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Knowledge and practices of breastfeeding mothers towards prevention of the emerging corona virus (COVID-19)☆

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ABSTRACT
Aim: To identify knowledge and practices of breastfeeding mothers towards prevention of the emerging corona virus (COVID-19).

Material and Methods: Cross-sectional design was used in this study. Data was collected via social media applications. Three hundred and seventy breastfeeding mothers completed the on-line survey. Questionnaire was assessing knowledge and practices of COVID-19 related to breastfeeding.

Results: The participating mothers have basic knowledge about COVID-19. Correct “Preventive measures” ranged from 84% to 99.7% but mothers have misconceptions regarding some modes of transmission, especially through blood & breast milk. In addition, they have a lack of understanding of how to deal with newborns of mothers infected or suspected to be infected with COVID-19 disease.

Conclusion: Participants have basic knowledge about COVID-19 in general but they have improper preventive breastfeeding practices against the disease in particular. Nurses and midwives have the main role to increase awareness of breastfeeding mothers regarding preventive measures of COVID-19.

1. Introduction

Emerging disease (COVID-19) that is caused by a novel coronavirus referred to as SARS-CoV2, has been spreading worldwide. It was firstly identified in Wuhan, Hubei Province in China in December 2019.1 To date, there is a lack of information available regarding the association of COVID-19 with breastfeeding.

It has been found that the virus was not present in the amniotic fluid, cord blood, neonatal throat swabs and breastmilk samples from COVID-19 infected mothers and all samples tested were negative for the virus. So, the transmission is most likely to be in the newborns during early bonding and feeding. Further, there is currently no evidence concerning transmission through genital fluids.2

Evidence of viral passage into breastmilk was not demonstrated for either of other previously known viruses (SARS- Co- V and MERS- CoV), which are coronaviruses as COVID- 19.2 The American College of Obstetricians and Gynecologists (ACOG) (2020) recommends that infants born to mothers with confirmed COVID-19 should be considered a patient under investigation and isolated. Further, it is recommended that a mother with confirmed COVID-19 or who is an asymptomatic mother under investigation should take all possible precautions by various means to avoid spreading the virus to her infant while breastfeeding. Alternatively, a different individual may be considered to feed the infant with expressed breast milk.3

The main risk for infants of breastfeeding is the close contact with the mother, who is likely to share infective airborne droplets. In light of the current evidence, the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk. The risks and benefits of breastfeeding, including the risk of holding the baby close to the mother, should be discussed with her. So, women who prefer to...
breastfeed, precautions should be taken to limit viral spread to the baby.2

In Jordan, no data has been available about breastfeeding mothers and their concerns regarding breastfeeding in this pandemic of COVID-19. Although there has been a huge educative campaign regarding COVID-19 prevention and universal precautions to deal with this pandemic, nothing has been focused on breastfeeding mothers. Therefore, the purpose of this study was to assess knowledge and practices of breastfeeding mothers towards prevention of the emerging coronavirus (COVID-19). It is expected that this study will assess the needs of the breastfeeding mothers about breastfeeding during COVID-19 pandemic, which will help in developing educational material about best practices to protect themselves as well as their breastfeeding children.

2. Material and methods

2.1. Design

Quantitative, descriptive, cross-sectional design was used to achieve the objective of this study.

2.2. Setting

There is no specific setting for this study since the breastfeeding mothers were invited via social media to take part in the study by filling an online questionnaire.

2.3. Sample

The target population of this study is breastfeeding mothers regardless of their age and breastfeeding duration. The accessible population is the breastfeeding mothers who can access the Google form survey through their social electronic networks (Facebook, WhatsApp). The sampling technique was convenient sampling. Inclusion criteria: any mother who had got an infant (first 12 months of life) and she was using breastfeeding as a method of feeding exclusively or complementary, she would like to participate, and she could use the link of google form and fill in the questionnaire. The sample size was calculated based on Thorndike’s rule,3 which requires 20 participants for each independent variable to ensure the validity of the statistical conclusions. As there were 13 variables in this study, a minimum of 260 participants was needed (n = 13 × 20 = 260). The sample size required for this study is 260 participants. Extra participants that equals 20% of the sample size were recruited to compensate for attrition rate or incomplete questionnaires.

