The impact of the coronavirus pandemic curfew on the psychosocial lives of pregnant women in Jordan

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ABSTRACT

Objectives: Worldwide the COVID-19 pandemic has negatively affected the health and psychosocial lives of people. International guidelines recommend special attention to pregnant women during pandemics and national emergencies. This study aimed to report the impact of the COVID-19 pandemic curfew on the psychosocial lives of pregnant women in Jordan.

Design: A cross-sectional study was conducted and included women who were pregnant during the COVID-19 curfew in Jordan, which took place between mid-March and mid-June of 2020.

Settings: A web-based survey that was posted on various social media platforms.

Participants: Women who at the time of the study were 18 years of age or more, were living in Jordan, and were pregnant during the curfew.

Measurements and findings: Data collected included women's characteristics, the impact of the curfew on the pregnancy, physical activity, and psychosocial lives and the barriers to seeking healthcare, in addition to pregnancy and delivery details, and changes in nutrition and supplements intake.

A total of 877 women responded to the survey. The results showed that 21.1% of the respondents did not receive any antenatal care (ANC) during the curfew. The respondents also reported that the main barriers for seeking ANC included healthcare facilities being closed (85.2%), the need for travel permits (76.8%), financial difficulties (63.9%), and fear of catching the COVID-19 virus (60.1%). Furthermore, 93.3% reported that they had psychological stress, and 29.9% reported that they had at least one form of domestic violence. Statistically significant associations existed between various women's characteristics, obstetric, psychosocial factors, and the level of psychological stress.

Key conclusions: The COVID-19 pandemic curfew, which was applied in Jordan, resulted in a negative impact on the psychosocial lives of pregnant women. As a result, pregnant women did not receive optimal antenatal care and experienced higher degrees of psychological stress and domestic violence.

Implications for practice: The findings of our study may encourage national healthcare policymakers to ensure the provision of appropriate psychosocial support of pregnant women during large scale emergencies.

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Introduction

In December 2019, the highly contagious coronavirus disease (COVID-19) emerged in China and very rapidly spread across the world. Many countries, including Jordan, adopted several measures to control disease transmission. These measures included early detection, isolation of suspected and confirmed cases, travel restrictions, and widespread quarantines. The first case of COVID-19 in Jordan was reported on the 2nd of March 2020 (Jordanian Ministry of Health, 2020). Furthermore, by mid-March and in response to the rapid spread of the disease in the surrounding countries and worldwide, the Jordanian authorities adopted various measures to contain the spread of the COVID-19 infection. These measures are summarized in Table 1 (Jordanian Ministry of Health, 2020).

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Table 1
Measures that were adopted by the Jordanian authorities to contain the spread of COVID-19 infection.

Closing the international borders.
Suspension of schools, universities, public activities, and gatherings.
Public transportation was stopped.
Private transportation was restricted and only by official permits.
All outpatient clinical services and elective procedures were closed.
Hospitals were open for emergency services only.
Only emergency medical services were available in the public and private sectors.
Patients had to call national emergency services for transportation to healthcare facilities.
In early June 2020, the lockdown restrictions were eased.
Outpatient clinical services opened for limited hours and limited number of patients every day.
Private and public transportations were allowed only during the daytime between 6 am and 6 pm with a limited number of passengers.

The COVID-19 pandemic curfew has changed daily routine activities across the world. These changes occurred abruptly and subsequently caused physical and psychological burdens on people, including pregnant women. The Royal College of Obstetricians and Gynecologists (RCOG) stated that pregnant women do not appear to be more likely to contract the COVID-19 infection than the general population. However, if infected, they can theoretically have more severe symptoms presumably because pregnancy alters the immune system and its response to viral infections (Anon, 2021a).

The World Health Organization (WHO) Antenatal Care (ANC) model recommends that the first ANC consultation should happen within the first 12 weeks of pregnancy. This reflects the importance of the booking visit, where various health issues may be discussed. Furthermore, the WHO ANC guideline has recommended an increase in the number of ANC consultations to eight instead of four. In comparison with four consultations, eight were associated with eight per 1000 births reduction in the stillbirth rate.

As a result of the pandemic, a report by Coxon et al. (2020) showed that ANC services in Europe were reduced to minimize the risks of infection to both pregnant women and healthcare workers. Furthermore, Stefanovic and Kurjak (2020) showed in a public media report that the pandemic has affected the lifestyles of pregnant women such as dietary habits, exercise, and smoking, in addition to an increase in anxiety, stress, depression, and domestic violence. The aim of this study was to report the impact of the COVID-19 pandemic curfew on the psychosocial lives of pregnant women in Jordan.

