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CHANGES IN SLEEP IN PREGNANT WOMEN DURING COVID-19 PANDEMIC

Ruris Haristiani[1]*, Nur Al Marwah Asrul[2], Yusmar Yusuf[3]
[1]Faculty of Nursing, Universitas Jember, Jl. Kalimantan Tegalboto No.37, Krajan Timur, Sumbersari, Kec. Sumbersari, Kabupaten Jember, Jawa Timur 68121, Indonesia
[2]Medical and Health Sciences Faculty, Universitas Islam Negeri Alauddin Makassar, Jl. Sultan Alauddin No.63, Romangpolong, Kec. Somba Opu, Kabupaten Gowa, Sulawesi Selatan 92113, Indonesia
[3]Faculty of Teacher Training and Education, Universitas Khairun, Jl. Pertamina Kampus II Unkhair Gambesi Kota Ternate, Maluku Utara 97711, Indonesia
*rurisharistiani@unej.ac.id

ABSTRAK

Covid-19 Pandemic has an impact on human health and wellbeing. Psychological distress and changes in routine during lockdown led to changes in sleep habits and sleep quality. This systematic review aimed to examine pregnant women's sleep change during the Covid-19 outbreak. In December 2021, there were six electronic databases for articles published by 2019 (the first covid-19 outbreak) to 2021 (PubMed, Research Gate, Science Direct, ProQuest, Sage, and Google scholar). The search yielded 1846 unique articles, 6 of which were eligible. Most of the articles did observations, interviews, and questionnaires on pregnant women. Of six works of literature selected, four indicated a positive correlation between the pandemic Covid-19 and sleep disorders in pregnant women, while two suggested the opposite results. Sleep changes experienced were varied, such as getting late bedtime, shortening in sleep duration, worsening sleep quality, and even respondents who rarely sleep.

Keywords: covid-19 pandemic; pregnant women: sleep changes

INTRODUCTION

In late December 2019, a progression of pneumonia cases of obscure reason arose in Wuhan (Hubei, China) (Gennaro et al., 2020). The illness emerging from SARS-CoV-2 disease later spreads quickly, causing an overall pandemic. By March 11th, 2020, the WHO proclaimed the pandemic status when the number of nations included was 114, with more than 118,000 cases and more than 4000 cases of death (WHO,2020). The world is affected by Coronavirus Disease 19 (COVID-19), and it is not over yet. This condition has a negative impact on human health and wellbeing. Psychological distress and related symptoms such as stress, panic and anxiety were found in the general population during the period of a health crisis (Marzouqi et al., 2021). Quarantine and social distancing have been shown to contribute to anger, feelings of confusion, and stress. Moreover, it may reduce an individual's sense of safety and social support (Werner et al., 2020). These conditions may lead to changes in sleep patterns related to anxiety and depression.

Increased sleep disturbances (both quality and quantity) and characteristic sleep changes were observed among global communities (Gupta & Pandi-Perumal, 2020). A study from Morocco reported a high prevalence of anxiety, depression, and sleep disturbances during lockdown (Janati et al., 2020). In the general population in India, it was reported the delay in bedtime and wake-time along with a reduction in total time spent in sleep during the night (Gupta & Pandi-Perumal, 2020). The potential impact of the COVID-19 pandemic on mental health should not be neglected, especially in vulnerable populations (Ceulemans et al., 2021). According to the World Health Organization, approximately 10% of pregnant women experience a mental disorder, primarily depression (Bertolote, 2008)

Pregnant women face numerous life changes that make them particularly vulnerable to mental health disorders and face a life where sleep and psychological health such as anxiety, stress and depression often interact. These may lead to physical consequences (e.g., disturbed metabolism, immunity suppression). A study by Miguel found that difficulties initiating sleep were strongly associated with the presence of both anxiety and depression symptoms (Meira e Cruz & Sweetman, 2021).

