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Influencing Factors of Anxiety Symptoms in the Late Pregnant Women: A Prospective Study

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Abstract

Background: Many factors affect the anxiety of late pregnant women. Serious anxiety may cause many health problems not only during this pregnancy/delivery but also in her life long period and also their offspring. The purpose of this study was to determine the factors associated with these anxieties.

Method: Study populations were late pregnant women (>28 weeks) in Chongqing, China. The symptoms of prenatal anxiety and its influencing factors were determined.

Result: Univariate analysis showed that the followings significantly affected women's anxiety: number of previous pregnancies/deliveries, health education during school period, pressure of pregnancy, family care degree, delivery mode of surrounding parturients, and social supports. Logistic regression analysis showed that the followings significantly affected women's anxiety: the delivery mode of surrounding parturient, family care, and pressure of pregnancy.

Conclusion: We identified several factors associated with pregnant women's anxieties. These data will be of use in health policy making in this area.

Keywords: China; Pregnant women; Late pregnancy; Anxiety symptoms; Influencing factors

Introduction

After pregnancy, with the changes of roles and physiological hormones, women's psychology will change a lot. According to the existing relevant research, more than 10% of pregnant women have anxiety symptoms [1], and the prevalence of anxiety symptoms in Chinese women is 16.02% [2]. The existing research on anxiety symptoms of pregnant women is far less than depression symptoms. However, diagnosis of anxiety in pregnant women can be a challenging problem, especially among clinical lecturers [3]. Excessive anxiety will also bring serious consequences, causing psychological and physical discomfort, such as headache, difficulty in sitting and sleeping, etc. In addition, anxiety symptoms can have adverse effects on pregnant women and fetuses, including adverse pregnancy symptoms, obstetric complications and adverse pregnancy outcomes [4]. The effects of anxiety during pregnancy on their offspring are not only during pregnancy, this effect is likely to continue, including neonatal period, infant period, childhood, adolescence, etc. Hasanjanzadeh P, et al. pointed out in a study of pregnant women's psychology and pregnancy outcome that anxiety can affect the important physical indicators of newborn, such as birth weight, height and head circumference [5]; Petzoldt J, et al's study found that crying of infants has a significant relationship with anxiety of pregnant women before delivery [6]; anxiety is an important predictor of children's fracture, bad social mood and behavior [7,8]; anxiety of pregnant women can also lead to poor psychological status of adolescents [9]. In this study, healthy women who have no history of cesarean section (women who can give birth normally) in Chongqing city of China were investigated. The factors influencing women's anxiety in late pregnancy (>28 weeks) were explored from individual, family and social dimensions. To formulate targeted interventions for pregnant women's individual, family and society, also to further improve the mental health level of pregnant women, and to ensure the health of future generations to provide scientific basis.

Methods

Research design

According to the economic situation of each district and county in Chongqing, from northeast to southwest, we selected women in the late pregnancy (>28 weeks) from Yunyang, Dianjiang, Yubei and Jiangjin by stratified sampling. All subjects had no history of cesarean section and signed informed consent. The data of the study comes from the project of National Natural Science Foundation of China

"Study on the Public Propagation Model for Generative Mechanism and Regularity of Cesarean Birth Behavior" (Project No: 71573027). The study investigated the predictors of anxiety in late pregnant women from three aspects: individual, family and society.

Variable description

The Hamilton Anxiety Scale (HAMA) was used to measure the anxiety of pregnant women. Hamilton anxiety scale includes 14 items, which can better reflect the anxiety severity of patients, and it is one of the most widely used scales to evaluate anxiety status in clinical practice. The Hamilton Anxiety Scale was compiled by Hamilton in 1959 [10], According to the suggestions of Zuoji Z etc. in the related research, the anxiety level can be divided into three categories: no anxiety (<7), possible anxiety (7-14) and certain anxiety (≥ 14) [11].