Material and methods

This cross-sectional web-based study was conducted between September and November of 2020. An electronic survey was posted through various social media platforms. Inclusion criteria required the woman to be 18 years of age or more, resident of Jordan during the curfew which happened between mid-March and mid-June 2020 and was pregnant during the COVID-19 curfew. In addition, recruited women were required to have access to social media platforms. The web-based approach was adopted for various reasons including the severely limited mobility during the curfew, the reduction of the risks of transmitting COVID-19 infection between the research team and the recruited women, and the easy access to the internet and social media platforms in Jordan where 80% of adults have internet access and 94% of them use social networks as reported by the Pew Research Center (Poushter et al., 2018). In addition, web-based surveys can reach a larger population and reduce research time and cost (Rosa et al., 2015).

The study questionnaire was designed by the researchers. Because ANC in Jordan is provided by obstetricians, the validity of the questionnaire was established by five obstetricians. In addition, the survey link was sent to 30 randomly selected pregnant women who at the time of the study were under the care of the researchers. They were asked to complete the questionnaire and

provide their comments which were considered in the final version of the questionnaire, which was posted on various social media platforms and was left open for nine weeks. Furthermore, participation in the study was voluntary, and no personal identifying data was collected. Additionally, the responses in the survey were anonymous, and participants could withdraw from the study at any time before submitting their responses. A submitted response was considered as consent to participate in the study. To increase the number of participants who submitted the survey, it was not mandatory to answer all the questions and none of the questions in the survey were mandatory. Additionally, participants were given the choice to answer or not to answer any question or domain in the study and were able to submit the survey whenever they liked. Furthermore, no incentives were offered to the participants.

The questionnaire was divided into four domains. The first domain was about the women's characteristics such as age, height, weight, and educational achievement. The second domain included information about the impact of the curfew on pregnancy and barriers to seeking healthcare in addition to pregnancy and delivery details. The third domain was about changes in nutrition and supplements intake, smoking, and physical activity. The fourth domain was about the psychosocial impact of the curfew, where women were asked if they were exposed to domestic violence either verbal or physical. Regarding the psychological stress level, women were asked to rate their level of stress using a numeric analogue scale (NAS), ranging from zero to ten, where zero meant no stress and ten meant very high-stress level (Karvounides et al., 2016).

This was an open survey; therefore, a convenience sample was adopted. Data analysis was performed using the IBM Statistical Package for Social Sciences (SPSS) for Windows, Version 22.0. Armonk, NY. Continuous variables were expressed by means and standard deviations, and categorical variables were shown as numbers and frequencies. Various variables were regrouped for better comparisons. According to the degree of psychological stress women experienced during the curfew, they were further grouped into low and high levels based on the mean, where scores below the mean were considered low and scores at or above the means were considered high. Correlations where appropriate were performed using the Pearson's correlation coefficient and Chi-square. The alpha level of 0.05 was considered statistically significant.

This study was granted ethical approval by the Institutional Review Board of Yarmouk University in accordance with the Declaration of Helsinki. The committee's reference number is 1/136/2020.

Results

During the study period, 877 women completed the survey. The response rates for the four study domains varied widely, with the highest response rate being in the women's characteristics domain and the lowest in nutrition. Table 2 shows the response rates for the four domains.

Table 2
Response rates to the four study domains.

Statistics	Study domain			
	Characteristics	Obstetrics	Psychosocial	Nutrition
Mean number of respondents	866.9	589.7	602.5	560.6
Percentages	98.8	67.2	68.7	63.5
Standard deviation	6.2	147.7	149.8	94.8
Minimum response	856.0	466.0	4100	465.0
Maximum response	877.0	868.0	853.00	798.0

Table 3
Women's characteristics.

Valid Percentage	Number	Category	Number of Respondents	Variable
19.5	171	18–24	877	Age groups (years)
66.2	581	25–34		
14.3	125	35–45		
68.3	599	Center of Jordan	877	Place of residence
22.9	201	North of Jordan		
8.8	77	South of Jordan		
32.0	282	High school or less	877	Education
13.1	116	Diploma		
54.9	479	University		
4.4	38	Underweight	863	Body mass index
54.0	466	Normal		
22.4	193	Overweight		
19.2	166	Obese		
39.0	337	Yes	864	Was working during curfew
61.0	527	No		
20.4	176	No effect	865	Effect of curfew on family income
77.9	674	Became less		
1.7	15	Became more		
2.3	20	Diabetes mellitus	866	Comorbidities
4.6	40	Hypertension	868	
9.4	81	Thyroid disease	862	
1.5	13	Heart disease	866	
12.3	105	Bronchial asthma	856	
1.6	14	Renal disease	863	
1.8	16	Epilepsy	866	
5.9	51 Who had COVID-19 during the curfew ?	Myself	865	
6.5	56	Husband, son, daughter		
12.6	109	My family		
12.8	111	My husband's family		

Women's characteristics

The mean age (SD) was 28.9 ($\pm$1.9) years. The mean (SD) for body mass index (BMI) was 25.7 ($\pm$4.7) kg/m^2. The results showed that 51 women (5.6%) had COVID-19. Table 3 summarizes the women's characteristics.

