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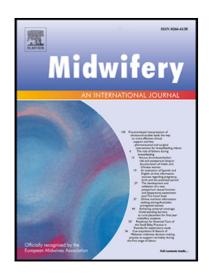Fatemeh hosseinpour , Mark D. Griffiths , Zainab Alimoradi

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Association of social capital with mental health and quality of life among low- and high-risk pregnant women

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Abstract

Introduction: Social capital means having resources and support in relationships and social ties. It can affect the individual's quality of life and mental health. The present study investigated the association between social capital with psychological status and quality of life among low-risk and high-risk pregnant women.

Methods: The present cross-sectional study was conducted with the participation of 394 pregnant women receiving prenatal care in urban comprehensive health centers in Qazvin, Iran. Two-stage sampling was used to select comprehensive health centers by random cluster sampling and then pregnant women randomly. Social capital, quality of life (QoL), psychological status, and demographic and obstetric characteristics were assessed. Uni-variable and multivariable linear regression models were used to analyze the data.

Results: Among the participants, 267 had low-risk pregnancies (67.77%) and the remainder were high-risk. The mean age of participants was 27.94 years (SD=5.86), the mean gestational age was 23.63 weeks (SD=7.71). The mean overall quality of life score among low-risk pregnant women was 32.00 (SD=5.27) and among high-risk pregnant women was 29.70 (SD=3.65). High-risk pregnant women experienced significantly higher anxiety and depression and fear of COVID-19. Social capital had a significant and weak relationship with anxiety among low-risk pregnant women ($r=0.22$, $p<0.001$). Also, a weak and significant relationship between social capital and anxiety ($r=0.24$, p=0.007), depression ($r=0.24$, $p=0.007$) and fear of COVID-19 ($r=0.27$, $p=0.002$) was found among high-risk pregnant women.

Conclusion: Women with high-risk pregnancies experienced lower quality of life, higher anxiety and depression, and greater fear of COVID-19. There was also a weak relationship between social capital and the aforementioned variables among high-risk pregnant women. Designing and implementing interventions to increase quality of life and reduce anxiety and stress among high-risk pregnant women appears to be warranted.

Introduction

Pregnancy is a complex phenomenon in terms of extensive physical, mental, psychological and/or social changes (Bjelica, Cetkovic, Trninic-Pjevic, & Mladenovic-Segedi, 2018). Although pregnancy is a natural process, in almost 20% of the cases, the presence of underlying diseases or unexpected diseases of the mother or fetus can complicate the pregnancy and lead to a high-risk pregnancy (James, Steer, Weiner, & Gonik, 2010). In high risk pregnancy, the likelihood of an adverse outcome such as miscarriage, short-term or long-term physical or mental complications is higher than among healthy pregnant women (Holness, 2018). Worldwide, approximately 20 million women experience high-risk pregnancies, and more than 800 women die each day from prenatal causes. Moreover, 6% to 33% of these cases are in the group of high-risk pregnancies (Yilmaz & Oskay, 2021).

Women with high-risk pregnancies may need sophisticated care, including lifestyle modification, medical and technical support, and even hospitalization (Rodrigues, Zambaldi, Cantilino, & Sougey, 2016). As a result, these women may experience feelings of vulnerability and stress that affect their mental health (e.g., anxiety and depression) (Fairbrother, Young, Zhang, Janssen, & Antony, 2017), as well as their perceptions of quality of life (QoL) (Forger, Ostensen, Schumacher, & Villiger, 2005; Mckee, Cunningham, Jankowski, & Zayas, 2001; Vallim et al., 2011). In addition to specific pregnancy conditions, since December 2019, the outbreak of COVID-19 worldwide has become a new source of fear and stress for many individuals, especially among pregnant women (Alimoradi, Abdi, Gozal, & Pakpour, 2022; Alimoradi et al., 2021; Alimoradi, Gozal, et al., 2022; Nodoushan, Alimoradi, & Nazari, 2020). Public health measures including quarantine, home confinement, and physical distancing designed to reduce the transmission of the disease (Polisena et al., 2021) inadvertently reduce social interactions (Chou et al., 2020) and reduce obstetrics health services during pregnancy (Khalil et al., 2021). The spread of infectious diseases such as COVID-19 can also cause severe fear among pregnant women because complications and mortality often increase among pregnant women (Ayenew et al., 2020). Fear, high levels of anxiety, and subsequent psychological problems during pregnancy can increase psychological distress, anxiety and depression (Giesbrecht et al., 2022), disrupt women's daily activities and their ability to cope with childbirth (Molgora et al., 2018), increased risk for poor birth outcomes (Giesbrecht et al., 2022), and adverse consequences such as miscarriage, nausea and vomiting, preeclampsia and/or mental disorders (Jomeen, 2004). The consequence of fear especially related to COVID-19 during pregnancy and mental health problems might be exacerbated among high-risk pregnant women (Giesbrecht et al., 2022).

