



Comparison of the effect of face-to-face and social media-based training on the self-care of

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women with gestational diabetes mellitus (GDM)

Abstract

objectives:

Gestational diabetes is one of the most common medical complications during pregnancy. The aim of this study was to compare the effect of face-to-face and social media-based education on self-care of women with gestational diabetes.

methods: This quasi-experimental randomized controlled study was performed on 73 pregnant women with gestational diabetes. Participants completed a self-care and demographic questionnaire and then were divided into three groups. In the face-to-face training group, 4 training sessions (one hour) were held for one month. The e-learning group received 2 messages per day for 30 days via Telegram and the control group received only routine training. One month after the intervention, the questionnaire was completed by all individuals.

results: There was no statistically significant difference between groups in terms of mean self-care score before the intervention, but after the intervention, the mean self-care score was increased in the face-to-face training group ($P < 0.001$) and social media training group ($P = 0.01$) and the group Control ($P = 0.22$).

Conclusion: In the present study, face-to-face and social media-based education was effective in promoting self-care of pregnant women with gestational diabetes, but in comparing the two educational methods, there was no different between the two intervention groups.

Keywords: Gestational diabetes, training, face-to-face, social media, self-care

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Introduction

Gestational Diabetes Mellitus (GDM) is one of the most prevalent medical complications during pregnancy [1], which is caused by dysfunctional glucose tolerance and first starts or is diagnosed during pregnancy [2]. It affects 5–18% of all pregnancies[3] while the prevalence of this type of diabetes in Iran ranges from 1.3 to 18.6% [4].

The consequences of gestational diabetes on mothers and babies are extremely critical. The adverse effects gestational diabetes have on the infant are increased risk of macrosomia, neonatal hypoglycemia, shoulder dystocia [5], and intrauterine growth restriction [6]. The complications a pregnant woman could face include preterm delivery, polyhydramnios, preeclampsia, and eclampsia. Also, at older ages, these mothers are more likely to develop type II diabetes [2]. Because of the increasing prevalence of this dysfunction, its complications and related costs, it is critical to treat and control the disease [7]. Although this disease has no definitive treatment, the most important factor to control it is self-care behaviors with the patients assuming over 95% of care by themselves [8]. Providing accurate information to patients about diabetes and its complications will increase their self-confidence in self-care, thus correcting health behaviors [4]. Therefore, it is necessary to adopt appropriate interventions such as training, self-care and increase prenatal care to reduce the consequences [9].

Self-care is a key concept in health progress [7] and is the first step to help patients better care and manage their conditions, in ways the health slogan in 2014 was reading "A healthy life with self-care", indicating the need to improve one's capacity to take care of his/her health [8]. In other words, self-care is an active and practical process directed by the patient and is deemed necessary to prevent short-term and long-term complications. This process includes various physiological, social, emotional, spiritual dimensions where the physiological dimension includes: nutrition, effects and medication complications, exercise, disease progress and its side effects, methods of prevention and controlling of blood sugar and regulating medications being important aspects of self-care [10].

Emamgholi Khoshechin et al. (2016) demonstrated that few women with gestational diabetes can take good care actions as such problems as unawareness, difficulty controlling diabetes, improper information, incomplete training about diabetes and feeling of inability are thought of factors hindering self-care. It was shown in this study that mothers were eager to learn more information, the necessary self-care training should be given to strengthen self-care[11].

Some studies have assessed the role of training interventions in diabetes, reporting that interventions adopted for behavioral changes could be effective in improving self-care and abilities to control diabetes [12].

A study by Johnson and Berry (2018) demonstrated that using text messages (SMSs) to improve self-management and empowerment may be a cost-effective solution to reduce various complications stemming from gestational diabetes. In this study, participants' satisfaction was found to be at a high level, in ways they agreed to receiving



messages in subsequent pregnancies if they were to be diagnosed with gestational diabetes; meanwhile, they were willing to send these messages to their friends with gestational diabetes [13].

At present, training courses tend to be face to face, though, they bring about advantages, there are also disadvantages. The disadvantages include time and space restrictions for trainers and patients. New training methods include e-training. E-training is able to cover many people at a time such that patients receive the information they need continuously without having to spend time, money or even leaving home to attend face-to-face classes. Because of recent advances in information and communication technology, some emerging e-training frameworks have appeared, including multimedia-SMS-based training in cyberspace, which allows the users to send a variety of audio, video and even short training video-clips at any time. as it takes less time and money than face-to-face training. Multimedia SMS-based training has made it possible for patients to have access to training content at any time and any place should they forget it or they need to review training materials [14].

