The mental health status and access to antenatal care information among pregnant women during COVID-19 epidemic: a cross-sectional study in China

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Table of Contents

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Abstract

Background: China is the first country experienced the large scale of COVID-19 epidemic. To interrupt the transmission, social distancing strategies were required. Many routine health care services were severely disrupted, including antenatal care services. The mental health status as well as how pregnant women reacted to the situation, where and how did they obtain antenatal care information are unknown.

Objective: This study aimed to determine mental health status by measuring perceived stress, anxiety and depression, to explore approaches of obtaining antenatal health information and to determine their associations with the mental health status among pregnant women during COVID-19 epidemic in China.

Methods: We conducted an online survey to assess mental health status among pregnant women and collected information on approaches of accessing antenatal care information during the COVID-19 epidemic from February 5 to 28, 2020.

Results: A total of 1,873 women from 22 provinces/regions of China participated in the survey. The occurrence of experiencing perceived stress, anxiety and depression among pregnant women was 89.1% (95% CI: 87.6%, 90.4%), 18.1% (95% CI: 16.4%, 19.9%) and 45.9% (95% CI: 43.6%, 48.1%), respectively. Hospitals' official accounts in the Chinese social media platforms WeChat and Weibo were the most popular channels for pregnant women to obtain antenatal care information. Access to antenatal care information and services via the hospitals' official social media accounts were associated with a significantly lower risk of suffering from stress (adjusted odds ratio (aOR)=0.47, 95% confidence interval (CI): 0.30 to 0.73, P=0.001),

anxiety (aOR=0.52, 95% CI: 0.40 to 0.68, P<0.001) and depression (aOR=0.72, 95% CI: 0.58 to 0.90, P=0.003).

Conclusions: During the COVID-19 epidemic, occurrence of experiencing perceived stress, anxiety and depression was high in Chinese pregnant women. Mental health care in the current pandemic is urgently needed to reassure and support pregnant women. Developing specific contents for pregnant women on how to cope in emergency and major disease outbreak via social media platforms could be an effective way to mitigate mental health disorders in future epidemic preparedness and response. Clinical Trial: NA

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Keywords: COVID-19; Mental Health; Perceived stress; Anxiety; Depression; antenatal care; social media platform

Introduction

The novel Coronavirus Disease 2019 (COVID-19) emerged in Wuhan City China since December 2019 [1,2]. The Chinese government initiated the Level-one Response to Major Public Health Emergencies soon after [3], and the World Health Organization (WHO) declared the COVID-19 outbreak as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020. COVID-19 has spread to almost all nations worldwide as a pandemic [4].

To interrupt the COVID-19 transmission the Chinese government implemented social distancing strategies across the whole nation. Public service provision, including hospitals, was disrupted as many medical workforce and supplies were deployed to support treating COVID-19 patients. As the results, the utilization of social services was significantly reduced [5]. Pregnant women and fetus are especially vulnerable during natural disaster or major disease epidemic [6,7]. However, routine antenatal clinics were unavoidably affected by this emergency, being either closed or reduced capacity.

Like Facebook and WhatsApp used in many countries, a number of homegrown social media platforms such as WeChat and Weibo have penetrated the daily life of Chinese people. WeChat is now the most popular mobile phone application in China, with 654.1 million users in 2019, followed by Weibo with 359.6 million [8]. Increasingly institutes/organizations such as enterprises, governments, and hospitals have established WeChat/Weibo official accounts (WOAs) to disseminate service information, and promote interactions with end users. WeChat and Weibo are also the two most popular social media platforms used by hospitals to inform the public services available in the hospital, and provide health education and counselling free of charge. We did not know how the epidemic and social distancing with restricted movement affecting pregnant women's mental health status in China, and if accessing to antenatal service information is associated with their mental wellbeing. The aims of this study were to determine mental health status by measuring perceived stress, anxiety and depression, to determine their associations with the mental health status among pregnant women in COVID-19 epidemic in China. The findings of study could provide valuable information for other countries who are facing COVID-19.