Therefore, maternal physical health depends on their mental health, which is viewed by some as the guarantor of the health of the family and the child who will be born soon (von Hinke, Rice, & Tominey, 2019). Both mental health and QoL are multidimensional concepts affected by various factors including life stages, lifestyles, personalities, attitudes, social capital, social protection, and socioeconomic conditions (Almedom, 2005; McKenzie, Whitley, & Weich, 2002). Therefore, assessment of mental health and QoL should consider individuals' social attributes including social capital (McKenzie et al., 2002).

Social capital at the individual level means having enough resources and support in social relations and ties (Fulkerson & Thompson, 2008). Social capital can play an important role in individuals' ability to access health services and consequently their health (Giordano & Lindstrom, 2010). In fact, having higher social capital may increase access to prenatal care and facilitate a healthy pregnancy (McTavish & Moore, 2015; Semali, Leyna, Mmbaga, & Tengia-Kessy, 2015). Women's health during pregnancy and six months after it has a positive relationship with the level of individual social relationships (Lamarca, Leal, Leao, Sheiham, & Vettore, 2014). Following a decrease in individual social capital, health risk behaviors such as smoking, alcohol consumption, and malnutrition increase among pregnant women (Tofani, Lamarca, Sheiham, & Vettore, 2015). Therefore individual social capital has an important role in the physical and mental health of pregnant women and should be considered by the health

community and the government. To best of authors' knowledge, few studies have investigated the status of women's social capital during pregnancy and its association with their health and quality of life (Agampodi, Rheinländer, Agampodi, Glozier, & Siribaddana, 2017; Morozumi et al., 2020; RezaeiNiaraki, Roosta, Alimoradi, Allen, & Pakpour, 2019). However, the difference in the social capital status of high-risk and low-risk pregnant women and its relationship with physical and psychological components have not been assessed and compared.

Aim of study

The present study aimed to investigate the association of social capital with the quality of life and psychological status (e.g. anxiety, depression and fear of COVID-19) of pregnant women regarding their risk status of pregnancies (as low risk and high risk pregnancy).

Method
Study design

The present cross-sectional study was designed and conducted to investigate the association between social capital with mental health and quality of life among pregnant women who were referred to comprehensive health centers in Qazvin, Iran.

Participants

A total of 394 pregnant mothers participated in the present study. Iranian pregnant women referred to urban comprehensive health centers were eligible irrespective of gestational age and gestational risk status (i.e., low- or high-risk pregnancy), having a minimum literacy, and willingness to participate. High-risk pregnancy is defined as experiencing any maternal or fetal complication during pregnancy that increased health risks for the pregnant mother, fetus or both. Women with high-risk pregnancies may need extra care in preconception, prenatal and childbirth period to reduce the possibility of complications. These situations include:

- preexisting health conditions (e.g. autoimmune diseases, such as lupus or multiple sclerosis, COVID-19, diabetes, uterus fibroids, high blood pressure, HIV/AIDS, kidney disease, low body weight with BMI of less than 18.5, mental health disorders such as depression, obesity, thyroid disease, cardiac disease, blood clotting disorders);
- pregnancy-related health conditions (e.g. gestational diabetes, placenta previa, fetal growth restriction, birth defects or genetic conditions in the fetus, multiple gestation, preeclampsia and eclampsia, previous preterm labor or birth, or other complications with previous pregnancies);
- lifestyle factors (including smoking, drug addiction, alcohol abuse and exposure to certain toxins).
- age (being over 35 or under 17 when pregnant) (Gilbert, 2011).

In present study, participants were asked about their pregnancy risk status as high or low risk. They were asked to choose high risk pregnancy if they are experiencing any of abovementioned situations and if their health care provider/ midwife and/or obstetrician told they have high risk pregnancy and need to have extra care than usual prenatal care program.