Current obstetric data and barriers to seeking antenatal care

The mean (SD) for the number of previous pregnancies was 2.3 ($\pm$1.4), and the mean (SD) for the number of previous deliveries was 1.1 ($\pm$1.4). Regarding pregnancies during the curfew, 95.1% of the women had a singleton pregnancy. Furthermore, 21.1% had no ANC consultations, and 26% reported that the longest time without an ANC consultation was more than two months. Additionally, 7.3% of the women had a miscarriage, and 27.9% delivered during

the curfew. Table 4 shows the various obstetric details including methods of ANC consultations and barriers.

Nutrition, exercise, and smoking

Table 5 summarizes the changes in the dietary patterns, supplement intake, smoking, and exercise during the curfew. Data analysis showed a statistically significant increase in the number of meals during the curfew (Chi square = 82.167, df = 1, $P < 0.001$). Regarding the changes in dietary patterns, more food quantities were consumed with a change toward healthier eating to boost immunity. Regarding supplement intake, the results showed that during the curfew 56.1% of the women reported that their supplement intake changed, either increased or decreased. The most common reasons for the changes were related to boosting immunity, limited resources, or poor compliance. The results showed that 5.6% of the

Table 4
Current obstetric variables.

Valid Percentage	No.	Category	Responses	Variable
79.0	607	Yes	768	Had antenatal care consultation during lockdown
21.0	162	No		
The various methods of antenatal care consultations women used during lockdown				
83.0	517	Yes	623	Obstetrician's clinic
45.1	216	Yes	479	Nearby healthcare Center
78.3	371	Yes	474	Emergency room of a hospital
71.5	379	Yes	530	Telephone consultation
61.5	300	Yes	488	Internet consultation
30.9	254	Never	821	How often you experienced difficulty reaching place of antenatal care?
41.5	341	Sometimes		
15.7	129	Often		
11.8	97	Always		
Barriers for reaching the place of antenatal care				
64.8	414	Yes	639	Travel permits
85.2	483	Yes	567	Healthcare facility closed
60.1	280	Yes	466	Fear of catching COVID-19
63.9	326	Yes	510	Financial difficulties
Had pregnancy complications				
2.1	10	Yes	479	Intrauterine foetal death
7.2	35	Yes	483	Undiagnosed foetal anomalies
5.2	25	Yes	481	Pre-eclampsia
7.2	35	Yes	486	Gestational diabetes mellitus
7.3	63	Yes		
863	Had miscarriage during lockdown			
87.3	55/63	First trimester		Pregnancy trimester when miscarriage happened
12.7	8/63	Second trimester		
27.4	238	Yes		
868	Had a delivery during lockdown			
12.2	29/238	Less than 37 weeks		GA when you delivered
87.8	209/238	37 weeks or more		
59.2	141/238	Vaginal		Type of delivery
40.8	97/238	Caesarean section		

women started smoking, and 44.9% reported having less sport activity.

Psychosocial variables

Data analysis showed that 93.3% of respondents reported that they had psychological stress. The most common reasons for stress were fear of catching the infection and changes in lifestyle in 93% and 85.5%, respectively. Additionally, the most common coping mechanisms were sleeping more, smoking, and eating, in over 75% of the respondents.

Regarding domestic violence, 29.9% of the respondents reported that they had experienced at least one form of domestic violence, with verbal violence being the most common form. Regarding telephone usage during the curfew, data analysis showed a statistically significant increase in the duration of usage compared to before the curfew (Chi square = 153.141, df = 1, $P = 0.000$). In addition, there was a statistically significant increase in the number of hours of television (TV) watching during the curfew compared to before (Chi- square = 82.167, df = 1, $P = 0.000$).

The score of the psychological stress, as measured on NAS, was low in 40.1% of the respondents and high in 59.9%. Table 6 shows the psychosocial variables.

Table 7 summarizes the factors in the four domains that have statistically significant correlations with the level of psychological stress during the curfew. The results showed that older age, lower educational achievement, low family income, and the presence of a family member infected with COVID-19 were associated with higher psychological stress levels. Furthermore, higher psychological stress levels were reported by women whose ANC facilities were far from home, who had no ANC consultations for more than two months, did not have laboratory tests or obstetric ultrasound scans, who had more difficulties reaching ANC facilities, and women who had pregnancy complications.

Regarding nutrition, supplements, smoking and sports domain, the psychological stress levels were more in women who had more frequent daily meals and women who started to smoke during the curfew (All Ps were < 0.05).

