1)=10.00, p=0.011$	$X^2(1)=6.03, p=0.014$	$X^2(1)=9.00, p=0.012$

* $X^2(a)$ = Chi-square (degrees of freedom)

The pair-wise comparison of three groups was performed using the Mann-Whitney test. WhatsApp-based learning group showed a statistically difference with both the control group and pamphlet group in terms of awareness, attitude and self-efficacy ($z=-6.06, p<0.001$). Nonetheless, no significant difference was noticed between the control and pamphlet learning groups with regard to awareness, attitude and self-efficacy after intervention.

DISCUSSION

The present study investigated the effect of the social network-based learning method on awareness, attitude, and self-efficacy of the pregnant women concerning prevention of UTI compared to pamphlet learning during the COVID-19. The main purpose of social networks use is to inform the pregnant women of urinary infections risk and support them in preventing such complications. As per the results of the present research, social network-based training has increased the awareness and attitude of pregnant women regarding UTIs. Also, the self-efficacy of pregnant women has increased due to the knowledge provided to them through the social network.

Social networks can serve as a beneficial tool for the women with numerous advantages, including social support and reduced stress that can generally improve their life quality and empower them in their mother role through information exchange and emotional support [6]. Likewise, the social network is a new way to empower nursing mothers and encourage them to increase the duration of breastfeeding their children. Social networks are also regarded as an important tool for obtaining information about infant feeding [9]. The present study is consistent with previous studies in terms of increased self-efficacy and empowerment of pregnant women in pursuing UTI preventive behaviors.

In a 2015 qualitative study in the United States, the results showed that social support can be helpful in reducing alcohol-exposed pregnancies. Besides, social networks and social support can play a positive role in preventing alcohol-exposed and unintended pregnancies. Women also described the use of social networks as influential in gathering information and making decisions about contraception [13]. In the same vein, another study revealed that health services based on WhatsApp groups can improve the

health of mothers and babies [12].

Using short message service (SMS) reminders is an efficient method to improve women's compliance with iron supplementation during pregnancy [14]. Pregnant women often cannot attend educational classes because they are too busy. Social networks have created opportunities to leave care from the monopoly of hospitals and clinics and have transferred them to the patients' places of residence. The upward trend of using social networks in human societies has raised this device as a new tool in remote care. The use of social networks not only facilitates access to care, but also removes barriers related to place and time. One of the limitations of this study was the disruption in the mobile phone service. Also, the short duration of the intervention and filtering of social networks were other limitations. One of the strengths of the research is the use of the electronic platform for effective training in pregnant women during the quarantine of the Corona epidemic.

CONCLUSION

Interaction of individuals with each other in social networks significantly affects the attitude and awareness of pregnant women, empowering them in the UTIs prevention behaviors. The implementation of social network-based training programs and interventions proved to be effective in improving awareness, attitude, and self-efficacy of the pregnant women about the UTIs prevention behaviors. Mobile phone and social network-based health training has provided an opportunity to influence the attitude and behavior of pregnant women to prevent UTIs.

With the onset of the Covid-19 epidemic in 2020 and declaration of national quarantines by the states, the telehealth quickly became an important way to manage the healthcare of patients while keeping them safe through social distancing and maintaining quarantine. With the encouragement of people to follow the stay-at-home orders, the telehealth rapidly started to become a necessary component of non-emergency healthcare. As one of the main pillars of health care, training can be realized through online modules using appropriate and accessible social software and networks. Considering its specific advantages such as less need to attend the clinic and providing follow-up and training for those women who are far from medical centers, social network-based training enjoys the potential to be used for

other pregnant women. Taking all into account, it seems necessary to pay more attention to distance learning in Iran and make efforts towards strengthening its infrastructure.

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AUTHOR'S CONTRIBUTION

All authors contributed to the literature review, design, data collection and analysis, drafting the manuscript, read and approved the final manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

ETHICS APPROVAL

In this research, all the ethical principles related to human research were completely observed. These ethical principles were as follows:

Obtaining permission from research deputy of university, sending a letter to the relevant training and medical centers, providing sufficient explanations to the participants and obtaining written and informed consent from the participants at the time of starting the studies and maintaining the confidentiality of information.

This study has also been approved by the ethics committee of Isfahan university of medical sciences under the code of IR.MUI.RESEARCH.REC.1398.518.

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