Methods

We conducted an online cross-sectional survey from February 5 to 28, 2020. The contents of the survey included questions on knowledge and behaviors of COVID-19 prevention, mental health status, and channels of obtaining antenatal care information.

Data collection

The questionnaire was designed on Wenjuanxing platform. We used directly online recruiting and snowballing recruitment methods. The Quick Response (QR) code or the link of the survey questionnaire was posted in the antennal clinics or sent to pregnant women's mobile phone directly by antenatal clinic staff. Pregnant women were invited to participate in the survey by either scanning the QR code or clicking the link using mobile phone, iPad or other digital devices. Participants were also encouraged to share the survey QR code or link with other pregnant women in their network. The study was approved by the Institutional Review Board of School of Public Health, Fudan University, Shanghai, China (IRB#2020-02-0803).

Women's sociodemographic and obstetric information, including age, education level, status of employment, parity, gestational age, pregnancy complication was collected. There were six questions regarding personal self-protection behavior and knowledge of antenatal care during the COVID-19 epidemic based on the joint Chinese professional societies' guidelines [9]. The behavior question was about hand sanitation. The five knowledge questions were 1) whether the antenatal care should be cancelled, 2) whether pregnant women could have CT scan, 3) symptoms urging to go to hospital, 4) where to seek for care in case of fever, 5) should newborn be quarantined if mother diagnosed with COVID-19. Each question was scored one and the total score was six. Women were categorized to higher knowledge and appropriate behavior group if their scores reaching median and above of the total score.

Mental well- being assessment

Perceived stress

We used the validated Chinese perceived stress scale (CPSS) to assess the perceived stress of pregnant women [10]. The CPSS is a self-reported 14-item questionnaire with seven positive and seven negatives, measuring "the degree individuals appraise situations in their lives as stressful" [11]. Each item is scored on a five-point Likert scale of 0-4 from "0- never" to "4-very often" [12]. The total score of the scale was to sum up scores of positive items and reversed negative items. The cutoff point among Chinese population is 25. Person's score higher than 25 is regarded as experiencing perceived stress [13].

Anxiety

The validated 20-item Chinese version of Self- Rating Anxiety Scale (SAS) was used to measure anxiety symptoms of pregnant women. Each item is scored on a four-point Likert- scale of one to four from "1-a little of the time" to "4-most of the time". Items 5, 9 ,13, 17 and 19 were negatively worded. The total score is obtained by 1.25 multiple the sum adding scores of positive items and reversed scores of negative items. The total score of SAS ranged from 20 to 80. A Chinese person scored 50 and above is considered as suffering from anxiety [14, 15].

Depression

The 10-item Chinese version of the Edinburgh Depression Scale (EDS) was used to measure maternal depression. Each item is scored on a four-point Likert scale of zero to three. The total score ranges from zero to 30 and the cut-off scores are from nine to 13 points. In this study, the cut-off score was nine. A woman with 10 and above scores was defined as having depression [16-19].

Accessing antenatal care information

Questions on accessing antenatal care information during the COVID-19 epidemic were multiple choices, including hospitals' hotline, mobile phone short message service (SMS), hospitals' official WeChat accounts, hospitals' official Weibo accounts, WeChat/ Weibo moments (an information sharing forum) posted by friends and family members, digital message or verbal advice by friends and family members. Women choosing either the hospitals' WeChat or Weibo official accounts were categorized as accessing information via hospitals' official accounts on social media platforms.

Those choosing WeChat/ Weibo moments from friends and family members, or other ways by friends and family members were categorized as accessing information from friends and family members.

Quality control

As the quality control of the survey one question was inserted after the CPSS scale. If a participant failed to answer the question as required, the questionnaire would be regarded as invalid. Among a total of 2,186 pregnant women participated in the survey 1,873 retuned questionnaire was valid

Data analysis

Chi-square test was used to analyze the categorical variables, and multiple binary logistic regression was performed to examine the associations between different approaches of accessing antenatal care information and stress, anxiety and depression. The significance level was 0.05 and data analysis was conducted using SPSS 21.0 (SPSS, Inc., Chicago, IL) for Windows and R Statistic Software 3.6.3.

