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ORIGINAL PAPER

SOCIO-DEMOGRAPHIC AND PREGNANCY-RELATED CHARACTERISTICS ASSOCIATED WITH PRENATAL DISTRESS: A TURKISH STUDY

Emel Bahadir Yilmaz

Department of Midwifery, Faculty of Health Sciences, Giresun University, Giresun, Turkey

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Abstract

Aim: This study aimed to determine socio-demographic and pregnancy-related characteristics associated with prenatal distress. *Design*: Cross-sectional study. *Methods:* This cross-sectional study was carried out at the obstetrics and gynecology clinics of the Maternity and Children's Hospital, Giresun, Northern Turkey (n = 230). The data were collected using the Demographic Information Form, Insomnia Severity Index, and Prenatal Distress Scale. The Kruskal Wallis test and the Mann Whitney U test were used to compare characteristics. Bivariate correlation analysis was conducted to investigate the influencing factors of prenatal distress. *Results:* Prenatal distress levels of pregnant women were low (10.27 ± 5.02). Prenatal distress was affected at the level of statistical significance by employment status (Z = -1.976; p = 0.048), income status (X^2 = 6.568; p = 0.037), and history of stillbirth (Z = -2.398; p = 0.016). Nausea, vomiting, and insomnia during pregnancy were determined as significant variables that increase prenatal distress level. *Conclusion:* The results for this Turkish population were consistent with the previous literature on prenatal distress and influencing factors of pregnant women. Evaluation of prenatal distress level in pregnancy follow-up is necessary to prevent the development of mental illness. In this respect, it is suggested that pregnancy follow-up be carried out with a holistic approach.

Keywords: insomnia, nausea, prenatal distress, Turkish population, vomiting.

Introduction

During pregnancy, which is recognized as a time of various health challenges for both mother and baby, women experience, and try to adapt to, many physiological, psychological and social changes (Kuğu, Akyüz, 2001; Daş, 2016). However, navigating these changes can prove difficult for many women since besides the conscious motivators of the psychosocial adaptation process during pregnancy, there are also unconscious motivators. Unconscious motivators may sometimes lead to anxiety, conflicting emotions, and negative feelings in women (Kuğu, Akyüz, 2001). Therefore, to address the psychophysiological and psychosocial needs of pregnant women, prenatal distress and influencing factors should be defined. Prenatal distress is specific to pregnancy, as it encompasses the pregnancy-related worries and fears of the mother (Alderdice, Lynn, 2011; Alderdice, Lynn, Lobel, 2012). Prenatal distress can be identified by determining the concerns and anxieties of pregnant women, which are often caused by medical problems,physical symptoms, and worries about becoming a parent, interpersonal relationships, somatic changes, the birth process, and health of the baby (Yüksel, Akın, Durna, 2011; Alderdice, Lynn, Lobel, 2012; Alderdice et al., 2013). Furthermore, prenatal distress may be exacerbated by a woman's pregnancy-induced physical limitations, negative emotions associated with her general health status, and the support, or lack of support, that she receives from her spouse during pregnancy (Pop et al., 2011; Ertuğrul et al., 2015).

Huizink et al. (2004) emphasize that prenatal distress is closely related to the neuroendocrine changes that occur in pregnancy. In fact, various studies on prenatal distress have identified many factors which may create stress reactions in women during pregnancy. These include: high-risk pregnancy (Gümüşdaş, Ejder-Apay, Özorhan, 2014); a psychiatric disorder, or chronic illness, exposure to domestic violence (Woods et al., 2010; Razurel et al., 2017); low educational status, presence of family problems (Kang et al., 2016); a first pregnancy, problems in the work environment and with spouse, few sources of support after birth (Yüksel, Akın, Durna, 2014); young age during pregnancy, being unemployed, and experiencing an unplanned pregnancy (Çapık, Ejder-Apay, Sakar,

Corresponding author: Emel Bahadir Yilmaz, Department of Midwifery, Faculty of Health Sciences, Giresun University, Yeni Mahalle Fakülte Street and No: 4, Giresun, Turkey; e-mail: emel.bahadir.yilmaz@giresun.edu.tr

2015). Fetal health can be adversely affected by prenatal distress in pregnant women, resulting in physical and psychological problems.

Aim

This study aimed to determine socio-demographic and pregnancy-related characteristics associated with prenatal distress.

Methods

Design

Cross-sectional study.