2.4. Ethical considerations

The required IRB approval was obtained from the Institutional Review Board of the responsible institution. The information sheet was the first section of the data collection method, which was considered a consent form since the participating mother fill the questionnaire. It included the purpose of the study and participants’ rights. Participants would understand that their participation was voluntary and they could stop answering the questions at any time they would like to. Anonymity and confidentiality of data were maintained, and participants did not provide any details that identify them. The information and data collected from the participants were kept confidential and were used for research purposes only. The members of the research team were the only people who dealt with the participants’ information.

2.5. Data collection method

The data collection method was consisting of a Google Electronic Form questionnaire. It was two main parts: the first main one was the demographic sheet that composed of 13 questions. The second main part of the questionnaire was assessing knowledge and practices of COVID-19 related to breastfeeding. It was composed of three sections. The first section was about breastfeeding practices (five questions). The second section was about knowledge of COVID-19 (all 17 questions). The third section was about the practices of breastfeeding mothers towards COVID 19 (all 11 questions). The questionnaire was developed for the current study after a thorough recent literature review related to COVID-19 disease’s signs, symptoms, spread, and preventive measures. Further, the recommended practices of breastfeeding mothers towards COVID 19 have been used to form the questionnaire. These practices have been adopted from recommendations of international organizations as World Health Organization (WHO), International Lactation Consultant Association (ILCA), the United Nations Children’s Fund (UNICEF), International Society for Research on Human Milk and Lactation (ISRML) and Center of Disease Control (CDC) during 2020. The questionnaire was evaluated by experts in maternal and child health and by expert in breastfeeding for content validity. Then the questionnaire was modified based on their revisions. Further, reliability (internal consistency) of the questionnaire was measured by calculating Cronbach Alpha and it was 0.65.

2.6. Data collection procedure

Data was collected by Google Form Electronic Survey. Then the form was distributed to breastfeeding mothers through their social electronic networks (Facebook and WhatsApp). Participants read first the information sheet. Then the participants completed the questionnaire and submit it. The data was collected between May, 2020- October, 2020.

2.7. Data Analysis

Data were analyzed by SPSS Statistical Package for Social Sciences SPSS version 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (frequencies, percentages, mean and standard deviation) were used to describe the participants’ characteristics, knowledge and practices of COVID-19.

3. Results

The total sample of this study was 370 breastfeeding mothers who completed the online questionnaire. The participants’ age ranged between (20- 43 years, M= 30 years, SD= 4.1). Around 40% (n= 161) of the participants earned a Bachelor’s degree in scientific specialties. Two-thirds of the participants were not employed (n= 234, 63.2%). Forty-two percent of the participants (n=155) gave birth via C/S. Most of the participants were living in cities (n= 332, 89.7%) mostly in Jordan. Jordanian participants account for 82% (n= 303) of the sample. Regarding breastfeeding practices, nearly all participants (n= 361, 97.6%) of the sample breastfed colostrum to their babies. However, only 146 mothers (39.5%) breastfed their babies exclusively for the first six months of age, and 256 mothers (69%) are breastfeeding but not exclusively. Only around one-fourth of the mothers (n=102, 27.6%) were using both methods of feeding (breastfeeding and bottle feeding) (Table 1).

3.1. Assessment of Knowledge and General Preventive Measures towards COVID-19

The results of this study showed that the participating mothers have sufficient basic knowledge about COVID-19 such as the coronavirus is caused by a virus (n=354, 95.7%), and it is an infectious disease (n=369, 99.7%). However, knowledge about the mode of transmission was not well known between the participants. Around two-thirds of the sample (n= 257, 69.5%) stated that the coronavirus can be transmitted through blood transfer and can be transmitted through sexual contact (n= 214, 57.8%). Further, more than half of the sample said that the
coronavirus cannot be transmitted through the air (n=222, 60%). On the other hand, nearly all of the sample stated that coronavirus can be transmitted through sneezing (n= 358, 96.8%), touching or kissing an infected person (n= 363, 98%), and through using equipment of the infected person (n= 352, 95%). Regarding the signs and symptoms of COVID-19, most of the participating mothers expressed correct knowledge about signs and symptoms of COVID-19 (Table 2). Further, most of the participating mothers (n= 275, 74.3%) stated that signs and symptoms of COVID-19 start to appear on the infected person within two weeks or more as a maximum period.