Sample size estimation

Sample size was estimated using two approaches. Based on a previous study, social capital had a moderate significant association with physical and mental components of QoL among low-risk pregnant women (Pearson correlation coefficient=0.40) (RezaeiNiaraki et al., 2019). Considering r=0.40, α=0.05, β=0.20, the required number of participants was estimated to be at least 50 individuals for each group (low-risk and high-risk pregnant women). In the second approach, to determine the sample size for linear multivariable analysis, a calculation based on the Green rule (Green, 1991) was estimated. For this purpose, n=50 + 8K was used comprising 16 predictive variables (k). Consequently, the sample size was estimated to be 178 individuals

for each group. To assure the adequacy of the sample size for multivariable linear regression, the minimum sample size of 400 individuals was considered.

Sampling procedure

Two-stage sampling was used. In the first stage, random cluster sampling was used. Clusters were defined based on geographical locations of the comprehensive health centers in Qazvin city (i.e., north, south, east, west, and center). Two comprehensive health centers were selected randomly from each of five geographical regions (overall 10 centers). Then, the list of pregnant women referred to selected health centers to receive prenatal care was prepared. Based on a simple random sampling method, 40 pregnant from each health center were selected. They were contacted by telephone and were invited to participate in the study.

Measures

The main variables in the present study were demographic and reproductive characteristics, social capital, quality of life, and mental health status (including depression, anxiety, and fear of Covid-19). The following measures were used to collect the data:

Demographic and Reproductive Characteristics Checklist: Information on the following variables was collected: pregnant women and their spouse's age, level of education, employment status, perceived family economic level, place of residence, ownership of home, length of residence at current home, gestational age, number of pregnancies and deliveries, history of abortion, number of living children, number of wanted pregnancies, sex of the fetus, pregnancy risk status (low-risk or high-risk), and the reason for high-risk pregnancy.

Social Capital Questionnaire (SCQ): The 36-item SCQ (Onyx & Bullen, 2000) comprising eight domains was used to assess social capital. Items (*e.g., "Does society value you?"*) are rated on a four-point scale from 1 (*Very low*) to 4 (*Very much*) and scores range between 36 and 144. Total score is based on the sum of all items, with higher scores indicating greater social capital. The measure examines both types of structural and network social capital the eight domains comprise community connections (seven items), social agencies (five items), trust and safety (five items), neighborhood connections (five items), family and friends (three items), tolerance of diversity (three items), value of life (three items), and work connections (five items). The psychometric properties of original version (Onyx & Bullen, 2000) and Persian version have been shown to be good (Eftekharian, Kaldi, Sum, Sahaf, & Fadaye Vatan, 2016). It should also be noted that the last five items of the scale were specifically associated with work connections. Since the majority of participants identified as 'housewives' (i.e., without formal employment and involved in home duties), it was impossible to examine this subscale for all participants. Therefore, the final analysis of this section was performed using 31 items within seven subscales and scores range between 31 and 124. To compare subscales, in addition to the summed total score, the mean for each subscale and total score (ranging from 1 to 4) was calculated and reported. The internal consistency of the SCQ based on Cronbach's alpha coefficient in the present study was very good (0.88).

12-item Short-Form Health Survey (HS-SF12): The HS-SF12 (Ware Jr, Kosinski, & Keller, 1996) was used to assess quality of life. This scale is an abbreviated form of 36-item QoL Questionnaire that is widely used in various studies. Items (e.g. *"How you rate your overall health?"*) are rated from 1 (bad) to 4 (excellent), Total score is based on the sum of all items and ranges between 12 to 48 with higher scores indicating better QoL (Ware Jr et al., 1996). The HS-SF12 has eight subscales (including general health, bodily pain, social function, vitality, physical function, role limit physical, mental health and role limitation mental) and two main components of mental component summary (MCS) and physical component summary (PCS) (Ware Jr et al., 1996). The psychometrics properties of Persian version have been shown to be good (Montazeri,

Vahdaninia, Mousavi, & Omidvari, 2009). The internal consistency of the HS-SF12 based on Cronbach's alpha coefficient in the present study was very good (0.80).

Hospital Depression and Anxiety Scale (HADS): The 14-item HADS (Zigmond & Snaith, 1983) was used to assess depression and anxiety. The HADS assesses the level of anxiety and depression in outpatient populations and comprises seven items for depression (e.g., *"I still enjoy the things I used to enjoy"*) and seven items for anxiety (e.g., *"I feel tense or 'wound up'"*). Items are rated on a four-point scale from 0 (*not at all*) to 3 (*always*). Total score is based on the sum of all items and scores range between 0 to 21 on each subscale with higher scores indicating greater depression and anxiety (Zigmond & Snaith, 1983). The psychometric properties of Persian version have been shown to be good (Lin & Pakpour, 2017; Montazeri, Vahdaninia, Ebrahimi, & Jarvandi, 2003). The internal consistency of the HADS based on Cronbach's alpha coefficient in the present study was very good (0.83).