Personal factors

It mainly comes from three aspects: demographic characteristics, pregnancy and childbirth history, and personal behavior. Demographic characteristics include age, nationality, place of residence, education level, occupation, income, BMI and insurance status; The history of pregnancy and childbirth includes pregnancy times (ever), delivery times (ever), number of spontaneous abortion and number of induced abortion; Personal behavior includes six variables: Exercise during pregnancy, number of pregnancies health education received from pregnant women's schools, delivery willingness, delivery knowledge ,independence, pressure of pregnancy. Independence used the 16 Personality Factor Questionnaire (16PF) developed by Cattell RB, et al. and the results was divided into three groups (≤ 7, 8-17 and ≥ 18) according to the related research [11,12]. The pressure of pregnancy was measured with the pregnancy pressure scale [13] compiled by Chen CH, et al and referred to the segmentation method given by Yingli P, et al. It was classified as no pressure (0), mild pressure (0.01-1), moderate pressure and above (>1) [14].

Family factors

The main investigated variables are the advice of delivery from husband, parents and parents in law and the family care degree. The Family APGAR index (APGAR) compiled by Smilkstein was used to measure the family care degree [15], and the results were divided into low score (0-3), medium score (4-6) and high score (7-10) according to the description and application in relevant research [11].

Social factors

Social factors mainly include the care of doctors (nurses), the delivery mode of surrounding parturient, friends' advice of delivery and social support. Social support uses the social support measurement table compiled by Xiao SY, et al. in 1994 [16].

Statistical methods

In this study, SAS 9.4 software was used for statistical analysis. First, the relationship between dependent variables and independent variables was explored by single factor analysis. Then, the variables in single factor analysis (P<0.05) were in stepwise logistic regression with the inclusion criteria of 0.05 and the exclusion criteria of 0.10 to screen out the factors related to the anxiety of women in late pregnancy.

Results

As of July 2019, 1094 women in the late pregnancy were surveyed. Among them, 13.16% were identified as having anxiety symptoms and 22.85% may have anxiety symptoms.

Single factor analysis

Personal factors: The study of pregnant women's personal factors showed that (Table 1), Pregnancy times (ever) in pregnancy and childbirth history, number of pregnancies health education received from schools and pressure of pregnancy were significantly related to the anxiety of late pregnancy women (P<0.05). Compared with women who had been pregnant 0 times and 2-3 times, the women had been pregnant 1 time had higher proportion of anxiety symptoms (P<0.0001). The rate of women who had not received pregnant women's school education was higher than women who had received in "Possible anxiety" (P=0.0161). With the pressure of pregnancy increases, the number of women with "Possible anxiety" and "Certain anxiety" is also increasing (P<0.0001). Demographic characteristics and other variables had no statistical significance on the anxiety status.

Family factors: Family factors showed that (Table 2), the higher the family care degree, the higher the proportion of "no anxiety" and the lower the proportion of "certain anxiety" (P<0.0001). And there was no significant correlation between anxiety and the advice of delivery from husband, parents and parents in law (P>0.05).

Social factors: According to the study of social factors (Table 3), the delivery mode of surrounding parturient and social support were significant factors affecting women's anxiety (P<0.0001). Compared with "Cesarean section mainly" and "The two delivery methods are equal", the women whose delivery mode of the surrounding parturient is "Vaginal delivery mainly" had less proportion in "Possible anxiety" and "Certain anxiety" (P<0.0001). With the decrease of social support, the proportion of "Possible anxiety" and "Certain anxiety" increased (P<0.0001). There was no significant relationship between anxiety and the care of doctors (nurses), friends' advice of delivery (P>0.05).

Multivariate logistic regression analysis

Test of Parallel lines: The variables with statistical significance (P<0.05) in univariate analysis, including the number of pregnancies, the number of pregnancies received health education from pregnant women's schools, the way of delivery of surrounding pregnant women, family care, social support and pregnancy pressure, were included in the orderly logistic regression model. The results of parallel line test (Table 4) showed that the steps of stepwise regression met the parallel line hypothesis (P>0.05).

