

# Influence of Online Sources and Social Networking Sites on Breastfeeding Rate and Practices in Jordan

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## ABSTRACT

**Objective:** This study assesses the influence of using mobile health in supporting breastfeeding through online sources and Social Network Sites (SNS) among pregnant and lactating mothers on EBF rates and practices at one and two months postpartum.

**Design:** A cross-sectional study with initial face-to-face interviews using a structured questionnaire followed up with telephone interviews at one and two months postpartum was conducted at University Hospital over two months period. A convenient sample of 181 Jordanian women in their third trimester of pregnancy was recruited. The included data were: personal characteristics, breastfeeding intention and rate at 1 and 2 months, and questions about the use of online researching or different SNS resources, in providing necessary information for breastfeeding, along with how much the information was trusted and if it had an impact on BF practices. Breastfeeding status and use of online resources were assessed at the initial and follow-up Interviews.

**Results:** Online sources were used by 74% of participants. They most often used Google (44%), followed by Facebook (24.6%), as significant sources of obtaining and sharing information with others for breastfeeding support. Moreover, 82.5% of those users did so before giving birth and were overwhelmingly confident (92.5%) in the accuracy of the obtained information. Users (n=134) were significantly more likely than non-users (n=47) to indicate that online sources enhanced breastfeeding practices and influenced their decision to continue EBF. Using these sites during pregnancy was associated with a significantly higher EBF rate among users in the first month and second month postpartum respectively.

**Conclusion:** The study demonstrated high use of online and SNS resources that enhanced BF practices and the rate at one and two months of age. In areas where breastfeeding programs are lacking, there is a need to design interactive mobile health platforms to motivate women to engage in breastfeeding during pregnancy.

**Keywords:** Breastfeeding; Social media; Social support; Hospitals, University; Jordan

**Abbreviations:** ABA: Australian Breastfeeding Association; CI: Confidence Interval; EBF: Exclusive Breastfeeding; JUH: Jordan University Hospital; NICU: Neonatal Intensive Care Unit; OR: Odds Ratio; SNS: Social Networking Sites; WHO: World Health Organization.

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**Received date:** April 06, 2020; **Accepted date:** April 13, 2020; **Published date:** April 23, 2020

**Citation:** Badran EF, Aldamiri NN, Shamasneh A, Braik LM, Allehdan SS, Tayyem RF (2020) Influence of Online Sources and Social Networking Sites on Breastfeeding Rate and Practices in Jordan. *Pediatr Ther* 10:359. doi:10.35248/2161-0665.20.10.359

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## INTRODUCTION

Breast milk is the most beneficial food for infants younger than six months because of its unique nutritious content; breastfeeding also benefits the mother [1]. The World Health Organization (WHO) [2] defined Exclusive Breastfeeding (EBF) as feeding infants only breast milk and no solids or other liquids, including water, except for oral rehydration solution, vitamins, minerals, and medications for 6 months of life. Breastfeeding initiation usually occurs within the first hour of life [2], but EBF initiation and maintenance are challenging to implement, particularly because of the many baby formulas that offer easier ways to feed infants. A novel indicator is the rate of BF initiation and exclusive breastfeeding. Worldwide and in Jordan these rates are suboptimal. Using data from the Jordan Population and Family Health Surveys (JPFHSs). According to the 2018 JPFHS, 26% of children under six months are exclusively breastfed in Jordan. One way to increase EBF might be through mobile health. WHO in 2011 defined mobile health as a “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, Personal Digital Assistants (PDAs), and other wireless devices” [3]. Online sources and Social Networking Sites (SNS) are increasingly popular around the world, and their users include pregnant women and lactating mothers. Therefore, researchers have explored whether involvement with SNS influences breastfeeding among those users. Some previous studies emphasize the critical support roles of partners, friends, and healthcare providers when it comes to breastfeeding, with regards to assisting in decision making about how the baby is fed and in providing support for breastfeeding after the baby is born [4] few studies have found that online activities influenced breastfeeding intention [5], and there are insufficient data on the influences of online sources and SNS on EBF rates and practices in Jordan. In some parts of Jordan, there is limited access to in-person breastfeeding programs. Therefore, this study focused on a place where breastfeeding support programs are not readily accessible and where evidence-based data are lacking. Theses on Line resources are one of self-management awareness programs for Breastfeeding to “to improve Breastfeeding rate, practices, reduce morbidity, and lower the cost of care Objective of the study: We investigated the effect of Jordanian pregnant and lactating women’s uses of self-management awareness online breastfeeding support inline resources on their success in breastfeeding rates and practices at one and two months postpartum.

