

Factors related to Pregnancy Status Among Lebanese Women During COVID-19 Confinement

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Abstract

Background: During the coronavirus disease confinement, couples are likely to spend more free time together at home, which could have a positive impact on the amount and level of intimacy. However, home confinement and lockdowns have created challenges and vulnerabilities, causing relevant changes in sexual health and couple stability, particularly in women. The objective of this study was to evaluate the socio-economic and psychological factors related to current pregnancy status and unwanted pregnancy among a sample of Lebanese women during the COVID-19 lockdown.

Methods: A cross-sectional online-based study was conducted between June 8 and August 1, 2020, among 369 Lebanese women. The questionnaire developed on Google Forms was distributed through social media and WhatsApp groups, using the snowball technique. The current pregnancy status and unwanted pregnancy were assessed using binary questions (Yes/No).

Results: Our results showed that 11.1% of women were pregnant, of whom 22.0% reported unwanted pregnancies. Having children (ORa=0.183) and using contraceptives (ORa=0.231) were at lower odds of getting pregnant. Higher psychological violence would negatively affect pregnancy, but the association tended to significance ($p=0.065$). Also, regular visits to the physician for routine checkups (ORa=0.053) were significantly associated with lower odds of unwanted pregnancy. Higher psychological violence would affect unwanted pregnancy; however, the association tended to significance ($p=0.056$).

Conclusion: Our main findings indicate that women of younger age, smoking less, and never working were at a higher probability of being pregnant. Furthermore, psychological violence tended to be an associated factor for current pregnancy status and unwanted pregnancy. More information and awareness are needed to encourage women to conceive and maintain their well-being during a pandemic.

Introduction

The severe acute respiratory syndrome is a viral respiratory illness caused by a coronavirus called Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It started in China in December 2019 and rapidly spread globally by March 2020, according to the World Health Organization [1]. To date, the coronavirus disease 2019 (COVID-19) outbreak has affected 213 countries and caused 23 million infections and 800,906 deaths [2]. Although several ongoing clinical trials are exploring definitive solutions for the pandemic, no treatment or vaccine is currently available for COVID-19. The best strategy recommended to prevent the spread of the disease is through public health measures, including quarantine and social distancing.

While most of the world is settling into a new social distancing pattern, couples are likely to spend more free time together at home [3]. More and quality time with a love partner may have a positive impact on the amount and level of intimacy that might lead to the desired pregnancy [4]. A study of 1482

participants (944 women and 538 men) found that a considerable number of couples who planned for childbearing before the COVID-19 pandemic are continuing their attempts [3]. Some of them even started to express their desire for reproduction during confinement [3]. However, home confinement and lockdowns have created challenges and vulnerabilities, more specifically in women, causing relevant changes in sexual health and couple stability [5]. The vulnerabilities are related to social, political, and economic systems, which in turn are amplifying the impacts of the pandemic [6]. Specifically, during lockdowns, there are wide discrepancies in the sexual desire within couples, where some use sex as a coping mechanism to stay connected and relieve anxiety while others completely lose interest in sex [7]. In Italy, a study has shown that stress at work and the bustle of everyday life can be potent sexual inhibitors that lead to a lower propensity to get pregnant due to concerns about future economic hardships and the potential consequences of the disease on pregnancy [3].

On the other hand, confinement and minimal contact with the outside community trigger all types of violence [8]. Indeed, incidents of violence against women have dramatically increased worldwide since countries implemented lockdowns to contain the pandemic [9]. While data on the current COVID-19 lockdown situation is limited, studies of past natural disasters and their effects highlight predictors of the increase in violence during these periods. Violence at home is strongly associated with the male partner. Loss of income for male partners creates a lower degree of control over economic security and exerts more control over their partners. Individuals may resort to transactional sex to meet their basic needs and cope with reduced and inadequate income, which may increase the risk of unwanted pregnancies [10], with several studies highlighting the strong association between partner violence and unwanted pregnancy [11, 12]. Abused women must compromise about contraceptive or condom use and family planning [13, 14]. Their lack of control over their reproductive health is increasingly recognized as a critical mechanism underlying a high risk of unwanted pregnancy, further increased during certain pandemic conditions, such as COVID-19. Many reasons trigger the development of unwanted pregnancy, including forced sex, financial difficulties, having children, and being unmarried [15]. Preliminary reports on COVID-19 indicate increased unplanned and unwanted pregnancies due to rapidly dwindling stocks of contraceptives, increased incidence of domestic violence, and growing income insecurity [16].

