

# Obstetrics Healthcare Providers' Mental Health and Quality of Life During COVID-19 Pandemic: Multicenter Study from Eight Cities in Iran

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**Background:** The coronavirus disease of 2019 (COVID-19) pandemic has become the most challenging issue for healthcare organizations and governments all over the world. The lack of evidence-based data on the management of COVID-19 infection during pregnancy causes an additional stress for obstetrics healthcare providers (HCPs). Therefore, this study was undertaken to evaluate depression, perceived social support, and quality of life among obstetrics HCPs.

**Materials and Methods:** This cross-sectional multicenter study was conducted in eight cities in Iran. During the study period, 599 HCPs were separated into direct, no direct, and unknown contact groups according to their exposure to COVID-19-infected pregnant patients. The Patient Health Questionnaire-9 (PHQ-9), Multidimensional Scale of Perceived Social Support (MSPSS), and Short Form-36 (SF-36) were used to assess depression, perceived social support, and quality of life.

**Results:** Obstetrics and gynecology specialists had significantly higher social functioning and general health scores compared to other HCPs (residents/students or nurses/midwives). Depression was negatively correlated with most of the domains of quality of life, regardless of the COVID-19 contact status of the study participants. Social support, however, was positively correlated with some domains of quality of life, such as physical functioning, energy/fatigue, and emotional well-being, among staff members who had either direct contact or no contact with COVID-19 patients.

**Conclusion:** During the COVID-19 outbreak, the depression score among obstetrics HCPs was negatively associated with quality of life. Social support, however, had a reinforcing effect on quality of life.

**Keywords:** coronavirus, COVID-19, healthcare provider, obstetrics, quality of life, SARS-CoV 2

## Introduction

The coronavirus disease of 2019 (COVID-19) pandemic is the most important and challenging issue today for healthcare organizations and governments all over the world. The first case of COVID-19 was reported in Wuhan, China, on December 31, 2019.<sup>1</sup> Due to its highly contagious nature, this virus can spread easily by respiratory droplets to individuals in close contact with either symptomatic patients or asymptomatic carriers in the incubation period.<sup>2</sup> Many countries around the world have reported travel-associated, confirmed-infected cases; unfortunately, this global health issue has grown rapidly into a pandemic.<sup>3,4</sup>

During the outbreak of this infectious disease, fear may increase because of the emergence of extraordinary conditions; rumors and poor information regarding a disease outbreak in social networks may also worsen the situation.<sup>5</sup> During the recent COVID-19 pandemic, more than 50% of the general population rated the psychological impact of the outbreak as moderate or severe.<sup>6</sup> Because of the emergence of COVID-19, hospitals were overwhelmed with suspected cases and this led to field hospitals being set up by governments in some cities. Because of the insufficient number of healthcare providers (HCPs) and the large number of patients, the leaves of many members of medical staffs were canceled, and some medical service providers were given extended shifts.

HCPs are among the most vulnerable groups for psychiatric problems, and they need special consideration to cope with the emerging challenges in their workplace.<sup>7,8</sup> In similar infectious disease outbreaks, HCPs have experienced disaster-related psychological distress and other adverse events,<sup>9-12</sup> which have been shown to be prevented or at least minimized after comprehensive programs to help HCPs were applied.<sup>13,14</sup> Previous research has shown that occupational stress caused by overworking, a lack of facilities, and a lack of social support are negatively correlated with the quality of life among nurses.<sup>15</sup> As the recent outbreak has highlighted the fragility of psychological resilience, attention must be given to the psychological state of healthcare workers during the COVID-19 pandemic.<sup>16</sup>

Unfortunately, the lack of evidence-based data on the management of pregnant patients infected with COVID-19<sup>17</sup> has induced feelings of helplessness and hopelessness for most HCPs, which can potentially affect their life quality. Caring for pregnant women infected with COVID-19 exerts an additional stress on obstetrics staff members because of the possible associations of COVID-19 infection with maternal morbidity and mortality. Moreover, the unknown impact of the virus on fetal development and the possibility of vertical transmission of the virus to the fetus are other worrisome problems for obstetricians.<sup>18,19</sup> The mental health of obstetrics HCPS is one of the most important issues in the COVID-19 outbreak because HCPs suffering from psychological distress are at higher risk for medical error and the subsequent diminished quality of services given to pregnant women, who are of special concern.

