

Partner's emotional reaction to pregnancy mediates the relationship between pregnancy planning and prenatal mental health

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Abstract

Background: An unplanned pregnancy may follow by increasing depression and anxiety and the aim of the present study was to evaluate the mediating role of partner's emotional reaction to pregnancy (PERP) on the relationship between pregnancy planning and prenatal mental health.

Methods: This cross-sectional study was conducted on 303 healthy Iranian pregnant women during their third trimester. The levels of depression and anxiety were measured using the Edinburgh Postnatal Depression Scale and the State-Trait Anxiety Inventory. Further, the PERP score was measured using a researcher-made questionnaire. The data were analyzed using the plug-in application PROCESS macro.

Results: The results showed that PERP score was related to pregnancy planning and prenatal depression and anxiety reversely. The direct effect of the pregnancy planning on depression ($c=-.05$) and anxiety levels ($c=-.02$) were not significant; but indirect effect of pregnancy planning on depression (Point Estimate= $-.379$, CI: $-.523$ to $-.250$) and anxiety levels (Point Estimate= $-.560$, CI: $-.741$ to $-.385$) with mediating role of PERP. were significant.

Conclusions: The results indicated that the effect of the pregnancy planning on prenatal mental health is mediate by PERP and in unplanned pregnancy, women need to receive their positive partner's reaction toward pregnancy to preserve their mental health.

Plain English Summary

An unplanned pregnancy may follow by affecting women's mental health and in this study a mediating role of partner's emotional reaction to pregnancy on the relationship between pregnancy planning and prenatal mental health was assessed. This study was conducted on 303 healthy Iranian pregnant women during their third trimester. Using the validated the levels of depression, anxiety and partner's emotional reaction to pregnancy were measured. The results showed that partner's emotional reaction to pregnancy was related to pregnancy planning and prenatal depression and anxiety inversely. The results showed that the effect of the pregnancy planning on depression and anxiety levels were not direct. But, by mediating the partner's emotional reaction to pregnancy, the effect of pregnancy planning on depression and anxiety levels (indirect effect) were significant. The results indicated that in unplanned pregnancy, women need to receive their positive partner's reaction toward pregnancy to preserve their mental health.

Background

Mental disorders are some of the most common and important complications during pregnancy [1, 2], which could adversely affect the pregnancy outcome [3]. Adverse health behavior [4] and increased attempted suicides among pregnant mothers [5] are some of the associated complications that could threaten the health of the mother and fetus. Furthermore, the negative effect of psychological disorders on marital relationships [6] may threaten the mental health of pregnant women. Therefore, many studies aimed to determine factors which affect the mental health of pregnant women. Many studies have shown that during pregnancy women's mental health is associated with social support [7-9], marital relationships [10], as well as socioeconomic factors.

Also, unplanned pregnancy is known as a risk factor for increasing family conflict and decreasing marriage harmony, depressive symptoms among partners [11, 12]. Some studies reported of increased risk of depression and anxiety following unplanned pregnancies [13, 14]. But, it is believed that even unplanned pregnancy can also be associated with pregnancy acceptance [15]. Therefore, the relationship between pregnancy planning and women's mental health during pregnancy may be formed during a process of the couple's relationship following planned or unplanned pregnancy.

The relationship between pregnancy planning and related factors to women's mental health may explain this discrepancy. In a systematic review marital relationships and social support were reported to be important determinants for maternal mental health during pregnancy [1]. Other studies have also shown that social support, especially the partner's, is of great importance in maintaining the mental health of pregnant women [7, 16, 17]. Further, affecting the marital relations, the partner's emotional support has important effects on the mental health of women during pregnancy [8, 9] in such a way that some studies have reported that the partner's emotional support has a positive relation to increased marital satisfaction in women [18]. However, during pregnancy, among all the partner's supportive behavior, his emotional reaction to pregnancy such as that on learning about his wife's pregnancy or about pregnancy-related events such as movement of the fetus or the growth of the abdomen as a result of the growth of the fetus, might be of special importance because it indicates the importance of pregnancy to the partner.

