



The Effect of Spouse Participation in Gestational Diabetes Care on Pregnant Women's Perceived Social Support

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Abstract

Background: Lack of social support may lead to destructive effects on pregnancy outcomes, especially for women with gestational diabetes.

Objectives: This study aimed to examine the effect of spouse participation in gestational diabetes care on pregnant women's perceived social support.

Methods: This quasi-experimental study was carried out in one of the health centers affiliated with Shahroud University of Medical Science, Shahroud, Iran, during 2018 - 19. A total of 80 pregnant women with gestational diabetes were non-randomly allocated to two groups of 40 members. The control group received the standard care, whereas the experiment group received, in addition to the standard care, gestational diabetes care as well as face-to-face and online education with their spouses. Demographic and Diabetes Social Support Questionnaire-Family Version was filled by the two groups before and five weeks after the intervention. Data analyses were performed using descriptive statistics, independent *t*-test, paired *t*-test, and chi-squared test with SPSS (V16).

Results: The total score of social support in the experiment group had a significant increase compared to that in the control group (3.42 ± 1.16 , 3.06 ± 1.14 , and $P < 0.001$). In addition, the three aspects of social support (i.e., taking blood sugar test, adhering to diet, and receiving social support) in the experiment group had a significant increase compared to those in the control group ($P < 0.05$).

Conclusions: Considering the positive effect of spouse participation on the perceived social support of pregnant women with gestational diabetes and on their healthy pregnancy, it was recommended that health policymakers should codify pregnancy cares, despite the cultural limitations, in order to facilitate maximum participation of spouses.

Keywords: Gestational Diabetes, Social Support, Spouse, Education

1. Background

Gestational diabetes is a growing health problem in the world, so it is one of the most highly prevalent pregnancy complications (1). After pregnancy, blood sugar in women with gestational diabetes returns to normal level; however, women with gestational diabetes have 15 - 20% higher risk of developing diabetes during the next 5 - 10 years (2). The prevalence of gestational diabetes in developed and developing countries is growing fast, so the global prevalence ranges from 1 - 14% (3). The prevalence in Iran is about 1 out of every 20 pregnant women (4). The complication adds to the health risk to the mother and fetus during pregnancy and afterwards (5, 6). Women with gestational diabetes not only have to deal with mental and

physical pressures of diabetes, but they also have to deal with issues like complicated and multi-dimensional therapeutic regimens. They have to adhere self-care behaviors such as self-monitoring blood sugar, diet, and weight, regular insulin injection, and frequently and timely medical checks during pregnancy (7). Thereby, these women need more social support than normal pregnant women (8), as the lack of social support puts the mother's health at risk during pregnancy and leads to destructive pregnancy outcomes (9, 10).

Social support refers to receiving information, financial supports, and emotional support from the significant ones, including members in one's social network, spouse, relatives, and friends (11). Support by close individuals and spouses in particular, can be helpful for the improvement

of the physical, mental, and spiritual health of women during pregnancy (12). A qualitative study by Emamgholi Khooshehchin showed that emotional support was highly helpful for adhering diet, measuring blood sugar, and doing exercise as a part of self-care for gestational diabetes. It leads to positive improvements in women's capability to choose a healthy lifestyle (13). Women's health is a serious concern in all countries, and pregnancy with complications like gestational diabetes can impose risk to healthy pregnancy. Therefore, it is important for health systems in the world to find solutions in order for improving gestational health. It appears that one of these solutions is to motivate close individuals and spouse to participate in, particularly, providing pregnancy care.

The need for education to increase the father's participation in pregnancy care and its positive effects on the mother and infant's health have been supported by several studies in different countries (14, 15). Spouses' extensive knowledge of their partners' problems and their participation in providing pregnancy cares is a sign of their interest in pregnancy health (16). However, spouses' limited knowledge of proper health behaviors, pregnancy problems, and physical needs of pregnant women is an important obstacle to demonstrate supportive behaviors by them. It is imperative, therefore, to provide pregnancy care education especially in the case of risky pregnancy like gestational diabetes (17). Spouses can be highly supportive by accompanying their wives in walking, motivating them to adhere to the diet, and providing emotional support for measuring glucose or insulin injection (18).

2. Objectives

Taking into account the facts that women with gestational diabetes receive less social support than healthy pregnant women (8) and that the cultural difference may affect the results for various populations, the present study aimed to determine the effect of spouse participation in gestational diabetes care on pregnant women's perceived social support.

