A Structural Equation Model of Social Support, Stress and Depression in Pregnant Women During Epidemic Period

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Abstract

Objective: To investigate the connections among social support, stress, and depression. Design: Cross-sectional study. Setting: Guizhou Province in China. Population or Sample: An aggregate of 1,056 expectant ladies, had finished our questionnaire during pregnancy from March to April in 2020. Methods: The Edinburgh prenatal sadness scale, an independent pressure scale, and social support scale evaluated the downturn, stress, and social support of pregnant people during the pestilence. An auxiliary condition model was utilized to examine the immediate and aberrant connection between social support and prenatal misery. Main Outcome Measures: Incidence of depression. Results: During the pandemic time, 73.01% of pregnant ladies experienced prenatal misery. The model is suitable (chi-square = 11.96, CFI = 0.97, RMSEA = 0.07, RMR = 0.03). The auxiliary condition model indicated that the immediate pathway of social support to depression was critical (normalized pathway coefficient = -0.34), and the aberrant pathway of stress to depression via social support was additionally huge (normalized pathway coefficient = 0.50). Stress partially intercedes the connection between social support and depression. Conclusion: Our discoveries posit that social support is related to an expanded danger of depression. Stress is decidedly corresponding to depression and assumes an interceding position between social support and stress. Thusly, directed mediation ought to be completed to lessen the depression of pregnant ladies and improve their psychological wellness status. Keywords: stress, depression, social support, structural equation model

A structural equation model of social support, stress and depression in pregnant women during epidemic period: a cross-sectional study

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Running head: social support, stresss and depression

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Results : During the pandemic time, 73.01% of pregnant ladies experienced prenatal misery. The model is suitable (chi-square = 11.96, CFI = 0.97, RMSEA = 0.07, RMR = 0.03). The auxiliary condition model indicated that the immediate pathway of social support to depression was critical (normalized pathway coefficient = - 0.34), and the aberrant pathway of stress to depression via social support was additionally huge (normalized pathway coefficient = 0.50). Stress partially intercedes the connection between social support and depression. **Conclusion** : Our discoveries posit that social support is related to an expanded danger of depression. Stress is decidedly corresponding to depression and assumes an interceding position between social support and stress. Thusly, directed mediation ought to be completed to lessen the depression of pregnant ladies and improve their psychological wellness status.

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INTRODUCTION

Coronavirus disease 2019 (COVID-19), birthed by the 2019 unusual Covid, is an exceptionally infectious illness. It has now become an overall pandemic[1]. WHO has proclaimed the current pandemic a worldwide general wellbeing crisis. Internationally, starting on 26 October 2020, there have been 42,966,344 affirmed instances of COVID-19, including 1,152,604 demises, conveyed to WHO. Because of the incredible endeavors of the World Health Organization and worldwide scourge anticipation, the infection has been successfully controlled in certain nations, yet the global circumstance is yet not confident. Simultaneously, numerous other wellbeing challenges remain, including the mental pressure, mental weight, social support, and several difficulties caused the epidemic[2, 3]

Depression is a typical difficulty of pregnancy, and its indications range from mellow despondency to extreme depression, which is regularly joined by dread, nervousness, a sleeping disorder, and impassion or antagonism towards the spouse and additionally newborn[4]. For moms, depression during pregnancy is not just connected with postnatal complications[5-7]; it is additionally identified with a higher danger of gestational diabetes mellitus (GDM), hypertension, and preeclampsia[8-11]. The transient impacts of a mother's downturn on

the infant are more serious dangers of untimely birth, low birth weight, and development impediment. Enthusiastic and social issues are a portion of the drawn-out negative results for offspring of discouraged mothers[12], similar to cognitive development impairment[13, 14], attention deficit disorder[15],[16]. Based on the huge impacts of prenatal depression on the medium and long term wellbeing of both mother and child, it is critical to distinguish adjustable danger elements that add to prenatal depression circumvention in the Chinese populace.