The majority of research on COVID-19 infection has been focused on screening and treatment methods; only

a few studies have evaluated the effects of the COVID-19 outbreak on the mental health and life quality of HCPs. The current study aimed to compare the perceived social support, quality of life, and depression status of obstetrics HCPS caring for both COVID-19 positive and negative pregnant women in eight different cities in Iran.

## Materials and Methods

### Ethics Statement

This study was conducted according to the ethical standards of Shiraz Medical University (Ethics code: IR.SUMS.REC.1398.1397). Participants were allowed to refuse to participate with no problems or considerations. In the first page of the online questionnaire (at <https://porsline.ir>), study participants were asked to give consent to participate before being guided to the questionnaire; only after participants gave informed consent were able to continue to the next pages.

### Study Design and Population

This cross-sectional multicenter study took place 3 weeks after the first COVID-19 case in Iran was reported on February 19, 2020. A total of 599 HCPs working in obstetrics wards in eight different cities in Iran who were assigned to care for pregnant women suspected of or confirmed as being infected with COVID-19.

The current study designated three different zones in Iran. The red zone refers to cities that have had pregnant women with confirmed COVID-19 infection admitted to hospitals and in direct contact with the obstetrics staff (Tehran, Rasht, and Isfahan). The yellow zone refers to the cities in which obstetrics staff members were in touch with suspected but unconfirmed cases (Bandar Abbas, Kerman, Kermanshah), and the green zone refers to cities in which no suspected or confirmed COVID-19 cases were admitted to hospitals during the study period (Shiraz and Ahvaz).

### Inclusion/Exclusion Criteria

This study enrolled HCPs (physicians, nurses, and midwives) from obstetrics wards who were assigned to care for pregnant women either suspected or confirmed of being infected with COVID-19. All participants had at least 2 shifts weekly (16 h) and were actively engaged in the management of pregnant women either confirmed or suspected of COVID-19 infection during the study period. Any staff member who could not access the Internet to

complete the online questionnaire or who was unable to complete the self-report questionnaire was excluded from the study.

## Diagnosis of the Pregnant Women with COVID-19 Infection

Information about pregnant women either infected with or suspected of having COVID-19 in each city of Iran was obtained from the Iranian Ministry of Health. Confirmed or suspected COVID-19 pneumonia cases in pregnant women were diagnosed according to the interim guidance by the Centers for Disease Control and Prevention (CDC). Pregnant women with fever and signs and symptoms of a lower respiratory tract infection and women with fever or signs and symptoms of a lower respiratory tract infection plus a positive history for traveling to high-risk geographical areas or a history of close contact with a confirmed COVID-19 case within 14 days were isolated immediately in well-ventilated units, and HCPs were provided with face masks and gloves. Specimens for confirmation of COVID-19 infection were collected by nasopharyngeal swap, and then pregnant patients were admitted to hospitals equipped with obstetrics units. Additional personal protective equipment (PPE) (eg, N95 respirators, gowns, face shields) were given to HCPs who were in close contact with confirmed cases of COVID-19 infection.

## Data Collection

Data were collected by the online questionnaire available in the form of Porsline, an online questionnaire software in Iran (<https://porsline.ir>). First, the questionnaire was sent to some of the participants in one of the target centers to obtain feedback regarding the clarity of the questions. Then, it was sent to all participants on social network (WhatsApp and Telegram). The questionnaires were returned automatically upon completion by each participant. All completed questionnaires were received between March 9, 2020 and March 16, 2020.

## Measurement of Depression

The Patient Health Questionnaire-9 (PHQ-9) was used to measure depression scores in this study. This questionnaire contains nine simple and easy-to-answer questions scored as 0 (not at all), 1 (several days), 2 (more than half of the days), or 3 (every day). Total possible score ranged from 0 to 27. The levels of depression of the participants were

categorized as severe (score of 20 or higher), moderate to severe (score of 15–19), mild to moderate (score of 10–14), mild (score of 5–9), and normal (score below 5). The reliability and validity of this survey in epidemiological research were previously demonstrated in an Iranian population.<sup>20</sup>

## Measurement of Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess the sufficiency of each participant's social support. This questionnaire contained 12 items scored from 1 (very strongly disagree) to 7 (very strongly agree). These items evaluated family, friends, and other types of social support. A total final score from 1 to 2.9, from 3 to 5, or from 5.1 to 7 was considered as a low, moderate, or high level of perceived social support, respectively.<sup>21</sup> Previous research has confirmed the validity and reliability of this scale in the Iranian population.<sup>22</sup>