Multivariate analysis results: The orderly logistic regression analysis showed that (Table 5), the delivery mode of surrounding parturient, family care and pressure of pregnancy were related to the anxiety of the late pregnancy women. Women who had a "vaginal delivery similar to a cesarean section" were more likely to report anxiety than those who had "Vaginal delivery mainly" (P=0.0035, OR=1.526, 95% CI: 1.149-2.026); the higher the score of family care, the lower the possibility of suffering from anxiety symptoms (P<0.0001, OR=0.382, 95% CI: 0.303-0.482); and the higher the pressure of pregnancy, the greater the possibility of anxiety (P<0.001, OR=8.143, 95% CI: 5.796-11.439).

Discussion

A total of 1094 women were investigated in this study. 144 women were identified as having anxiety symptoms, accounting for 13.16%, and 250 women suspected of anxiety, accounting for 22.85%. Goodman JH, et al. Through a systematic review, we have studied the prevalence of generalized anxiety among pregnant women in the world up to October 2013 [1]; Zhang SB obtained the prevalence of anxiety of 16.02% in China by using the data from the Centers for

Table 1: The relationship between personal factors and women's anxiety in late pregnancy.

Characteristics	Anxiety			
	No	Possible	Certain	P[a]
Age				0.736
<35	673(64.10)	239(22.76)	138(13.14)	
≥ 35	27(61.36)	11(25.00)	6(13.64)	
Nationality				0.5011
Han nationality	681(63.82)	245(22.96)	141(13.21)	
Minority nationality	19(70.37)	5(18.52)	3(11.11)	
Place of Residence				0.8471
Urban	438(63.57)	163(23.66)	88(12.77)	
Rural	262(64.69)	87(21.48)	56(13.83)	
Educational level				0.8795
Junior high school	209(64.91)	66(20.50)	47(14.60)	
High school	207(64.49)	76(23.68)	38(11.84)	
Bachelor degree or above	284(62.97)	108(23.95)	59(13.08)	
Occupation				0.4951
Staff of institutions	134(66.67)	44(21.89)	23(11.44)	
Enterprise staff	117(62.90)	46(24.73)	23(12.37)	
Self-employed	70(70.00)	16(16.00)	14(14.00)	
Farmers/housewives/unemployed/unemployed	379(62.44)	144(23.72)	84(13.83)	
Monthly income per capita (RMB)				0.4672
≤ 3000	179(67.55)	50(18.87)	36(13.58)	
3001-5000	279(62.00)	106(23.56)	65(14.44)	
5001-10000	193(62.87)	78(25.41)	36(11.73)	
>10000	49(68.06)	16(22.22)	7(9.72)	
BMI				0.4484
<18.5	110(60.77)	42(23.20)	29(16.02)	
18.5-25	534(65.04)	182(22.17)	105(12.79)	
≥ 25	56(60.87)	26(28.26)	10(10.87)	
Payment method of medical expenses				0.7303
At own expense	264(61.83)	105(24.59)	58(13.58)	
Basic medical insurance for urban employees (including maternity insurance)	203(64.44)	73(23.17)	39(12.38)	
New rural cooperative medical system (including civil affairs assistance)	184(66.19)	58(20.86)	36(12.95)	
Other insurance	49(66.22)	14(18.92)	11(14.86)	
Pregnancy times(ever)				<.0001
0	217(72.09)	49(16.28)	35(11.63)	
1	98(49.49)	62(31.31)	38(19.19)	
≥ 2	385(64.71)	139(23.36)	71(11.93)	
Delivery times(ever)				0.1286
0	460(62.76)	166(22.65)	107(14.60)	
≥ 1	240(66.48)	84(23.27)	37(10.25)	
Number of spontaneous abortion				0.531
0	645(63.80)	230(22.75)	136(13.45)	