Exploration reveals that the pestilence circumstance of COVID-19 can influence the emotional well-being of the populace. 58% of the overall populace feels that COVID-19 has a moderate and serious mental effect (16.5%, moderate and extreme discouragement; 28.8%, moderate and extreme tension; 8.1%, moderate and extreme pressure level)[17]. This extra mental weight may irritate the enduring of pregnant ladies, particularly the individuals who need emotionally supportive networks, because powerful social emotionally supportive networks may ease these issues[18].

Investigations have demonstrated that prenatal depression in expectant women is firmly identified with pressure and social support[19-21], however,a couple of investigations focus on the mediating impact of pressure between social support and sorrow. Simultaneously, concerning the worldwide pandemic, the mental state of expectant ladies has changed definitely. There is no investigation on the connection between prenatal sorrow, stress, and social support with regards to the pandemic. In this examination, we utilized a survey star to gather the gauge information of expectant ladies during the pandemic time frame to investigate the connection between ladies' prenatal gloom, stress, and social support, to give a more focus on mental mediation and an arrangement of social support for pregnant ladies later on.

MATERIAL AND METHODS

Study sample

Study site

The subjects were expectant ladies enrolled in Guizhou Province from March to April 2020. Utilizing a cross-sectional examination by stratified sampling strategy, Guizhou Province was partitioned into 7 strata as indicated by Guiyang, Qiannan Prefecture, Anshun, Zunyi, Bijie, Tongren, and Liupanshui. Two public medical clinics were randomly chosen inside each metropolitan zone, while 2-3 public medical clinics were arbitrarily chosen inside each countryside zone.

Participants and sampling

Incorporation models for the examination were expectant ladies with clinical cards, prenatal registration arrangements, and who ready to partake in the investigation. The expectant ladies who declined to finish the surveys because of mental, actual ailment, or different reasons (for example neglecting to have sufficient opportunity) were expunged.

An aggregate of 1,056 expectant ladies, having set up a clinical card for a prenatal registration during pregnancy from March to April in 2020 in Guizhou Province, China, was selected for the examination.

Questionnaire

The educated assessors and nearby network medical attendants requested each qualified pregnant lady to fill in a self-regulated survey to gather segment attributes, pregnancy data (last menstrualcycle, pregnancy recurrence, the record of antagonistic pregnancy, pregnancy difficulties, etc.), and information disposition/conduct poll for COVID-19. A few members, likewise, finished the depression/perceived pressure surveys during the pandemic of COVID-19, which were set up on an online stage using www.wjx.cn in mainland China, and members were approached to finish polls through the Internet. The ethics council of the Affiliated Hospital of Guizhou Medical University endorsed this examination. All the strategies utilized in this examination were led as per applicable rules and guidelines.

Instruments

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Edinburgh Prenatal Depression Scale (EPDS)

The Edinburgh Prenatal Depression Scale was utilized to assess depression during pregnancy. The device has been broadly utilized in 35 nations and has been approved in China. There are ten items in the Edinburgh Prenatal Depression Scale. The score scope of each piece is 0-3, yet various scores of individual items convey various implications. The all out score range is 0-30. EPDS is a self-rating scale, which takes around 5 minutes to finish. The basic estimation of the Chinese form of Edinburgh Prenatal Depression Scale utilized in this investigation is 9.5, that is, the point at which the EPDS score comes to above 9.5, it shows depression during pregnancy.

Perceived Stress Scale (PSS)

PSS was utilized to become more acquainted with the member's emotions and contemplations inside the one-month timeframe. The scale incorporates 14 items, each of which was evaluated by varying frequencies, specifically: never, periodically, at times, frequently, and consistently. Scores shift as per different frequencies. The absolute scores of all things were used to survey stress level.

Multidimensional Scale of Perceived Social Support (MSPSS)

MSPSS was designed to evaluate the level of emotional observed social support from family, companions, and other significant connections. The scale, with an aggregate of 12 things, includes three sub-scales, to be specific family support, companion backing, and fundamental relationship support. Various degrees of understanding and difference were set in the scale, to be totally disagree, strongly disagree, partially disagree, uncertain, partially agree, strongly agree, and totally agree, every one of which was allotted to various scores.