## Measurement of Quality of Life

The Short Form-36 (SF-36) survey was used to evaluate quality of life. This survey had 36 items for evaluating the status of the two main aspects of physical and mental health. The main aspect of physical health had 4 subgroups, ie, physical functioning, pain, general health, and limitations due to physical health, and limitations due to emotional problems, emotional well-being, social functioning, and energy/fatigue were the subgroups included in the mental health aspect of quality of life. The parts assessing physical and mental health were scored separately from 0 to 100. Lower scores indicated severe impairment and higher scores represented better functions in each item. The Persian Version of the SF-36 Quality of Life Index has been shown to be a reliable and valid measurement tool in Iranian populations.<sup>23</sup>

## Statistical Analysis

All statistical analyses were conducted using SPSS version 20.0 (IBM, Armonk, NY, USA). Data are presented as number and percentage (%), mean and (SD), or median (interquartile range) as appropriate. One-way ANOVA, Chi-square, and Kruskal Wallis tests were used to compare categorical or continuous variables (outcome measures). Additionally, the Spearman test was applied to evaluate the relationship between depression, perceived social support, and quality of life domains. A p-value less than 0.05 was interpreted as statistically significant.

## Results

### Demographic Characteristics

As shown in Table 1, 599 female HCPs, including 275 (45.9%) nurses/midwives, 194 (32.4%) obstetrics and gynecology (OB & GYN) specialists, and 130 (21.7%) resident physicians/medical students who were practicing in maternity units during the study period completed this survey. The majority of participants 251 (41.9%) were in the 30–40-year-old age group. A total of 253 (42.2%) participating HCPs had major roles in the diagnosis, treatment, or care of patients with documented COVID-19 infection. Furthermore, 240 (40.1%) HCPs had no direct contact with COVID-19 patients, and 106 (17.7%) of the total study population had close contact with suspected COVID-19 patients; they were categorized as the unknown group in this study.

### Evaluation of Depression, Perceived Social Support, and Quality of Life Among HCPs of Obstetrics Wards

Table 2 shows the results of the comparison of the PHQ, perceived social support, and quality of life scores among HCPs according to their contact status with COVID-19 patients. The mean (SD) of PHQ depression scores for maternity unit HCPs from red (direct contact), green (no contact) and yellow (unknown) zones were 8.3 (6.2), 8.3 (6.0), and 7.2 (5.7), respectively, which showed no statistically significant difference ( $p=0.254$ ). Compared with

HCPs who had no direct contact with COVID-19 patients (green zone) or their contact was unknown (yellow zone), those in the direct contact group (red zone) had higher scores of family support (median [IQR]: 5.7 [5.1–6.5],  $p=0.015$ ). There were no statistically significant differences among HCPs groups based on COVID-19 contact status for scores of friend support ( $p=0.72$ ); however, in terms of other types of social support, HCPs in the yellow zone had significantly higher scores as compared to the other two groups (median [IQR]: 5.7 [5.1–6.5],  $p=0.015$ ). HCPs from the yellow zone had significantly higher scores in two domains of quality of life when compared to their counterparts in the red and green zones: limitations due to physical health (median [IQR]: 75 [50–100],  $p=0.002$ ) and limitations due to emotional problems (median [IQR]: 83.3 [33.3–100],  $p=0.015$ ). There were no significant differences among the study groups in other domains of quality of life, including physical functioning, energy/fatigue, emotional well-being, social functioning, pain, and general health (Table 2).

As shown in Table 3, similar analyses were performed according to the profession of the HCPs. HCPs were divided into 3 groups of OB/GYN specialists, resident physicians/medical students, and nurses/midwives. There was no significant difference among these groups in terms of total PHQ and perceived social support scores ( $p>0.05$ ). Furthermore, OB/GYN specialists had significantly higher social functioning (median [IQR]: 62.5 [50–87.5]) and general health scores (median [IQR]: 85 [60–95]) when compared to the other study groups ( $p=0.003$  and  $p=0.002$ , respectively).