≥ 1	55(66.27)	20(24.10)	8(9.64)	
Number of induced abortion				0.7248
0	467(64.33)	165(22.73)	94(12.95)	
≥ 1	233(63.32)	85(23.10)	50(13.59)	
Exercise during pregnancy				0.0603
Yes	494(65.78)	165(21.97)	92(12.25)	
No	206(60.06)	85(24.78)	52(15.16)	
Number of pregnancies health education received from schools				0.0161
0	390(60.56)	169(26.24)	85(13.20)	
≥ 1	310(68.89)	81(18.00)	59(13.11)	
Delivery willingness				0.1116
Unsure	279(62.42)	109(24.38)	59(13.20)	
Vaginal delivery	394(66.11)	127(21.31)	75(12.58)	
Cesarean section	27(52.94)	14(27.45)	10(19.61)	
Delivery knowledge				0.7874
≤ 23(Median)	382(64.64)	128(21.66)	81(13.71)	
>23	318(63.22)	122(24.25)	63(12.52)	
Independence				0.8702
≤ 7	31(60.78)	14(27.45)	6(11.76)	
8-17	662(64.09)	234(22.65)	137(13.26)	
≥ 18	7(70.00)	2(20.00)	1(10.00)	
Pressure of pregnancy				<.0001
No pressure (0)	106(93.81)	4(3.54)	3(2.65)	
Mild pressure (0.01-1)	571(66.86)	205(24.00)	78(9.13)	
Moderate pressure and above (>1)	23(18.11)	41(32.28)	63(49.61)	

Note: [a] indicates that the Kruskal Wallis test is used here because anxiety is an ordered three category variable.

Table 2: The relationship between family factors and women's anxiety in late pregnancy.

Characteristics	Anxiety			
	No	Possible	Certain	P[a]
Husband's advice of delivery				0.2836
None	355(61.21)	156(26.90)	69(11.90)	
Vaginal delivery	316(67.81)	81(17.38)	69(14.81)	
Cesarean section	29(60.42)	13(27.08)	6(12.50)	
Parents' advice of delivery				0.2740
None	308(65.67)	104(22.17)	57(12.15)	
Vaginal delivery	377(63.26)	137(22.99)	82(13.76)	
Cesarean section	15(51.72)	9(31.03)	5(17.24)	
Advice from parents in law				0.3336
None	367(64.73)	139(24.51)	61(10.76)	
Vaginal delivery	317(62.77)	107(21.19)	81(16.04)	
Cesarean section	16(72.73)	4(18.18)	2(9.09)	
Family care degree				<.0001
Lowscore (0-3)	16(42.11)	10(26.32)	12(31.58)	
Mediumscore (4-6)	103(40.71)	82(32.41)	68(26.88)	
Highscore (7-10)	581(72.35)	158(19.68)	64(7.97)	

Note: [a] indicates that the Kruskal Wallis test is used here because anxiety is an ordered three category variable.

Table 3: The relationship between social factors and women's anxiety in late pregnancy.

Characteristics	Anxiety			
	No	Possible	Certain	P[a]
The care of doctors (nurses)				0.7005
Great	495(63.06)	191(24.33)	99(12.61)	
Good	163(66.80)	48(19.67)	33(13.52)	
General and Below	42(64.62)	11(16.92)	12(18.46)	
Delivery mode of surrounding parturient				<.0001
Vaginal delivery mainly	353(71.75)	94(19.11)	45(9.15)	
Cesarean section mainly	85(61.15)	31(22.30)	23(16.55)	
The two delivery methods are equal	262(56.92)	125(27.00)	76(16.41)	
Friends' advice of delivery				0.8483
None	361(63.89)	137(24.25)	67(11.86)	
Vaginal delivery	314(63.95)	103(20.98)	74(15.07)	
Cesarean section	25(65.79)	10(26.32)	3(7.89)	
Social support				<.0001
Low	265(56.38)	116(24.68)	89(18.94)	
Moderate	395(69.06)	125(21.85)	52(9.09)	
High	40(76.92)	9(17.31)	3(5.77)	

Note: [a] indicates that the Kruskal Wallis test is used here because anxiety is an ordered three category variable.