Results

The mean age of the 1,873 participants was 29 years of age. The distribution of women's current residence covered 22 provinces/regions of China, with the majority of participants from Shanghai and a small proportion based in Hubei Province, the most severely affected area by the COVID-19 epidemic. Majority of women had college and above education level, were employed and primiparous. The number of pregnant women in the first, second and third trimesters was almost evenly distributed. The median score of COVID-19 prevention knowledge and appropriate self-protection behavior was three, ranged from one to six (Table 1).

Table 1. Pregnant women's characteristics and their approaches of accessing to antenatal care information during the COVID-19 epidemic (N=1,873)

Variables	Accessing antenatal care information via hotlines or SMS[a]			Accessing health care information via hospital official accounts on social media platforms			Accessing health care information from friends or family members		
	No, n (%)	Yes, n (%)	*P*	No, n (%)	Yes, n (%)	*P*	No, n (%)	Yes, n (%)	*P*
Overall	988(52.7)	885(47.3)		457(24.4%)	1416(75.6)	/	1127(60.2)	746(39.8)	/
Age									
<29	371(51.4)	351(48.6)	0.35	196(27.1)	526(72.9)	0.02	456(63.2)	266(36.8)	0.04
≥29	610(53.6)	528(46.4)		256 (22.5)	882(77.5)		665(58.4)	473(41.6)	
Education									
≤Junior high	103(46.0)	121(54.0)	0.005	88 (39.3)	136(60.7)	<0.001	143(63.8)	81(36.2)	0.02
Senior high	130(46.9)	147(53.1)		92 (33.2)	185(66.8)		184(66.4)	93(33.6)	
≥College	755(55.0)	617(45.0)		277(20.2)	1095(79.8)		800(58.3)	572(41.7)	
Employment status									
Unemployed	140(55.8)	111(44.2)	0.30	80 (31.9)	171 (68.1)	0.003	162(64.5)	89(35.5)	0.13
Employed	848(52.3)	774(47.7)		377(23.2)	1245(76.8)		965(59.5)	657(40.5)	
Parity									
Primiparous	685(56.3)	531(43.7)	<0.001	286(23.5)	930 (76.5)	0.23	714(58.7)	502(41.3)	0.08
Multiparous	303(46.1)	354(53.9)		171(26.0)	486 (74.0)		413(62.9)	244(37.1)	

Variables	Perceived stress			Anxiety			Depression		
	No, n (%)	Yes, n (%)	P	No, n (%)	Yes, n (%)	P	No, n (%)	Yes, n (%)	P
Trimester									
1st	271(45.3)	327(54.7)	<0.001	112(18.7)	486 (81.3)	<0.001	348(58.2)	250(41.8)	0.20
2nd	384(54.6)	319(45.4)		204(29.0)	499 (71.0)		441(62.7)	262(37.3)	
3rd	333(58.2)	239(41.8)		141(24.7)	431 (75.3)		338(59.1)	234(40.9)	
Living area									
Urban	699(52.5)	632(47.5)	0.83	286(21.5)	1045(78.5)	<0.001	781(58.7)	550(41.3)	0.09
Suburban	174(52.4)	158(47.6)		86 (25.9)	246 (74.1)		208(62.7)	124(37.3)	
Rural	115(54.8)	95(45.2)		85 (40.5)	125 (59.5)		138(65.7)	72(34.3)	
Current residence									
Non-Shanghai	285(62.2)	173(37.8)	<0.001	133(29.0)	325 (71.0)	0.008	276(60.3)	182(39.7)	0.96
Shanghai	703(49.7)	712(50.3)		324(22.9)	1091(77.1)		851(60.1)	564(39.9)	
Pregnancy complications									
No	737(53.2)	649(46.8)	0.53	331(23.9)	1055(76.1)	0.38	831(60.0)	555(40.0)	0.75
Yes	251(51.5)	236(48.5)		126(25.9)	361 (74.1)		296(60.8)	191(39.2)	
Score of COVID-19 prevention knowledge and self-protection behaviors									
Low	257(53.8)	221(46.2)	0.61	144(30.1)	334 (69.9)	<0.001	292(61.1)	186(38.9)	0.64
High	731(52.4)	664(47.6)		313(22.4)	1082(77.6)		835(59.9)	560(40.1)	