The level of knowledge of participating mothers regarding the general preventive measures and their effectiveness in decreasing the incidence of being affected by the coronavirus was at a high level. The correct answers of "preventive measures" ranged from 84% to 99.7% of the sample (Table 3). However, one preventive measure that stated "avoid dealing with wild animals decreases the incidence to be infected with COVID-19" was not known well among the participants (n= 217, 58.6%).

### 3.2. Practices of breastfeeding mothers towards COVID-19

Practices of participating mothers regarding breastfeeding during the pandemic of COVID-19 were varied. Fifty percent of the mothers (n=185) agreed that COVID-19 affects breastfeeding ability. Most of the mothers (n=310, 83.8%) knew the definition of respiratory hygiene during breastfeeding which is using a medical mask when approaching the infant.

Further, around three-quarters of them agreed that coronavirus can be transmitted by breastfeeding (n=279, 75.4%). Although nearly all mothers (n= 349, 94.3%) admitted that breast milk remains the best source of nutrition for most infants. Similarly, most of the mothers (n=268, 72.4%) agreed that breastfeeding strengthens the immune system by transferring antibodies directly from the mother to the infant including COVID-19. Regarding hygiene practices, it was clear from the results that general hygiene practices as using face mask, putting gloves, and hand washing were well known by the participants (Table 4). However, one-quarter of the mothers (n=95, 25.7%) did not agree and one-sixth of them (n=59, 16%) did not know that there should be a safe distance between the infant and infected mother was well known between the participating mothers (Table 4). Around 50% of the sample refused that "Mothers and infants must be enabled to stay together and practice skin-to-skin contact, and to be together in the room throughout the day and night, especially immediately after birth during the breastfeeding period, whether mothers are suspected of being infected, or possibly infected, or infected with new corona (COVID-19) with the application of all necessary precautions".

In case the breastfeeding mother would be infected with the
coronavirus and she would be very sick that prevent her ability to breastfeed. 75.4% of the participating mothers (n = 279) agreed that “the mother can pump the milk and give it to her baby through a clean cup and/or spoon - all with measures to reduce the infection”. Similarly, if the mother would be in a very poor condition and unable to breastfeed or squeeze milk from the breast, 76.8% of the participating mothers (n = 329) supported that such mother must investigate the possibility of reintroducing breast milk (re-breastfeeding after stopping breastfeeding and using a lactation specialist for this purpose) or resorting to another breastfeeding mother to breastfeed the child.

4. Discussion

Since COVID-19 was considered pandemic along with the rapid expansion of the second wave in Jordan, it may be essential for the general population to be updated with evidence based information about the disease to raise their awareness about how to prevent and

### Table 3

| General preventive measures of COVID-19 | Yes | No | Do not know |
|---------------------------------------|-----|----|-------------|
| 1. Avoid dealing with wild animals decreases the incidence to be infected with COVID-19? | 217 | 86 | 67 18.1 |
| 2. COVID-19 can be transmitted from infected person to uninfected one if SARS is present on the infected one only? | 309 | 39 | 22 5.9 |
| 3. Putting face mask when going out of home will decrease the risk of infecting with coronavirus? | 312 | 51 | 7 1.9 |
| 4. Using disposable gloves when going out of home will decrease the risk of infecting with coronavirus? | 322 | 43 | 5 1.4 |
| 5. To reduce the risk of developing corona disease, individuals should avoid going to crowded places and leaving a safe distance of two meters far from other people? | 367 | 0 | 0.0 3 0.8 |
| 6. To reduce the risk of developing corona disease, frequent washing of hands with soap and water after contacting things or people or returning from outside to the home is necessary? | 369 | 0 | 0.0 1 0.3 |
| 7. People who contacted with a person with corona disease should be immediately isolated in a suitable place for at least 14 days? | 366 | 3 | 0.8 1 0.3 |
| 8. We must stay at home for the entire period of Corona disease? | 358 | 10 | 2.7 2 0.5 |
| 9. Hands should be washed immediately when returning home? | 369 | 0 | 0.0 1 0.3 |
| 10. Isolation and treatment of infected persons with corona disease is an effective method to reduce spreading the disease? | 368 | 0 | 0.0 2 0.5 |
| 11. It is not possible to travel during the period of health bans and epidemics? | 356 | 12 | 3.2 2 0.5 |