Considering the importance of self-care in gestational diabetes and the existence of few studies in Iran on the results from using virtual network training concerning women with gestational diabetes, this study aimed to compare the effect of face-to-face training and social network-based training on the self-care of women diagnosed with gestational diabetes.

Materials and methods

The present study was a semi-experimental study including a randomized control group that was done on 73 pregnant women with gestational diabetes presenting to Birjand's health centers in 2019. Because the number of women with gestational diabetes was few, the sampling was done in a non-probability form based on inclusion criteria from all General Health Centers in Birjand. The number of 23, 24 and 26 people were selected from three geographical areas of Birjand, i.e., from north, central region and southern parts, respectively. Inclusion criteria included: mother's gestational age at 24-32 weeks, singleton pregnancy, holding at least the fifth elementary grade, no history of drug and alcohol addiction, no smoking and hookah addiction, no history of medical disease (diabetes, heart disease, respiratory, renal, epilepsy, hypertension, anemia complications), having a mobile phone running virtual networks and familiarity with it. Exclusion criteria included: unwillingness to continue cooperation, developing a specific disease during the study period, non-participation in more than one training session and not taking any messages in the training group based on social networks. At first, informed consent was obtained from the participants and some issues were explained to all participants, then a demographic-midwifery inventory and a self-



care behavior inventory were completed by the patients. Then, the people of each region were randomly divided into three control, face-to-face training and social network groups.



The training package included texts, photos and videos about gestational diabetes for both intervention groups.

In the face-to-face training group, four training sessions were held in the form of lectures and group discussions using video projectors, training images and videos. In the first session, gestational diabetes and its associated complications as well as the benefits from self-care behaviors to prevent the complications, in the second session, the importance of observing a healthy diet and acquiring skills in planning a healthy diet, in the third session, solutions to control blood sugar, within a natural range and the importance of performing proper physical exercises and injection of insulin as well as working with blood sugar control devices and finally in the fourth session, a summary of previous topics were explained. At the end of each session, the pamphlets related to training points of the same session were provided to the patients.

As for the training group, the training points were sent via two messages on social networks each day for up to a month; the training courses included texts, photos and videos which were sent via Telegram, as the content expressed in the virtual training was the same as the face-to-face training group. The control group received routine training at health centers. One month after the intervention ended, the self-care inventory was completed again by all participants in this study. In order to observe ethical considerations, a training package was provided to the control group after the questionnaire was completed.

The Demographic and Midwifery Inventory consists of 2 parts, the first part of which includes individual demographic characteristics such as age, education and occupation, etc., and the second part includes questions about the history of midwifery such as number of pregnancies, gestational age and abortion, etc.

The Self-Care Questionnaire, taken from the Summary of Diabetes Self-Care Activities Scale (SDSCA) by Tobert and Glasgow [15] was a 14-item self-report scale. Kordi et al. (2016) administered this scale on pregnant women [7]. He reduced the scale to remove foot care and developed an 11-item questionnaire we used in this study: this questionnaire investigated dietary self-care activities (5 items), physical activity (2 items), blood sugar monitoring (2 items), drug use (1 item), smoking (1 item) of patients during the past 7 days. The answers to all questions were on the Likert scale (0-7) except for smoking. In this way, people reported their diabetes-related self-care behaviors on a scale from 0 (I did not do it on any of the days) to 7 (I did it every 7 days of the week). A score of 0 or 1 was assigned to the item of smoking depending on whether or not they used it.

Because the number of items in each domain was not equal, the scores of each domain were divided by the number of items in that domain. The highest and lowest scores were reported to be 7 and 0, respectively. The validity of the demographic inventory and self-care scale was determined by content validity method. As for the reliability of the questionnaire in this study, 20 patients meeting inclusion criteria were given the inventory and Cronbach's coefficient for this questionnaire was 0.78. Also, the reliability of this questionnaire was 0.70 in Kurdish study [7].

Data were analyzed by SPSS software version 19. The Kolmogorov-Smirnov test was used to investigate the normalcy of data distribution. The data had a normal distribution. Chi-square test and Fisher's exact test were used to compare demographic characteristics in three groups while ANOVA analysis was applied to compare the mean self-care score before and after the intervention. Moreover, intra-group comparison was done by paired t-test. In all

statistical analyses, the statistical significance was reported to be $\alpha=0.05$.