Data analysis

Concluded information was gathered and transferred from the online stage referenced previously. With data imported and checked for culmination, SAS9.3 was used for datacalculation, and Amos 22.0 was utilized to construct the organizational condition model. Descriptive statistics were accounted for on socio-segment qualities, social support, depression, and feeling of anxiety. Mean±standard deviation (SD) was utilized to portray regularlyappropriated constant factors, median (interquartile range, IQR) for skewed-circulated consistent factors, and frequencies (percentage) for sectionalized factors. In this investigation, social support, stress, and depression scores were unceasing factors, that did not adjust to an ordinary circulation, hence, Spearman correlation examination was utilized to test the connection.

This examination constructed a structural equation model of social support, stress, and depression and tried the intervening part of pressure between social support and depression. Confirmatory Factor Analysis (CFA) assessed the decency of fit. Through a satisfactory measurement model,a Structural Equation Model (SEM) was utilized to assess the theoretical connections among social support, stress, and depression. In the bivariate examination, the sociodemographic attributes fundamentally connected with depression were controlled as covariates in SEM. Since social support, stress, and depression do not comply with typical appropriation, we utilized the powerful most extreme probability assessment (MLR) to gauge the boundaries of the basic condition model. In the event that P < 0.05 was gotten by a respective test, the boundaries were viewed as factually huge. Chi-square/DF, Comparative Fit File (CFI), Root Mean Square Error of Approximation (RMSEA), and Standard Root Mean Square Residual (SRMR) were utilized to assess the fitting between the estimation model and the auxiliary model. On the off chance that the proportion of chi-square/DF < 3.0, CFI [?] 0.95, RMSEA [?] 0.06, SRMR < 0.08, the model fitting is regarded as acceptable.

RESULTS

General Characteristics

Maternal qualities are revealed in Table 1. As per the Edinburgh Postpartum Depression Scale, 771 expectant ladies were determined to have depression. The predominance of prenatal depression was 73.01%. The age of the respondents was 16-50 years of age, however, most were somewhere in the range of 16 and 40 years of age. 58.81% of expectant ladies lived in urban communities during the pestilence time frame. 62.32% of expectant

ladies had advanced education levels (college or above), 50.57% were primiparas, 54.55% had family pay over 5000 yuan, and the expectant ladies in ahead of schedule, center, and late pregnancy represented 24.43%, 45.27%, and 30.30%, separately. The frequency of pregnancy inconveniences was 19.89%.

Contrasted and the undepressed set, the dejected gathering had a higher extent of more aged women, advanced education levels, higher family pay, and were bound to live in the field during the pandemic time frame.

Correlations among depression, social support, and stress

Table 2 demonstrates the relationship between depression, social support, and stress. Relationship examination indicated that social support was adversely associated with depression, while stress decidedly corresponded with depression. The Spearman connection coefficients were - 0.40 (P < 0.01) and 0.27 (P < 0.01), respectively.

The immediate route from social support to depression was substantial (normalized pathway coefficient = - 0.34, P < 0.01), and the ancillary pathway from stress to depression was additionally huge (normalized pathway coefficient =0.50, P < 0.01).

Measurement model

The CFA demonstrated that the calculation archetypical produced a suitable model (Chi-square value=11.96, Degrees of Freedom (DF)=9, $P < 0.01$, CFI=0.97, RMSEA=0.07, SRMR = 0.03). Every element loadings stood at $P < 0.01$ level. Outcome recalibrated element loads are displayed in Fig. 1.

Direct and indirect effects of structural models

The straight route from social support to depression was substantial (recalibrated route coefficient = -0.34, $P < 0.01$), and the ancillary route from social support to depression also displayed a noteworthy figure (recalibrated route coefficient = -0.09 x 0.50 = -0.45, $P < 0.01$). The outcome reveals that the recalibration impact of the ancillary route resembles the straight pathway (- 0.34 vs. - 0.45) (table 3 and table 4). The SEM prototypical is presented in Fig. 1.