3. Methods

This quasi-experimental study with two groups was carried out in Bahar hospital affiliated with Shahroud University of Medical Science, Iran. The participants were selected through convenience sampling from September 2018 to March 2019. They were non-randomly allocated to control and experiment groups, so that the participants in the control group were selected through continuous sampling ($n = 40$), and then the participants in the experiment

group were selected ($n = 40$). The sample size was determined using the following formula based on which 40 people were included in each group:

$$\frac{(Z_1 + Z_2)^2 (2S^2)}{d^2}$$

Inclusion criteria were diagnosis of gestational diabetes by a specialist and according to lab criteria, using oral medications or insulin, receiving diet control, living with the spouse, marriage age > 18, reading and writing literacy, no chronic or nervous disease, first pregnancy, singleton fetus, no abnormality, Gestational age of 20 - 30 weeks, and having an Android or IOS smartphone and ability to work with it. The exclusion criteria were premature delivery, divorce, death of the spouse, reluctance to participate in the educational session, and failure to study the educational content.

3.1. Research Tools

Two research tools, including a demographics questionnaire and the Diabetes Social Support Questionnaire-Family Version (DSSQ-Family) were used in this study.

3.1.1. Demographics Questionnaire

The questionnaire was a researcher-designed tool including age, education of mother and spouse, economic status, history of hospitalization for diabetes, and treatment method. Content validity of the tool was supported by three faculty board members in Iran University of Medical Sciences. The questionnaire was filled out by the gestational diabetes women at the beginning of study.

3.1.2. DSSQ-Family

This questionnaire was designed by Greca in 2000 with 52 statements based on Likert's five-point scale (never = 0, always = 5). The questionnaire's scores range from 0 to 260: the higher the score, the higher the patient's understanding of the support provided. The questionnaire has five aspects viz. medication use support (q.1 - q.8), blood sugar test support (q.9 - q.20), diet support (q.21 - q.40), exercise support (q.41 - 47), and emotional supports (q.48 - q.52) (19). The validity and reliability of this questionnaire have already been reported in previous studies in Iran (20). In the present study, content validity method was adopted to determine scientific validity of DSSQ-Family. That is, the tool was provided to three faculty board members at the School of Nursing, Iran University of Medical Sciences, for examination and confirmation of scientific validity. To check the reliability of the tool, it was provided to 30 women with gestational diabetes who met the inclusion criteria (they expressed their consent), and Cronbach's alpha of 0.97 was obtained for the tool. Test-retest reliability was examined

to evaluate the external reliability, and the correlation coefficient of 96% was obtained.

3.1.3. Intervention Method

The pregnant women with gestational diabetes in the control group filled the two tools on the first day of the study. These women received normal medical and health care, and they filled out DSSQ-Family once more five weeks after the study.

The participants in the experiment groups filled out the two tools on the first day of the study, and they received the intervention program in addition to the normal education. The intervention consisted of two sessions of face-to-face education followed by an online education using Telegram and Whatsapp mobile applications. The first educational session was a private session with presence of the mother and spouse to provide them with information about gestational diabetes, the symptoms, and side-effects for the mother and fetus. In addition, they were provided with an e-pamphlet for more self-study (e.g., an introduction to gestational pregnancy, the side-effects for the mother and fetus, the symptoms, diet, exercising, treatment, etc.). The couples were asked to study the pamphlet prior to the second session. The second session was also private, and it was held at seven days intervals during the next visit to the clinic. The content of the second session included the treatments, the importance of using medications, blood sugar self-monitoring, and the role of spouse in controlling the disease. The sessions were held through giving short lectures, displaying PowerPoint slides, and showing educational films. At the end of the sessions, the participants were given a chance to ask their questions. After the first session and throughout the intervention course, moreover, the couples received educational text, audio, video clips, and animation via Telegram and Whatsapp about gestational diabetes, the side effects for the mother and fetus, the importance of diet, exercising, taking medications, blood sugar monitoring, insulin injection, and the importance of spouse's support for the mother. On average, the participants received 4 - 5 messages per week and 20 - 25 message throughout the study period (for 5 weeks).

An attempt was made by the author to make sure that the messages had been timely and successfully delivered and read by the participants. Otherwise, the author called the participants to check if there was any problem. Throughout the intervention, the author called the participants once a week to check the participants and received feedbacks about the education from the mothers and the spouses. Five weeks after the intervention, the participants in the experiment group were asked to fill out the DSSQ-Family.