A study In 2016 revealed that high levels of stress, anxiety and depression were identified among women at risk of becoming infected with the Zika virus in Brazil and Puerto Rico (Tucci et al., 2017). Meanwhile, in the COVID-19 pandemic, maternal distress might be compounded by concerns and fears regarding the risk of infection or hospitalization due to COVID-19 (Ceulemans et al., 2021). The need to access perinatal care continues amidst the call for social distancing, anticipation of visitor and birth support person(s) restrictions, and potential separation of the mother from the baby in cases of severe infection. These factors can contribute to acute episodes of anxiety and depression in pregnant women (Werner et al., 2020).

The frequent anxieties associated with a birth increase in the face of the added stress and threat of COVID-19 since Anxiety and depression are also powerful psychological mechanisms that may impact sleep physiology (Meira e Cruz & Sweetman, 2021). A recent study by Lin and colleagues reported a strong association between sleep disturbance, anxiety, and depressive symptoms among pregnant women during the COVID-19 pandemic (Lin et al., 2021). There have been limited studies on the impact of this pandemic to sleep disturbances in pregnant women during the pandemic; however, this study will pay attention to how pandemic Covid-19 has affected sleep patterns in pregnant women.

METHOD

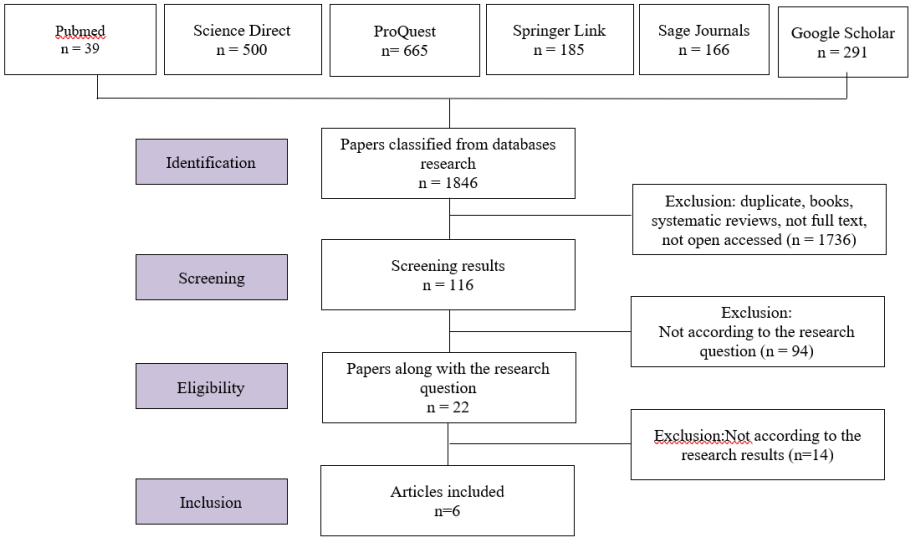
This systematic review is a study design that permits the analysis of facts in the literature systematically and reveals scientific results provided by other authors. This study pointed out a narrative review to portray current literature on sleep patterns in pregnant women during the Covid-19 outbreak. A review of the literature was undertaken using the electronic databases: PubMed, Research Gate, Science Direct, ProQuest, Sage, and Google Scholar. The following inclusion criteria of studies have been defined: published incomplete text, electronically available in English. The results were correlated to aspects of sleep disturbances in pregnant women during Covid-19. However, we excluded editorials, letters to the editors, theses, reports of experience, and reflective studies. Besides, this literature review is limited from 2019 (the first covid-19 outbreak) to 2021.

The following keywords; sleep disturbance OR sleep habit OR sleep pattern AND Covid-19 OR coronavirus AND pregnant women OR maternal women were used in databases. The search engine obtained 1846 articles published based on the keywords used. However, we excluded titles that did not match the topic. In the end, we used a total of six articles as references because these articles meet the inclusion criteria. The questions used to review the journal have been adjusted to the PICOT method, where each question has a P = population; in this study, the researcher used pregnant women as the population. I = intervention, researchers examine what happens during the Covid-19 pandemic. C = comparative control/intervention, the researcher did not use comparative intervention or control in his research. T = time; the researchers used the time of the COVID-19 global pandemic as time in the research review of the journal. Researchers took all the research designs to examine what sporting activities were like during the COVID-19 pandemic.