Table 4: Test of Parallel lines.

Have been		Test of Parallel lines		
Included	**Deleted**	**χ^2**	**df**	**P-value**
Pressure of pregnancy	-	0.0038	1	0.9511
Family care	-	0.3437	2	0.8421
Delivery mode of surrounding parturient	-	1.9281	4	0.7490

Table 5: Multifactor analysis.

Variables	Estimate	SE	Wald χ^2	P-value	OR (95%CI)
Delivery mode of surrounding parturient					
Vaginal delivery mainly	Ref.				
Cesarean section mainly	0.2863	0.2076	1.9009	0.1680	1.331(0.886-2.000)
The two delivery methods are equal	0.4224	0.1447	8.5175	0.0035	1.526(1.149-2.026)
Family care degree	-0.9617	0.1186	65.8035	<0001	0.382(0.303-0.482)
Pressure of pregnancy	2.0971	0.1734	146.2384	<0001	8.143(5.796-11.439)

Disease Control and prevention [2]; Atif N, et al. investigated the anxiety of pregnant women in low-income areas, and found that about 20% of them were women Sexual anxiety [17]. Our study is basically consistent with the above study, but there are certain differences, which may be related to different investigation background. In our study, 22.85% of women suspected to have anxiety symptoms, which is not included in the anxiety prevalence rate, which may also be the reason why we have slightly lower anxiety in our study.

This study shows that if a pregnant woman's delivery mode of surrounding parturient is "Vaginal delivery mainly" it will be beneficial to relieve her anxiety symptoms. This shows that external environment can affect women's psychological state. If women around them give birth by themselves, pregnant women will increase their confidence in childbirth and reduce their fear of childbirth, so there will be less anxiety. Although the multivariate analysis showed no difference between women with "Cesarean section mainly" and women with "Vaginal delivery mainly", in the univariate analysis, the prevalence of anxiety was significantly higher in the "Cesarean section mainly" group than in the vaginal delivery group.

The higher the family care score, the less likely it is to have anxiety symptoms. In real life, family care often reflects the relationship between family and pregnant women, including the relationship with parents, husband, etc. Zhou X, et al. Through random selection of hospital patients, retrospective study and questionnaire survey, we found that the relationship between pregnant women and their families is an important factor affecting women's anxiety [18]. Xianfen L, et al. Conducted a psychological study on pregnant women by using the women who came to the hospital for antenatal care as the subjects. The

study shows that the relationship between husband and wife and the relationship between mother and daughter-in-law have a significant impact on women's psychology, especially on women's anxiety [19]. Therefore, it is very important for women's mental health in the third trimester to focus on shaping harmonious family relationship and improving family care.

The pressure of childbirth of perinatal women directly reflects and measures women's cognition, confidence and psychological preparation for the coming childbirth. The study shows that prenatal stress is an important predictor of women's psychological anxiety. Goyal S, et al. found in the study that social and psychological stress, including work stress, is an important influencing factor of perinatal women's anxiety [20]. Li Y, et al. verified that stress is an important predictor of anxiety through path analysis model [21]. A 2011 study by Zhou X, et al. also found that pregnancy stress is an important source of prenatal anxiety in women [18]. Therefore, we should give more help to women in the third trimester in terms of educational cognition and childbirth confidence. To relieve women's pressure on pregnancy is an important measure to improve women's mental health and reduce the incidence of anxiety.

Conclusion

The results of this survey show that delivery mode of surrounding parturient, family care degree and pressure of pregnancy are the important factors affecting the anxiety of women in late pregnancy. This suggests that we should pay enough attention to the prenatal mental health of pregnant women, and help them to learn more about childbirth knowledge, so as to improve their confidence in safe childbirth and reduce their pressure; In addition, the family and society should give pregnant women full care, from multiple perspectives to prevent the possible adverse psychological status of pregnant women, achieve early screening, early intervention, and improve the psychological health level of pregnant women.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

This study was approved by the Ethics Committee of Chongqing Medical University in 2015.

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