Fear of COVID-19 Scale (FCV-19S): The seven-item FCV-19S was used assess fear of COVID-19 (Ahorsu et al., 2022). The items (e.g., "*Thinking about COVID-19 makes me sad"*) are rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Total score is based on the sum of all items and scores range between 7 to 35. A higher score indicates greater fear of COVID-19. The scale has good psychometric properties in many different languages (Alimoradi, Lin, Ullah, Griffiths, & Pakpour, 2022). Good psychometric properties of the Persian version have been shown to be good (Ahorsu et al., 2022). In the present study, the internal consistency of the FCV-19S was very good (Cronbach's alpha=0.85).

Ethical considerations

The present study was approved by the Ethics Committee of Qazvin University of Medical Sciences (ethics code – ID: IR.QUMS.REC.1400.159). When conducting the research, the necessary permits were obtained to attend comprehensive health centers; the design, objectives and research methods were fully introduced to all the participants, and informed written consent was obtained from individuals to participate in the study. Individuals were assured that their information would remain confidential. All the pregnant women voluntary participated in the project and all participants were informed that they could withdraw from the study at any time.

Data analysis

Data were analyzed using SPSS software version 24. Continuous variables are described in terms of means and standard deviations (SDs). Categorical variables are described in terms of frequencies and percentages. Association of social capital with mental health and QoL based on pregnancy risk status (i.e., low-risk or high-risk) was assessed using independent *t*-tests, Pearson correlation coefficients, and chi-square tests. Multivariable linear regression was used to assess the predictive role of social capital for pregnant women's mental health and QoL. In the multi-variable model, variables were entered via the stepwise method. Categorical variables were coded as dummy variables for entry in the regression model. To implement the linear regression model, the mean social capital score was the independent variable. QoL, depression, anxiety, and fear of COVID-19 were the dependent variables. The assumptions of linear regression test including the normal distribution of dependent variables and the absence of outliers were tested and confirmed before the implementation of the regression model. After the test, there was variance inflation factor (VIF) <2 and tolerance <1 for all variables. Therefore, the test assumptions were met. The significance level of all tests was *p*<0.05.

Results
Demographic and reproductive characteristics

A total of 400 individuals were invited to participate and 394 pregnant women completed the survey (response rate=98.5%), of which 267 (67.77%) had low-risk pregnancies and the remainder had high-risk pregnancies. In total, the mean age of the participants was 27.94 years (SD=5.86), the mean gestational age was 23.63 weeks (SD=7.71), the mean length of their stay in their current place of residence was 4.14 years (SD=4.29), and the majority of their pregnancies were wanted (82%). The majority of clients (50.3%) and their spouses (45.4%) had a diploma. The majority of women were housewives (73.1%) and most husbands were employed (94.4%). The majority of participants (82.4%) were of poor to moderate economic status (82.4%). There was no significant difference between the two groups between age, spouse age, gestational age, number of pregnancies and deliveries, length of stay in the current place of residence, and desire for pregnancy. Details of demographic and reproductive characteristics are shown in Table 1.

Quality of life

The mean overall QoL score was 32.00 out of 48 among low-risk pregnant women (SD=5.27) and 29.70 among high-risk pregnant women (SD=3.65). High-risk pregnant women had lower QoL in both physical (12.84 vs. 13.73, p=0.001) and mental (16.87 vs. 18.28, p<0.001) components compared to low-risk pregnant women. Although low-risk pregnant women had significantly higher quality of life scores, no significant difference was observed in the subscales relating to vitality, social function, physical function, and physical role limitation. In both groups, the lowest scores were observed in the dimensions of physical role limitation and mental role limitation and the highest score was observed in the social function subscale. Table 2 shows the details of overall QoL and domain-specific scores.

Mental health

High-risk compared to low-risk pregnant women experienced significantly higher anxiety scores (11.22 vs. 9.33 [out of 21], p<0.001) and depression (10.52 vs. 8.27 [out of 21], p<0.001) and greater fear of COVID-19 (22.14 vs. 20.25 [out of 35], p<0.001) (Table 2).