In many women, occurrence of pregnancy is an event associated with great changes in sensations, emotions, and excitements [19]; which are influenced by their familial relations [20] and can impact their mental health [9]. Further, the social roles that women play, the reproductive one is of special importance, where pregnancy for women is the realization of their gender roles such that decreased fertility in middle-aged women has been described as a sense of fruitlessness and unproductivity [21]. Previous studies indicate that pregnancy is considered by many women proof of their womanhood [22] and that failure to express emotions about pregnancy may be perceived as indifference.

In a study on Japanese pregnant women's satisfaction with family relations and their mental health, it was reported to have a direct association with increased morning sickness [20]. These findings show that physical signs, manifesting pregnancy, are of great importance for the women. Therefore, in societies as such, due to the emotional attachments between the partners, the partner's confirmation of her fertility [23] might add to the importance of the partner's emotional reaction to pregnancy and its effect on her mental health. According to these relationships, the aim of the study was evaluating the partner's emotional reaction to pregnancy (PERP) as a mediator of the relationship between pregnancy planning and the psychological health of pregnancy.

Methods

This cross-sectional study was conducted in Isfahan, Iran, from August 2017 to April 2018, approved by the Ethics Committee of Isfahan University of Medical Sciences. The study population included pregnant women in their third trimester receiving pregnancy care at health centers in Isfahan. The inclusion criteria were having a single pregnancy and not having any diagnosed medical, gynecological and mental disorders under treatment. The centers were selected from two networks: 1 and 2 in Isfahan using stratified random cluster sampling. Urban health networks organize health care centers services based on the Iranian health care system. In Isfahan, health services are organized by two health care networks. Therefore, two networks were considered as clusters and six health care centers covered by each network were selected randomly. Pregnant women who were referred to the centers were selected using convenience sampling. The inclusion criteria were evaluated by reviewing the women's medical files. The sample size was determined by using single population proportion formula based on the assumptions of about 16% of prenatal anxiety prevalence from a previous study of the Iranian pregnant women [24] with a precision (margin of error) of 1.5% between the sample and population parameter. Considering a 95% confidence interval, the number of the participants was estimated at about 303 pregnant women. On receiving the informed consent of the participants, the women's demographic and obstetric history (including parity, history of infertility, gestational age and pregnancy planning) and the history of depression prior to pregnancy were recorded.

Measurements

The level of self-report depression was evaluated using the 10-items Edinburgh Postnatal Depression Scale designed with a 4-point Likert scale (0-3). The primary studies reported a cut-off point of 12 or higher as the depression index during

pregnancy [25] and the validity for use with the Iranian population was approved with a Cronbach α of 0.79 [26]. The self-report anxiety level was measured using State-Trait Anxiety Inventory (STAI) T-Anxiety Scale by Spielberger, which measures the trait anxiety. This questionnaire contains 20 items on a 4-point Likert scale (1-4). The range of scores is 20–80, with the higher score indicating a greater trait anxiety. A cut-off point of scores ≥ 40 was coded as trait anxiety disorder (anxiety disorder). Further, a depression level above 12 was considered as depression disorder [27].

The PERP was measured using a researcher-made 19-items questionnaire completed by pregnant women. The items of the questionnaire were designed by performing content analysis on interviews conducted with 10 pregnant women or women with a history of pregnancy with the assistance of 3 psychologists. Based on the results, psychometrics of the initial version of a questionnaire with 19 items (with 3 Inverse questions) was performed on a 5-point Likert scale (1-5): strongly disagree (1), disagree (2), somehow disagree or agree (3), agree (4), and strongly agree (5).

For example, one of the items of the questionnaire was “observing fetal movement in my abdomen is interesting to my partner” or “the news of this pregnancy made my partner happy” or “I need something to happen to make my partner to make him pay more attention to me”. The content validity ratio (CVR) and content validity index (CVI) of the questionnaire were calculated using the opinions of 10 experts. For the quantitative content validity, all 19 items remained because of a CVR being more than 0.62 and a CVI being more than 0.8.