[a] Short message service

The occurrence of perceived stress, anxiety and depression symptoms among the pregnant women was 89.1% (95% CI: 87.6%, 90.4%), 18.1% (95% CI: 16.4%, 19.9%) and 45.9% (95% CI: 43.6%, 48.1%), respectively. Univariate analysis showed that women with higher education, being employed, living in Shanghai, and scored higher for COVID-19 prevention knowledge and self-protection behavior were negatively associated with experiencing at least one of the three mental health disorders. Being multiparous, residing in rural areas, with pregnancy complications were more likely to suffer at least one form of the three mental health disorders assessed, compared to those being primiparous, living in urban areas, and without pregnancy complications (Table 2).

Table 2. Pregnant women's characteristics and mental health disorders (N=1,873)

Variables	Perceived stress			Anxiety			Depression		
	No, n (%)	Yes, n (%)	P	No, n (%)	Yes, n (%)	P	No, n (%)	Yes, n (%)	P
Overall	205(10.9)	1668(89.1)	/	1534(81.9)	339(18.1)	/	1014(54.1)	859(45.9)	/
Age									
<29	68(9.4)	654(90.6)	0.10	581(80.5)	141(19.5)	0.21	385(53.3)	337(46.7)	0.60
≥29	135(11.9)	1003(88.1)		942(82.8)	196(17.2)		621(54.6)	517(45.4)	
Education									
≤Junior-high	10(4.5)	214(95.5)	<0.001	159(71.0)	65(29.0)	<0.001	102(45.5)	122(54.5)	<0.001
Senior high	21(7.6)	256(92.4)		214(77.3)	63(22.7)		124(44.8)	153(55.2)	
≥College	174(12.7)	1198(87.3)		1161(84.6)	211(15.4)		788(57.4)	584(42.6)	
Employment status									
Unemployed	18(7.2)	233(92.8)	0.04	197(78.5)	54(21.5)	0.13	123(49.0)	128(51.0)	0.08
Employed	187(11.5)	1435(88.5)		1337(82.4)	285(17.6)		891(54.9)	731(45.1)	
Parity									
Primiparous	138(11.3)	1078(88.7)	0.45	1008(82.9)	208(17.1)	0.13	683(56.2)	533(43.8)	0.02
Multiparous	67(10.2)	590(89.8)		526(80.1)	131(19.9)		331(50.4)	326(49.6)	
Trimester									