**Table 1** Characteristics of 599 Studied Participants

| Age (Years)  | Number (%) |
|--|------------|
| 20–30  | 157 (26.2) |
| 30–40  | 251 (41.9) |
| 40–50  | 130 (21.7) |
| ≥ 50   | 61 (10.2)  |
| <b>Profession</b>  |            |
| Obstetrics and gynecology specialist                     | 194 (32.4) |
| Resident physician/medical student                       | 130 (21.7) |
| Nurse/Midwife  | 275 (45.9) |
| <b>Marital status</b>                                    |            |
| Married  | 433 (72.3) |
| Single   | 166 (27.7) |
| <b>Close contact with confirmed patients with COV-19</b> |            |
| Yes  | 253 (42.2) |
| No   | 240 (40.1) |
| Unknown  | 106 (17.7) |

### Correlation Analysis Between Depression and Quality of Life with Social Support

The correlations between depression and perceived social support and the domains of quality of life are shown in Table 4. The results showed that depression was negatively correlated with most domains of quality of life, regardless of the COVID-19 contact status of HCPs. Family support, friend support, and significant other social support were positively correlated with some domains of quality of life, such as physical functioning, energy/fatigue, and emotional well-being, in both groups from the red and green zones. Family support and friend support also seemed to be positively correlated with general health. None of the perceived social support factors seemed to be significantly correlated with quality of life in the unknown contact group. The same correlation analysis was conducted based on the profession of HCPs, and the



**Table 2** Comparison of Depression, Perceived Social Support and Quality of Life in Participants by Contact Status

|                                       | Close Contact with Confirmed Patients with COVID-19 |                 |                       | P-value |
|---------------------------------------|---|-----------------|-----------------------|---------|
|                                       | Yes (Red Zone)                                      | No (Green Zone) | Unknown (Yellow Zone) |         |
| PHQ total score                       | 8.3 ± 6.2   | 8.3 ± 6.0       | 7.2 ± 5.7             | 0.254   |
| <b>Depression</b>                     |   |                 |                       |         |
| Normal                                | 82 (33.3)   | 74 (32.3)       | 36 (36)               | 0.782   |
| Minimal Symptom                       | 74 (3.1)  | 70 (30.6)       | 35 (35)               |         |
| Minor depression                      | 47 (19.1)   | 54 (23.6)       | 17 (17)               |         |
| Major depression (moderately severe)  | 27 (11)   | 20 (8.7)        | 8 (8)                 |         |
| Major depression (severe)             | 16 (6.5)  | 11 (4.8)        | 4 (4)                 |         |
| <b>Perceived social support</b>       |   |                 |                       |         |
| Family support                        | 5.7 [5.1–6.5]                                       | 5.5 [4.8–6]     | 5.5 [5–6.2]           | 0.015   |
| Friend support                        | 5.7 [4.7–6.2]                                       | 5.5 [4.5–6]     | 5.5 [5–6]             | 0.072   |
| Other types of social support         | 5.7 [5.2–6.5]                                       | 5.5 [5–6.2]     | 6 [5.2–6.5]           | 0.023   |
| <b>Quality of life</b>                |   |                 |                       |         |
| <b>Physical aspect</b>                |   |                 |                       |         |
| Physical functioning                  | 90 [80–100]   | 90 [78.7–100]   | 90 [80–100]           | 0.709   |
| Limitations due to physical health    | 50 [25–100]   | 50 [25–100]     | 75 [50–100]           | 0.002   |
| Pain                                  | 80 [55–100]   | 8 [55–100]      | 90 [65–100]           | 0.198   |
| General health                        | 75 [55–90]  | 75 [55–90]      | 70 [60–85]            | 0.947   |
| <b>Mental aspect</b>                  |   |                 |                       |         |
| Social functioning                    | 53 [37–75]  | 53 [37–75]      | 62.5 [37.5–75]        | 0.716   |
| Energy/fatigue                        | 55 [40–70]  | 55 [45–70]      | 60 [45–71.2]          | 0.427   |
| Emotional well-being                  | 60 [44–72]  | 60 [44–73]      | 60 [51–76]            | 0.543   |
| Limitations due to emotional problems | 33.3 [33.3–100]                                     | 33.3 [0–100]    | 83.3 [33.3–100]       | 0.015   |

**Notes:** Data are mean ± SD, number (%), or median (IQR); P-values calculate by One way of ANOVA, Chi-square test or Kruskal Wallis Test.

results are shown in Table 5. Similarly, depression was negatively correlated with quality of life in all groups. Additionally, perceived social support had significant correlations with some domains of quality of life, which are detailed in Table 5.

## Discussion

To the best of our knowledge, this study is the first of its kind to focus on the mental health, quality of life, and perceived social support of HCPs working in obstetrics wards during the recent COVID-19 outbreak.