In the psychosocial domain, the results showed that higher psychological stress scores were reported by women who had financial difficulties, had worries from catching the infection, had wor-

Table 5
Nutrition, supplements, exercise, and smoking.

Valid Percentage	No.	Category	Responses	Variable
5.5	48	One meal	867	Number of meals before lockdown
63.5	550	Two meals		
31.0	269	Three meals or more		
8.8	76	One meal	863	Number of meals during lockdown
73.7	636	Two to three meals		
17.5	151	Four meals or more		
Change in eating pattern				
59.7	374	Yes	626	More food quantities
57.8	350	Yes	606	More meal number
26.5	136	Yes	514	Less meals because of less money
29.8	150	Yes	504	Less food quantities because of less money
86.0	579	Yes	673	Change in meal times
46.0	241	Yes	524	More healthy eating: fear of infection
53.7	281	Yes	523	More healthy eating: not eating out
Supplement intake during lockdown				
93.9	749	Yes	798	Folic acid
85.6	589	Yes	688	Iron
82.9	509	Yes	614	Multivitamins
74.8	453	Yes	606	Vitamin D
61.6	309	Yes	502	Omega 3
76.8	468	Yes	609	Calcium
51.4	249	Yes	484	Vitamin C
56.1	340	Yes	606	Did supplement intake during lockdown change?
Reasons for change in supplement intake				
47.9	249	Yes	520	More supplements to improve immunity
35.3	179	Yes	507	Less supplements because of less money
33.3	160	Yes	480	Less supplements because I was not able to get them
27.1	126	Yes	465	Less supplements because of poor compliance
Smoking				
27.9	238	Yes	853	Smoker before lockdown
6.5	55	Yes	850	Started smoking during lockdown
Sport				
23.3	195	Yes	838	Sport before lockdown
46.5	364	No change	783	Change in sport during lockdown
50.3	394	Less sport		
3.2	25	More sport		

ries from changes in lifestyle, had marital and family problems, and were victims of domestic violence (All Ps were < 0.05).

Discussion

The results showed different response rates to the various study domains. This probably is related to both the questionnaire being lengthy and containing several domains (Rolstad et al., 2011). We acknowledge that our questionnaire was both lengthy and contained many domains.

Obstetric domain

Our results showed that the curfew led to a reduction in the number of ANC consultations and a longer duration between consultations. These reductions were independent of the women's age, gestational age, level of education, or place of residence. A similar pattern was reported in another study (Muhaidat et al., 2020). Furthermore, the most common barriers for seeking ANC were ANC facilities being closed, travel restrictions, concerns about catch-ing the infection, and financial difficulties. This reflects the large-scale negative effects of the COVID-19 curfew on pregnant women regardless of their characteristics. Therefore, during large-scale emergencies, pregnant women need more attention to minimize the risk of adverse effects on both mothers and babies because such emergencies are associated with increased maternal and perinatal morbidities and mortalities (Brennan and Nandy, 2001; Fryer et al., 2020). Furthermore, considering the travel restrictions and the ANC facilities being closed, our results showed that over two-thirds of the women who responded used various alternative methods for ANC consultations such as online consultations via social media platforms or telephone consultations. This pattern was encouraged in various recommendations to reduce face-to-face contact between pregnant women and health-care providers to reduce the risks of spreading the COVID-19 infection (Chen et al., 2020; Favre et al., 2020). While such methods do not reflect optimal ANC because necessary investigations and obstetric ultrasound scans cannot be performed online, they may be integrated in the ANC pathway in similar large scale future emergencies.

Table 6
Psychosocial variables (NAS: numeric analogue scale).

Valid Percentage	No.	Category	Responses	Variable
93.3	764	Yes	819	Had psychological stress during curfew
Cause of psychological stress				
81.1	542	Yes	668	Financial
52.0	245	Yes	471	Work related, working from home
64.7	357	Yes	552	Worries about children's education
93.0	610	Yes	656	Fear of catching infection
85.5	531	Yes	614	Change in lifestyle
55.6	294	Yes	529	Marital problems
Coping mechanisms with stress				
72.7	404	Yes	556	Sleeping more
74.9	441	Yes	589	Smoking
76.7	431	Yes	562	Eat less
75.5	388	Yes	514	Eat more
37.3	167	Yes	448	Sport
62.8	310	Yes	494	Learn new skills
Domestic violence				
29.9	137	Yes	458	Domestic violence
		Type of domestic violence		
20.0	87	Yes	434	At least verbal
7.1	29	Yes	410	At least physical
16.5	69	Yes	419	At least financial
Daily hours of using mobile phone				
59.3	453	Low:< mean (<4.69)	764	Before the curfew (hours)
40.7	311	High: = > mean (4.7)		
59.0	439	Low: <the mean (<7.18)	744	During the curfew
41.0	305	High: => mean (7.18)		
Daily hours of watching television				
66.7	453	Low: < mean (<2.04)	679	Before the curfew
33.3	226	High: => (2.04 or more)		
57.2	451	Low: below mean (< 3.7)	789	During the curfew
42.8	338	High: => (3.7 or more)		
45.8	432	Low: < mean (< 6.9)	943	Overall score psychological stress (NAS)
54.3	511	High: => (6.9 or more)		