1st	75(12.5)	523(87.5)	0.23	490(81.9)	108(18.1)	0.56	330(55.2)	268(44.8)	0.78
2nd	76(10.8)	627(89.2)		583(82.9)	120(17.1)		380(54.1)	323(45.9)	
3rd	54(9.4)	518(90.6)		461(80.6)	111(19.4)		304(53.1)	268(46.9)	
Living area									
Urban	157(11.8)	1174(88.2)	0.01	1103(82.9)	228(17.1)	0.02	743(55.8)	588(44.2)	0.008
Suburban	38(11.4)	294(88.6)		274(82.5)	58(17.5)		178(53.6)	154(46.4)	
Rural	10(4.8)	200(95.2)		157(74.8)	53(25.2)		93(44.3)	117(55.7)	
Current residence									
Non-Shanghai	26(5.7)	432(94.3)	<0.001	355(77.5)	103(22.5)	0.005	227(49.6)	231(50.4)	0.02
Shanghai	179(12.7)	1236(87.3)		1179(83.3)	236(16.7)		787(55.6)	628(44.4)	
Pregnancy complications									
No	161(11.6)	1225(88.4)	0.12	1152(83.1)	234(16.9)	0.02	763(55.1)	623(44.9)	0.18
Yes	44(9.0)	443(91.0)		382(78.4)	105(21.6)		251(51.5)	236(48.5)	
Score of COVID-19 prevention knowledge and self-protection behaviors									
Low	28(5.9)	450(94.1)	<0.001	349(73.0)	129(27.0)	<0.001	220(46.0)	258(54.0)	<0.001
High	177(12.7)	1218(87.3)		1185(84.9)	210(15.1)		794(56.9)	601(43.1)	
Access to antenatal care information via hotlines or SMS									
No	101(10.2)	887(89.8)	0.29	796(80.6)	192(19.4)	0.11	529(53.5)	459(46.5)	0.59
Yes	104(11.8)	781(88.2)		738(83.4)	147(16.6)		485(54.8)	400(45.2)	
Access to antenatal care information via hospitals' official accounts on social media platforms									
No	25(5.5)	432(94.5)	<0.001	333(72.9)	124(27.1)	<0.001	213(46.6)	244(53.4)	<0.001
Yes	180(12.7)	1236(87.3)		1201(84.8)	215(15.2)		801(56.6)	615(43.4)	
Access to antenatal care information from friends or family members									
No	133(11.8)	994(88.2)	0.15	925(82.1)	202(17.9)	0.81	636(56.4)	491(43.6)	0.01
Yes	72(9.7)	674(90.3)		609(81.6)	137(18.4)		378(50.7)	368(49.3)	

More than 75% (1,416/1,873) of pregnant women reported having ever accessed antenatal health care information via hospitals' WOAs, and WOAs was also selected by more than 60% (1185/1873) of pregnant women as the most favorite way to access antenatal care information. The Chi-square test showed that women of relatively elder age, higher education levels, being employed, during the 1st or 3rd trimester, residing in urban areas, living in Shanghai area were more likely to access information via hospitals' WOAs. The access to information via WOAs was positively associated with higher score of COVID-19 prevention knowledge and self-protection behavior (Table 1).

The multiple binary logistic regression showed that the access to antenatal care information via hospitals' WOAs were significantly associated with lower risk of perceived stress (OR=0.47, 95% CI: 0.30 to 0.73, P=0.001), anxiety (OR=0.52, 95% CI: 0.40 to 0.68, P<0.001) and depression (OR=0.72, 95% CI: 0.58 to 0.90, P<0.01), respectively. Furthermore, pregnant women obtained health care information from friends and family members appeared to be associated with higher risk of experiencing depression (OR= 1.33, 95% CI: 1.10 to 1.60, P=0.003) (Figure 1).
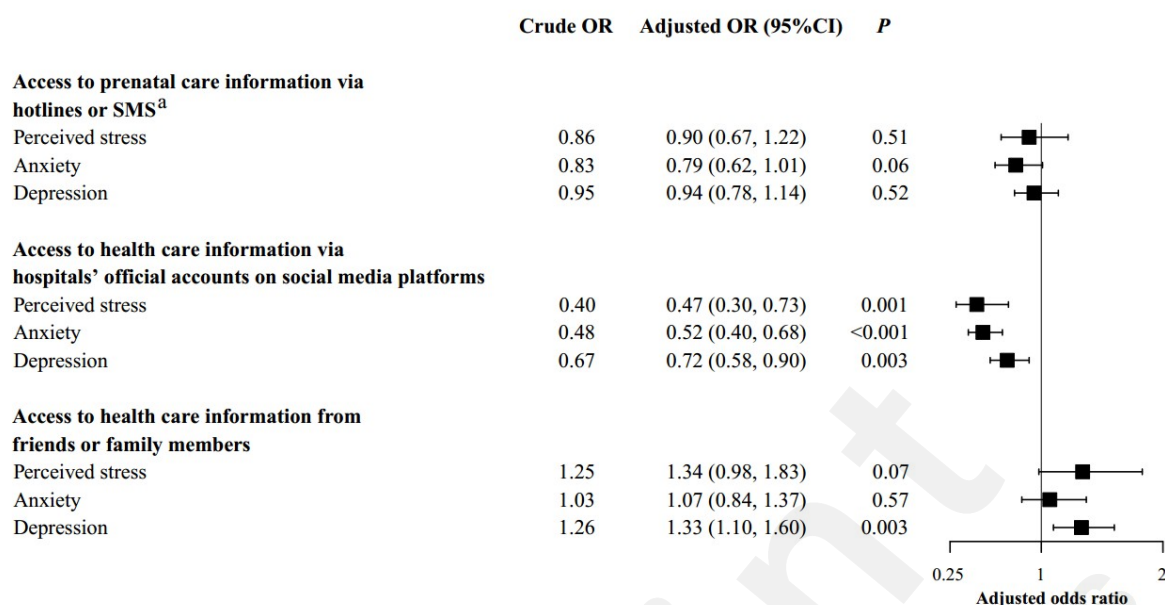
	Crude OR	Adjusted OR (95%CI)	P
Access to prenatal care information via hotlines or SMS[a]			
Perceived stress	0.86	0.90 (0.67, 1.22)	0.51
Anxiety	0.83	0.79 (0.62, 1.01)	0.06
Depression	0.95	0.94 (0.78, 1.14)	0.52
Access to health care information via hospitals' official accounts on social media platforms			
Perceived stress	0.40	0.47 (0.30, 0.73)	0.001
Anxiety	0.48	0.52 (0.40, 0.68)	<0.001
Depression	0.67	0.72 (0.58, 0.90)	0.003
Access to health care information from friends or family members			
Perceived stress	1.25	1.34 (0.98, 1.83)	0.07
Anxiety	1.03	1.07 (0.84, 1.37)	0.57
Depression	1.26	1.33 (1.10, 1.60)	0.003