Description of keywords used in the literature search using the PICOT method (patient, intervention, comparison and outcome)

PICO Component	
P	Pregnant Women OR Pregnancy OR Maternal Women
I	No Intervention in this literature review
C	No Comparison in this literature review
O	Sleep OR Sleep Habits OR Sleep Pattern OR Sleep Deprivation OR Sleep Behaviour OR Sleep Lack OR Sleep Disturbance
T	Covid 19 OR Covid OR Pandemc Covid-19 OR Coronavirus OR Coronavirus Disease

Below is the flow chart of citations that have been reviewed



RESULTS

There are six articles reviewed, of which four studies revealed that pandemic harms sleep while two studies showed a negative correlation respectively.

A study conducted by Wei Lin, et al. involving 751 pregnant women when the number of infected people rose rapidly in Shenzen, China, showed that the pandemic affected their lives. If we look into the result, almost one-fifth of participants slept after 00:00. More than 30% of the women experienced difficulty in falling asleep. Less than half of the participants reported excellent subjective sleep quality. The rest of them replied at an ordinary level. More than 10% complained of bad sleep quality, which these sleep variables found to be associated with anxiety symptoms statistically.

Another study to examine changes in lifestyle behaviours among pregnant women in the United States showed that there were 194 of 705 pregnant women experienced less sleep in the early of the COVID-19 pandemic. In comparison, the rest reported the same or more sleep. Relevant items hypothesized to have an association with health behaviours: loss of income, connection with communities, neighbours, family and friends, and social distancing practices were included in this study, while based on bivariate analysis, more robust social connections were associated with lower odds of reporting less sleep.

A cross-sectional survey study in the city of Ordu, the third-largest population in Turkey, was conducted from February to March 2021, when cases of COVID-19 infection were increasing

massively over this period. The results indicated that 314 (88.2 %) of 356 pregnant women reported mild sleepiness during severe sleepiness in 11.8% of the pregnant women. Even though high rates of sleepiness and anxiety were found in this study, we could not compare this finding with the pre-pandemic condition due to no data.

Yongjie Zhou conducted another study comparing sleep changes between pregnant and non-pregnant women using the insomnia severity index (ISI). Different results were found in previous articles on insomnia were more common in non-pregnant or control groups than in the pregnant group. This study also indicated a small percentage of pregnant women experienced symptoms of anxiety, depression and another physical discomfort. A study by Karen Matvienko, et. al; examined stress levels between pregnant women before and after covid-19 pandemic in Ireland. Even though the findings indicated significant decreases in pregnant women's perceived social support during the pandemic, there is no statistical difference between sleep changes in pregnant women the pre and after the Covid-19 pandemic. The last article reviewed is a study conducted by Johanna Pope.et.al., which examined prenatal stress, social support and health behaviours of 573 pregnant women. Almost half of the respondents reported sleeplessness which almost one third reported getting enough sleep sometimes, 14,7 % reported never getting enough sleep, and ten out of 573 experienced never getting sleep.