Variable	Category	stress level N (%)	High psychological stress level N (%)	X^2	P-value
Age groups	18–24	231 (32.5)	335 (67.5)	6.57	0.037
	25–34	231 (40.8)	335 (59.2)		

The caesarean section (CS) rate in our cohort did not change compared to the rate before the curfew. The rate in our study was in keeping with the published rate of nearly 40% in Jordan before the curfew (HamdAllah, 2018). While our findings of a stable CS rate were supported by a report from the United States (Malhotra et al., 2020), a study from China showed an increase in the rate of CS (Zhang et al., 2020) during the pandemic. Possible explanations for the different patterns in CS rates in various studies may be related to study populations, obstetric complications, and sample sizes. We acknowledge that we have not studied the impact of catching the infection on CS rate as it was not an aim of our study.

Food, supplements, exercise, and smoking

The results showed that dietary habits changed during the curfew. The majority of the respondents reported changes in meal timings, numbers, and food quantities. In addition, there was a trend toward healthier eating. A study from Denmark showed similar results where respondents ate more food quantities and had more meals (Giacalone et al., 2020). This is probably due to women spending more time at home. Regarding supplements, the results showed a change in the pattern of supplements intake during the curfew. Approximately half of the respondents reported an increase in supplements intake to boost their immunity, and one-third re-

ported a decrease due to financial reasons and poor compliance. While public worries from infections and their consequences may encourage people to seek a healthier lifestyle, people may seek comfort in food to overcome the stress of the curfew.

Physical exercise was affected by the curfew. Over half of the respondents reported less exercise for various reasons. Another report showed that most people adopted a lifestyle with less physical activity and exercise (Lim and Pranata, 2021). In addition, the results of our study showed that while two-thirds of smokers had no change in their smoking patterns, 5.6% of the respondents started smoking during the curfew. Another study from England showed that while the curfew was not associated with a significant change in smoking, it was associated with increases in smoking cessation (Jackson et al., 2021). Furthermore, women who started smoking during the curfew may have experienced more stress and probably started smoking as a coping mechanism.

Psychosocial domain

Our results showed that the curfew had a significant negative impact on the psychological wellbeing of pregnant women. A study from Italy which included pregnant women showed that the COVID-19 outbreak had moderate to severe psychological effects, particularly, a higher degrees of anxiety (Saccone et al., 2020). Similar findings were reported in a study from Canada, where three-

Table 7

Variables showing statistically significant correlation with the level of psychological stress reported by women.