Figure 1. Approaches of accessing antenatal care information and mental health disorders [b] (N=1,873)

[a] Short message service; [b] Multiple binary logistic regression, controlled for age, education, employment, living areas, residence location, trimester, parity, pregnancy complication, score for preventing COVID-19 knowledge and behavior.

Discussion

Principal Results

Our study provides a snapshot of the status of mental health among pregnant women in the early stage of the COVID-19 epidemic in China. The participants of the survey covered 22 provinces of China. The occurrence of perceived stress, anxiety and depression among pregnant women was high, 89.1%, 18.1% and 45.9%, respectively. Accessing hospitals' official accounts on social media platforms WeChat and Weibo were the most popular way obtaining antenatal care information. Women who accessed health information via hospitals' official accounts on social media platforms had significantly lower risk of perceived stress, anxiety and depression.

The proportion of women having perceived stress, anxiety and depression was higher in this study sample compared with previous studies in China using the same measurements and cutoff points in different context. The findings in previous studies showed the rate of perceived stress was 73.3% [20], 11.3% for anxiety [21, 22], and 17.6 % to 25.4% for depression [19, 23]. The explanations for the discrepancies could be that during the COVID-19 epidemic, pregnant women might hesitate to have routine antenatal visit due to the fear of being infected with COVID-19 in hospital or on the way to hospital. The antenatal care utilization dropped dramatically especially in the early stage of the epidemic when there were no designated medical facilities for pregnant women with confirmed or suspected COVID-19. Further, feeling isolated from their social support network and health care facilities could perpetuate stress and anxiety among pregnant women. There are strong evidence showing the link between maternal stress, anxiety and depression and a variety of complications and adverse pregnancy and birth outcomes, such as susceptibility to infection, low birth weight, preterm birth, and impaired cognitive development in the offspring [24-26]. The high occurrence of mental health disorders among pregnant women found in this study warrants urgent mental health interventions.