### Table 4

| Preventive knowledge and practices of breastfeeding | Agree | Disagree | Do not know |
|----------------------------------------------------|-------|----------|-------------|
| 1. Corona disease (Covid-19) affects breastfeeding ability? | 185 | 50 | 123 62 |
| 2. Corona (Covid-19) can be transmitted through breast milk? | 279 | 75.4 | 20 5.4 71 |
| 3. Respiratory hygiene during breastfeeding is the use of a medical mask when approaching a child. | 310 | 83.8 | 27 7.3 33 8.9 |
| 4. Mothers and infants should be enabled to stay together and practice skin contact, and be in the room throughout the day and night, especially immediately after childbirth during the period of breastfeeding, whether the mothers are suspected of being infected. | 150 | 40.5 | 174 47 46 12.4 |
| 5. Mothers who have the new Corona virus (Covid-19) who are breastfeeding should wash their hands before touching the infant and wear a face mask, if possible, while breastfeeding. | 329 | 88.9 | 18 4.9 23 6.2 |
| 6. Even during this Corona virus (Covid-19) pandemic, breast milk remains the best source of nutrition for most infants. | 349 | 94.3 | 8 2.2 13 3.5 |
| 7. If the mother infected with the emerging corona virus is very sick that she cannot breastfeed, the mother can pump the milk and give it to her baby through a clean cup and/or spoon - all with measures to reduce the infection. | 279 | 75.4 | 48 13 43 11.6 |
| 8. If the mother is diagnosed with the emerging corona virus or is suspected of having this disease, her newborn should be kept at least two meters from the mother. | 216 | 58.4 | 95 25.7 59 15.9 |
| 9. If the nursing mother suffers from respiratory symptoms such as shortness of breath: She should use a medical mask when approaching the child. The hands should be thoroughly washed with soap or antiseptic before and after contact with the child. | (continued on next page) |
pants were aware of importance of colostrum to their newborns as they recognized international organizations including, but not limited to, the considered the importance of breastfeeding for mothers and their infant protect themselves against COVID-19. The global recommendations continued

Table 4 (continued)

|   |   |   |   |
|---|---|---|---|
| 351 94.9 | 6 1.6 | 13 3.5 |
| 10. | Breastfeeding strengthens the immune system by transferring antibodies directly from the mother to the infant, and this applies to mothers infected with the emerging corona virus. | 268 72.4 | 29 7.8 | 73 19.7 |
| 11. | If the mother is in a very poor condition and is unable to breastfeed or squeeze milk from the breast, then she must explore the possibility of regenerating breast milk (breastfeeding after stopping breastfeeding) and using a breastfeeding specialist for (re-breastfeeding after a period of suspension), or resorting to the nursing mother (another woman breastfeeding or caring for baby). | 284 76.8 | 36 9.7 | 50 13.5 |

protect themselves against COVID-19. The global recommendations considered the importance of breastfeeding for mothers and their infant in light of the pandemic, however, breastfeeding is encouraged by all the recognized international organizations including, but not limited to, the WHO, UNICEF and CDC. This study was conducted to understand breastfeeding mothers’ preventive knowledge and behaviors of COVID-19 about breastfeeding. However, this study showed nearly all participants were aware of importance of colostrum to their newborns as they all initiated breastfeeding & gave their babies colostrum, which was congruent with previous studies conducted in Jordan which revealed that majority of postpartum Jordanian women initiated breastfeeding at the first hour & within three hours postpartum, respectively. Moreover, Khasawneh et al. 2020 concluded in their study that Jordanian women were knowledgeable & aware about breastfeeding benefits & WHO recommendations in this regard.

In contrary to the expectations that mothers were afraid of transmission of coronavirus through breastfeeding which might lead to reduction in breastfeeding rates, two third of mothers of this study (69%) were breastfeeding representing higher rates than previous studies in Jordan and some Arab countries (Qatar & Kuwait) (58%, 58%, & 39%), respectively. However, this may be explained by the characteristics of study sample particularly employment, this is because most of the subjects (two third) were housewives. However, employment was found as a common barrier to complete breastfeeding in other studies. In addition, data of this study was collected in May/2020, the time in which there were many countries, including Jordan, have imposed lockdown & enforced general public health infection prevention measures in an effort of reducing the transmission of COVID-19. So, they were under strict stay-at-home measures which in turn might give them a chance to stay with their infants all the times & encourage them to continue breastfeeding.