Table 1.
The Articles Reviewed

No	References	Title	Population	Design	Result and Conclusion
1	Wei Lin a, Bo Wu a, Bin Chen a, Guiying Lai a, Shengbin Huang b, Shaoli Li c, Kefu Liu c, Chuyan Zhong a, Weikang Huang a, Shixin Yuan d, Yueyun Wang a,	Sleep Conditions Associate with Anxiety and Depression Symptoms among Pregnant Women during the Epidemic of COVID-19 in Shenzhen	751 pregnant women in Shenzhen city	a cross-sectional survey	Most of participants (71.4%) went to bed before 00:00, the rest of them slept after 00:00 (17.6%) or with a random time (11.1%). Sixty-two percent of pregnant women had a moderate sleep duration (7~9 hours), while 11.6% and 26.2% of them reported a shorter or longer duration. Almost one third (32.6%) of the women had difficulty in falling sleep. Less than half of the women (48.2%) reported a good subjective sleep quality, 40.6% of them replied an ordinary level, and 11.2% of them complained a bad sleep quality.
2	Kara M. Whitaker a , ∗ , Peiyin Hung b , Anthony J. Alberg c , Nicole L. Hair b , Jihong Liu c	Variations in health behaviors among pregnant women during the COVID-19 pandemic	the model sample sizes varied from 653 to 706 women.	A cross-sectional internet-based survey	Nearly one-third (194 o f 705) of participants reported getting less sleep.
3	Deha Denizhan Keskin, Seda Keskin, Sedat Bostan	Mental disorders among pregnant women during the COVID-19 pandemic. A cross-	The study population consisted of 356 pregnant women who were followed up at the Ordu University Training and	The descriptive cross-sectional survey study	mild sleepiness was found in 88.2% and severe sleepiness in 11.8% of sample with a very strong linear relationship was found between the anxiety, depression, hopelessness and sleepiness levels of the pregnant women at the P = 0.001 error level.

<table>
<tr><th>No</th><th>References</th><th>Title</th><th>Population</th><th>Design</th><th>Result and Conclusion</th></tr>
<tr><td></td><td></td><td>sectional study</td><td>Research Hospital</td><td></td><td></td></tr>
<tr><td>4</td><td>Yongjie Zhou, Hui Shi, Zhengkui Liu, Songxu Peng, Ruoxi Wan, Ling Qi, Zezhi Li, Jiezhi Yang, Yali Ren, Xiuli Song, Lingyun Zeng1, Wei Qian and Xiangyang Zhang</td><td>The prevalence of psychiatric symptoms of pregnant and non-pregnant women during the COVID-19 epidemic</td><td>544 pregnant women and 315 non-pregnant Women as control in in several Maternal and Child Health Hospitals in Beijing</td><td>A cross-sectional survey</td><td>pregnant women (14/544) had fewer psychiatric symptoms including insomnia, than non-pregnant wo men.</td></tr>
<tr><td>5</td><td>Karen Matvienko-Sikara,*, Johanna Popea, Avril Cremina, Hayley Carrb, Sara Leitaoc, Ellinor K. Olanderd, Sarah Meaney</td><td>Differences in levels of stress, social support, health behaviours, and stress-reduction strategies for women pregnant before and during the COVID-19 pandemic, and based on phases of pandemic restrictions, in Ireland</td><td>210 pregnant women were recruited online and in the antenatal department of a tertiary maternity hospital before the pandemic, and 235 women recruited online during the pandemic</td><td>A cross-sectional survey design</td><td>There is negative impacts of the pandemic on sleep behavior with the proportion below:
<table>
<tr><th>Sleep Well</th><th>Before Pandemic</th><th>During Pandemic</th></tr>
<tr><td>Never</td><td>8 (3.9 %)</td><td>7 (3 %)</td></tr>
<tr><td>Almost never</td><td>24 (11.8 %)</td><td>36 (15.4 %)</td></tr>
<tr><td>Sometimes</td><td>58 (28.4 %)</td><td>86 (36.8 %)</td></tr>
<tr><td>Fairly often</td><td>77 (37.7 %)</td><td>68 (29.1 %)</td></tr>
<tr><td>Very often</td><td>37 (18.1 %)</td><td>37 (15.8 %)</td></tr>
</table></td></tr>
<tr><td>6</td><td>Johanna Popea,*, Ellinor K. Olanderb, Sara Leitaoc, Sarah Meaneyc, Karen Matvienko-Sikar</td><td>Prenatal stress, health, and health behaviours during the COVID-19 pandemic: An international survey</td><td>573 pregnant women participated in the survey</td><td>A cross-sectional</td><td>Frequency of getting enough sleep
Never 10 (1.8 %)
Almost never 84 (14.7 %)
Sometimes 180 (31.6 %)
Fairly often 198 (34.7 %)
Very often 98 (17.2 %)</td></tr>
</table>

DISCUSSION

This literature review is aimed to identify changes in sleep in pregnant women during the Covid-19 pandemic. Conclusion: there were six articles included majority indicated a high level of sleeplessness related to anxiety in pregnant women during the pandemic periods, two of which indicated no difference. Not only was the change of sleep examined in most articles reviewed but also the level of stress and anxiety women experienced during their pregnancy.