DISCUSSION

From this investigation, Structural Equation Model (SEM) was utilized to examine the correlation among social support, stress, and prepartum depression. The outcome revealed that a positive link exists between stress and prepartum depression, while there is an adverse relationship between social support and prepartum depression.

Our investigation reveals that the occurrence of prenatal depression is as high as 73.01% during the pandemic timeframe, which is a lot higher than that during the non-plague state[22, 23]. This might be identified with the eruption of the pandemic and the exceptional time of pregnancy[24]. Moreover, we establish that the high-hazard elements of prenatal depression, for example, older age, might be identified with the higher physical and mental weight of more seasoned pregnant ladies than youthful pregnant ladies, which is reliable with Enayati's study[25]. Furthermore, expectant ladies in the city where the scourge happened are bound to have prenatal depression contrasted with those in country regions with less admittance to data about the pandemic. This might be connected in light of the fact that those in metropolitan zones are outfitted with refreshed data about the pandemic and would in general accept that the danger of getting tainted is higher in metropolitan regions than those in-country ones with less populace development. Likewise, similar to Yeon's investigation, this examination proposes that the higher the instructive level and the higher the family pay one has, the higher the danger is for prenatalprenatal depression, which might be identified with the more noteworthy tension on mental workers[26].

There exist several affecting elements on prenatal depression in expectant ladies, among which social support and weight assume significant parts. The examination reveals the members would in general apply a lot of mental weight and philosophical weight on themselves, which place themselves into predicaments[27].

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Expectant women have fewer occasions to go out during the pandemic timeframe, and going out will expand the danger of presentation to COVID-19. There is less up close and personal correspondence with loved ones, causing a tough and uneasy communication of their feelings. Comparable circumstances frequently lead to inordinate mental and philosophical tension on expectant ladies, which will negatively affect the two people and society in the long haul. Steady with the finish of this investigation, Zou's examination shows that great social support can improve some burdensome side effects, for example, the absence of inspiration and misery of life[28]. Accordingly, it is important to fortify family upholds, companion backing, and network upholds for expectant ladies during the plague time frame. Being instructed in emotional well-being and effectively taking an interest in mental guiding for pregnant ladies during the plague time frame will lessen their nervousness and improve their depression indications.

Simultaneously, this investigation likewise established that pressure has a fractional interceding impact between social support and depression. Expectantmothers during the pandemic time frame, from one viewpoint, bear the weight of pregnancy, then again, they are upset by the scourge, subsequently, they are powerless against emerging ongoing pressure[29, 30]. Exploration indicates that pressure builds the danger of depression, which thusly prompts different mental issues. Numerous investigations have focused on the impact of weight on prenatal depression manifestations, recommending that focused intercession ought to be completed to ease pregnant ladies stress[31, 32]. Studies have affirmed that prenatal pressure the board courses can successfully lessen expectant mothers' pressure, subsequently diminishing expectant mothers' depression, however, there are a couple of related examinations in Chinaa[31, 32]. Later on, these researchers may deliberate adding the substance of stress alleviation into the day-by-day management of expectant mothers and consistently complete pressure the board courses to assist pregnant ladies with prenatal depression manifestations to improve their psychological wellness.

This examination is the initial attempt to develop a structural condition model of social support, stress, and depression in expectant mothers during the pandemic timeframe. This examination established that the expansion in social support in this populace would decrease the frequency of depression. Simultaneously, the expansion of social support will likewise lessen the mental weight of expectant mothers, which will in anancillarymanner lead to a decrease of prenatal depression. The intervening function of pressure between social support and depression merits consideration. Through exposure, schooling, and social support, diminishing tension on expectant mothershelps decrease the depression of expectant mothers during the scourge time frame.

Conclusion

The psychological well-being of expectant mothers in the pandemic era in the Guizhou area is critical. Concerning patients with prepartum depression indications, lessening the pressure, and upscaling the social support will aid in alleviating their depression.

Disclosure of interests

None of the authors have any personal or financial conflicts of interest.

Contribution to authorship

Y.L. performed the analyses and wrote the manuscript. S.D., L.Z., coordinated the study centers, L.S. and D.Z. supervised the analyses, and D.Z. conceived the project. All authors critically reviewed the manuscript for important intellectual content.