Data analyses were performed using descriptive statistics, independent *t*-test, paired *t*-test, and chi-squared test with SPSS (version 16 Chicago, Illinois, USA), and the significance level was set at 95%.

3.2. Ethical Consideration

The present study was approved by the Ethics Committee of Iran University of Medical Sciences (IUMS1396.9311686020). A clinical trial protocol was recorded in Iranian Registry of Clinical Trials (IRCT) under the No.: IRCT20170509279N4. All the participants signed a written letter of consent. Confidentiality of information was observed, and the participants were allowed to leave the study in any stage.

4. Results

Two participants from the control group left the study, one due to premature delivery and one due to moving to another city. Four participants from the experiment group also left the study, three due to broken smartphone and one due to failure to participate in the educational sessions. Thus, 38 participants remained in control and 36 in the experiment group. The collected data showed that there was no significant difference between the two groups in terms of demographical information such as age of the mothers and the spouses, pregnancy age, employment status of the mothers, education of the mothers and spouses, economic status, history of hospitalization due to diabetes, and therapeutic method (Table 1).

As listed in Table 2, there was a significant difference in the experiment groups in terms of enjoying social support concerning medication application ($P = 0.027$), blood sugar test ($P = 0.002$), diet ($P = 0.01$), and emotional support ($P < 0.001$) before and five weeks after the intervention. Moreover, the mean total score of social support significantly increased five weeks after the intervention compared to that before the intervention ($P < 0.001$).

The variations in the mean score of social support aspects, including blood sugar test ($P = 0.017$), diet ($P = 0.012$), and emotional support ($P < 0.001$), were significant in both groups, and the improvement in the intervention group was higher than that of the control group. The increase in the social support score in the experiment group was higher than that in the control group ($P < 0.001$) (Table 3).

5. Discussion

In this study, the effect of spouse participation in gestational diabetes care on pregnant women's perceived so-

Table 1. Demographic Characteristics of Pregnant Mothers with Gestational Diabetes and Their Spouses in the Education and Control Group ^a

Variables	Education	Control	P	t ^b	χ ^{2 c}	df
Mothers' age (y)			0.152	1.447		
< 25	5 (13.9)	5 (13.5)				
25 - 29	6 (16.7)	13 (35.1)				
30 - 34	16 (44.4)	13 (35.1)				
< 35	9 (25)	6 (16.2)				
Mother's education			0.222 ^d			
Reading and writing	3 (8.3)	3 (8.1)				
Junior high school	4 (11.1)	11 (29.7)				
High school	19 (52.8)	13 (35.1)				
College degree	10 (27.8)	10 (27)				
Mother's job			0.727		0.122	1
Housewife	28 (77.8)	30 (81.1)				
Employed	8 (22.2)	7 (18.9)				
Gestational age (weeks)			0.988	0.015		
< 25	7 (19.4)	7 (18.9)				
25 - 27	4 (11.1)	5 (11.1)				
28 <	25 (69.4)	25 (69.4)	0.733	0.343		
Spouse's age (y)						
< 30	7 (19.4)	5 (13.5)				
30 - 34	12 (33.3)	17 (45.9)				
35 - 39	10 (27.8)	6 (16/2)				
40 <	7 (19/4)	9 (24/3)				
Spouse's literacy			0.699 ^d		1.43	3
Reading and writing	6 (16/7)	4 (10//8)				
Junior high school	12 (33/3)	11 (29/7)				
High school	12 (33/3)	12 (32/4)				
College degree	6 (16.7)	10 (27)				
Spouses' job			0.384 ^d			
Office employee	8 (22.2)	10 (27)				
Freelancer	26 (72.2)	23 (62.2)				
Worker	1 (2.8)	4 (10.8)				
Unemployed	1 (2.8)	0 (0)				
Economic status			0.999 ^d			
Poor	2 (5.6)	2 (5.4)				
Moderate	30 (83.3)	30 (81.1)				
Good	4 (11.1)	5 (13.5)				
History of hospitalization			0.401		0.706	1
Negative	14 (38.9)	18 (48.6)				
Positive	22 (61.1)	19 (51.4)				
Treatment method			0.297 ^d			
Diet	13 (36.1)	10 (27)				
Oral drugs	9 (25)	17 (45.9)				
Insulin	10 (27.8)	8 (21.6)				
Insulin and oral drugs	4 (11.1)	2 (5.4)				

^a Values are expressed as No. (%).^b Independent t-test.^c Chi-squared test.^d Fisher's exact test.