Because little is currently known about pregnancy status during the COVID-19 outbreak, this study aimed to evaluate socioeconomic and psychological factors related to current pregnancy and unwanted pregnancy among a sample of Lebanese women during the COVID-19 lockdown.

Methods

Study design and sampling

A cross-sectional online-based study was conducted between June 8 and August 1, 2020. The questionnaire developed on Google Forms was distributed through social media and WhatsApp groups, using the snowball technique. All married women between 18 and 51 with internet access and currently living with their partner were eligible. Excluded were those with a fertility problem and those single,

widowed, or divorced. A total of 369 women filled out the questionnaire that required 40 minutes to complete. Inclusion criteria were available in the consent form at the beginning of the survey. Participation in this study was voluntary, and participants received no compensation in return. The anonymity of participants was guaranteed during the data collection process.

Minimal sample size calculation

The Epi info software (Centers for Disease Control and Prevention, Epi Info™) calculated a minimum sample of 306 participants, considering a Lebanese female population of 2,294,260 [17], a prevalence of 15% of pregnant woman [18], 95% confidence level, and after adding of 4% margin of error. A sample of 500 women was targeted to allow for missing values. The final sample size included 369 participants.

Translation and piloting

The online survey consisted of closed-ended questions in English and Arabic. It was pilot tested on ten subjects to check the clarity of the questionnaire; related data were included in the final dataset. The link to Google Forms was then distributed to potential respondents.

A forward and backward translation was conducted for all the items of the questionnaire. One translator was in charge of translating the scales from English to Arabic, and a second one performed the back translation. Discrepancies between the original English version and the translated one were resolved by consensus.

Questionnaire

The questionnaire consisted of three sections. The first one assessed the sociodemographic details of participants (age, educational level, the region of residence, religion, working status, monthly income, smoking and alcohol status, and physical activity) in addition to the sociodemographic characteristics of the partner as reported by the participant woman herself. The household crowding index was calculated by dividing the number of persons living in the house by the number of rooms, excluding the bathroom and kitchen [19]. The monthly income was divided into four levels: no income, low <1,000 USD, intermediate 1,000–2,000 USD, and high income >2,000 USD. Moreover, fear of poverty was measured on a Likert scale from 0 to 10, where zero indicates no fear of poverty and ten extreme fear of poverty.

The second section consisted of questions selected from other studies [20-22] and constructed by the authors based on the research questions. The questions focused on the couple and the children, the woman's role in the family, the woman's relationship with her partner, in addition to items related to pregnancy status and concerns during confinement. Examples of the asked questions: "Do you discuss family planning with your partner?", "Are you capable of meeting the financial needs of your family?", "Have you ever faced any pregnancy-related complications (such as severe bleeding, unsafe abortion)?", "Do you have a history of negative pregnancy outcomes (such as a neonatal death, miscarriage, or stillbirth)", "How do you describe your current pregnancy?" and "Were you regularly visiting your doctor for routine checkups during the confinement?". The current pregnancy status and unwanted pregnancy

were assessed using binary questions (Yes/No). The current pregnancy status was described as the ability of women to choose to reproduce or be coerced into an unwanted pregnancy.

The final part consisted of a scale to measure violence, the Composite Abuse Scale (Revised) – Short Form (CASR-SF). This 15-item scale evaluates the existence, extent, and severity of physical, sexual, or psychological abuse [23]. The total score is calculated by summing the 15 responses. Items are graded on a Likert scale from 1 to 6, where a higher score indicates a higher intensity/occurrence of abuse. Three subscales scores are derived from the total score, reflecting physical (4 items), sexual (2 items), and psychological (6 items) abuse [23]. In this study, the Cronbach's alpha was 0.902 for the total scale, 0.791 for the psychological abuse subscale, 0.759 for the physical abuse subscale, and 0.740 for the sexual abuse subscale. The author of the questionnaire, Professor Marilyn Ford-Gilboe, granted permission to use the scale.

Statistical analysis

Completed forms were imported into a Microsoft Excel spreadsheet. Data were then analyzed on Statistical Package for the Social Sciences (SPSS) software version 23 (Chicago, IL, USA). A descriptive analysis was performed using the counts and percentages for categorical variables and means and standard deviations for continuous measures. The Student's t-test and Chi-Square test were used to compare means and frequencies between the different subgroups, respectively, to assess the association between variables; assumptions of continuous variables normality and other conditions were checked. When conditions were not fulfilled, the Mann Whitney and the Fisher exact test were used, respectively. Regarding multivariable analysis, four logistic regressions using the forward method were performed, considering the variables in the bivariate analysis that showed a p-value less than 0.05 to minimize confounding. The statistical significance was set at a p-value <0.05.