Sample

In this study, the population of the study consisted of women attending the obstetrics and gynecology clinics of the Maternity and Children's Hospital, Giresun, Northern Turkey, from 1 May to 30 July 2016. The study included 230 subjects based on a power analysis with a medium effect size of 0.30 to achieve a power of 0.95 and $\alpha = 0.05$. Criteria for the inclusion of pregnant women were as follows: age 18 years or older, able to provide consent to participate in the research, and the ability to converse in Turkish.

Data collection

The data were collected by the researcher using the Demographic Information Form, Insomnia Severity Index, and Prenatal Distress Scale.

Demographic Information Form (DIF)

The DIF was prepared by the researcher in accordance with the related literature (Woods et al., 2010; Alderdice et al., 2013; Çapık, Ejder-Apay, Sakar, 2015; Ertuğrul et al., 2015; Kang et al., 2016; Razurel et al., 2017; Yüksel et al., 2014). The DIF included questions about demographic characteristics of the women, including: age, family structure, educational level, marital status, employment status, socioeconomic status, and pregnancy-related characteristics (i.e. obstetric history, health history, and the presence of chronic disease).

Insomnia Severity Index (ISI)

The ISI was developed by Bastien, Vallières, Morin (2001). The ISI is a seven-item self-report questionnaire assessing the nature, severity, and impact of insomnia on a five-point Likert scale (ranging from 0–4). Total scores range from 0 to 28 points. The total score is interpreted as follows: 0–7 = absence of insomnia; 8–14 = subthreshold insomnia; 15–21 = moderate insomnia; and 22–28 = severe insomnia. The validity and reliability of the Turkish version of the ISI were tested by Boysan et al. (2010).

Revised Prenatal Distress Questionnaire (NUPDQ)

The NUPDQ was created by Yali, Lobel (1999) and later modified by Lobel et al. (2008), and a 17-item version has been developed. A self-rating instrument, the NUPDQ consists of four subscales: Factor 1 – reflecting concerns about physical and social changes, giving birth, and the baby (items 1, 3, 4, 6, 7, 8, 10, 11, 12); Factor 2 – reflecting concerns about healthcare quality and health status (items 2, 9, 17); Factor 3 – reflecting concerns about infant care and postnatal life (items 13, 15, 16); and Factor 4 – reflecting economic concerns (items 5, 14). Items are evaluated according to a three-point Likert scale (ranging from 0–2). The questionnaire scores range from 0 to 34. Higher questionnaire scores indicate higher prenatal distress. The validity and reliability of the Turkish version of the NUPDQ were tested by Yüksel, Akın, Durna (2011). The Cronbach alpha for Factor 1, Factor 2, Factor 3, and Factor 4 were found to be 0.85, 0.46, 0.52 and 0.54, respectively. Cronbach's alpha for the NUPDQ as a whole was calculated to be 0.79.

Data were collected from women attending the obstetrics and gynecology clinics of the Maternity and Children's Hospital, Giresun, Northern Turkey, from 1 May to 30 July 2016. After ethical approval was obtained from the ethics committee of the hospital, the questionnaires were administered to participants by the researchers. Those who met the eligibility criteria were invited to participate. Pregnant women were briefly informed by the researchers about the purpose and methods of the study. Data were collected using the Demographic Information Form, Insomnia Severity Index, and Prenatal Distress Scale. Women completed the forms in approximately 15 to 20 minutes.

Data analysis

The Statistical Package for Social Sciences (SPSS, Chicago, IL) for Windows, version 21.0 was used for data entry and analysis. The Kolmogorov–Smirnov test for normality revealed the following statistics: 0.015 for total prenatal distress; 0.000 for Factor 1; 0.000 for Factor 2; 0.000 for Factor 3; and 0.000 for Factor 4 ($p < 0.05$). Since the data were not normally distributed, the Kruskal Wallis test and the Mann Whitney U test were used to compare characteristics. Bivariate correlation analysis was conducted to investigate the influencing factors of prenatal distress, using the Spearman correlation coefficient.

Results

Sociodemographic characteristics

The mean age of the women who participated in the research was 27.93 ± 5.89 years. Seventy-three

percent of participants were from a nuclear family structure, and 48% lived in towns. Only 38% of the participants reported that they had attained an education level of high school and above. Participants' employment rate was 23%, and 93% of spouses were employed. Ninety-three percent of the women felt they had socioeconomic security, and 64% defined their income status as "income is equal to outgoings" (Table 1).