## MATERIALS AND METHODS

### Study design

This study’s objectives were met using a cross-sectional structured questionnaire. An initial face-to-face interview in Arabic was conducted by trained researchers at Maternity Antenatal Clinic. Outpatient Clinic The study target included a convenience sample of pregnant women during their third trimester (starting at week 28), followed up by second and third telephone interviews when their infants were one and two months old.

### Setting

The initial face-to-face interviews were conducted between November and December 2018 at Jordan University Hospital (JUH) in Amman, Jordan, which provides regular pre and post-natal care for low and high-risk mothers. The hospital was not rated as a UNICEF/WHO Baby-Friendly Hospital during the implementation of this study.

### Participants

The eligibility criteria were that women had to be 1) in the third trimester of pregnancy, 2) planning to give birth at the JUH Department of Obstetrics and Gynecology, and 3) willing to be followed up with through second and third telephone interviews when their infants were one or two months old. Mothers were considered eligible if they had had regular proper antenatal visits, defined as at least eight regular contact prenatal health visits during pregnancy at the JUH Department of Obstetrics and Gynecology, with at least one ultrasound before 24 weeks of gestation. Women whose infants were born with major congenital anomalies and/or gastrointestinal diseases and those whose infants were transferred to other medical institutions before discharge or died within the first 48 hours of life were dropped from the study. The final sample included 181 participants who participated in the initial face-to-face interview and follow-up telephone interviews.

### Sample size

The sample size was calculated based on the assumptions that were arrived by expecting that 10%-15% working mothers breastfeed their infants at a 95% confidence level (CI) and 80% power. The minimal sample size was then determined to be 61. The original sample for this project of 181 in total covered our required sample.

### Data collection

The questionnaire had four sections: personal characteristics and previous breastfeeding experience: questions breastfeeding intention in the third trimester; questions about breastfeeding rate at 1 and 2 months and questions about the use of online sources and SNS, including site types, about using online resources for self-education for getting breastfeeding guidance and extent of trust of Online resources sites in providing breastfeeding information. The data was collected, translated, entered into a database and analyzed.

### Statistical analysis

All questionnaire answers were entered into a database. Afterward, using SPSS ver. 22 (SPSS Inc., Chicago, IL, USA), the statistical analysis was computed. Descriptive statistics were computed to summarize the participants’ characteristics, previous breastfeeding experience, intention to breastfeed, use of online sources in general, and use of online sources related to breastfeeding guidance (the follow-up interviews). Chi-square for contingency tests was used to examine differences between

online users' and non-users' opinions about the use of online sources regarding breastfeeding experiences and information.

**Table 1:** Characteristics of the participants (N=181).

Variable	n (%)
<b>Age (years)</b>	
<25	68 (37.6)
≥ 25	113 (62.4)
<b>Educational attainment</b>	
Some high school or high school completion	47 (26.0)
Bachelor's degree or postgraduate degree	134 (74.0)
<b>Occupation</b>	
Employee	88 (48.6)
Homemaker	93 (51.4)
<b>Family income (USD)</b>	
<700	73 (40.3)
≥ 700	87 (48.1)
Varies	21 (11.6)
<b>Length of maternity leave in working women (n=88)</b>	
<Two months	44 (50.0)
≥ Two months	44 (50.0)
<b>Parity</b>	
Nulliparous	70 (38.7)
Multipara	111 (61.3)
<b>Planned pregnancy</b>	
Yes	123 (68.0)
No	58 (32.0)
<b>Reporting good prenatal care</b>	
Yes	159 (87.8)
No	22 (12.2)
<b>Pregnancy outcome</b>	
Singleton	144 (79.6)