Our findings revealed lower mental health problems were only associated with obtaining antenatal

care information from WOAs, compared with other approaches, including hotlines and mobile phone text messages, and advice from friends and family members. This highlights the importance of both the channels and the trustworthiness of the source information acquisition. Compared to hotline and SMS, WOAs offer the flexibility for women to obtain more comprehensive information that meets their needs. Surprisingly, we found that women obtained antenatal care information from friends and family members appeared to have higher risk of depression. This could be partially explained by women suffering from depression were more likely to turn to their friends and family for help; or they received more concerns from friends or family members. Be able to access health information from a reliable and credible source has always been a primary service need of mothers and children [27]. The results suggest that during public health emergency, reliable information provided by health professionals via social media platforms is a feasible and potential effective way to deliver health care information and services to pregnant women. The findings also signify the importance and necessity of communicating authoritative contents by health service providers in social media platforms as one component of epidemic preparedness and response in the future.

The Chinese government and many professional societies responded swiftly on emergency maternal health interventions in the COVID-19 epidemic. Several professional organizations jointly issued management guidelines for COVID-19 during Pregnancy on January 31, 2020 [8]. The National Health Commission of China released the 'List of Designated Hospitals for Suspected or Confirmed COVID-19 Pregnant Women in Each Province' on 12 February 2020 [28]. Following these, a large number of maternal and child health institutions have posted service information and guidance for antenatal care on WOAs [29, 30] (Figure 2). However, training and capacity building is urgently needed on timely translating evidence-based information to health education materials that the public can comprehend. As more and more health institutions choose to provide service such as counselling, consultation services online, the quality of online services needs to be closely monitored. We call for more resources to be invested to promote quality online antenatal health information dissemination and service provision.

Figure 2. Examples of antenatal care information in hospital official WeChat account (Screen shots of antenatal care

information on official WeChat platform of Shanghai Maternal and Child Health Center, China, introducing when, where and how to have antenatal care, and how to prevent COVID-19 for pregnant women and children etc.**)**

Limitations

The findings of this study should be interpreted with caution. This is an online survey, participants were self-selected, tended to be in higher education groups, and possibly more health conscious. The results may also be subjected to recall bias as the variables are based on self-reporting. The cross-sectional design prevents demonstrating significant causal associations. Finally, the residence location of participants was not geographically evenly distributed; there was only a small proportion of pregnant women from Hubei Province, the mostly affected area.

Conclusion

In the COVID-19 epidemic in China, a high proportion of pregnant women suffered from perceived stress, anxiety and depression. Accessing professional antenatal care information via hospitals' WOAs is associated with a significantly lower risk of mental health disorders. The findings advocate that it necessary for antenatal health service providers to develop evidence-based health information on social media platforms and to disseminate reliable health education and health service information. This should be an essential component of epidemic preparedness and response to mitigate negative mental health outcomes among pregnant women.

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Authors and contributors

HJ & ML conceived the study. HJ, ML and LMJ designed the research tools. HJ, LMJ, XNL, WYC, FYY, XWZ, NA, XYL, XYL, ZYX, XLZ, LLL contributed to the data collection. HJ, ML, XX, XGY, XNL carried out data analysis and interpretation. HJ, ML and LMJ drafted the manuscript. All author provided the critical comments and approved the final draft of the manuscript.

Declaration of interests

Authors declare no conflicts of interest.