Results

Sample description

Table 1 presents details regarding sociodemographic and other characteristics of the sample. The mean age of women was 32.5 ± 6.4 years, the majority had a university education level (87.5%), 59.9% were employed, 27.6% had no income, and 42.5% practiced physical activities. Only 31.2% of them were smokers, and 10.8% consumed alcohol.

Also, the majority of partners had a university education level (68.6%), were employed (90.5%), 45.5% had an intermediate income level, 53.9% were smokers, 40.1% consumed alcohol, and 34.7% practiced physical activities. The mean age of the partners was 37.6 ± 7.2 years.

The mean duration of confinement was 71.0 ± 42.8 days, and the mean fear of poverty was 5.8 ± 3.2 .

Table 1: Sociodemographic and other characteristics of the studied sample (N=369)		
	Woman response	Partner characteristics reported by woman
	Frequency (%)	Frequency (%)
Education level		
Primary	3 (0.8%)	18 (4.9%)
Complementary	11 (3.0%)	34 (9.2%)
Secondary	32 (8.7%)	64 (17.3%)
University	323 (87.5%)	253 (68.6%)
Religion		
Christian	115 (31.2%)	115 (31.2%)
Muslim	155 (42.0%)	159 (43.1%)
Druze	81 (22.0%)	80 (21.7%)
Atheist	2 (0.5%)	2 (0.5%)
Refused to answer	16 (4.4%)	13 (3.5%)
Working status		
Employed	221 (59.9%)	334 (90.5%)
Unemployed	148 (40.1%)	35 (9.5%)
Monthly income		
No income	102 (27.6%)	19 (5.1%)
Low	94 (25.5%)	71 (19.2%)
Intermediate	112 (30.4%)	168 (45.5%)
High	61 (16.5%)	111 (30.1%)
Smoking status		
Non smoker	254 (68.8%)	170 (46.1%)
Smoker	115 (31.2%)	199 (53.9%)
Alcohol consumption		
Yes	40 (10.8%)	148 (40.1%)
No	329 (89.2%)	221 (59.9%)
Physical activity		
Yes	157 (42.5%)	128 (34.7%)
No	212 (57.5%)	241 (65.3%)
	Mean ± SD	Mean ± SD
Age in years	32.5 ± 6.4	37.6 ± 7.2
Days of confinement		71.0 ± 42.8
Fear of poverty		5.8 ± 3.2

Reproductive status of women

The mean duration of marriage was 7.8 ± 5.9 years, and the mean number of pregnancies was 2.1 ± 1.5 . Only 24.7% of women had a history of negative pregnancy outcomes, 7.9% had a history of pregnancy termination, 16.8% had a history of unintended pregnancy, and 16.0% had pregnancy-related complications. Table 2 shows the other characteristics of women's reproductive status.

Table 2: Reproductive status of the study participants	
	Frequency (%) N=369
History of pregnancy negative outcome	91 (24.7%)
History of pregnancy termination	29 (7.9%)
History of unintended pregnancy	62 (16.8%)
Pregnancy related complications	59 (16.0%)
Frequency of sexual intercourse	
1-2 times per week	167 (45.3%)
3 or more times per week	80 (21.7%)
1 to three times per month	88 (23.8%)
Less than one time per month	34 (9.2%)
Discussion with partner about family planning	
Never	9 (2.5%)
Sometimes	99 (26.8%)
Always	261 (70.7%)
Couple wants the same number of children	316 (85.6%)
Fertility preferences for the woman	
Desire to have children	192 (52.0%)
Desire to stop childbearing	177 (48.0%)
	Mean ± SD
Duration of marriage in years	7.8 ± 5.9
Age at marriage in years	24.8 ± 3.9
Number of pregnancies	2.1 ± 1.5
Number of children	2.0 ± 0.85
Age at first birth	26.0 ± 5.2