Multiple	37 (20.4)
<b>Delivery method</b>	
Vaginal	138 (76.2)
Cesarean section	43 (23.8)
<b>Gestational age</b>	
Other	13 (7.2)
<37 weeks	62 (34.3)
≥ 37 weeks	119 (65.7)
<b>NICU admission for their newborn</b>	
Yes	100 (55.2)
No	81 (44.8)
<b>Length of NICU stay for their newborn (n=100)</b>	
<5 days	70 (70.0)
≥ 5 days	30 (30.0)
<b>The most supportive person during breastfeeding in postpartum period</b>	
Mother	99 (54.7)
Sister	37 (20.4)
Doctor	11 (6.1)
Mother-in-law	21 (11.6)
<b>Other</b>	13 (7.2)
<b>Exclusive breastfeeding (n=181)</b>	
At one month	140 (77.3)
At two months	133 (73.5)
<b>Exclusive breastfeeding during NICU hospitalization (n=100)</b>	
Yes	81 (81.0)
No	19 (19.0)

A linear regression analysis was performed to assess the influence of the use of online sources on EBF. A multivariate logistic regression analysis was used to evaluate the associations between using online sources and EBF at one and two months postpartum. Odds ratios (OR) and 95% Confidence Intervals (CI) were calculated, and statistical significance was set at  $p < 0.05$ .

## Ethical consideration

The study proposal was approved by the institutional review board of Jordan University Hospital (reference number 93/2019). The study was conducted in accordance with the ethical standards of the 1975 Declaration of Helsinki. Written informed consent was obtained from each participant after a full explanation of the study purposes. All authors declare that they have no conflict of interests.

## RESULTS

As demonstrated in Table 1. About one-third of the babies (34.3%) were born before the 37<sup>th</sup> week of pregnancy. Vaginal delivery was most common (76.2%). About two-thirds of the mothers reported having breastfed a previous child, and 54.7% reported that their mothers gave the most support to them regarding breastfeeding for the current baby. More than one-half of the new-borns (n=100;55.2%) spent time in the Neonatal Intensive Care Unit (NICU), a stay most likely to last less than five days (70%). Among those who spent time in the NICU, 81% were EBF.

**Table 2:** Prenatal breastfeeding intention and experience to breastfeed, and family breastfeeding support in the postpartum period (N=181).

Variable	n (%)
<b>Previous breastfeeding experience</b>	
Yes	120 (66.3)
No	61 (33.7)
<b>The most supportive person during breastfeeding in postpartum period</b>	
Mother	99 (54.7)
Sister	37 (20.4)
Doctor	11 (6.1)
Mother-in-law	21 (11.6)
Other	13 (7.2)
<b>Maternal intention for the duration of exclusive breastfeeding as reported during the third trimester of pregnancy</b>	
<One month	66 (36.5)
≥ One month	93 (51.4)
Undecided	22 (12.2)

Prenatal data on the women's and intention to breastfeed is shown in Table 2. During the last trimester, about 80% of the pregnant women indicated they intended to breastfeed their

babies, and about one-half of those women intended to breastfeed for longer than one month.

**Table 3:** Prevalence of maternal use of online resources (N=181).

Variable	n (%)
<b>Use of online resources (N=181)</b>	
Yes	134 (74.0)
No	47 (26.0)
<b>Types of resources (n=134)</b>	
Google (online resource)	59 (44.0)
Facebook	33 (24.6)
WhatsApp	25 (18.7)
Instagram	6 (4.5)
Others	11(8.2)
<b>Using online resources for getting breastfeeding guidance (n=134)</b>	
Yes	126 (94.0)
No	8 (6.0)
<b>Time of using online resources for breastfeeding guidance (n=126)</b>	
During last trimester of pregnancy	104 (82.5)
After facing a problem (postnatal)	22 (17.5)
<b>Using online calls for contacting person to help you breastfeed (n=134)</b>	
Yes	92 (68.7)
No	42 (31.3)
<b>Getting pre- or postnatal advice from obstetrician-gynecologists to use online resources in breastfeeding guidance (n=181)</b>	
Yes	76 (42.0)
No	105 (58.0)
Yes	124 (92.5)
No	10 (7.5)

As shown in Table 3, 134 out of the 181 participants (74%) used online sources (including SNS). They most often used Google (44%) followed by Facebook (24.6%) to find information and they were least likely to use Instagram and various other sources. Seventy-five percent (n=25) of mothers of premature babies reported using closed Facebook groups to get information regarding breastfeeding support and that they shared their

experience with similar lactating mothers. Almost all the 134 participants who used online sources indicated that they used these resources for breastfeeding guidance (n=126; 94%). Moreover, 82.5% (n=108) of those who used the online sources for breastfeeding advice did so before giving birth, and almost all were confident (92.5%) in the accuracy of the information they obtained.