Maternal and neonatal health, the charge of obstetrics HCPs, are two of the most important community health indicators worldwide. Today, the mental health of HCPs has been significantly affected by COVID-19 outbreak in various aspects. A recent survey reported an increased risk of depression, anxiety, and insomnia especially among female HCPs during the COVID-19 emergence, prompting psychological preventive measures or interventions.<sup>8</sup>

Liu et al showed that medical staff members in China who had close contact with COVID-19 patients had much higher levels of anxiety and depression when compared with their counterparts who had no contact. Close contact with COVID-19 patients was also shown to negatively affect the medical staff's quality of life.<sup>14</sup> In contrast, a recent study conducted in Singapore found that there was higher prevalence of anxiety among non-medical healthcare workers without direct contact compared to medical personnel who might have direct contact with COVID-19 cases. The contradictory findings in Singapore could be due to the fact that COVID-19 was a less severe problem in Singapore as compared to China, and frontline healthcare workers encountered lower levels of anxiety and depression.<sup>24</sup> In another study by Xiao et al<sup>25</sup> conducted during the COVID-19 pandemic, it was shown that medical staff's social support level was positively associated with self-efficacy and quality of sleep; however, it had a negative association with stress and anxiety.

In the current study, the average PHQ depression scores for obstetrics HCPs with direct, no direct, and

**Table 3** Comparison of Depression, Perceived Social Support and Quality of Life in Participants by Profession of HCPs

|                                       | <b>Obstetrics and Gynecology Specialist</b> | <b>Resident Physician/Medical Student</b> | <b>Nurse/Midwife</b> | <b>P-value</b> |
|---------------------------------------|---|---|----------------------|----------------|
| PHQ total score                       | 7.4 ± 5.7                                   | 8.6 ± 6.8                                 | 9.0 ± 6.2            | 0.166          |
| <b>Depression</b>                     |   |   |                      |                |
| Normal                                | 44 (45.8)                                   | 13 (27.7)                                 | 25 (24.3)            | 0.074          |
| Minimal Symptom                       | 22 (22.9)                                   | 16 (34)                                   | 36 (35)              |                |
| Minor depression                      | 18 (18.8)                                   | 9 (19.1)                                  | 20 (19.4)            |                |
| Major depression (moderately severe)  | 8 (8.3)                                     | 4 (8.5)                                   | 15 (14.6)            |                |
| Major depression (severe)             | 4 (4.2)                                     | 5 (10.6)                                  | 7 (6.8)              |                |
| <b>Perceived social support</b>       |   |   |                      |                |
| Family support                        | 5.7 [5–6.5]                                 | 5.7 [5–6.4]                               | 5.7 [5.2–6.5]        | 0.940          |
| Friend support                        | 5.7 [5–6.2]                                 | 5.5 [4.5–6.2]                             | 5.7 [4.7–6.5]        | 0.418          |
| Other types of social support         | 5.7 [5.1–6.5]                               | 5.7 [5.2–6.5]                             | 6 [5.3–6.5]          | 0.633          |
| <b>Quality of life</b>                |   |   |                      |                |
| <b>Physical aspect:</b>               |   |   |                      |                |
| Physical functioning                  | 90 [80–100]                                 | 95 [87.5–100]                             | 90 [75–100]          | 0.050          |
| Limitations due to physical health    | 75 [25–100]                                 | 50 [25–87.5]                              | 50 [25–70]           | 0.476          |
| Pain                                  | 90 [55–100]                                 | 80 [51.2–100]                             | 75 [55–100]          | 0.300          |
| General health                        | 85 [60–95]                                  | 65 [55–85]                                | 70 [55–80]           | 0.002          |
| <b>Mental aspect:</b>                 |   |   |                      |                |
| Social functioning                    | 62.5 [50–87.5]                              | 50 [37.5–62.5]                            | 50 [37.5–62.5]       | 0.003          |
| Energy/fatigue                        | 60 [45–70]                                  | 50 [32.5–67.5]                            | 50 [35–70]           | 0.182          |
| Limitations due to emotional problems | 66.7 [33.3–100]                             | 33.3 [33.3–100]                           | 50 [0–100]           | 0.827          |
| Emotional well-being                  | 68 [44–76]                                  | 56 [40–72]                                | 56 [44–72]           | 0.208          |

**Notes:** Data are mean ± SD, number (%), or median (IQR); P-values calculate by One way of ANOVA, Chi-square test or Kruskal Wallis Test.

unknown contacts with pregnant women infected with COVID-19 had no statistically significant differences. However, the correlation analysis results showed that the depression score was negatively correlated with most domains of quality of life regardless of the contact status of HCPs.