Bivariate analysis: correlates of pregnancy status

Of the total sample, 41 women (11.1%) were pregnant. As compared to pregnant women, non-pregnant women had a significantly higher mean age ($M_{\text{non-pregnant}}=32.9$ vs. $M_{\text{pregnant}}=29.1$, $p<0.001$), number of children ($M_{\text{non-pregnant}}=2.0$ vs. $M_{\text{pregnant}}=1.5$, $p<0.001$), psychological violence ($M_{\text{non-pregnant}}=1.4$ vs. $M_{\text{pregnant}}=0.29$, $p<0.001$), physical violence ($M_{\text{non-pregnant}}=0.42$ vs. $M_{\text{pregnant}}=0.10$, $p=0.005$), sexual violence ($M_{\text{non-pregnant}}=0.17$ vs. $M_{\text{pregnant}}=0.00$, $p<0.001$), and total violence ($M_{\text{non-pregnant}}=2.2$ vs. $M_{\text{pregnant}}=0.39$, $p<0.001$). Additionally, a significantly higher mean partner age ($M_{\text{non-pregnant}}=38.05$ vs. $M_{\text{pregnant}}=33.83$, $p<0.001$) was found in non-pregnant women as compared to pregnant women. A significantly higher proportion of pregnant women never worked (17.1%), were former smokers (42.9%), had no children (25.8%), wanted to have children (16.1%), had no history of children (12.5%) and partner abuse (13.5%), and did not use contraception (31.7%). Regarding partners, a significantly higher proportion of those with high income (18.0%), as compared to the other categories, had a pregnant woman partner. No significant association was found for the other used variables (Table 3).

Table 3: Bivariate analysis taking the current pregnancy status (Yes (41 (11.1%)) / No (328 (88.9%)) as the dependent variable

	Current pregnancy status					
	Woman's characteristics			Partner's characteristics		
	No	Yes	p-value	No	Yes	p-value
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Age in years	32.9 (6.4)	29.1 (5.1)	<0.001	38.1 (7.3)	33.8 (5.4)	<0.001
Age at marriage in years	24.8 (3.8)	25.3 (4.1)	0.381	30.6 (14.0)	30.1 (4.6)	0.793
Household crowding index	0.98 (0.44)	0.87 (0.50)	0.150			
Fear of poverty	5.9 (3.1)	5.3 (3.5)	0.230			
Number of children	2.0 (0.85)	1.5 (0.66)	<0.001			
CASR psychological	1.4 (3.2)	0.29 (0.84)	<0.001			
CASR physical	0.42 (1.7)	0.10 (0.44)	0.005			
CASR sexual	0.17 (0.83)	0.00 (0.00)	<0.001			
CASR total	2.2 (6.1)	0.39 (1.2)	<0.001			
	N (%)	N (%)		N (%)	N (%)	
Work status						
<i>From home</i>	117 (91.4%)	11 (8.6%)	0.019	68 (93.2%)	5 (6.8%)	0.282
<i>Go to work</i>	78 (83.9%)	15 (16.1%)		227 (87.0%)	34 (13.0%)	
<i>Unemployed</i>	75 (96.2%)	3 (3.8%)		30 (93.8%)	2 (6.3%)	
<i>Never works</i>	58 (82.9%)	12 (17.1%)		3 (100.0%)	0 (0.0%)	
Monthly income						
<i>No income</i>	89 (87.3%)	13 (12.7%)	0.194	17 (89.5%)	2 (10.5%)	0.048
<i>Low income</i>	87 (92.6%)	7 (7.4%)		66 (93.0%)	5 (7.0%)	
<i>Intermediate income</i>	95 (84.8%)	17 (15.2%)		154 (91.7%)	14 (8.3%)	
<i>High income</i>	57 (93.4%)	4 (6.6%)		91 (82.0%)	20 (18.0%)	
Smoking status						
<i>Regular</i>	39 (97.5%)	1 (2.5%)	<0.001	125 (91.9%)	11 (8.1%)	0.104
<i>Occasional</i>	69 (92.0%)	6 (8.0%)		51 (81.0%)	12 (19.0%)	
<i>Former smoker</i>	8 (57.1%)	6 (42.9%)		19 (95.0%)	1 (5.0%)	
<i>Non-smoker</i>	212	28		133	17	