Findings

The present study demonstrated that the mean age of pregnant mothers participating in the control group was 31.37 ± 4.79 years, face-to-face training was 34.04 ± 5.88 years and social network-based training was 30.58 ± 6.67 years. There were no statistically significant differences between them. The three groups did not have a statistically significant difference with each other in terms of other demographic variables "Table 1"

The three groups showed no statistically significant difference in terms of mean total self-care score before the intervention started, however after the intervention started, the mean total self-care score in face-to-face training group ($P < 0.001$) and in social network-based training group ($P = 0.01$) saw an increase compared to the control group ($P = 0.22$). Although the mean changes in the face-to-face and social network-based training group were greater than that of the control group, no statistically significant difference was noted "Table 2".

Examining self-care domains, the mean nutrition score before the intervention showed no statistically significant difference, however, after the intervention, the mean nutrition score in the face-to-face training group showed a statistically significant increase compared to the other two groups ($P = 0.001$) "Table 2".

In the domain of activity, no statistically significant difference was noted in the mean activity score before the intervention in the three groups, however, after the intervention, the mean activity score in the face-to-face training group saw a statistically significant rise compared to the other two groups "Table 2". There was no statistically

significant difference between the mean blood sugar control score and drug taking score in the three study groups after the intervention "Table 2".



Table 1 .
Demographic characteristics of the three groups studied.

Variable	Control	Face to face training	Social networks training
	Frequency (%)	Frequency (%)	Frequency (%)
Mother's education			p=0/06
Primary	5(20.8)	5(20)	1(4.2)
Junior	3(12.5)	7(28)	2(8.3)
High school	2(8.3)	5(24)	8(33.3)
Academic	14 (58.3)	7(28)	13(54.2)
Mother's job status			P= 0.29
Housekeeper	22(91.7)	24(96)	20(83.3)
Employer	2(8.3)	1(4)	4(16.7)
Spouse' education			P=0.36
Primary	1(4.2)	2(8)	1(4.2)
Junior	3(12.5)	6(24)	4(16.7)
High school	6(25)	11(44)	8(33.3)
Academic	14(58.3)	6(24)	11(45.8)
Spouse' job status			P=0.26
Unemployed	1(4.2)	1(4)	3(12.5)
Laborer	5(20.8)	13(52)	7(29.2)
Self-employed	8(33.3)	6(24)	8(33.3)
Employee	10(41.7)	5(20)	6(25)



Table2.Comparison of total self-care score and its domains in the three groups studied.

Time	Group	Total self-care score	Paired statistical t-test result	Mean changes	Nutrition score	Paired statistical t-test result	Activity score	Paired statistical t-test result	Blood sugar control score	aired statistical t-test result	Drug adherence score	Paired statistical t-test result
Control group	Before	2.73±1.31	P=0.22	0.05±0.19	3.55±1.44	P=0.5	1.06±1.51	P=0.18	2.14±2.74	P=0.5	3.2±3.38	P=0.9
	intervention		t=1.23			T=0.68		T=1.36		T=0.67		T=0.1
	After intervention	2.78±1.26			3.48±1.47		1.37±1.87		2.25±2.74		3.22±3.39	
Face to face training group	Before	2.23±1.00	P<0.001	0.76±0.93	2.85±1.37	P<0.001	2.54±2.27	P=0.05	0.14±0.33	P=0.06	2.68±3.4	P=0.76
	intervention		T=4.07			T=3.89		T=1.98		T=1.95		T=0.3
	After intervention	2.99±0.82			3.94±0.81		3.48±2.17		0.38±0.69		2.48±3.38	
Virtual training group	Before	2.61±0.83	P=0.01	0.55±1.01	3.82±1.18	P=0.11	2.16±2.00	P=0.06	0.58±0.84	P=0.11	1.5±2.76	P=0.22
	intervention		T=2.68			T=1.65		T=1.94		T=1.63		T=1.24
	After intervention	3.17±0.88			4.22±0.93		3.02±2.33		1.25±2.16		2.04±3.25	

Discussion

The findings of the present study demonstrated that training in form of face-to-face training on social network-based training was effective in improving the mean total self-care score of pregnant women with gestational diabetes compared to the control group, however, comparing the two training methods, no difference was observed between the two intervention groups.

Johnson and Berry (2018) investigated the effect of self-care in women with gestational diabetes using SMS reminders with the results indicating the positive effect of SMS training on the total self-care score in women with gestational diabetes [13].

Aligholipour et al. (2019) compared face-to-face training and multimedia messaging (Telegram) training on self-care measures by 66 patients with diabetes, where the mean self-care scores increased in both intervention groups, however, no significant difference was noted between the two groups under intervention; thus the results of the present study were found to be consistent with this study. One of the strengths of the present study was the existence of a control group as the Ali Gholipour's study had concerned with the two face-to-face and multimedia messaging (telegram) training [16]. Also, a study by Masoudi et al. (2019) compared the effectiveness of face-to-face and distance training on reducing common complaints of pregnant women during pregnancy, with the results suggesting that training via new technologies such as mobile phones can be quite effective alongside face-to-face training [17].