The current results also revealed that HCPs with an unknown contact status had higher scores of limitations due to physical health and due to emotional problems as compared to their counterparts with or without direct contact. During the COVID-19 outbreak in Iran, the shortage of masks and other PPEs was among the main causes of distress for HCPs all over the country. In this critical situation, HCPs who had close contact with confirmed COVID-19 cases received all the required advanced PPEs, while those with no direct or unknown contact received only surgical masks and gloves. Therefore, the lack of PPEs for those HCPs who had contact with suspected cases may have led to higher limitations due to physical health and emotional problems, because this group of HCPs were worried about the contagiousness of

the disease and perceived themselves to be more susceptible to COVID-19 infection.

The results of the current study further showed that OB/GYN specialists had higher social functioning and general health scores when compared to resident physicians/medical students and nurses/midwives. Routinely in Iran's teaching hospitals, resident physicians, medical students, nurses and midwives are the first line of contact with patients. Screening, admitting, and isolating the COVID-19-infected pregnant women were done mostly by the first-line HCPs before OB/GYN specialists were exposed to the patients. Thus, first-line residents/students or nurses may have additional stress and fear of facing unknown conditions compared to specialists. It seems that the better social functioning and general health scores of the gynecology specialists were related to this point.

In line with a previous survey reporting that high-perceived social support among HCPs was positively correlated with their mental health status during the COVID-19 outbreak,<sup>14</sup> the current findings indicated that family support, friend support, and other types of social support

**Table 4** Correlation Analysis Between Depression and Quality of Life with Social Support in Participants by Contact with COVID-19 Patient

| Quality of Life                       | Contact with COVID-19 (Red Zone) |                |                |                        |            | No Contact with COVID-19 (Green Zone) |                |                        |            |                | Unknown Contact with COVID-19 (Yellow Zone) |                        |            |                |                |                        |
|---------------------------------------|----------------------------------|----------------|----------------|------------------------|------------|---------------------------------------|----------------|------------------------|------------|----------------|---|------------------------|------------|----------------|----------------|------------------------|
|                                       | Depression                       | Family Support | Friend Support | Other Types of Support | Depression | Family Support                        | Friend Support | Other Types of Support | Depression | Family Support | Friend Support                              | Other Types of Support | Depression | Family Support | Friend Support | Other Types of Support |
| <b>Physical aspect:</b>               |                                  |                |                |                        |            |                                       |                |                        |            |                |   |                        |            |                |                |                        |
| Physical functioning                  | -0.368**                         | 0.191**        | 0.138*         | 0.153*                 | -0.279**   | 0.211**                               | 0.183**        | 0.235                  | -0.516**   | 0.172          | 0.202*                                      | 0.166                  |            |                |                |                        |
| Limitations due to physical health    | -0.437**                         | 0.144*         | 0.115          | 0.097                  | -0.453**   | 0.111                                 | 0.096          | -0.033                 | -0.458**   | -0.065         | -0.111                                      | -0.013                 |            |                |                |                        |
| Pain                                  | -0.406**                         | 0.125          | 0.113          | 0.093                  | -0.421**   | 0.245**                               | 0.250**        | 0.19**                 | -0.419**   | -0.007         | 0.052                                       | 0.067                  |            |                |                |                        |
| General health                        | -0.481**                         | 0.178**        | 0.151*         | 0.142                  | -0.451**   | 0.239**                               | 0.220**        | 0.132                  | -0.403**   | 0.053          | 0.187                                       | 0.196                  |            |                |                |                        |
| <b>Mental aspect:</b>                 |                                  |                |                |                        |            |                                       |                |                        |            |                |   |                        |            |                |                |                        |
| Emotional well-being                  | -0.728**                         | 0.196**        | 0.211**        | 0.160*                 | -0.719**   | 0.342**                               | 0.320**        | 0.230**                | -0.664**   | 0.161          | 0.191                                       | 0.141                  |            |                |                |                        |
| Social functioning                    | -0.396**                         | 0.091          | 0.113          | 0.101                  | -0.334**   | 0.120                                 | 0.069          | -0.062                 | -0.194     | 0.055          | 0.058                                       | -0.003                 |            |                |                |                        |
| Energy/fatigue                        | -0.762**                         | 0.21**         | 0.230**        | 0.150*                 | -0.732**   | 0.344**                               | 0.315**        | 0.252**                | -0.663**   | 0.036          | 0.075                                       | 0.050                  |            |                |                |                        |
| Limitations due to emotional problems | -0.498**                         | 0.138*         | 0.120          | 0.169**                | -0.445**   | 0.170*                                | 0.162*         | 0.021                  | -0.496**   | -0.058         | -0.094                                      | 0.033                  |            |                |                |                        |

Notes: \*P-values < 0.05; \*\*P-values < 0.01.