Abbreviations

COVID-19: coronavirus disease
CPSS: Chinese perceived stress scale
EDS: Edinburgh Depression Scale
QR code: The Quick Response code
SAS: Self- Rating Anxiety Scale
SMS: short message service
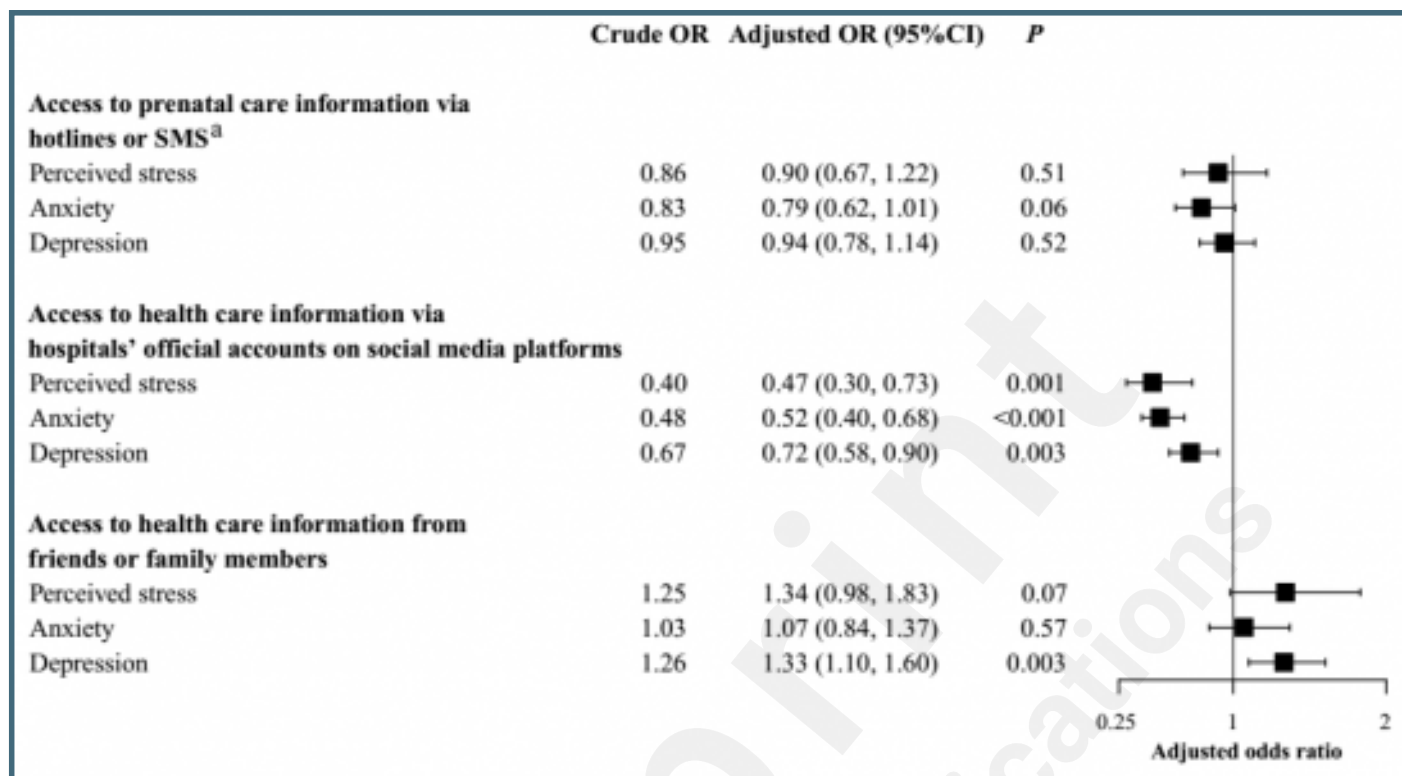WOAs: WeChat/Weibo official accounts

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Supplementary Files

Figures

Approaches of accessing antenatal care information and mental health disorders (n=1,873).

	Crude OR	Adjusted OR (95%CI)	P	
Access to prenatal care information via hotlines or SMS[a]				
Perceived stress	0.86	0.90 (0.67, 1.22)	0.51	
Anxiety	0.83	0.79 (0.62, 1.01)	0.06	
Depression	0.95	0.94 (0.78, 1.14)	0.52	
Access to health care information via hospitals' official accounts on social media platforms				
Perceived stress	0.40	0.47 (0.30, 0.73)	0.001	
Anxiety	0.48	0.52 (0.40, 0.68)	<0.001	
Depression	0.67	0.72 (0.58, 0.90)	0.003	
Access to health care information from friends or family members				
Perceived stress	1.25	1.34 (0.98, 1.83)	0.07	
Anxiety	1.03	1.07 (0.84, 1.37)	0.57	
Depression	1.26	1.33 (1.10, 1.60)	0.003	

Adjusted odds ratio

Examples of antenatal care information in hospital official WeChat account.