	(88.3%)	(11.7%)		(88.7%)	(11.3%)	
Type of smoking						
<i>Cigarette</i>	21 (84.0%)	4 (16.0%)	0.089	73 (90.1%)	8 (9.9%)	0.753
<i>Waterpipe</i>	84 (96.6%)	3 (3.4%)		73 (90.1%)	8 (9.9%)	
<i>Cigarette and waterpipe</i>	7 (100.0%)	0 (0.0%)		4 (100.0%)	0 (0.0%)	
<i>Other</i>	0 (0.0%)	0 (0.0%)		8 (80.0%)	2 (20.0%)	
Do you have children?						
<i>No</i>	49 (74.2%)	17 (25.8%)	<0.001			
<i>Yes</i>	279 (92.1%)	24 (7.9%)				
Fertility preferences						
<i>Have more children</i>	161 (83.9%)	31 (16.1%)	0.001			
<i>Stop childbearing</i>	167 (94.4%)	10 (5.6%)				
Past pregnancy complications						
<i>No</i>	272 (87.7%)	38 (12.3%)	0.108			
<i>Yes</i>	56 (94.9%)	3 (5.1%)				
Frequency of sexual intercourse						
<i>1-2/wk</i>	140 (83.8%)	27 (16.2%)	0.019			
<i>≥3/wk</i>	74 (92.5%)	6 (7.5%)				
<i>1-2/month</i>	80 (90.9%)	8 (9.1%)				
<i>few times/year</i>	34 (100.0%)	0 (0.0%)				
Decision to have children						
<i>Woman</i>	31 (93.9%)	2 (6.1%)	0.618			
<i>Partner</i>	15 (88.2%)	2 (11.8%)				
<i>both</i>	282 (88.4%)	37 (11.6%)				
Partner abuse						
<i>No</i>	262 (86.5%)	41 (13.5%)	0.009			
<i>Yes</i>	50 (100.0%)	0 (0.0%)				
<i>No answer</i>	16 (100.0%)	0 (0.0%)				
History of child abuse						
<i>No</i>	273 (87.5%)	39 (12.5%)	0.047			

<i>Yes</i>	55 (96.5%)	2 (3.5%)			
Contraception use					
<i>No</i>	82 (68.3%)	38 (31.7%)	0.01		
<i>Yes</i>	30 (90.9%)	3 (9.1%)			
Contraception method					
<i>Oral pills</i>	13 (81.3%)	3 (18.8%)	0.217		
<i>IUD</i>	5 (100.0%)	0 (0.0%)			
<i>Condoms</i>	17 (100.0%)	0 (0.0%)			
<i>Other</i>	3 (100.0%)	0 (0.0%)			
Aware of emergency contraception (EC)					
<i>No</i>	179 (88.2%)	24 (11.8%)	0.988		
<i>Yes</i>	90 (88.2%)	12 (11.8%)			
Reasons for not using contraception					
<i>Lack of knowledge</i>	4 (100.0%)	0 (0.0%)	0.007		
<i>Fear of side effects</i>	60 (88.2%)	8 (11.8%)			
<i>Religious concerns</i>	1 (33.3%)	2 (66.7%)			
<i>Unavailable</i>	1 (100.0%)	0 (0.0%)			
<i>Unaffordable</i>	1 (100.0%)	0 (0.0%)			
<i>Desire to have more children</i>	28 (60.9%)	18 (39.1%)			
<i>Other</i>	11 (84.6%)	2 (15.4%)			

Bivariate analysis: correlates of unwanted pregnancy

A significantly higher proportion of unwanted pregnancies was found among women with a history of unwanted pregnancy (80.0%), who worked from home (54.5%), sometimes discussed with their partner about family planning (50.0%), desired to stop childbearing (50.0%), and did not regularly visit their physician (57.1%). The association between the violence scale and subscales and unwanted/wanted pregnancy was not significant. Similarly, no significant association was found for the other used variables (Table 4).