For reliability assessment, a pilot study was performed on 14 eligible pregnant women and the tool was completed in two stages with a time interval of three weeks. The calculated Cronbach Alpha and intra-class correlation index were .92 and .99 respectively. The construct validity was assessed using exploratory factor analysis. Equity, a scree plot and parallel implementation of Monte Carlo test were used to finalize the items. A value of 0.4 was considered the minimum load factor. The Varimax rotation was applied to two factors indicating 52.01% of the observed variance. The equity values of 2 factors were larger than 1.6 for 25.341 and 6.860. Exploratory factor analysis (Table 1) led to a questionnaire with 19 items and two categories including affect to pregnancy events (APE) with 10 items and reaction to needs RN with 9 items. The level of total PERP was the sum of the item scores of the questionnaire. The higher score indicating the partner's affect to pregnancy was more pleasant for women.

Statistical analysis was performed using SPSS software version 19. Statistical significance of the effect of mediation was examined through the plug-in application PROCESS macro v 3.4 by Hayes. The statistical significance of the mediating PERP was examined over 10,000 bootstrap samples. This method generated an estimate of the indirect effect, including 95% confidence intervals. When zero was not within the 95% confidence limits, one should conclude that the indirect effect was significantly different from zero.

The pregnancy planning (planned pregnancy: 1, unplanned pregnancy: 0) was treated as independent variable, the levels of depression and anxiety were treated as dependent variables and the level of the PERP score as an independent variable. To determine the potential confounding variables, Pearson and Spearman correlation coefficients between the depression and anxiety levels, women's age, education, monthly income were calculated and the variables correlated with the main variables ($p < 0.05$), were treated as potential confounding variables. The variables correlated with depression, anxiety and PERP (and its subscales), entered the regression model as covariant.

Results

The participants in the present study were 303 pregnant women with a gestational age of 28 to 36 weeks and a mean age of 32.56 years. Most of the participants in the study were multiparas (60.7%), with a secondary education and a monthly income level of under \$ 1000 (Table 2). The results showed that the monthly income had a weak association with the depression ($r = -0.198$, $p = 0.002$) and anxiety levels ($r = -0.199$, $p = 0.002$) during pregnancy. Further, the link between the women's age level ($r = -0.180$, $p = 0.003$) and education ($r = -0.179$, $p = 0.003$) and level of anxiety was significant and

weak. Also, the relationship between monthly income and partner's reaction was significant ($r=.223$, $p=.001$). Therefore, the monthly income, age and educational level as covariant variables entered the regression model.

The results showed that the PERP was related to pregnancy planning ($p<.0001$). Additionally, the results showed that, apart from these variables, women's levels of depression ($p < 0.0001$) and anxiety ($p = 0.002$) had a significant inverse correlation with the PERP level (Table 3).

The levels of depression ($\beta=-.21$, $p=.002$, CI: $-.14$ to $-.62$) and anxiety ($\beta=-.28$, $p= .003$, CI: $-.12$ to $-.55$) were related to APE and also, were related to RN respectively ($-.53$, $p<.0001$, CI: $-.28$ to $-.38$). The adjusted results for the level of education and monthly income showed that the indirect effect of pregnancy planning on depression and anxiety had been significant and inverse (Table 4). The direct effect of pregnancy planning on depression and anxiety was not significant, suggesting that the correlation of the pregnancy planning with depression and anxiety are completely mediated by the PERP and its subscales (Figure 1).

Discussion

The aim of the present study was evaluating the PERP and its subscales as mediator of the relationship between pregnancy planning and the prenatal psychological health. Numerous studies have been conducted in evaluating the relationship between pregnancy planning and prenatal mental health, as well as the relationship between social support and prenatal mental health [28]. But, as far as we know, the mediation of the PERP and the mental health of the woman during pregnancy was evaluated for the first time.

The results showed that the desirable the PERP, APE and RN decrease levels of depression and anxiety in the mother during pregnancy and also, mediate the relationship between pregnancy planning and the prenatal depression and anxiety. These results indicate that to moderate the stressful pressures following unplanned pregnancy, the positive partner's emotional reaction to the pregnancy is important.

Many studies have shown that the partner's social support would decrease the woman's levels of depression and anxiety during pregnancy [1, 23, 29] as well as the depression disorder [30];

Further, the level of the PERP level is well-established as a major predictive factor for depressive and anxiety in pregnant women.