Table 1 Sociodemographic characteristics of participants (n = 230)

Characteristics	n	%
Family structure		
nuclear	169	73
extended	60	26
fragmented	1	1
Place of residence		
village	34	15
town	111	48
country	85	37
Education		
illiterate	22	10
< high school	120	52
≥ high school	88	38
Employment status		
employed	54	23
unemployed	176	77
Employment status of spouse		
employed	215	93
unemployed	15	7
Socioeconomic security		
yes	211	92
no	19	8
Income status		
income = outgoings	148	64
income < outgoings	56	24
income > outgoings	26	12

Pregnancy-related characteristics

Of the women who participated in the study, 36% were in their second pregnancy, 20% had a history of stillbirth (baby dying in the womb), and 10% had a history of preterm birth. Eleven percent were in a high-risk pregnancy, and 28% stated that their pregnancy was unplanned. It was determined that 60% of the participants had experienced nausea, 53% had problems with vomiting, 13% had a chronic illness, 16% had health problems, and 12% used medication. It was also determined that half of the study participants suffered from insomnia (Table 2).

With a mean gestational week of 36.12 ± 5.44 weeks, study participants were asked to assess their nausea and vomiting severity on a scale from 1 to 10. Their nausea severity was calculated as 5.30 ± 2.69, and vomiting severity was calculated as 5.31 ± 2.79. Insomnia severity was determined as 7.94 ± 6.33, and the mean prenatal distress score was 10.27 ± 5.02.

Table 2 Pregnancy-related characteristics of participants (n = 230)

Characteristics	n	%
Number of pregnancy		
1	68	30
2	83	36
3	44	19
≥ 4	35	15
History of stillbirth		
yes	46	20
no	184	80
History of preterm birth		
yes	22	10
no	208	90
High-risk pregnancy		
yes	25	11
no	205	89
Planned pregnancy		
yes	165	72
no	65	28
Nausea problems		
yes	137	60
no	93	40
Vomiting problems		
yes	122	53
no	108	47
Chronic illness		
yes	29	13
no	201	87
Health problems		
yes	36	16
no	194	84
Medication		
yes	27	12
no	203	88
Insomnia severity		
absence of insomnia (0–7)	115	50
subthreshold insomnia (8–14)	74	32
moderate insomnia (15–21)	38	17
severe insomnia (22–28)	3	1

Characteristics associated with prenatal distress

As can be seen in Table 3, the prenatal distress levels of pregnant women were affected at the level of statistical significance by their employment status (Z_{MWU} = -1.976; p = 0.048), income status (X^2_{KWT} = 6.568; p = 0.037), and history of stillbirth (Z_{MWU} = -2.398; p = 0.016). However, a history of preterm birth, high-risk pregnancy, unplanned pregnancy, and severity of insomnia did not affect the levels of prenatal distress in pregnant women at a statistically significant level (p > 0.05).

Table 3 Characteristics associated with prenatal distress in pregnant women

Characteristics	n	mean ± SD	Statistical tests
Employment status			
employed	54	11.37 ± 5.15	Z_{MWU} = -1.976
unemployed	176	9.93 ± 4.95	p = 0.048*
Income status			
income = expenses	148	9.90 ± 5.08	X^2_{KWT} = 6.568
income < expenses	56	11.67 ± 4.88	p = 0.037*
income > expenses	26	9.34 ± 4.55	
History of stillbirth			
yes	46	8.71 ± 4.21	Z_{MWU} = -2.398
no	184	10.66 ± 5.14	p = 0.016*
History of preterm birth			
yes	22	10.59 ± 4.60	Z_{MWU} = -0.424
no	208	10.24 ± 5.08	p = 0.672
High-risk pregnancy			
yes	25	11.48 ± 3.93	Z_{MWU} = -1.400
no	205	10.12 ± 5.13	p = 0.161
Planned pregnancy			
yes	165	10.23 ± 5.09	Z_{MWU} = -0.424
no	65	10.38 ± 4.90	p = 0.672
Insomnia severity			
absence of insomnia (0–7)	115	9.44 ± 4.72	X^2_{KWT} = 7.670
subthreshold insomnia (8–14)	74	10.91 ± 5.13	p = 0.053
moderate insomnia (15–21)	38	11.71 ± 5.48	
severe insomnia (22–28)	3	8.0 ± 1.0	