Variable	Category	N (%)	N (%)		
Age groups	18–24	231 (32.5)	335 (67.5)	6.57	0.037
	25–34	231 (40.8)	335 (59.2)		
	35–45	58 (47.2)	65 (52.8)		
Education groups	High school or <	90 (33.5)	179 (66.5)	8.48	0.014
	Diploma	43 (37.7)	71 (62.3)		
	University	206 (44.2)	260 (55.8)		
Pandemic effect on family income	No effect	102 (59.3)	70 (40.7)	34.02	<0.001
	Becomes <	230 (34.8)	430 (65.2)		
	Becomes >	6 (40.0)	9 (60.0)		
Family member had COVID-19	Yes	32 (29.4)	77 (70.6)	5.68	0.01
	No	305 (41.3)	433 (58.7)		
Place of ANC close to home	Yes	196 (45.3)	237 (54.7)	11.95	<0.001
	No	125 (33.3)	250 (66.7)		
Number of antenatal care visits	0	14 (30.4)	32 (69.6)	9.82	0.044
	1	37 (44.0)	47 (56.0)		
	2	38 (36.5)	66 (63.5)		
	3	53 (31.9)	113 (68.1)		
	4 or more	180 (43.8)	231 (56.2)		
Longest time without antenatal care	< 1 month	79 (45.9)	93 (54.1)	9.31	0.01
	1–2 months	168 (40.7)	245 (59.3)		
	>2 months	63 (31.0)	140 (69.0)		
Had regular laboratory and ultrasound scan tests	Yes	205 (45.5)	246 (54.5)	42.22	<0.001
	No	127 (34.0)	246 (66.0)		
How often did you have difficulties reaching antenatal care place?	Never	141 (56.0)	111 (44.0)	42.21	<0.001
	Sometimes	121 (36.1)	214 (63.9)		
	Often	39 (30.5)	89 (69.5)		
	Always	24 (25.3)	71 (74.7)		
Did you have pregnancy complications?	Yes	246 (44.0)	313 (56.0)	5.51	0.012
	No	34 (31.8)	73 (68.2)		
Did you have difficulties reaching the delivery place?	Yes	14 0.177	65 0.823	21.18	<0.001
	No	110 0.47	124 0.53		
Psychological stress:Financial	Yes	163 (30.4)	374 (69.6)	38.70	<0.001
	No	75 (60.0)	50 (40.0)		
Psychological stress: Fear of catching COVID-19	Yes	214 (35.2)	394 (64.8)	11.07	<0.001
	No	27 (60.0)	18 (40.0)		
Psychological stress: Change in lifestyle	Yes	188 (35.7)	339 (64.3)	10.44	<0.001
	No	45 (54.2)	38 (45.)		
Psychological stress: Marital problems	Yes	71 (24.4)	220 (75.6)	33.61	<0.001
	No	114 (48.7)	120 (51.3)		
Psychological stress:Family problems	Yes	66 (25.1)	197 (74.9)	26.62	<0.001
	No	114 (47.1)	128 (52.9)		
Domestic violence from husband / family	Yes	15 (15.8)	80 (84.2)	27.10	<0.001
	No	317 (43.7)	409 (56.3)		
Number of meals during lockdown	1 meal	16 (21.6)	58 (78.4)	21.04	<0.001
	2 meals	118 (38.2)	191 (61.8)		
	3 meals	152 (48.3)	163 (51.7)		
	4 meals	39 (39.0)	61 (61.0)		
	Five or >	15 (31.9)	32 (68.1)		
Start smoking during lockdown	Yes	14 (25.5)	41 (74.5)	5.50	0.012
	No	323 (41.5)	455 (58.5)		
Changes in smoking pattern	No change	139 (42.6)	187 (57.4)	13.66	<0.001
	Less smoking	32 (26.7)	88 (73.3)		
	More smoking	15 (25.0)	45 (75.0)		
Changes in sport during lockdown	No change	169 (47.2)	189 (52.8)	20.65	<0.001
	Less sport	125 (32.1)	265 (67.9)		

quarters of the recruited women experienced moderate to high anxiety levels during the pandemic compared to 30% before the pandemic (Davenport et al., 2020). The higher depression and anxiety scores associated with the curfew not only affect the psychological wellbeing of pregnant women, but it may negatively affect the physical wellbeing of pregnant women and their babies.

Pregnancy specific anxiety is a negative emotional state related to worries about the pregnancy, delivery, and maternal and neonatal wellbeing (Levin, 1991). The prevalence is between 10 and 15% (Alderdice et al., 2012). While these figures reflect the psychological status in non-pandemic conditions, it would be expected to increase during the pandemic as shown in our results. In addition, psychological stress has potential adverse effects on both the mother and the newborn baby such as preterm deliveries, pro-

longed duration of labour, and low satisfaction rate with the whole experience related to pregnancy, labour, and delivery (Rouhe et al., 2009; Saisto and Halmesmäki, 2003). We acknowledge we have not studied the impact of the curfew on pregnancy and neonatal outcomes.

Nearly 30% of the respondents in our study experienced domestic violence during the curfew, and verbal violence was the most common form.

While we acknowledge that we did not study the rate of domestic violence before the curfew to compare that with the rate during the curfew, we would expect an increase in the rate. This is supported by the results of a report from the Jordanian Family Protection Department (JFPD) which showed a 33% increase in domestic violence during the curfew (EuroMed Rights, 2020), and

the findings that pregnant women are more likely to be victims of domestic violence (Dahlen et al., 2018). The results of our study showed a significant increase in the daily mobile telephone usage and TV watching (Chae, 2020). showed a significant increase in mobile telephone usage during the COVID-19 curfew compared to before. In addition, according to the Regulator for the Communications Services in the UK (Anon, 2021b), people spent 40% of their time watching TV during the curfew. Such changes in telephone usage and TV watching are probably related to people's need to receive updates on the pandemic, to learn, study, or work online, for entertainment, and to cope with the stress associated with the curfew.

Limitations

We acknowledge the limitations of our study. The sample size was small. Psychological stress was not measured by a validated instrument administrated face to face by a trained specialist. Furthermore, the survey was available for women who have access to social media platforms; therefore, women with limited resources and women who do not have access to the internet may not have had a chance to participate.

Conclusion

The COVID-19 pandemic curfew, which was applied by the Jordanian authorities, resulted in a negative impact on the psychosocial lives of pregnant women. As a result, pregnant women did not receive optimal antenatal care. Additionally, they experienced higher degrees of psychological stress and domestic violence.