Psychosocial changes in pregnant women during the Covid-19 pandemic need to be investigated since some previous studies suggested that the outbreak pandemic affected negatively psychosocial outcomes in pregnant women. For instance, during the 2003 SARS outbreak, pregnant women tended to show behavioral changes due to overestimated infected risk. Similar negative bio-psychosocial impacts were also demonstrated by pregnant women in the Zika virus pandemic (Lin et al., 2021)

Changes in people's routines during lockdown led to changes in sleep habits and sleep quality. Sleep disturbance both in quality and quantity was observed among the global population. Covid-somnia refers to experiencing sleep deprivation in the covid-19 period (Gupta & Pandi-Perumal, 2020). It is speculated that lockdown leads to emotional and psychological distress, uncertainties, and unemployment. However, sleep quality may not only be affected during the COVID-19 pandemic, but it may also lead to sleep disorders emergence. For instance, a case report indicated that COVID-19 infection led to insomnia and restless legs syndrome (Tony et al., 2020). During pregnancy, hormonal modifications and, at the same time, multiple psychological changes may affect sleep quality and sleep duration. Besides, gravid patients may also be at particular risk during the Covid-19 pandemic period as they still require ongoing prenatal care and follow-up while the world retreats into isolation (Werner et al., 2020).

Based on articles reviewed, four of which indicated that pregnant women experienced sleep changes, including going to bed-time, duration of sleep was getting shorter, quality of sleep being terrible, and some reported never getting enough sleep. This finding is in line with a study by Jose, et.al. that showed the group of women who were pregnant during the COVID-19 pandemic were found to present more psychopathological symptoms such as depression and phobic anxiety than the group of women who did not experience the COVID-19 pandemic during their pregnancy (Peralta-ramirez et al., 2020)

It is conceivable that individuals with biological weakness might have encountered sleep deprivation and change in sleep patterns during the COVID-19 pandemic. Inflammatory mediators-released caused infection may lead to increasing the duration and NREM sleep (Gupta & Pandi-Perumal, 2020). Another physiological factor impacting antenatal depression in spite of social distancing and loneliness was lack of partner support. Some women stated that psychological suffering is due to excluding their partners from antenatal visits and around the time of birth (Ceulemans et al., 2021).

On the opposite, two articles indicated the opposite finding: no difference in sleep behaviour between pre and during the pandemic, and even an article indicated the negative impact of the pandemic on sleep behaviour. Since some studies were cross-sectional, the relationship between cause and effect could not be ascertained. Concepts like sleep reactivity suggest that various individuals respond to stressful conditions differently (Gupta & Pandi-Perumal, 2020). Individuals with high sleep reactivity may experience develop sleep deprivation. Moreover, it must be noticed that stress, anxiety and sleep reactivity are likewise not causative factors but merely risk factors for the development of sleeping disorders (Drake et al., 2014). Other evidence suggests an association between sleep and SARS-CoV-2 infection is bidirectional. Sleep plays an important role in the regulation of cellular as well as humoral immunity, and sleep deprivation can reduce immune response (Ibarra et al., 2015).

CONCLUSION

Most of the articles we found did observations, interviews, and questionnaires on pregnant women. From six pieces of literature selected, four indicated a positive correlation between the

pandemic Covid-19 and sleep disorders in pregnant women, while two suggested the opposite results. Sleep changes experienced were varied, such as getting late bedtime, shortening in sleep duration, worsening sleep quality, and even respondents who rarely sleep. Even though some studies suggested that unpleasant conditions during the pandemic and physical and physiological changes during pregnancy may cause sleep disorders, more research and prospective studies are needed to reevaluate the results. Besides, considering the high prevalence of sleep disorders in pregnant women, optimal management is essential during a pandemic to reduce the negative effect of sleep disorders on pregnant women and ensure the baby is not negatively affected.

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