Overall, the majority of respondents were knowledgeable about nature, preventive measures, signs & symptoms, and some modes of transmission of COVID-19 disease, which was consistent with previous surveys conducted on general population in Jordan & some countries worldwide. Khabour et al. (2020), concluded that Jordanians have a good perception about the nature, cause and symptoms of COVID-19 disease. Bekele et al. (2020), in their review summarized findings from China, Iran and Qatar which revealed that about 90%, 96% & 79.4%, had good knowledge about COVID-19 disease, respectively, & in the United States, about 71.7% of participants knew the symptoms. However, our results might be attributed to the effect of different media channels in Jordan, that were employed to raise awareness about COVID-19 among the Jordanian population. In addition, the social media platforms had a significant effect in spreading the information about the danger of COVID-19.

Noteworthy from the finding of this study that more than half of participants believe that COVID-19 could be transmitted through blood and sexual contact, also the statement “avoid dealing with wild animals decreases the incidence to be infected with COVID-19” was not known well among the participants. However, it might reflect the lack of information available on different media channels by specialized professionals regarding these points.

Regarding knowledge & preventive practices of breastfeeding, even though the majority of respondents considered breastfeeding as the best source of nutrition for infants. Further, its importance in enhancing immune system by transferring antibodies directly from the mother to the infant including COVID-19, half of them believed that COVID-19 affect breastfeeding abilities, supporting a study conducted in Turkey showed that half of mother didn’t know or think that breastfeeding is unsafe during COVID-19 outbreak. In addition, about three-quarter of respondents agreed that coronavirus could be transmitted by breast milk, which was congruent with an Indian study reported that half of participants not aware about transmission of COVID-19 through breast milk. However, till now most studies failed to detect coronavirus in breast milk.

Moreover, most of the mothers (83.8%) knew the definition of respiratory hygiene during breastfeeding, also general hygienic practices as using the face mask, putting gloves, and hand washing were well known by them. Similarly, in previous studies conducted on general population in Jordan & the United States more than half of participants knew the common preventive measures during COVID-19 pandemic.

Regarding breastfeeding practices in case of mothers get infected with COVID-19, two-thirds of respondents agreed on giving infants the pumped or expressed breast milk by a clean cup or spoon. In addition, they support restoring of breastfeeding after stopping it & using a lactation specialist in this regard, or resorting to another breastfeeding mother to breastfeed the child. Thus suggesting the participant’s awareness of importance of breastfeeding as discussed earlier, which in line with World Health Organization’s recommendations during COVID-19 pandemic.

On the other hand, a few percent of participants neither agreed nor knew that there should be a safe distance between the infant and infected mother, and half of sample refused rooming-in & staying in close contact with the infants after delivery & during breastfeeding in case of being infected, or possibly infected, or infected with new corona, even with using preventive precautions, although the updated WHO’s guidelines recommend that mothers with suspected or confirmed COVID-19 infection should be encouraged to initiate and continue breastfeeding. Such findings highlight the need of mothers for specialized awareness and education campaigns designed to correct misconceptions about practices of breastfeeding during COVID-19 pandemic.

The results of this study showed that the participating mothers have sufficient basic knowledge about COVID-19 in general and preventive breastfeeding practices against the disease in particular, but they have misconceptions regarding some modes of transmission especially through blood & breast milk. In addition, they have lack of understanding of how to deal with newborns of mother’s infected or suspected to be infected with COVID-19 disease. So, these necessitate more efforts by systems to increase awareness & organize education campaigns to correct misleading in this regard.
4.1. Limitations

A limitation of this study was the sampling procedure used which depended on the accessibility of participants to internet-based services and their willingness to participate in an online-based survey. Another limitation that might affect our results was different media channels in Jordan, that were employed to raise awareness about COVID-19 among the Jordanian population.

5. Conclusion

To the best of the researchers’ knowledge, this is one of the initial studies to investigate knowledge and practices of breastfeeding during COVID-19 pandemic in the middle-east particularly in Jordan. The participating mothers have basic knowledge about COVID-19 in general but they have improper preventive breastfeeding practices against the disease in particular.

5.1. Implications and Recommendations

Nurses and midwives have main role to increase awareness of breastfeeding mothers regarding preventive measures of COVID-19 & organize education campaigns to correct misleading knowledge and practices. Interventional studies are recommended for breastfeeding mothers in Jordan to increase their awareness about how to deal with infectious diseases such as COVID-19 during breastfeeding.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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