These findings complement the results of research that showed an association between unwanted pregnancies and women's psychological health during pregnancy [13, 14]. It also confirms the results of studies that have shown that marital relationship affects the prenatal psychological health [31, 32].

Another finding of this study showed a positive relationship between planned pregnancy and the PERP. The results also showed that the depression and anxiety levels in pregnant women were inversely related to the PERP level. These findings suggest that unplanned pregnancy reduce a PERP level and thus affects the prenatal mental health. However, the lack of a direct effect of the pregnancy planning on depression and anxiety indicates that if a PERP would not decrease during unplanned pregnancies, an unplanned pregnancy will not increase the depression and anxiety of pregnant women.

Previous research has shown that unplanned pregnancies are accompanied by family disruption and a decline in the marital quality and couples' relationships; and it may associate with decreasing partner's emotional support and increasing risk of the women's depression and anxiety.

It was reported that the father's emotional reaction to the partner's pregnancy was one of major themes in the fatherhood development process [33]. As for the pregnancy of the woman, the father's emotional reaction to pregnancy may be considered as messages of the fatherhood development and the partner's approval of pregnancy; and in this way, it may

affect the mother's mental health. Because, there was reported that unplanned pregnancy was associated with an increased probability of not approving the pregnancy [34]. Also, some studies showed that the partner's approval of pregnancy was associated with improvement of the woman's mental health and that the partner's disapproval would lead to depression and anxiety during pregnancy [2, 34].

Also, the present study showed that although the PERP level was less frequent among women with lower economic status, where the PERP in these families was perceived as a desirable reaction, the levels of depression and anxiety decreased in pregnant women. Therefore, it is necessary to teach the partner the skill of expressing positive reactions in families with lower socioeconomic status in order to improve the mental health of pregnant women in unplanned pregnancy.

Although in the present study, the partner's approval of pregnancy was not directly measured, the higher level of partner's affect in the planned pregnancies confirms this explanation. But the lack of direct effect of the pregnancy planning and women's mental health may suggest that having a planned pregnancy is likely to affect women's mental health, when is followed by suitable partner's reaction.

Although, the present study showed that, apart from the socioeconomic status, the mental health of pregnant women depended on their perception of the PERP, in interpreting the results, there were some limitations that needed to be considered. The first notable limitation was that such factors as the partner's personality characteristics could have affected the form of the couple's relationship and probably the PERP level and women's mental health. Further, because the data on the PERP and the woman's mental health during pregnancy were collected in a cross-sectional study, we could not establish the temporal relation between the two conditions. The women's mental health could have provoked a positive behavior in their partners and might have led to the partner's positive emotional reaction to pregnancy. Also, depressed women would report more negative responses by their partners. Besides the mental disorders might have affected the perceived partner's behavior in pregnant women; which in the cross sectional studies cannot be captured. However, measurement of relationship variables such as quality, length of relationship, and other family-specific variables such as time since last child (if other children), could improve future similar studies.

Conclusions

The study showed that the partner's emotional reaction to pregnancy mediates the relationship between the pregnancy planning and prenatal mental health; which indicates the pregnant women need to receive their partner's positive reaction toward pregnancy to preserve their mental health.

Abbreviations

PERP: Partner's emotional reaction to pregnancy

APE: Affect to pregnancy events

RN: Reaction to needs

CI: Confidence interval

Declarations

Ethics Approval and Consent for Participation

All the procedures applied to the participants were in accordance with the ethical standards of the Isfahan University of Medical Sciences and written consent of the voluntary participants fully informed of the study. It was also explained that their refusal to participate in the study would have no effect on their routine pregnancy care.

Consent for publication

No applicable.

Availability of data and materials

Data and material are available on request from the corresponding author.

Competing interests

The authors declare that they have no conflict of interest.

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Authors' contributions

MG, AK, GK were involved in study conception, design and drafting of the manuscript. AK wrote the first draft of this study protocol. AK, GK, MB and AE reviewed and revised the first draft of the manuscript. MG, GK and AK involved in propagating of the questionnaire. AK was responsible for coordinating the study. MG was responsible for interview with participants and AK description and data analysis. All authors have read and approved the final version of the manuscript.