**p < 0.05; SD – standard deviation; Z_{MWU} – Mann Whitney U test; X^2_{KWT} – Kruskal Wallis test*

Results of correlation analysis

Table 4 shows the results of correlation analysis, which reveal a positive weak correlation between total prenatal distress levels and insomnia severity in pregnant women (r = 0.225; p = 0.001). Table 4 also shows a positive weak correlation between insomnia severity and Factor 1, Factor 2, and Factor 3 (r = 0.142, p = 0.031; r = 0.225, p = 0.001; r = 0.261, p = 0.000; respectively). Furthermore, a negative weak correlation was determined between Factor 1 and age (r = -0.163; p = 0.013) and nausea severity (r = -0.196; p = 0.022), and vomiting severity (r = -0.199; p = 0.028). No statistically significant correlation was determined between total prenatal distress level and age, and between nausea severity and vomiting severity (p > 0.05).

Table 4 Bivariate correlation between age, nausea, vomiting, insomnia severity, and prenatal distress among pregnant women

	1	2	3	4	5	6	7	8	9
1. Total prenatal distress	1								
2. Factor 1	0.808*	1							
3. Factor 2	0.606*	0.204*	1						
4. Factor 3	0.630*	0.213*	0.514*	1					
5. Factor 4	0.541*	0.124	0.451*	0.552*	1				
6. Age	-0.114	-0.128	-0.007	-0.013	0.011	1			
7. Nausea severity	-0.119	-0.183**	0.071	0.024	0.040	-0.066	1		
8. Vomiting severity	-0.096	-0.205**	0.145	0.090	-0.005	-0.092	0.890*	1	
9. Insomnia severity	0.231*	0.126	0.152**	0.244*	0.248*	0.017	0.233*	0.235*	1

**p < 0.01; **p < 0.05; factor 1 – concerns about physical and social changes, and giving birth and the baby; factor 2 – concerns about healthcare quality and health status; factor 3 – concerns about infant care and postnatal life; factor 4 – economic concerns*

Discussion

The first finding of our study was that the prenatal distress levels of pregnant women were low (10.27 ± 5.02). Prenatal distress levels of pregnant women in Turkey were determined as 9.86 ± 5.02 in the studies by Yuksel et al. (2011); as 9.88 ± 4.79 in the study by Altıncelep (2011); and as 9.89 ± 4.80 in the studies by Yüksel, Akın, Durna (2014). Results of prenatal distress levels in our study and the aforementioned studies were very similar, and were also found to be low in a study by Çapık, Ejder-Apay, Sakar (2015), which was conducted using a different distress scale. In a study conducted in the United States, 78% of pregnant women had low-to-moderate psychological stress, while the distress levels of pregnant women were found to be low in a study conducted with healthy pregnant women in the Netherlands (Woods et al., 2010; Fontein-Kuipers et al., 2015). A study conducted in the United Kingdom determined that the level of stress associated with pregnancy was low (Lynn et al., 2011). Another study carried out in South Africa found that 26.5% of pregnant women experienced severe psychological stress (Peltzer, Shikwane, Matseke, 2011). These results reveal a low level of prenatal distress in pregnancy. This may be attributed to women's easy access to health services. In this respect, defining the factors that increase the level of prenatal distress may be a sounder approach.

Another finding of our study was that the prenatal distress levels of employed women were higher than those of unemployed women ($p < 0.05$). These results could be related to the type and demands of their employment. Indeed, a study by Sanguanklin et al. (2014) revealed that workload was an important factor causing psychological distress in women who continued with employment during pregnancy. However, contrary to this study, other research has shown that women who continued to work during their pregnancies had lower levels of psychological distress, and fewer symptoms of major depression (Fall, Goulet, Vézina, 2013; Awopetu et al., 2016). A study by Dağlar, Nur (2014) found that the depression and anxiety levels of unemployed pregnant women were higher than those of women who were employed. These results indicate the need for more detailed and comprehensive studies to determine how employment status affects women's experience of prenatal distress during pregnancy.

Our study also indicated that pregnant women with income lower than their outgoings experienced higher levels of prenatal distress ($p < 0.05$). Similarly, the study by Çapik, Ejder-Apay, Sakar (2015) found that prenatal distress levels increased as level of income decreased. The same study also determined that prenatal distress levels of pregnant women whose spouses were unemployed were higher than those of women whose spouses were employed. Another study evaluated the factors which affect the depression and anxiety levels of pregnant women; when their economic status perceptions were assessed, the depression and anxiety levels were higher for women who stated that "my income is less than my outgoings" (Dağlar, Nur, 2014). Another study on this issue reported that a low income level increased the psychological distress levels of pregnant women (Awopetu et al., 2016). Mothers with low incomes may not have easy access to healthcare services, and may worry about the care and future of their babies. In this respect, various study results indicate that level of income is an important factor in predicting the level of prenatal distress in pregnancy.