In a study, Besharti et al. (2019) investigated the effect of face-to-face and distance training (Telegram) of 138 women on the self-efficacy of osteoporosis preventive behavior, concluding that self-efficacy theory-based training through face to face and social network courses (Telegram) were effective in strengthening the self-efficacy of osteoporosis preventive behaviors [18].

However, the social network of Telegram training was found to be more effective than face-to-face training, which is not consistent with the findings of the present study. One of the reasons for the difference between the results of the present study and those of the Besharati's study is the continuation of virtual training and the non-continuation of face-to-face training in his study; in the Besharati's study, face-to-face training was formed only in one session, however, virtual training was gradually performed on a daily basis for 2 weeks. One of the strengths of the present study was that the two groups received the interventions on the same time period, such that both group received training for one month.

Examining self-care domains, i.e., that of nutrition, Maheri et al. (2017) concluded that face-to-face training had a positive effect on nutrition which is consistent with the findings of the present study, however, in a study by Aligholipour et al. (2019) nutrition score significantly increased in both virtual-based and face-to-face training groups. One of the reasons for the difference was the duration of intervention and the patients in the Ali Gholipour's study, where the intervention period in Ali Gholipour's study lasted for three months, with the patients receiving information on nutrition in advance as the diabetes was chronic; this is while the present study was performed for one month on mothers with gestational diabetes [16, 19].



People's attitudes toward change in nutrition were found not to be effective via short-term training, as attitudes are said to form a hidden mental structure in the human personality system, and it is difficult to work on this domain.

In the domain of activity, Maheri et al. (2017) showed that face-to-face training had a positive effect on activity which is consistent with the results of the present study; however, in the study by Seyed-Andi et al. (2018), they explored the effect of e-learning on self-care behavior of people with type II diabetes, concluding that the activity score in the e-learning group increased after the intervention [12, 19].

The reasons for the difference can be the duration of the intervention, so that the intervention lasted for three months, but the present study was performed for one month. Also, the patients in the present study did not perform activities due to pregnancy and fear of preterm delivery.

In the domain of blood sugar control, Oshvandi et al. (2014) examined training methods on self-care of diabetic patients, showing that the blood sugar control score increased significantly after training, which was contrary to the results of the present study. In his study, all participants obtained a glucometer, but in the present study it was not necessary to find a glucometer [20].

In Aligholipour et al. (2019) study, after training, the drug adherence score increased, one of the reasons for this was the participants in Ali Gholipour's study, where 50% of them had diabetes for more than 10 years, and resulting in increased duration of illness in participants [16].

It is recommended that future studies concern the effect of virtual-based training methods on other variables in pregnant mothers with gestational diabetes (quality of life, self-efficacy, etc.) as well as fasting blood sugar, pregnancy outcome and complications of gestational diabetes on the fetus.

The findings of the present study demonstrated that training in form of face-to-face training on social network-based training was effective in improving the mean total self-care score of pregnant women with gestational diabetes compared to the control group, however, comparing the two training methods, no difference was observed between the two intervention groups.

In general, the results of this study suggested that virtual training and face-to-face training had positive effects on self-care activities in pregnant mothers with gestational diabetes. Therefore, in case mobile phones or personal computers and Internet communication are available to patients and families today, virtual training can be used to improve and facilitate the learning process. With the onset of coronary coronavirus disease and fewer visits by pregnant women with gestational diabetes to health centers, virtual training will be a good method to increase self-care and nurses and midwives can get the information they require to take care of themselves.

While monitoring multimedia tools, patients receive step-by-step information, knowledge and skills for self-care and, if necessary, they engage with midwives and receive feedback in this connection. Of course, one may argue that the human relationship between nurse and midwife with the patient is the most basic principle guiding nursing and midwifery practice. Therefore, in practice, virtual training should not completely be an alternative to face-to-face



training and should be applied as a complementary or integrated approach. Also, when using virtual training to instruct patients, some other factors such as context, culture and beliefs should be taken into account.

Conclusion

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Acknowledgement

Hereby, we express our indebtedness to all the venerable professors and the individuals who assisted us with performing this article. This research was an excerpt of an M.A. in Nursing approved by the Birjand University of Medical Sciences with an Ethics Code of 0Ir.bums.REC.1398.237.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.



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