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References

1. Anderson FM, Hatch SL, Comacchio C, Howard LM. Prevalence and risk of mental disorders in the perinatal period among migrant women: a systematic review and meta-analysis. *Arch Womens Ment Health*. 2017; 20(3): 449-462.
2. Karmaliani R, Asad N, Bann CM, Moss N, McClure EM, Pasha O, Wright LL, Goldenberg RL. Prevalence of anxiety, depression and associated factors among pregnant women of Hyderabad, Pakistan. *Int J Soc Psychiatry*. 2009; 55(5): 414-424.
3. Glover V. Prenatal stress and its effects on the fetus and the child: possible underlying biological mechanisms. *Adv Neurobiol*. 2015; 52(4): 269-283.
4. Padmapriya N, Bernard JY, Liang S, Loy SL, Shen Z, Kwek K, Godfrey KM, Gluckman PD, Chong YS, Saw SM, Meaney MJ, Chen H, Muller-Riemenschneider F, GUSTO Study Group. Association of physical activity and sedentary behavior with depression and anxiety symptoms during pregnancy in a multiethnic cohort of Asian women. *Arch Womens Ment Health*. 2016; 19(6): 1119-1128.
5. Orsolini L, Valchera A, Vecchiotti R, Tomasetti C, Iasevoli F, Fornaro M, et al. Suicide during perinatal period: epidemiology, risk factors, and clinical correlates. *Front Psychiatry*. 2016; 7:138.

6. Salehi F, Shahhosseini Z. Association between women's marital satisfaction and anxiety during pregnancy, Iran J Psychiatry Behav Sci. 2017; 11(3): e7937.
7. Ilska M, Przybyla-Basista H. Partner support as a mediator of the relationship between prenatal concerns and psychological well-being in pregnant women. Health Psychol Rep. 2017; 5(4):285-295.
8. Pilkington P, Milne L, Cairns K, Whelan T. Enhancing reciprocal partner support to prevent perinatal depression and anxiety: a Delphi consensus study. BMC Psychiatry. 2016; 16:11.
9. Kazemi A, Ghaedrahmati M, Kheirabadi GR, Ebrahimi A, Bahrami M. The Experiences of Pregnancy and Childbirth in Women with Postpartum Depression: A Qualitative Study. Iran J Psychiatry Behav Sci. 2018; 12(4):7.
10. Fu W, Wilhelm LO, Wei Y, Zhou G, Schwarzer R. Emotional intelligence and dyadic satisfaction buffer the negative effect of stress on prenatal anxiety and depressive symptoms in Chinese women who are pregnant with twins. Anxiety Stress Coping. 2020 Mar 20:1-13.
11. Top ED, Cetisli NE, Guclu S, Zengin EB. Paternal Depression Rates in Prenatal and Postpartum Periods and Affecting Factors. Arch Psychiatr Nurs. 2016; 30(6):747-752.
12. Surkan PJ, Strobino DM, Mehra S, Shamim AA, Rashid M, Wu LS, Ali H, Ullah B, Labrique AB, Klemm RDW, West KP Jr, Christian P. Unintended pregnancy is a risk factor for depressive symptoms among socio-economically disadvantaged women in rural Bangladesh. BMC Pregnancy Childbirth. 2018;18(1):490.
13. Gonzalez-Mesa E, Kabukcuoglu K, Körükcü O, Blasco M, Ibrahim N, Kavas T. Cultural factors influencing antenatal depression: A cross-sectional study in a cohort of Turkish and Spanish women at the beginning of the pregnancy. J Affect Disord. 2018; 238: 256-260.
14. Garipey AM, Lundsberg LS, Miller D, Stanwood NL, Yonkers KA. Are pregnancy planning and pregnancy timing associated with maternal psychiatric illness, psychological distress and support during pregnancy? J Affect Disord. 2016; 15;205: 87-94.
15. Barrett G, Wellings K. What is a 'planned' pregnancy? Empirical data from a British study. Soc Sci Med. 2002; 55(4): 545-557.
16. Aktas S, Yesilcicek Calik K. Factors affecting depression during pregnancy and the correlation between social support and pregnancy depression. Iran Red Crescent Med J. 2015; 17(9): e16640.
17. Senturk V, Abas M, Dewey M, Berksun O, Stewart R. Antenatal depressive symptoms as a predictor of deterioration in perceived social support across the perinatal period: a four-wave cohort study in Turkey. Psychol Med. 2017; 47(4):766-775.
18. Debra L. Wright and William S. Influence of Emotional Support Exchange in Marriage on Caregiving Wives' Burden and Marital Satisfaction. Family Relations. 1998; 47: 195-204.
19. Schytt E, Hildingsson I. Physical and emotional self-rated health among Swedish women and men during pregnancy and the first year of parenthood. Sexual & Reproductive Healthcare. 2011; 2(2): 57-64.
20. Nakamura Y, Sato M, Watanabe I. Positive Emotion and its Changes during Pregnancy: Adjunct Study of Japan Environment and Children's Study in Miyagi Prefecture. Tohoku J Exp Med. 2018; 245(4):223-230.
21. Reyhani M, Kazemi A, Keshvari M: Rise and fall: two sides of a coin of middle aged women's perceptions of reproductive: a qualitative study. Arch Womens Ment Health. 2018; 21(4):421-428.
22. Hasanpoor-Azghdy SB, Simbar M, Vedadhir A. The Social Consequences of Infertility among Iranian Women: A Qualitative Study. Int J Fertil Steril. 2015; 8(4): 409-420.
23. Borghei NS, Taghipour A, Roudsari RL, Keramat A, Noghahi HJ. Predictors of Prenatal Empowerment among Iranian Pregnant Women. Electronic Physician. 2016; 8(9): 2962–2969.
24. Hajebi A, Motevalian SA, Rahimi-Movaghar A, Sharifi V, Amin-Esmaeili M, Radgoodarzi R, Hefazi M. Major anxiety disorders in Iran: prevalence, sociodemographic correlates and service utilization. BMC Psychiatry. 2018; 18: 8.

25. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*. 1987; 150(6): 782-786.
26. Kheirabadi GR, Maracy MR, Akbaripour S, Masaeli N. Psychometric properties and diagnostic accuracy of the edinburgh postnatal depression scale in a sample of Iranian women. *Iran J Med Sci*. 2012; 37(1): 32-38.
27. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA. *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press. 1983.
28. Fellmeth G, Plugge E, Fazel M, Oo MM, Pimanpanarak M, Phichitpadungtham Y, Wai K, Charunwatthana P, Simpson JA, Nosten F, Fitzpatrick R, McGready R. Prevalence and determinants of perinatal depression among labour migrant and refugee women on the Thai-Myanmar border: a cohort study. *BMC Psychiatry*. 2020; 20(1):168.
29. Biaggi A, Conroy S, Pawlby S, Pariante CM. Identifying the women at risk of antenatal anxiety and depression: A systematic review. *J Affect Disord*. 2016; 191: 62-77.
30. Bayrampour H, McDonald S, Tough S. Risk factors of transient and persistent anxiety during pregnancy. *Midwifery*. 2015; 31(6): 582–589.
31. Alipour Z, Kheirabadi GR, Kazemi A, Fooladi M. The most important risk factors affecting mental health during pregnancy: a systematic review. *East Mediterr Health J*. 2018; 24(6):549-559.
32. Alipour Z, Kazemi A, Kheirabadi G, Eslami AA. Relationship Between Marital Quality, Social Support and Mental Health During Pregnancy. *Community Ment Health J*. 2019; 55(6):1064-1070.
33. Golian Tehrani S, Bazzazian S, Dehghan Nayeri N. Pregnancy experiences of first-time fathers in iran: a qualitative interview study. *Iran Red Crescent Med J*. 2015; 17(2): e12271.
34. Barton K, Redshaw M, Quigley MA, Carson C. Unplanned pregnancy and subsequent psychological distress in husbanded women: a cross-sectional study of the role of relationship quality and wider social support. *BMC Pregnancy Childbirth*. 2017; 17(1): 44.