Social capital

Table 3 shows that women with high-risk pregnancies had higher social capital compared to women with low-risk pregnancies (2.49 vs. 2.33 [out of 4], p=0.001). This difference was significant in the social agency (2.47 vs. 2.29, p=0.002), participating in local community (2.58 vs. 2.46, p=0.02), feelings of trust and safety (2.52 vs. 2.34, p=0.003), family and friends' connections (2.24 vs. 1.88, p<0.001), and value of life (2.64 vs. 2.50, p=0.03). In both groups, the lowest score was in family and friends' connections and the highest score in value of life.

The association between social capital with quality of life and mental health

Table 4 shows that social capital had a significant association with anxiety (r=0.22, p<0.001) among low-risk pregnant women. Also, significant associations were observed between social capital and anxiety (r=0.24, p=0.007), depression (r=0.24, p=0.007) and fear of COVID-19 (r=0.27, p=0.002) among high-risk pregnant women. Due to some differences in the distribution of demographic and fertility variables between two groups, association between social capital with QoL and mental health was assessed using multivariable linear regression method with a stepwise approach. Multi-variable linear regression was used to adjust the effect of demographic and reproductive variables. The results of linear regression model showed that social capital was not a significant predictor of physical and mental components of QoL during pregnancy. Social capital was associated significantly with anxiety (β=0.19, p<0.001), depression (β=0.09, p=0.05), and fear of COVID-19 (β=0.14, p=0.006) after being adjusted for pregnancy risk status and other demographic variables (Table 5).

Discussion

The present cross-sectional study investigated the relationship between social capital with quality of life (QoL) and mental health among pregnant women considering their pregnancy risk status. Women with high-risk pregnancies had a significantly lower QoL score, higher anxiety, depression, and fear of Covid-19, but higher social capital. Social capital had a significant relationship with anxiety among low-risk pregnant women. Social capital had significant relationship with anxiety, depression, and fear of COVID-19 among high-risk pregnant women.

In the present study, social capital was significantly higher among women with high-risk pregnancies compared to low-risk pregnancies. High-risk pregnant women reported significantly higher social agency, participating in local community, feelings of trust and safety, family and friends' connections, and value of life. It appears that high-risk pregnant women had a higher level of social capital in the present study due to the fact that they were most exposed to the attention and focus of the family, comprehensive health centers, and the community. Social capital can affect health during pregnancy, and this impact is mainly through the improvement of psychosocial resources in small communities and through local public health services (Agampodi et al., 2017). In both groups, the lowest score was for family and friends' connections and the highest score was for value of life. Low scores for family and friends' connections might be due to living far away from family and relatives, which diminishes the role(s) of family members in social networks (RezaeiNiaraki et al., 2019). On the other hand, pregnant women irrespective of their risk status, reported their highest scores for value of life. As pregnant women expecting to give birth to their child, this creates meaning in their lives. Therefore, they appreciate the value of life and found life to be great (Carin, Lundgren, & Bergbom, 2011).

In the present study, the mean score of QoL among women with high-risk pregnancies was lower than women with low-risk pregnancies. The same result has been reported in previous studies (Dalfrà, Nicolucci, Bisson, Bonsembiante, & Lapolla, 2012; Mautner et al., 2009; MirMohammad Aliei, Khak, Kazemnejad, & Abbaszadeh, 2007). QoL is an individual's perception regarding their own health status in different aspects of physical, mental, and social wellbeing (Post, 2014). As high-risk pregnant women need more clinical laboratory tests, sonograms, medical care, lifestyle modification, more prenatal care visits by obstetricians, and even hospitalization (Rodrigues et al., 2016), they experience greater problems in their different aspects of QoL (Dalfrà et al., 2012; Mautner et al., 2009; MirMohammad Aliei et al., 2007). In present study, social capital was not a significant predictor of physical and mental components of QoL during pregnancy. This was inconsistent with previous study of Rezaei Niaraki et al. who reported a positive association between social capital and QoL among low-risk pregnant women (RezaeiNiaraki et al., 2019). This inconsistency might be due to different sampling time and different participants in the respective studies. The present study was conducted during COVID-19 pandemic with participation of both high and low-risk pregnant women, while Rezaei Niaraki et al. conducted their study before the COVID-19 pandemic with participation of low-risk pregnant women only. The results of multivariable linear regression analysis in present study showed that pregnancy risk status (high-risk vs. low-risk pregnancy) was the only independent significant predictor of the physical component of QoL and one of the significant predictors of mental component of QoL.