Table 2. Numerical Indices of Social Support and the Aspects in the Pregnant Women Before and Five Weeks After the Education

Social Support and the Aspects	Control					Education				
	Before	5 Weeks After	Paired t-Test			Before	5 Weeks After	Paired t-Test		
			t	P	df			t	P	df
Taking medicine	2.37 ± 1.49	2.4 ± 1.52	0.551	0.586	26	2.89 ± 1.67	3.02 ± 1.62	2.369	0.027	22
Blood sugar test	3.02 ± 1.36	3.07 ± 1.36	3.474	0.001	36	3.5 ± 1.44	3.74 ± 1.34	3.264	0.002	35
Diet	3.3 ± 1.28	3.3 ± 1.27	0.086	0.932	36	3.36 ± 1.13	3.48 ± 1.1	3.264	0.01	35
Exercise	2.46 ± 1.69	2.39 ± 1.71	2.169	0.037	35	2.31 ± 1.55	2.36 ± 1.59	0.816	0.42	34
Emotional support	3.48 ± 1.35	3.52 ± 1.37	1.602	0.118	36	3.27 ± 1.42	4.05 ± 1.12	7.2	< 0.001	35
Social support	3.05 ± 1.13	3.06 ± 1.14	1.246	0.221	36	3.21 ± 1.22	3.42 ± 1.16	4.652	< 0.001	35

^a Values are expressed as mean ± SD.**Table 3.** Comparing Social Support and its Variations in Pregnant Mothers with Gestational Diabetes Within the Education and Control Group ^a

Social Support and the Aspects	Control	Education	Independent t-Test		
			P	t	df
Taking medications	0.03 ± 0.24	0.13 ± 0.26	0.158	1.435	48
Blood sugar test	0.05 ± 0.09	0.24 ± 0.45	0.017	2.494	37.98
Diet	-0.001 ± 0.09	0.12 ± 0.26	0.012	2.616	43.55
Exercise	-0.06 ± 0.17	0.06 ± 0.44	0.122	1.564	69
Emotional support	0.04 ± 0.16	0.77 ± 0.64	< 0.001	6.597	39.36
Social support	0.01 ± 0.04	0.21 ± 0.27	< 0.001	4.381	71

^a Values are expressed as mean ± SD.

cial support was examined. Our study revealed that the total score of social support in the experiment group had a significant increase compared to that in the control group. The attempt by research team to find similar studies did not yield any results. However, our findings were consistent with the results from studies suggesting that education based on spouse participation improved health indices in diabetic and other patients (21). A study in Thailand on patients with diabetes type II showed that participation of family members in the care program had a significant effect on social support, self-care, knowledge, and attitudes of the patients. Their findings confirmed that family members' participation improved patients' perception of social support (22). Their findings were consistent with our results in this regard. Morovati Sharif Abad et al. conducted a study in Iran titled "The Effects of Menopause Health Education to Spouses on Perceived Social Support by Menopausal Women". Their results showed that social support score in women whose spouses received the education via lecture method increased two months after the education (23). In addition, a study by Mortazavi et al. showed that spouse participation in pregnancy care provision had no effect on the undesirable outcomes of pregnancy (e.g., gestational blood pressure, urination problems, and premature delivery); however, it improved perceived support in women during and after pregnancy (24).

The results of these two studies were consistent with the findings of the present study and highlighted the important role of spouses in improving health among women. Social support during pregnancy is very important, and it is believed that it can lead to positive results like higher knowledge, better attitudes, pregnancy safety, and higher chance of delivering a healthy infant (10, 25).

A study by Yargawa and Leonardi-Bee reviewed 63 articles and reported that the benefits of spouses' participation in supporting mothers in the developed and developing countries included higher access of mothers to child delivery supports before and during delivery, abandoning risky behaviors such as smoking, better mental health in women, less stress, less pain, and anxiety during delivery, and infant's health (15). Examination of mother's health, stress, anxiety as well as the infant's health were not the main objectives of our study; however, various studies have shown that receiving social support during pregnancy leads to less risk of post-delivery depression (10), and less risk of premature delivery or low weight of infant (25). Therefore, taking measure to improve social support for pregnant women leads to positive outcomes of pregnancy. Spouse participation in pregnancy care is one of these measures.