The findings of our study should encourage national health policymakers to ensure the provision of adequate health care and support for pregnant women and to consider the health and psychosocial impact of national emergencies on pregnant women.

Declaration of Competing Interest

No competing interests.

CRediT authorship contribution statement

Suhair Qudsieh: Conceptualization, Methodology, Supervision, Data curation, Writing – review & editing. **Ismaiel Abu Mahfouz:** Data curation, Formal analysis, Visualization, Writing – original draft. **Hana Qudsieh:** Writing – review & editing, Data curation, Investigation. **Lara Al Barbarawi:** Software, Writing – review & editing. **Fida Asali:** Formal analysis, Validation. **Mohammad Al-Zubi:** Data curation, Resources. **Ala' Al Barbarawi:** Visualization, Data curation, Resources.

Ethical approval

The study was approved by the institutional review Board of Yarmouk University. The approval number is 1/136/2020.

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References

Alderdice, F., Lynn, F., Lobel, M., 2012. A review and psychometric evaluation of pregnancy-specific stress measures. J. Psychosom. Obstet. Gynaecol. 33 (2), 62–77. doi:10.3109/0167482X.2012.673040, Jundoi:PMID: 22554138.

Brennan, R.J., Nandy, R., 2001. Complex humanitarian emergencies: a major global health challenge. Emerg. Med. 13 (2), 147–156. doi:10.1046/j.1442-2026.2001.00203.x, (Fremantle)JunPMID: 11482851.

Chae, S.G., 2020. A survey on the use of mobile phones due to COVID-19. Int. J. Internet Broadcast. Commun. 12 (3), 233–243. doi:10.7236/IJIBC.2020.12.3.233, [Internet]Aug 31Available from.

Chen, D., Yang, H., Cao, Y., Cheng, W., Duan, T., Fan, C., et al., 2020. Expert consensus for managing pregnant women and neonates born to mothers with suspected or confirmed novel coronavirus (COVID-19) infection. Int. J. Gynaecol. Obstet. 149 (2), 130–136. doi:10.1002/ijgo.13146, MayEpub 2020 Apr 1. Erratum in: Int J Gynaecol Obstet. 2020 Jul;150(1):136. PMID: 32196655.

Coxon, K., Turienzo, C.F., Kweekel, L., Goodarzi, B., Brigante, L., Simon, A., Lanau, M.M., 2020. The impact of the coronavirus (COVID-19) pandemic on maternity care in Europe. Midwifery 88, 102779. doi:10.1016/j.midw.2020.102779.

Dahlen, H.G., Munoz, A.M., Schmied, V., Thornton, C., 2018. The relationship between intimate partner violence reported at the first antenatal booking visit and obstetric and perinatal outcomes in an ethnically diverse group of Australian pregnant women: a population-based study over 10 years. BMJ Open 8 (4), PMC5922470. doi:10.1136/bmjopen-2017-019566, Apr 25e019566PMID: 29695386; PMCID.

Davenport, M.H., Meyer, S., Meah, V.L., Strynadka, M.C., Khurana, R., 2020. Moms are not ok: COVID-19 and maternal mental health. Front. Glob. Womens Health doi:10.3389/fgwh.2020.00001, June 2020.

EuroMed Rights Documenting violence against women during the COVID-19 crisis. EuroMed Rights. URL https://euromedrights.org/publication/documenting-violence-against-women-during-the-covid-19-crisis/ (accessed 10.9.20) 2021.

Favre, G., Pomar, L., Qi, X., Nielsen-Saines, K., Musso, D., Baud, D., 2020. Guidelines for pregnant women with suspected SARS-CoV-2 infection. Lancet Infect. Dis. 20 (6), 652. doi:10.1016/S1473-3099(20)30157-2, JunEpub 2020 Mar 3. PMID: 32142639;PMCID: PMC7134390.

Fryer, K., Delgado, A., Foti, T., Reid, C.N., Marshall, J., 2020. Implementation of obstetric telehealth during COVID-19 and beyond. Matern. Child Health J. 24 (9), 1104–1110. doi:10.1007/s10995-020-02967-7, SepPMID: 32564248; PMCID: PMC7305486.

Giacalone, D., Frøst, M.B., Rodríguez-Pérez, C., 2020. Reported changes in dietary habits during the COVID-19 lockdown in the Danish population: the Danish COVIDiet study. Front Nutr. 7, 592112. doi:10.3389/fnut.2020.592112, Dec 8PMID: 33364250; PMCID:PMC7752855.

HamdAllah, A., 2018. Rate and causes of cesarean section in north of Jordan. Iproceedings 4 (1), e10553. doi:10.2196/10553.

https://www.rcog.org.uk/en/guidelines-research-services/coronavirus-covid-19-pregnancy-and-womens-health/.

https://www.ofcom.org.uk/research-and-data/tv-radio-and-on-demand/news-media/coronavirus-news-consumption-attitudes-behaviour https://www.who.int/publications/i/item/9789241549912.