In terms of mental health, the present study found that women with high-risk pregnancies experienced significantly higher anxiety, depression and fear of COVID-19, which had a significant relationship with social capital. Thiagayson et al. reported a higher rate of major depression, minor depression, and anxiety disorders among women with high-risk pregnancies (Thiagayson et al., 2013). A significant direct association between social capital and the rate of depression among high-risk mothers was reported by Zhou et al. (Zhou et al., 2018). During the COVID-19 pandemic, pregnant women have experienced higher levels of anxiety, depression, and anxiety than before the COVID-19 epidemic (Gagneux-Brunon et al., 2020). Sinaci et al. reported that mothers who experienced high-risk pregnancies were more likely to experience stress, anxiety, and fear of COVID-19 than mothers who had low-risk pregnancies (Sinaci et al.,

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2020). Salehi et al. also found that fear of COVID-19 had a significant effect on mental health during pregnancy (Salehi & Rahimzadeh, 2020).

Limitations

The present study had a number of limitations including the cross-sectional nature of the survey (meaning that the directionality between variables could not be determined), the use of self-report method to complete the survey (meaning that the data are prone to various methods biases), a modest sample size (that may not necessarily be representative of all Iranian women), and a sample that only comprised Iranian women (that may not necessarily be representative of women from other cultures and countries).

Conclusion

The present study showed that women with high-risk pregnancies experienced lower quality of life, higher levels of anxiety and depression, and higher fears of COVID-19. Among high-risk pregnant women, there was a relationship between social capital and anxiety, depression, and fear of COVID-19. The findings suggest that healthcare providers should be aware of the benefits of social capital in managing stress and encourage women to build stronger relationships with others in their neighborhood environments during pregnancy. It appears that by designing interventions to increase social capital, the quality of life among mothers with high-risk pregnancies can be increased which would help them to reduce stress, depression, and anxiety.

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Table 1. Distribution and comparison of scio demographic and reproductive characteristics among participants based on their pregnancy related risk group

Mean (SD)		Total (n=394)	High-risk Participants (n=127)	Low-risk participants (n=267)	Test results
Age (in years)		27.94 (5.86)	27.73 (6.32)	28.04 (5.64)	t=0.50 p=0.62
Spouse age (in years)		32.27 (5.77)	32.49 (6.21)	32.17 (5.56)	t=-0.51 p=0.61
Gestational age (in months)		23.63 (7.71)	23.11 (6.79)	23.88 (8.11)	t=0.92 p=0.36
Gravid		1.64 (0.96)	1.78 (1.11)	1.57 (0.87)	t=1.88 p=0.06
Para		0.64 (0.89)	0.65 (0.91)	0.63 (0.88)	t=-0.13 p=0.89
Residency time in current place (year)		4.14 (4.29)	3.62 (2.44)	4.39 (4.92)	t=2.06 p=0.10
No (%)					
Education	Under diploma	39 (9.9)	20 (15.7)	19 (7.1)	χ^2=19.46 p<0.001
	Diploma	198 (50.3)	75 (59.1)	123 (46.1)	
	Academic	157 (39.8)	32 (25.2)	125 (46.8)	
Spouse education	Under diploma	38 (9.6)	18 (14.2)	20 (7.5)	χ^2=23.36 p<0.001
	Diploma	179 (45.4)	74 (58.3)	105 (39.3)	
	Academic	177 (44.9)	35 (27.6)	142 (53.2)	
Job	Housewife	288 (73.1)	103 (81.1)	185 (69.3)	χ^2=7.59 p=0.02
	Employed with childbirth Off	89 (22.6)	18 (14.2)	71 (26.6)	
	Employed without childbirth Off	17 (4.3)	6 (4.7)	11 (4.1)	
Job spouse	Unemployed	18 (4.6)	8 (6.3)	10 (3.7)	χ^2=1.37 p=0.50
	Employed	372 (94.4)	118 (92.9)	254 (95.1)	
	Retired	4 (1.0)	1 (0.8)	3(1.1)	
Economic status	Poor	183 (46.4)	69 (54.3)	114 (42.7)	χ^2=8.19 p=0.02
	Fair	142 (36.0)	45 (35.4)	97 (36.3)	
	Good	69 (17.5)	13 (10.2)	56 (21)	
Residency	Rural	38 (9.6)	17 (13.4)	21 (7.9)	χ^2=3.01 p=0.08
	Urban	356 (90.4)	110 (86.6)	246 (92.1)	
Abortion history	No	305 (77.4)	78 (61.4)	227 (85)	χ^2=27.42 p<0.001
	Yes	89 (22.6)	49 (38.6)	40 (15)	
Wanted Pregnancy	Unwanted	71 (18.0)	23 (18.1)	48 (18)	χ^2=0.001 p=0.97
	wanted	323 (82.0)	104 (81.9)	219 (82)	
Fetal gender	Not know	161 (40.9)	62 (48.8)	99 (37.1)	χ^2=4.91 p=0.09
	Boy	134 (34.0)	37 (29.1)	97 (36.8)	
	Girl	99 (25.1)	28 (22)	71 (26.6)	
QoL status	Poor	20 (5.1)	9 (7.1)	11 (4.1)	χ^2=19.54 p<0.001
	Fair	318 (80.7)	114 (89.8)	204 (76.1)	
	Good	56 (14.2)	4 (3.1)	52 (19.5)	