Table 4: Bivariate analysis taking the wanted/unwanted pregnancy as the dependent variable (N=41)			
	Wanted pregnancy N=32 (78.0%)	Unwanted pregnancy N=9 (22.0%)	p-value
Woman religion			
Christian	13 (76.5%)	4 (23.5%)	1.000
Muslim	13 (76.5%)	4 (23.5%)	
Druze	6 (85.7%)	1 (14.3%)	
Woman working status			
Work from home	5 (45.5%)	6 (54.5%)	0.032
Going to work	14 (93.3%)	1 (6.7%)	
Unemployed	3 (100.0%)	0 (0.0%)	
Never work	10 (83.3%)	2 (16.7%)	
Woman income			
No income	10 (76.9%)	3 (23.1%)	0.609
Low	6 (85.7%)	1 (14.3%)	
Intermediate	14 (82.4%)	3 (17.6%)	
High	2 (50.0%)	2 (50.0%)	
Women smoking status			
Regular	8 (72.7%)	3 (27.3%)	0.844
Occasional	9 (75.0%)	3 (25.0%)	
Previous	1 (100.0%)	0 (0.0%)	
Non smoker	14 (82.4%)	3 (17.6%)	
History of unwanted pregnancy			
Yes	1 (20.0%)	4 (80.0%)	0.006
No	31 (86.1%)	5 (13.9%)	
Discussion with partner about family planning			
Sometimes	4 (50.0%)	4 (50.0%)	0.033
Always	28 (84.8%)	5 (15.2%)	
Fertility preferences			
Desire to have children	27 (87.1%)	4 (12.9%)	0.014
Desire to stop childbearing	5 (50.0%)	5 (50.0%)	
Visiting regularly the physician			
Yes	20 (87.0%)	3 (13.0%)	0.016
No	3 (42.9%)	4 (57.1%)	
	Mean (SD)	Mean (SD)	
Women age in years	28.9 (5.3)	29.9 (4.3)	0.548
Age at marriage in years	25.6 (4.0)	24.4 (4.6)	0.477
Household crowding index	0.77 (0.32)	1.2 (0.84)	0.162
Fear of poverty	5.3 (3.4)	5.1 (3.9)	0.880
Number of children	1.3 (0.45)	2.2 (0.83)	0.002
CASR - total abuse scale	0.37 (1.3)	0.44 (1.0)	0.609
CASR - Psychological abuse subscale	0.25 (0.80)	0.44 (1.0)	0.588
CASR - Physical abuse subscale	0.12 (0.49)	0.00 (0.00)	0.793
CASR - Sexual abuse subscale	0.00 (0.00)	0.00 (0.00)	1.000
<i>CASR: Composite Abuse Scale Revised; SD: standard deviation</i>			

Multivariable analysis

A first logistic regression, taking the current pregnancy status during confinement as the dependent variable in the context of socioeconomic status of the family, showed that lower odds of getting pregnant were significantly associated with older age (ORa= 0.918), being unemployed (ORa=0.139) and working from home (ORa=0.321) as compared to never working, being a smoker as compared to non-smoker (ORa=0.409), and having children (ORa=0.363) (Table 5, Model 1).

A second logistic regression taking the current pregnancy status during quarantine as the dependent variable in the context of contraception use showed that having children (ORa=0.175) and using contraceptives (ORa=0.227) are at lower odds of getting pregnant (Table 5, Model 2).

A third logistic regression taking current pregnancy during confinement as the dependent variable in the context of violence against women showed that having children (ORa=0.183) and using contraceptives (ORa=0.231) are at lower odds of getting pregnant. The association between psychological violence and pregnancy tended to significance ($p=0.065$) (Table 5, Model 3).

A fourth logistic regression taking the wanted/unwanted pregnancy as the dependent variable showed that regular visits to the physician for routine checkups (ORa=0.053) were significantly associated with lower odds of unwanted pregnancy. The association between psychological violence and unwanted pregnancy tended to significance ($p=0.056$) (Table 5, Model 4).

Table 5: Multivariable analysis			
Model 1: Logistic regression taking the current pregnancy status during quarantine as dependent variable in the context of socioeconomic status of the family			
Factor	ORa	95% CI	p-value
Woman age	0.918	0.852 ; 0.990	0.026
Woman working status: unemployed vs. never worked*	0.139	0.033; 0.581	0.007
Woman working status: working from home vs. never worked*	0.321	0.118; 0.872	0.026
Woman smoker vs. non-smoker*	0.409	0.167; 0.999	0.050
Having children	0.363	0.147; 0.898	0.028
Variables entered: having children, fertility preferences, partner's age, partner's income, woman's age, woman's work status during quarantine, woman's smoking status.			
Model 2: Logistic regression taking the pregnancy status during quarantine as dependent variable in the context of contraception use			
Factor	ORa	95% CI	p-value
Having children	0.175	0.072 ; 0.425	<0.001
Contraception use before getting pregnant vs. no use*	0.227	0.062; 0.827	0.025
Variables entered: having children, fertility preferences, partner's age, partner's income, woman's age, woman's work status during quarantine, woman's smoking status and contraception use.			
Model 3: Logistic regression taking the pregnancy status during quarantine as dependent variable in the context of violence against woman			
Factor	ORa	95% CI	p-value
Having children	0.183	0.074; 0.452	<0.001
Contraception use before getting pregnant vs. no use*	0.231	0.063; 0.853	0.028
Psychological violence	0.738	0.534; 1.020	0.065
Variables entered: having children, fertility preferences, partner's age, partner's income, woman's age, woman's work status during quarantine, woman's smoking status and contraception use, psychological, physical and sexual violence.			
Model 4: Logistic regression taking the wanted/unwanted pregnancy as the dependent variable			
Factor	ORa	95% CI	p-value
Regularly visiting physician for routine checkup	0.053	0.005 ; 0.515	0.011
Psychological violence	4.482	0.963 ; 20.861	0.056
Variables entered: past unintended pregnancy, family plan, fertility preferences, visiting regularly the physician, psychological, physical and sexual violence.			
<i>*Reference group; CI, confidence interval; ORa, adjusted odds ratio</i>			