The results showed that women and men both found the counseling services for men essential, and recom-

mended 2-3 sessions of counseling and education for men (26, 27). Highlighting the necessity of spouse' participation, implementing methods of providing emotional support to pregnant women for measuring blood sugar and injecting insulin, and familiarizing spouses with the problems and risks of pregnancy were some of the items found important by women (18, 26). All these items were covered in the educational sessions in this study, which may have been one of the reasons behind the significant effect of spouses' participation on the perceived social support by pregnant women.

Promoting participation of spouses in pregnancy care is very important. According to many studies, factors like economic problems, cultural barriers, traditional structure of providing services to women (e.g., men are not allowed in women wards), attitudes of the medical team members, and lack of awareness in men about their roles were some of the barriers to men's participation in pregnancy cares (28, 29). On the other hand, the traditional, religious or cultural structure of the community (e.g., communication between midwives and men is not easy for either side) prevents occurrence of any actual and evidence-based experience despite men's desire to participate in pregnancy cares. In spite of men and women's desire to involve spouses in pregnancy care, the ground for such participation is not ready (30). Therefore, promoting men's participation, removing the barriers, and making the required revisions in the current health system are required. One of the practical and rational revisions is to lead the health system towards "family friendly" systems and, to this end, educating fathers along with mothers as well as using self-teaching media are recommended (31).

As for the limitations of this study, the ruling cultural and religious barriers in Iran, the social customs against the presence of fathers in pregnancy care educational classes, holding the educational session by an instructor of the opposite gender, and the preferability of providing counseling services and educational content about different support methods by a male psychologist to the spouses were notable.

5.1. Conclusions

Considering the positive effect of spouse participation on perceived social support of pregnant women with gestational diabetes and on their healthy pregnancy, it was recommended that health policymakers should codify pregnancy cares, despite the cultural limitation, in order to facilitate maximum participation of spouses.

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Footnotes

Authors' Contribution: Maryam Abdollahian and Safoura Dorri conducted the study under the guidance of Mansoure Ashghali Farahani. Maryam Abdollahian and Safoura Dorri wrote the manuscript. Mansoure Ashghali Farahani and Hamid Haghani directed, edited, and revised the manuscript.

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References

1. Nguyen BT, Cheng YW, Snowden JM, Esakoff TF, Frias AE, Caughey AB. The effect of race/ethnicity on adverse perinatal outcomes among patients with gestational diabetes mellitus. *Am J Obstet Gynecol*. 2012;**207**(4):3220-6. [PubMed ID: 22818875]. [PubMed Central ID: PMC3462223]. <https://doi.org/10.1016/j.ajog.2012.06.049>.
2. Jones EJ, Appel SJ, Eaves YD, Moneyham L, Oster RA, Ovalle F. Cardiometabolic risk, knowledge, risk perception, and self-efficacy among American Indian women with previous gestational diabetes. *J Obstet Gynecol Neonatal Nurs*. 2012;**41**(2):246-57. [PubMed ID: 22834848]. <https://doi.org/10.1111/j.1552-6909.2012.01339.x>.
3. Schwartz N, Nachum Z, Green MS. The prevalence of gestational diabetes mellitus recurrence-effect of ethnicity and parity: a meta-analysis. *Am J Obstet Gynecol*. 2015;**213**(3):310-7. [PubMed ID: 25757637]. <https://doi.org/10.1016/j.ajog.2015.03.011>.
4. Hossein-Nezhad A, Maghbooli Z, Vassigh AR, Larijani B. Prevalence of gestational diabetes mellitus and pregnancy outcomes in Iranian women. *Taiwan J Obstet Gynecol*. 2007;**46**(3):236-41. [PubMed ID: 17962102]. [https://doi.org/10.1016/S1028-4559\(08\)60026-1](https://doi.org/10.1016/S1028-4559(08)60026-1).
5. Halperin IJ, Feig DS. The role of lifestyle interventions in the prevention of gestational diabetes. *Curr Diab Rep*. 2014;**14**(1):452. [PubMed ID: 24318074]. <https://doi.org/10.1007/s11892-013-0452-2>.
6. Sayehmiri F, Darvishi Z, Sayehmiri K, Soroush S, Emameini M, Zarrilli R, et al. A Systematic Review and Meta-Analysis Study to Investigate the Prevalence of Helicobacter pylori and the Sensitivity of its Diagnostic Methods in Iran. *Iran Red Crescent Med J*. 2014;**16**(6):e12581. [PubMed ID: 25068041]. [PubMed Central ID: PMC4102974]. <https://doi.org/10.5812/ircmj.12581>.