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Table 2. Comparison of QoL, mental health and fear of COVID-19 among participants based on their pregnancy related risk group

Mean (SD)	Total (n=394)	High-risk participants (n=127)	Low-risk participants (n=267)	Test results
General health	3.17 (0.94)	2.98 (0.81)	3.25 (0.98)	t=2.89 p=0.004
Bodily pain	3.20 (0.93)	2.90 (0.83)	3.34 (0.94)	t=4.81 p<0.001
Social function	3.73 (1.15)	3.57 (1.08)	3.81 (1.17)	t=1.87 p=0.06
vitality	3.51 (1.21)	3.34 (1.15)	3.58 (1.23)	t=1.90 p=0.06
Physical function	2.00 (0.56)	2.00 (0.58)	2.00 (0.55)	t=0.13 p=0.90
Role limit physical	1.53 (0.41)	1.48 (0.40)	1.56 (0.41)	t=1.81 p=0.07
Mental health	3.75 (0.93)	3.52 (0.84)	3.86 (0.95)	t=3.59 p<0.001
Role limitation mental	1.54 (0.40)	1.45 (0.36)	1.58 (0.41)	t=3.16 p=0.002
PCS QoL	13.44 (2.39)	12.84 (2.18)	13.73 (2.44)	t=3.51 p=0.001
MCS QoL	17.82 (3.32)	16.87 (2.54)	18.28 (3.55)	t=4.51 p<0.001
QoL total score	31.26 (4.93)	29.70 (3.65)	32.00 (5.27)	t=5.04 p<0.001
Anxiety	9.94 (3.83)	11.22 (3.05)	9.33 (4.01)	t=-5.18 p<0.001
Depression	9.00 (3.84)	10.52 (2.73)	8.27 (4.07)	t=-6.48 p<0.001
HADS total	18.93 (7.01)	21.74 (4.94)	17.60 (7.44)	t=-6.55 p<0.001
FOC total	20.86 (4.92)	22.14 (4.63)	20. 25 (4.95)	t=-3.62 p<0.001

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Table 3. Comparison of social capita subscales among participants based on their pregnancy related risk group

	Sum score (SD)	Mean score (SD)			
		Total (n=394)	High-risk participants (n=127)	Low-risk participants (n=267)	Test results
Participating in local community	17.51 (3.17)	2.50 (0.45)	2.58 (0.44)	2.46 (0.45)	t=- 2.39 p=0.02
Social agency	11.75 (2.73)	2.35 (0.55)	2.47 (0.57)	2.29 (0.52)	t=- 3.08 p=0.002
Feelings of trust and safety neighborhood	11.98 (2.93)	2.40 (0.59)	2.52 (0.56)	2.34 (0.59)	t=- 2.97 p=0.003
Connections	12.10 (2.77)	2.42 (0.55)	2.49 (0.54)	2.39 (0.56)	t=- 1.78 p=0.08
Family and friends' connections	5.99 (2.52)	2.00 (0.84)	2.24 (0.79)	1.88 (0.84)	t=-4.11 p<0.001
Tolerance of diversity	6.94 (1.86)	2.31 (0.62)	2.37 (0.62)	2.29 (0.62)	t=-1.22 p=0.22
Value of life	7.63 (1.84)	2.54 (0.62)	2.64 (0.63)	2.50 (0.60)	t=- 2.20 p=0.03
Social capital total	73.89 (13.33)	2.38 (0.43)	2.49 (0.42)	2.33 (0.43)	t=- 3.49 p=0.001

Table 4. Correlation of social capital with QoL physical and mental components, anxiety, depression, and fear of COVID-19 among participants based on their pregnancy related risk group