Details of ethics approval

This article does not deal with ethical issues.

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Table 1 Basic characteristics of 1056 pregnant women in Guizhou Province[1]

Characteristic	Depression	Depression	Control	Total	P
Characteristic	Depression	Depression	Control	Total	P
Age (yrs)					
<18	1 (0.13)	1 (0.13)	3 (1.05)	4	0.01
18-25	170 (22.04)	170 (22.04)	87 (30.52)	257	
26-30	316 (40.99)	316 (40.99)	103 (36.14)	419	
31-40	269 (34.89)	269 (34.89)	88 (30.88)	357	
41-50	15 (1.94)	15 (1.94)	4 (1.40)	19	
Residence during the outbreak	Residence during the outbreak				
City	480 (62.26)	480 (62.26)	141 (49.47)	621	0.001
Countryside	268 (34.76)	268 (34.76)	132 (46.32)	400	
Others	23 (2.98)	23 (2.98)	12 (4.21)	35	
Education level					
Primary school	16 (2.08)	16 (2.08)	6 (2.11)	22	0.014
Junior middle school	159 (20.62)	159 (20.62)	84 (29.47)	243	
High school	95 (12.32)	95 (12.32)	38 (13.33)	133	
University and above	501 (64.98)	501 (64.98)	157 (55.09)	658	
Primipara					
Yes	398 (51.62)	398 (51.62)	136 (47.72)	534	0.260
No	373 (48.38)	373 (48.38)	149 (52.28)	522	
Monthly household income (yuan)	Monthly household income (yuan)				
<2000	72 (9.34)	72 (9.34)	42 (14.74)	114	0.011
2000-5000	257 (33.33)	257 (33.33)	109 (38.25)	366	
5000-8000	197 (25.56)	197 (25.56)	62 (21.75)	259	
>8000	245 (31.78)	245 (31.78)	72 (25.26)	317	
Pregnancy stage[2]					
1st trimester	193 (25.03)	193 (25.03)	65 (25.19)	258	0.709
2nd trimester	344 (44.62)	344 (44.62)	134 (28.03)	478	
3rd trimester	234 (30.35)	234 (30.35)	86 (26.88)	320	
Pregnancy complications[3]					
Yes	153 (19.84)	153 (19.84)	57 (20.00)	210	0.955
No	618 (80.16)	618 (80.16)	228 (80.00)	846	

[1] Values are frequencies (

[2] The first routine ultrasound examination, 1st trimester; gestational weeks 20-22, 2nd trimester; gestational weeks 33-35, 3rd trimester.

[3] Pregnancy complications include cardiovascular disease, blood system disease, respiratory system disease, nervous system disease.

Table 2 Correlation coefficient matrix of social support, stress and depression (n = 1056)

Variables	Depression	Social support	Stress
Depression	1.00		
Social support	-0.40**	1.00	
Stress	0.27**	-0.34**	1.00

**: $p < 0.01$

Table 3 Pathway coefficients of structural equation model (n = 1056)

Pathways	Estimate	Std. Estimate	SE	z	P
Social support- Depression	-0.09	-0.34	0.01	-8.47	<0.001**
Stress- Depression	0.22	0.50	0.02	9.86	<0.001**
Social support-Stress	-0.06	-0.09	0.02	-2.71	0.007**

Std. Estimate Standardized estimate, SE Standard error

**: $p < 0.01$

Table 4 Coefficients of measurement model and structural model among pregnant women (n = 1056)

Factor loadings	Estimate	Std. Estimate	SE	z	P
Stress					
Coping with stress	0.95	0.69	0.04	22.44	<0.001**
Perceived stress	1.12	0.79	0.04	26.1	<0.001**
Social support					
Family support	1.15	0.85	0.04	29.82	<0.001**
Friends support	1.13	0.88	0.04	30.89	<0.001**
Important people support	1.08	0.81	0.04	28.06	<0.001**

Std. Estimate Standardized estimate, SE Standard error

**: $p < 0.01$

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