7. Cardwell MS. Improving Medical Adherence in Women With Gestational Diabetes Through Self-Efficacy. *Clin Diabetes*. 2013;**31**(3):110-5. <https://doi.org/10.2337/diaclin.31.3.110>.
8. Iwanowicz-Palus G, Zarazczyk M, Bieñ A, Korzyńska-Pietas M, Krysa J, Rahnema-Hezavah M, et al. The Relationship between Social Support, Self-Efficacy and Characteristics of Women with Diabetes during Pregnancy. *Int J Environ Res Public Health*. 2021;**19**(1). [PubMed ID: 35010563]. [PubMed Central ID: PMC8744655]. <https://doi.org/10.3390/ijerph19010304>.
9. Appleton AA, Kiley K, Holdsworth EA, Schell LM. Social Support During Pregnancy Modifies the Association Between Maternal Adverse Childhood Experiences and Infant Birth Size. *Matern Child Health J*. 2019;**23**(3):408-15. [PubMed ID: 30627949]. <https://doi.org/10.1007/s10995-018-02706-z>.
10. Pao C, Guintivano J, Santos H, Meltzer-Brody S. Postpartum depression and social support in a racially and ethnically diverse population of women. *Arch Womens Ment Health*. 2019;**22**(1):105-14. [PubMed ID: 29968129]. [PubMed Central ID: PMC6800248]. <https://doi.org/10.1007/s00737-018-0882-6>.
11. Jeihooni AK, Hidarnia A, Kaveh MH, Hajizadeh E, Askari A. Application of the health belief model and social cognitive theory for osteoporosis preventive nutritional behaviors in a sample of Iranian women. *Iran J Nurs Midwifery Res*. 2016;**21**(2):131-41. [PubMed ID: 27095985]. [PubMed Central ID: PMC4815367]. <https://doi.org/10.4103/1735-9066.178231>.
12. Leifer G. *Maternity Nursing: An Introductory Text*. Philadelphia, USA: Elsevier/Saunders; 2012.
13. Emamgholi Khooshehchin T, Keshavarz Z, Afrakhteh M, Shakibazadeh E, Faghihzadeh S. Explanation the experiences of mothers with gestational diabetes about the factors affecting self-care: A qualitative study. *J Clin Nurs Midwifery*. 2017;**5**(4).
14. Chakrabarti S, Sarkar D. Awareness and involvement of male spouse in various aspects of antenatal care: observation in a rural area of West Bengal. *Int J Community Med Public Health*. 2017;**4**(4):1179. <https://doi.org/10.18203/2394-6040.ijcmph20171345>.
15. Yargawa J, Leonardi-Bee J. Male involvement and maternal health outcomes: systematic review and meta-analysis. *J Epidemiol Community Health*. 2015;**69**(6):604-12. [PubMed ID: 25700533]. [PubMed Central ID: PMC4453485]. <https://doi.org/10.1136/jech-2014-204784>.
16. Rahman AE, Perkins J, Islam S, Siddique AB, Moinuddin M, Anwar MR, et al. Knowledge and involvement of husbands in maternal and newborn health in rural Bangladesh. *BMC Pregnancy Childbirth*. 2018;**18**(1):247. [PubMed ID: 29914410]. [PubMed Central ID: PMC6007056]. <https://doi.org/10.1186/s12884-018-1882-2>.
17. Mortazavi F, Mirzaii K. [Reason of, barriers to, and outcomes of husbands' involvement in prenatal and intrapartum care program based on midwives' experiences: A qualitative study]. *J Arak Uni Med Sci*. 2012;**15**(1 (60)):104-15. Persian.
18. Carolan M, Gill GK, Steele C. Women's experiences of factors that facilitate or inhibit gestational diabetes self-management. *BMC Pregnancy Childbirth*. 2012;**12**:99. [PubMed ID: 22988897]. [PubMed Central ID: PMC3561108]. <https://doi.org/10.1186/1471-2393-12-99>.
19. La Greca AM, Bearman KJ. The diabetes social support questionnaire-family version: evaluating adolescents' diabetes-specific support from family members. *J Pediatr Psychol*. 2002;**27**(8):665-76. [PubMed ID: 12403857]. <https://doi.org/10.1093/jpepsy/27.8.665>.