		PCS QoL	MCS QoL	Anxiety	Depression	Fear of COVID-19
Low-risk (n=267)	Pearson correlation	0.02	-0.04	0.22	0.10	0.07
	sig. (2-tailed)	0.76	0.48	<0.001	0.11	0.23
High-risk (n=127)	Pearson correlation	0.09	0.08	0.24	0.24	0.27
	sig. (2-tailed)	0.31	0.37	0.007	0.007	0.002

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Table 5. Association of social capital with QoL physical and mental components, anxiety, depression and fear of covid 19 among participants based on their pregnancy-related risk group adjusted for demographic variables

		Unstandardized Coefficients		Standardized Coefficients	Sig.	Collinearity Statistics		Adjusted R^2
		B (95% CI)	SE	Beta		Tolerance	VIF	
FOC	Education (academic vs. under diploma)	-1.72 (-2.82; -0.61)	0.56	-0.17	0.002	0.70	1.44	
	Fetal Gender (boy vs. unknown)	-1.90 (-3.03; -0.77)	0.58	-0.17	0.001	0.85	1.18	
	Pregnancy risk	1.22 (0.21; 2.22)	0.51	0.12	0.018	0.93	1.08	
	Spouse age	-0.23 (-0.38; -0.08)	0.08	-0.27	0.003	0.28	3.62	0.14
	Gestational age	0.09 (0.02; 0.15)	0.03	0.13	0.008	0.85	1.17	
	SC total	0.05 (0.02; 0.09)	0.02	0.14	0.006	0.91	1.10	
	Economic status (good vs. poor)	-1.49 (-2.84; -0.14)	0.69	-0.12	0.031	0.77	1.29	
	Age	0.15 (0.002; 0.30)	0.08	0.18	0.047	0.26	3.83	
Depression	Education (academic vs. under diploma)	-2.61 (-3.33; -1.89)	0.36	-0.33	<0.001	0.92	1.09	
	Pregnancy risk	1.534 (0.79; 2.28)	0.38	0.19	<0.001	0.93	1.07	
	Job (employed without childbirth off vs. housewife)	3.03 (1.34; 4.73)	0.86	0.16	<0.001	0.96	1.05	0.22
	Wanted pregnancy	-1.43 (-2.31; -0.55)	0.45	-0.14	0.001	0.99	1.01	
	SC total	0.03 (0.00; 0.05)	0.01	0.09	0.046	0.96	1.04	
Anxiety	Education (diploma vs. under diploma)	2.01 (1.31; 2.72)	0.36	0.26	<0.001	0.92	1.09	
	SC total	0.05 (0.03; 0.08)	0.01	0.19	<0.001	0.93	1.08	
	Pregnancy risk	1.43 (0.68; 2.17)	0.38	0.17	<0.001	0.96	1.05	
	Spouse age	-0.21 (-0.32; -0.10)	0.06	-0.31	<0.001	0.29	3.44	0.20
	Wanted pregnancy	-1.23 (-2.12; -0.35)	0.45	-0.12	0.007	0.99	1.01	
	Job spouse (employed vs. unemployed)	-2.08 (-3.57; -0.59)	0.76	-0.13	0.006	0.98	1.02	
	Age	0.12 (0.01; 0.22)	0.06	0.18	0.040	0.28	3.55	
MCS QoL	Education (academic vs. under diploma)	1.05 (0.40; 1.71)	0.33	0.16	0.002	0.95	1.05	
	Pregnancy risk	-1.21 (-1.90; -0.52)	0.34	-0.17	0.001	0.96	1.05	0.09
	Spouse age	0.08 (0.03; 0.14)	0.03	0.14	0.003	0.994	1.01	
	Wanted pregnancy	1.09 (0.27; 1.90)	0.42	0.13	0.009	0.999	1.00	
PCS QoL	Pregnancy risk	-0.89 (-1.39; -0.39)	0.25	-0.17	0.001	1.00	1.00	0.03

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ZA & NB contributed to the conception and design of this research; EF, BY and FH contributed to the acquisition and analysis of the data; ZA and NB contributed to data analysis and the interpretation of the data; EF, BY, FH, ZA and NB drafted the preliminary manuscript. MDG was responsible literature review and extensively editing of the final version of the paper. All authors critically revised the manuscript, agreed to be fully accountable for ensuring the integrity and accuracy of the work, and read and approved the final manuscript to be published. All authors met the criteria for authorship and that all entitled to authorship were listed as authors in the title page.

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