Jackson, S.E., Garnett, C., Shahab, L., Oldham, M., Brown, J., 2021. Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019-20 data. Addiction 116 (5), 1233–1244. doi:10.1111/add.15295, MayEpub 2020 Nov PMID33089562.

Karvounides, D., Simpson, P.M., Davies, W.H., Khan, K.A., Weisman, S.J., Hainsworth, K.R., 2016. Three studies supporting the initial validation of the stress numerical rating scale-11 (Stress NRS-11): a single item measure of momentary stress for adolescents and adults. Pediatr. Dimens. 1 (4). doi:10.15761/pd.1000124.

Levin, J.S., 1991. The factor structure of the pregnancy anxiety scale. J. Health Soc. Behav. 32 (4), 368–381 DecPMID: 1765627.

Lim, M.A., Pranata, R., 2021. Sports activities during any pandemic lockdown. Ir. J. Med. Sci. 190 (1), 447–451. doi:10.1007/s11845-020-02300-9, FebEpub 2020 Jul 4PMID:32621168; PMCID: PMC7334119.

Malhotra, Y., Miller, R., Bajaj, K., Sloma, A., Wieland, D., Wilcox, W., 2020. No change in cesareansection rate during COVID-19 pandemic in New York City. Eur. J. Obstet. Gynecol. Reprod. Biol. 253, 328–329. doi:10.1016/j.ejogrb.2020.06.010, OctEpub 2020 Jun PMID: 32620511; PMCID: PMC7287463.

Jordanian Ministry of Health Ministry of Health, the official website of the Jordanian Ministry of Health | Coronavirus disease [WWW Document], 2020. URL https://corona.moh.gov.jo/en (accessed 9.9.20).

Muhaidat, N., Fram, K., Thekrallah, F., Qatawneh, A., Al-Btoush, A., 2020. Pregnancy during COVID-19 outbreak: the impact of lockdown in a middle-income country on antenatal healthcare and wellbeing. Int. J. Womens Health 12, 1065–1073. doi:10.2147/IJWH.S280342, Nov 16PMID: 33235516; PMCID: PMC7678687.

Poushter, J., Bishop, C., Hanyu, C., 2018. Social media use continues to rise in developing countries. https://www.pewresearch.org/global/2018/06/19/social-media-use-continues-to-rise-in-developing-countries-but-plateaus-across-developed-ones/

Rolstad, S., Adler, J., Rydén, A., 2011. Response burden and questionnaire length: is shorter better? A review and meta-analysis. Value Health 14 (8), 1101–1108. doi:10.1016/j.jval.2011.06.003, Decdoi:Epub 2011 Aug 2. PMID: 22152180.

Rosa, C., Campbell, A.N., Miele, G.M., Brunner, M., Winstanley, E.L., 2015. Using e-technologies in clinical trials. Contemp. Clin. Trials 45 (Pt A), 41–54. doi:10.1016/j.cct.2015.07.007, Novdoi:Epub 2015 Jul 12. PMID: 26176884; PMCID:PMC4648297.

Rouhe, H., Salmela-Aro, K., Halmesmäki, E., Saisto, T., 2009. Fear of childbirth according to parity, gestational age, and obstetric history. BJOG 116 (1), 67–73. doi:10.1111/j.1471-0528.2008.02002.x, JanEpub 2008 Dec 3. PMID: 19055652.

Saccone, G., Florio, A., Aiello, F., Venturella, R., De Angelis, M.C., Locci, M., Bifulco, G., Zullo, F., Di Spiezio Sardo, A., 2020. Psychological impact of coronavirus disease 2019 in pregnant women. Am. J. Obstet. Gynecol. 223 (2), 293–295. doi:10.1016/j.ajog.2020.05.003, Augdoi:Epub 2020 May 7. PMID: 32387321; PMCID: PMC7204688.

Saisto, T., Halmesmäki, E., 2003. Fear of childbirth: a neglected dilemma. Acta Obstet. Gynecol. Scand. 82 (3), 201–208 MarPMID: 12694113.

Stefanovic, V., Kurjak, A., 2020. The impact of COVID-19 pandemic on womenś health and pregnancy care. HealthManagement.org J. 20 (4), 254–257 Apr.

Zhang, J., Zhang, Y., Ma, Y., Ke, Y., Huo, S., He, L., Luo, W., Li, J., Zhao, A, 2020. The associated factors of cesarean section during COVID-19 pandemic: a cross-sectional study in nine cities of China. Environ. Health Prev. Med. 25 (1), 60. doi:10.1186/s12199-020-00899-w, Oct 10PMID: 33038922; PMCID: PMC7547292.