**Table 5** Correlation Analysis Between Depression and Quality of Life with Social Support in Participants by Their Profession

| Quality of Life                       | Obstetrics and Gynecology Specialist |                |                |                        |            | Resident Physician/Medical Student |                |                        |            |                | Nurse/Midwife  |                        |            |                |                |                        |
|---------------------------------------|--------------------------------------|----------------|----------------|------------------------|------------|------------------------------------|----------------|------------------------|------------|----------------|----------------|------------------------|------------|----------------|----------------|------------------------|
|                                       | Depression                           | Family Support | Friend Support | Other Types of Support | Depression | Family Support                     | Friend Support | Other Types of Support | Depression | Family Support | Friend Support | Other Types of Support | Depression | Family Support | Friend Support | Other Types of Support |
| <b>Physical aspect:</b>               |                                      |                |                |                        |            |                                    |                |                        |            |                |                |                        |            |                |                |                        |
| Physical functioning                  | -0.281**                             | 0.184          | 0.139          | 0.160                  | -0.569**   | 0.405**                            | 0.252          | 0.403**                | -0.369**   | 0.132          | 0.122          | 0.064                  |            |                |                |                        |
| Limitations due to physical health    | -0.452**                             | 0.163          | 0.119          | 0.152                  | -0.532**   | 0.079                              | 0.178          | 0.233                  | -0.370**   | 0.172          | 0.063          | 0.002                  |            |                |                |                        |
| Pain                                  | -0.282**                             | 0.128          | 0.119          | 0.060                  | -0.566**   | 0.272                              | 0.146          | 0.313*                 | -0.416**   | 0.080          | 0.081          | 0.050                  |            |                |                |                        |
| General health                        | -0.572**                             | 0.265*         | 0.225*         | 0.228*                 | -0.495**   | 0.107                              | 0.074          | 0.258                  | -0.360**   | 0.127          | 0.079          | 0.036                  |            |                |                |                        |
| <b>Mental aspect:</b>                 |                                      |                |                |                        |            |                                    |                |                        |            |                |                |                        |            |                |                |                        |
| Emotional well-being                  | -0.705**                             | 0.362**        | 0.283**        | 0.207*                 | -0.734**   | 0.283                              | 0.162          | 0.448**                | -0.728**   | 0.005          | 0.138          | -0.018                 |            |                |                |                        |
| Social functioning                    | -0.261*                              | 0.101          | 0.047          | 0.074                  | -0.387**   | 0.235                              | 0.199          | 0.219                  | -0.428**   | 0.024          | 0.089          | 0.128                  |            |                |                |                        |
| Energy/fatigue                        | -0.774**                             | 0.309**        | 0.228*         | 0.103                  | -0.746**   | 0.430**                            | 0.323*         | 0.573**                | -0.737**   | 0.027          | 0.150          | 0.004                  |            |                |                |                        |
| Limitations due to emotional problems | -0.553**                             | 0.239*         | 0.139          | 0.222*                 | -0.445**   | 0.050                              | 0.146          | 0.298*                 | -0.474**   | 0.106          | 0.086          | 0.089                  |            |                |                |                        |

Notes: \*P-values < 0.05; \*\*P-values < 0.01.

were positively correlated with some domains of quality of life, such as physical functioning, energy/fatigue, and emotional well-being in HCPs.

The main limitation of this study lies in the fact that data on quality of life, perceived social support, or depression status of HCPs before the COVID-19 outbreak was not available. Thus, this study was unable to determine whether or not the disease outbreak has changed baseline scores.

## Conclusion

The results of this study showed that depression and perceived social support can significantly affect the quality of life among obstetrics HCPs, regardless of their contact with COVID-19 patients. Hence, it seems that HCPs' mental health during the COVID-19 pandemic must be considered, and psychological support may improve their mental health and indirectly improve the quality of maternal health.

## Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. Also, the individual deidentified participant data is available after contacting the corresponding author via email. The data will be available immediately following publication without end date.

## Author Contributions

All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare no conflicts of interest in this work.