Discussion

To the best of our knowledge, this study is the first to assess the factors correlated with current pregnancy status and unwanted pregnancy during the COVID-19 confinement among 369 Lebanese women. Our results showed that 11.1% of women were pregnant, of whom 22.0% reported unwanted pregnancies. Recently, several large-scale studies aimed to explore pregnancy and fertility during the coronavirus pandemic, but no results are published yet. Also, available data on the impact of a disaster on reproduction and fertility are contradictory. Some studies reported increased birth rates following short-term disasters [24, 25], while others showed a decrease in pregnancies [26, 27]. Globally, coronavirus affects the reproductive choice of both those who choose to conceive and those who do not. Indeed, worrying thoughts surrounding this pandemic may influence sexual activity, and employment loss and economic instability may lead to delay in pregnancy. Thus, there will still be individuals who could not regulate their reproductive decisions. Also, women planning to conceive will be concerned about the care and treatment they get during pregnancy while in confinement. The prevalence of unwanted pregnancies in this study is lower than that reported in other countries (ranging from 26% to 50%) [28-35], which may not reflect the actual rate of unwanted pregnancies in the Lebanese community, as our sample may not be representative of the entire population of pregnant women in Lebanon.

Our results showed that women who never worked had a higher probability of being pregnant, consistent with those of other studies reporting that socially disadvantaged women who never worked had a higher likelihood of being pregnant and consider childbearing as an escape from their poverty and financial strain [36-39]. Unmet need for family planning and poor reproductive control were more likely to increase subsequent and repeated pregnancies [40]. Also, poverty and unfavorable socioeconomic conditions increase the rate of fertility, as disempowered women would engage in spontaneous and unprotected sexual activity despite higher parity and family growth [41]. Additionally, the lack of communication within the couple, absence of sex education, and lack of family planning awareness were more likely to increase the number of pregnancies [41]. Working women are aware of delaying pregnancy due to work demands, expanding their social network, and developing knowledge about birth control [42]. During the COVID-19 lockdown, working women faced job and income loss and gained more time at home with their families, which could be associated with increased intimacy and sexual activity in couples [43, 44].

Our study found that younger age was among the factors significantly related to motherhood, consistent with previous research showing that the incidence of pregnancy increases among younger women living in a lower socioeconomic environment [45-47]. Socially disadvantaged women show higher reproductive practice but have limited control over their fertility and are subject to a greater risk of maternal morbidity and mortality [48]. Our results also showed that younger women were less likely to smoke during pregnancy, in agreement with previous findings [49-52]. A study of a representative sample of 1858 Dutch mothers found that women who smoked before pregnancy were younger, less educated, and lived without a partner [53]. Also, women who successfully quit smoking during pregnancy were more likely to have a higher level of education and a partner who did not smoke before and during pregnancy [53].

Moreover, studies have found that the prevalence of infertility and the time it takes to conceive are higher in smokers than in non-smokers [54-57]. Also, the chemicals in cigarettes could affect any stage of the reproductive process of both sexes [58, 59]. However, a supportive relationship between spouses has a positive impact on pregnancy, as it enables them to quit smoking [60-62].

Our study showed that having already children and using contraceptives are associated with a lower probability of pregnancy. Indeed, families with multiple children may consider any potential pregnancy as unwanted and rely on birth control methods to prevent pregnancy [63-66]. Moreover, educated and empowered women are more likely to take control of their reproductive health and household management [67-69]; they would refuse to have forced intercourse or unwanted pregnancy, using contraception methods to avoid further childbearing and unsafe abortion [70-72]. Additionally, women of advanced maternal age, with adequate education and free from financial constraints, have more access to contraceptives than their peers [73, 74]. Several factors encourage couples to use family planning effectively, including regular sexual activity, good communication between partners regarding their reproductive health and child-rearing, financial hardship, and job instability [75]. Thus, older couples and well-educated spouses engage in fertility regulation interventions, which reduces unwanted pregnancies and induced abortions and contributes to small family size [69, 76, 77].