20. Khosravizade Tabasi H, Madarshahian F, Khoshniat Nikoo M, Hassanabadi M, Mahmoudirad G. Impact of family support improvement behaviors on anti diabetic medication adherence and cognition in type 2 diabetic patients. *J Diabetes Metab Disord*. 2014;**13**(1):113. [PubMed ID: 25436202]. [PubMed Central ID: PMC4247652]. <https://doi.org/10.1186/s40200-014-0113-2>.
21. Soriano EC, Lenhard JM, Gonzalez JS, Tennen H, Chow SM, Otto AK, et al. Spousal Influence on Diabetes Self-care: Moderating Effects of Distress and Relationship Quality on Glycemic Control. *Ann Behav Med*. 2021;**55**(2):123-32. [PubMed ID: 32491154]. [PubMed Central ID: PMC7962795]. <https://doi.org/10.1093/abm/kaa038>.
22. Withidpanyawong U, Lerkiatbundit S, Saengcharoen W. Family-based intervention by pharmacists for type 2 diabetes: A randomised controlled trial. *Patient Educ Couns*. 2019;**102**(1):85-92. [PubMed ID: 30150128]. <https://doi.org/10.1016/j.jpec.2018.08.015>.
23. Morovati Sharif Abad MA, Yoshany N, Bahri N, Delshad Noghabi A, Mirzaei M. [Effects of training the menopausal health to the husbands on perceived social support among women during transitional period to menopause]. *Iran J Obstet Gynecol Infertil*. 2015;**17**(134):8-16. Persian.
24. Mortazavi F, Delara M, Akaberi A. [Male involvement in prenatal care: impacts on pregnancy and birth outcomes]. *Nurs Midwifery J*. 2014;**12**(1):63-71. Persian.
25. Chikaliipo MC, Chirwa EM, Muula AS. Exploring antenatal education content for couples in Blantyre, Malawi. *BMC Pregnancy Childbirth*. 2018;**18**(1):497. [PubMed ID: 30558572]. [PubMed Central ID: PMC6296087]. <https://doi.org/10.1186/s12884-018-2137-y>.
26. Davis J, Vaughan C, Nankinga J, Davidson L, Kigodi H, Alalo E, et al. Expectant fathers' participation in antenatal care services in Papua New Guinea: a qualitative inquiry. *BMC Pregnancy Childbirth*. 2018;**18**(1):138. [PubMed ID: 29739351]. [PubMed Central ID: PMC5941321]. <https://doi.org/10.1186/s12884-018-1759-4>.
27. Lewis S, Lee A, Simkhada P. The role of husbands in maternal health and safe childbirth in rural Nepal: a qualitative study. *BMC Pregnancy Childbirth*. 2015;**15**:162. [PubMed ID: 26239123]. [PubMed Central ID: PMC4523911]. <https://doi.org/10.1186/s12884-015-0599-8>.
28. Firouzan V, Noroozi M, Farajzadegan Z, Mirghafourvand M. Barriers to men's participation in perinatal care: a qualitative study in Iran. *BMC Pregnancy Childbirth*. 2019;**19**(1):45. [PubMed ID: 30691402]. [PubMed Central ID: PMC6350307]. <https://doi.org/10.1186/s12884-019-2201-2>.
29. Alio AP, Lewis CA, Scarborough K, Harris K, Fiscella K. A community perspective on the role of fathers during pregnancy: a qualitative study. *BMC Pregnancy Childbirth*. 2013;**13**:60. [PubMed ID: 23497131]. [PubMed Central ID: PMC3606253]. <https://doi.org/10.1186/1471-2393-13-60>.
30. Matseke MG, Ruiter RAC, Barylski N, Rodriguez VJ, Jones DL, Weiss SM, et al. A Qualitative Exploration of the Meaning and Understanding of Male Partner Involvement in Pregnancy-Related Care among men in rural South Africa. *J Soc Behav Health Sci*. 2017;**11**. [PubMed ID: 29755646]. [PubMed Central ID: PMC5945278].
31. Kotelchuck M, Levy RA, Nadel HM. Voices of Fathers During Pregnancy: The MGH Prenatal Care Obstetrics Fatherhood Study Methods and Results. *Matern Child Health J*. 2022;**26**(8):1603-12. [PubMed ID: 35768674]. <https://doi.org/10.1007/s10995-022-03453-y>.