## References

- Phelan AL, Katz R, Gostin LO. The novel coronavirus originating in Wuhan, China: challenges for global health governance. *JAMA*. 2020;323(8):709–710. doi:10.1001/jama.2020.1097
- Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med*. 2020;382:1199–1207. doi:10.1056/NEJMoa2001316
- Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, evaluation and treatment coronavirus (COVID-19). In: *StatPearls [Internet]*. StatPearls Publishing; 2020.
- Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). *Int J Surg*. 2020.
- Ren S-Y, Gao R-D, Chen Y-L. Fear can be more harmful than the severe acute respiratory syndrome coronavirus 2 in controlling the corona virus disease 2019 epidemic. *World J Clin Cases*. 2020;8(4):652. doi:10.12998/wjcc.v8.i4.652
- Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health*. 2020;17(5):1729. doi:10.3390/ijerph17051729
- Kim MS, Kim T, Lee D, et al. Mental disorders among workers in the healthcare industry: 2014 national health insurance data. *Ann Occup Environ Med*. 2018;30:31. doi:10.1186/s40557-018-0244-x
- Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*. 2020;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976
- Koh D, Lim MK, Chia SE, et al. Risk perception and impact of Severe Acute Respiratory Syndrome (SARS) on work and personal lives of healthcare workers in Singapore: what can we learn? *Med Care*. 2005;43(7):676–682. doi:10.1097/01.mlr.0000167181.36730.cc
- Lehmann M, Bruenahl CA, Lowe B, et al. Ebola and psychological stress of health care professionals. *Emerg Infect Dis*. 2015;21(5):913–914. doi:10.3201/eid2105.141988
- McAlonan GM, Lee AM, Cheung V, et al. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry*. 2007;52(4):241–247. doi:10.1177/070674370705200406
- Park JS, Lee EH, Park NR, Choi YH. Mental health of nurses working at a government-designated hospital during a MERS-CoV outbreak: a cross-sectional study. *Arch Psychiatr Nurs*. 2018;32(1):2–6. doi:10.1016/j.apnu.2017.09.006
- Chen R, Chou KR, Huang YJ, Wang TS, Liu SY, Ho LY. Effects of a SARS prevention programme in Taiwan on nursing staff's anxiety, depression and sleep quality: a longitudinal survey. *Int J Nurs Stud*. 2006;43(2):215–225. doi:10.1016/j.ijnurstu.2005.03.006
- Liu X, Shao L, Zhang R, et al. *Perceived Social Support and Its Impact on Psychological Status and Quality of Life of Medical Staffs After Outbreak of SARS-Cov-2 Pneumonia: A Cross-Sectional Study*. 2020.
- Hamaideh SH. Occupational stress, social support, and quality of life among Jordanian mental health nurses. *Issues Ment Health Nurs*. 2011;33(1):15–23. doi:10.3109/01612840.2011.605211
- Ho CS, Chee CY, Ho RC. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. *Ann Acad Med Singapore*. 2020;49(1):1–3.
- Luo Y, Yin K. Management of pregnant women infected with COVID-19. *Lancet Infect Dis*. 2020;20(5):513–514. doi:10.1016/S1473-3099(20)30191-2
- Rasmussen SA, Smulian JC, Lednický JA, Wen TS, Jamieson DJ. Coronavirus disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol*. 2020.
- Schwartz DA, Graham AL. Potential maternal and infant outcomes from (Wuhan) coronavirus 2019-nCoV infecting pregnant women: lessons from SARS, MERS, and other human coronavirus infections. *Viruses*. 2020;12(2):194. doi:10.3390/v12020194
- Dadfar M, Kalibatseva Z, Lester D. Reliability and validity of the Farsi version of the Patient Health Questionnaire-9 (PHQ-9) with Iranian psychiatric outpatients. *Trends Psychiatry Psychother*. 2018;40(2):144–151. doi:10.1590/2237-6089-2017-0116



21. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *J Pers Assess.* 1988;52(1):30–41. doi:10.1207/s15327752jpa5201\_2
22. Bagherian-Sararoudi R, Hajian A, Ehsan HB, Sarafraz MR, Zimet GD. Psychometric properties of the persian version of the multidimensional scale of perceived social support in iran. *Int J Prev Med.* 2013;4(11):1277–1281.
23. Rafei N, Sharifian Sani M, Rafiey H, Behnampour N, Foroozesh K. Reliability and validity of Persian version of. *J Mazandaran Univ Med Sci.* 2014;24(116):75–83.
24. Tan BY, Chew NW, Lee GK, et al. Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Ann Intern Med.* 2020. doi:10.7326/M20-1083
25. Xiao H, Zhang Y, Kong D, Li S, N Y. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Med Sci Monit.* 2020;26:e923549–923541. doi:10.12659/MSM.923921

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