In addition, our study found that the prenatal distress levels of women with a history of stillbirth were statistically significantly lower than those of women who had not experienced stillbirth ($p < 0.05$). One study determined that post-traumatic stress disorder symptoms were commonly observed in women with a history of stillbirth; however, the symptoms generally resolved by one year postpartum after the birth of a healthy baby (Turton et al., 2001). The study by Surkan et al. (2008) determined that mothers who had experienced stillbirth were at least seven times more at risk of depressive symptoms than those who had not had this experience. However, the same study also found that those who were pregnant again within six months of a stillbirth had a lower risk of depressive symptoms than those who did not become pregnant again. These results suggest that the low prenatal distress levels of our study participants who had experienced stillbirth may be attributed to their having become pregnant again.

Following bivariate correlation analysis, a positive weak correlation was determined between total prenatal distress levels and insomnia severity in the pregnant women. In other words, as the severity of insomnia increased during pregnancy, the prenatal distress level increased as well. One study found a correlation between the severity of insomnia in the perinatal period and depression and anxiety symptoms in women (Swanson et al., 2011). Another study found that depression and anxiety symptoms caused sleep problems throughout pregnancy (Volkovich, Tikotzky, Manber, 2016). In yet another study, results showed that pregnant women with depression had difficulty in initiating and maintaining sleep (Ruiz-Robledillo et al., 2015). This suggests a possible correlation between the sleep problems of pregnancy and the level of a woman's mental distress. Since the

women in our study showed low levels of prenatal distress, this may account for the fact that they did not experience severe sleep problems.

Finally, a negative weak correlation was determined between Factor 1 and age, nausea severity, and vomiting severity ($p < 0.05$). In other words, as both the age of pregnant women and the severity of nausea and vomiting increased, together with physical and social changes, concerns about birth and baby also increased. The mean score for women between the ages of 18–24 years was 7.30 ± 3.92, while it was 5.61 ± 2.73 for those between the ages of 35–44 years. One study determined that anxiety symptoms decreased as the age of pregnancy increased (Köken et al., 2008). Another study reported a relationship between age and coping behavior, which suggests that the level of prenatal distress increases when pregnancy-related changes cannot be coped with effectively (Yali, Lobel, 1999). Older women with similar experiences seemed more able to prepare for anticipated changes. At the same time, nausea and vomiting exert negative effects on the physical and social functionality of women in the first trimester of pregnancy. These symptoms also negatively affect women's psychological state (Smith et al., 2000; Lacasse et al., 2008). In addition, some physical symptoms related to pregnancy proved to be important predictors of depression (Yanıkkerem et al., 2013). Nausea and vomiting in pregnancy are important factors that contribute to high prenatal distress levels.

Conclusion

In conclusion, this study found demographic factors (employment and income status), and physical factors (nausea, vomiting, and insomnia) that increase prenatal distress levels. Optimal maternal and fetal health are dependent upon regular physical checkups and mental health assessments of pregnant women, by which health professionals can identify the physical changes affecting each woman's mental state. Regular evaluation of women's prenatal distress levels in pregnancy is necessary to prevent the development of mental illness. This could be accomplished by using a holistic approach in order to evaluate the relationship between the mental, emotional, social, and spiritual conditions of pregnant women and how these influence maternal and infant health. One advantage to this approach is holistic medicine's focus on education and the responsibility of the mother to strive for balance and well-being. In this way, by closely working together, the prevention of prenatal distress during pregnancy can be more closely monitored by health professionals and mothers-to-be, and the goal of remaining healthy throughout pregnancy can be achieved.

Ethical aspects and conflict of interest

The study was approved by the ethics committee of the hospital in which the study was carried out (date: 11 December 2015 and number: 5711-8545), and conducted according to the ethics guidelines set out in the Declaration of Helsinki. Verbal consent was obtained from the pregnant women participating in the research. All participants were informed of the purpose and design of the study and were guaranteed anonymity and confidentiality. Participation in the study was voluntary. The authors declare no conflict of interest.

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