Findings from this study have shown that women subject to psychological violence may have a lower probability of pregnancy and a very high probability of unwanted pregnancy, in line with previous results showing a strong correlation between domestic violence and unintended pregnancy [78-80]. In a recent study conducted in Ireland during the COVID-19 pandemic among 70 women, 4.3% reported relationship deterioration with their partners, and 11% stated that there were tensions between family members confined in the same household [81]. The COVID-19 lockdown has raised many challenges such as stress, anxiety, financial difficulties, and social isolation that have impacted the mental health status of women and their relationship with their partners and family members; such conditions can aggravate the risk of violence in families and worsen situations at homes [82]. Although not conclusively established, experiences of violence may also be associated with risky behaviors and poor pregnancy outcomes [83]. It is essential to document the long-term physical and psychological impacts of abuse and the role these interactions can play in rising stress associated with a spectrum of negative health outcomes [83]. Moreover, it is unclear whether the lockdown has a negative or positive impact on the mental health status of women and how the severity or frequency of violence experienced by abused women changes during pregnancy [81].

Our results showed that women who visit their physician for routine checkups have a lower probability of unwanted pregnancy. Similarly, previous findings have shown that providing women with birth control techniques and counseling reduces unplanned pregnancies and abortions [84-86]. A prospective study of 10,000 reproductive-aged women found that structured counseling could improve knowledge and consistent use of contraceptive methods, which lowers the rate of unintended pregnancy, abortion, and births [87]. The unmet need for contraception, unreliable or inaccurate use of contraceptive methods, and misinformation about adverse effects, especially for hormonal or long-acting reversible contraceptives,

are at the core of unwanted pregnancies [88]. Therefore, gynecologist counseling will provide women with sufficient information about the different contraceptive methods, including their effectiveness, availability, risks, and benefits, resulting in controlling birth and decreasing unwanted pregnancies [89]. During the COVID-19 pandemic, regular checkup visits may be delayed or interrupted to lower the risk of exposure to the virus, but telemedicine or any telehealth method could overcome this problem.

Study implications

Our study highlights the need for active measures towards surveillance and management of violence as an indispensable part of the fight against COVID-19. Despite the provision of basic needs and promptly implemented actions to contain the pandemic, yet violence encountered during this period should be thoroughly addressed and investigated as it is associated with long-term devastating consequences.

Limitation

This study has several limitations. Its results could not be generalized to the population because of the small sample size, which may not be representative of the entire Lebanese female population as the actual number of respondents is low. Also, its cross-sectional design cannot infer causality. Since it assessed adult women living with a partner, this study did not explore the adolescent pregnancy state. Information bias could also exist as the study questionnaire was online and answers self-reported. Selection bias might have also occurred since the sample was not randomly selected but rather gathered by using the snowball sampling technique. The majority of participants were well-educated with computer literacy and internet access; thus, less-educated people and those with no internet access were not assessed. Residual confounding bias is also possible since there might be factors related to pregnancy and unwanted pregnancy that were not measured in this study.

Conclusion

Our main findings indicate that women of younger age, smoking less, and never working were at a higher probability of being pregnant. However, using contraception was associated with a lower likelihood of pregnancy. Furthermore, psychological violence tended to be an associated factor for current pregnancy status and unwanted pregnancy. Thus, vulnerable women should be identified and offered appropriate care, information, and awareness to encourage them to conceive and maintain their well-being during a pandemic.

List Of Abbreviations

SARS-CoV2: Severe acute respiratory syndrome coronavirus 2, COVID-19: Coronavirus disease 2019, USD: United States dollar, CASR-SF: the Composite Abuse Scale (Revised) – Short Form, SPSS: Statistical Package for Social Sciences, SD: Standard Deviation, ORa: adjusted odds ratios, CI: Confidence Interval.

Declarations

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No funding was received for conducting this study.

Conflicts of interest/Competing interests

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Availability of data and material

Data can be made available under reasonable request form the corresponding author.

Ethics approval and consent to participate.

The Psychiatric Hospital of the Cross ethics committee approved the study protocol (HPC-018-2020). Online consent was obtained from each person on the first page of the questionnaire. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Authors' contributions

CH designed the study; CH, DM, JA, HS, SBM drafted the manuscript; CH, SBM and PS carried out the analysis and interpreted the results; PS, DK, NL and HS assisted in drafting and reviewing the manuscript; CH, DM, SBM, JA and NL was responsible for data collection; HS edited the paper for English language, PS supervised the course of the article. All authors reviewed the final manuscript and gave their consent.

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