Tables

Table 1. The loading of the items of the partner’s emotional reaction to pregnancy questionnaire

Items	Load factors	
	Factor 1	Factor 2
<i>Affect to pregnancy events (10 Items)</i>		
Observing fetal movement in my abdomen is interesting to my partner	.667	
The news of this pregnancy made my partner happy	.637	
My partner's emotional respond at the time of pregnancy diagnosis was satisfactory for me	.632	
Our health (me and baby) is important to my partner	.616	
My partner is constantly follow the growth of the fetus	.601	
I feel my partner makes an emotional connection with the fetus by touching my abdomen	.599	
Talking about the baby inside my belly is pleasant for my partner	.598	
My partner speaks about the fetus in a way as if he sees it	.511	
I feel that my partner appreciate the efforts I make for bearing pregnancy	.527	
My partner is worried about my and baby's health	.517	
<i>Reaction to needs (9 Items)</i>		
My partner does not understand my physical condition and expects too much from me (Reverse)		.515
I feel that my partner does not care about me (Reverse)		.501
My partner has left me alone with all responsibilities of pregnancy (Reverse)		.672
It is important for my partner that I would not wear myself off by the housework		.611
Whenever I feel sad for pregnancy my partner do all in his power to help m		.553
My partner tries not to bother me during pregnancy		.677
I am sure that at the time of delivery my partner would accompany me to the maternity clinic		.665
My partner is by my side whenever I need him		.640
My partner is planning for the addition of the child to the family		.677

Table 2. Descriptive profile of the participants (n = 303)

	Mean (SD) or Number (%)
Age (mean)	32.56 (5.33)
Educational level (%)	
Primary	13 (4.3)
Secondary	232 (76.6)
Higher	58 (19.1)
Monthly income (\$)	
<500	13 (4.3)
500-1000	216 (71.3)
> 1000	74 (24.4)
Gestational age (mean)	32.6 (3.6)
Planed Pregnancy (%)	187 (61.7)
Depression level	9.1 (4.7)
Anxiety level	46.5 (7.8)
Partner's emotional reaction (mean)	23.8 (16.5)
Affect to pregnancy events (mean)	12.3 (7.66)
Reaction to needs (mean)	11.3 (7.79)

Table 3. The relations between antenatal mental health levels and partner's reaction to pregnancy

	Dependent variables											
	Depression level				Anxiety level				Partner's reaction to pregnancy			
	Adj r ² = .29; F=21.08; p=<.0001				Adj r ² =.04 F= 2.87; p=.01				Adj r ² = .14; F=11.05; p<.0001			
	Beta	Sig	CI 95%		Beta	Sig	CI 95%		Beta	Sig	CI 95%	
Age of women	.03	.55	-.06	.12	-.07	.22	-.58	.14	-.13	.02	-.07	-.77
Monthly income (\$)	-.11	.03	-1.78	-.07	-.05	.38	-4.63	1.79	.17	.002	8.95	1.90
Educational level	.08	.11	-.09	.81	-.07	.27	-2.61	.74	.01	.91	-1.62	1.61
History of infertility	-.02	.64	-2.73	1.70	-.03	.59	-10.66	6.02	-.01	.81	-7.41	9.47
Pregnancy planning	.01	.67	-1.00	1.01	-.01	.92	-3.67	3.94	.32	<.0001	14.44	7.21
PERP (total)	-.52	<.0001	-.12	-.17	-.19	.002	-.07	-.29	-	-	-	-

Abbreviation: Adj r²: Adjusted r square; CI: Confidence Interval; PERP: Partner's emotional reaction to pregnancy;

Beta: Standardized coefficients;

Table 4. Indirect effects and specific indirect effects of pregnancy planning on depression and anxiety adjusted for age and monthly income

Indirect Effect			Bootstrapping			
			Product of Confidents		95% Confidence Interval	
			Point Estimate*	SE	Lower	Upper
Pregnancy planning	PERP	Depression	-.379	.069	-.523	-.250
Pregnancy planning	PERP	Anxiety	-.560	.091	-.741	-.385
Pregnancy planning	APE	Depression	-.379	.069	-.519	-.247
Pregnancy planning	APE	Anxiety	-.179	.054	-.252	-.041
Pregnancy planning	RN	Depression	-.379	.069	-.519	-.247
Pregnancy planning	RN	Anxiety	-.42	.049	-.730	-.329

Abbreviation: SE: standard error; PERP: Partner's emotional reaction to pregnancy; APE: Affect to pregnancy events; RN: Reaction to needs

* Partially standardized effect

Figures

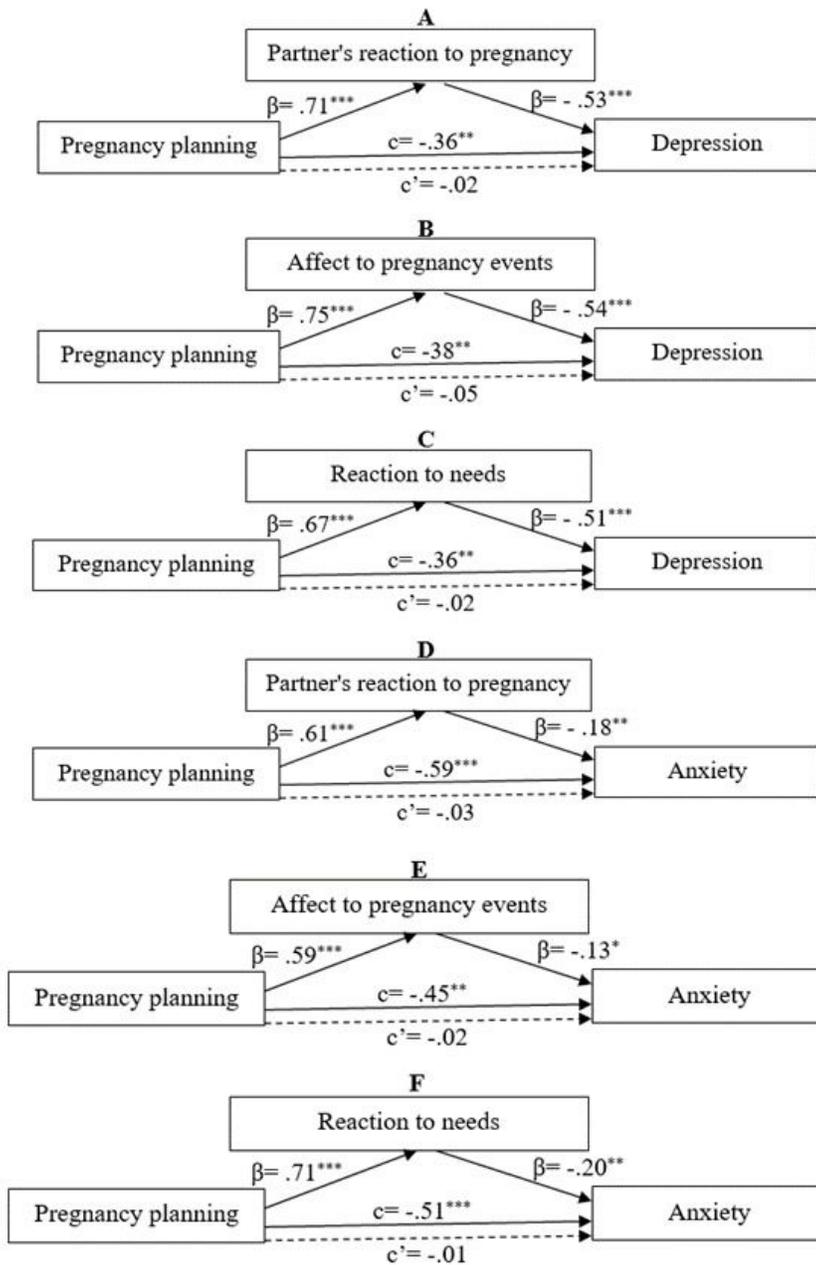


Figure 1

Mediation by partner's reaction and its subscales to pregnancy of the association between pregnancy planning and depression (A, B, C) and anxiety (D, E, F) Abbreviations: c: standardized total effect; c': standardized direct effect. * $p < .05$, ** $p < .01$, *** $p < .001$