About two-thirds of the participants (n=92; 69.7%) who used online breastfeeding resources used them to do personal contact with people for breastfeeding guidance and support.

However, less than one-half of the 181 (42%) participants were advised by their obstetricians or gynecologists to use trustworthy online sources for breastfeeding support and guidance during pre- and postnatal visits.

**Table 4:** Differences between online source and social networking site users and non-users regarding the benefit of sources for supporting breastfeeding practices (N=181).

Variable	Users (n=134)	Non-users (n=47)
<b>Improving breastfeeding practice</b>		
Yes	122 (91.0)***	21 (44.7)
No	12 (9.0)	26 (55.3)
<b>Improve decision to continue exclusive breastfeeding</b>		
Yes	113 (84.3)***	14 (29.8)
No	21 (15.7)	33 (70.2)
<b>Provide information about benefits of exclusive breastfeeding</b>		
Yes	118 (88.1)***	11 (23.4)
No	16 (11.9)	36 (76.6)
<b>Provide information about pumping and milk expression from breast</b>		
Yes	107 (79.9)***	11 (23.4)
No	27 (20.1)	36 (76.6)
<b>Provide information about medications or supplements to increase milk production</b>		
Yes	115 (85.8)***	16 (34.0)
No	19 (14.2)	31 (66.0)
<b>Provide information about breast engorgement</b>		
Yes	103 (76.9)***	13 (27.7)
No	31 (23.1)	34 (72.3)
<b>Provide information about sufficient breast milk supply</b>		
Yes	113 (84.3)***	15 (31.9)
No	21 (15.7)	32 (68.1)

\*\*\*p<0.001

Table 4 shows the differences between users of online sources and non-users regarding the influence of those sources for breastfeeding. The users were significantly more likely than non-users to indicate that online sources improved breastfeeding

practices, influenced the decision to continue EBF, and provided information about benefits of EBF, pumping and milk expression, lactogenic drugs and herbal supplements, ways to manage breast engorgement, and breast milk supply.

The influences of using online sources during pregnancy on the rate of EBF at the end of the first and second postpartum months were estimated using logistic regression analysis, where the dependent variable was whether EBF was being used at the

end of the first month or the end of the second month (Table 5). Using online sources during pregnancy increased the rate of EBF significantly by 5 and 4 times at first and second month postpartum, respectively ( $p < 0.001$ ).

**Table 5:** Influence of using online sources on the likelihood of exclusive breastfeeding at one month postpartum and at two months postpartum.

Variable	Exclusive breastfeeding at one month postpartum (n=140)		Adjusted OR (95% CI)**	Exclusive breastfeeding at two months postpartum (n=133)	
	n (%)	p*		n (%)	p*
<b>Using Online Sources during Pregnancy</b>					
Yes	116 (86.6%)	<0.001	5.08 (2.26-11.42)	110 (82.1%)	4.11 (1.90-8.89)
No	24 (51.1%)			23 (48.9%)	

\* p value calculated by univariate regression analysis

\*\*Adjusted OR refers to multivariate logistic regression model adjustment for maternal age, educational level, occupation, mode of birth, and NICU admission

## DISCUSSION

Around 80% of the Jordanian pregnant women in this study indicated they intended to breastfeed their infants. However, breastfeeding support programs are lacking in Jordan. Using online sources for advice and support is a way for pregnant women and new mothers to obtain information about breastfeeding. Empirical research on women's uses of these sources is limited, but the findings are consistent with our results. We found that mothers who used online sources were more likely than non-users to breastfeed exclusively during the first and second months of their infants' lives. There were significant differences between mothers who used these sources (n=134) and non-users (n=47) in EBF; 86% of online source users breastfed exclusively at one month, 82% at two months, versus 51% and 48% of non-users, respectively.

The most frequently used online source regarding breastfeeding before and after giving birth was Google, possibly because it tends to be the default search engine in Jordan. Among the SNS users (n=75; 55.9%), Facebook was reported as an important source of information and interaction (24.6%). One possible reason for SNS popularity might be that the participants expect to receive quick feedback or suggestions by using laptop computers or smartphones, which simplifies sharing and obtaining information and support [6]. A similar previous cross-sectional study in Saudi Arabia on pregnant women's use of online sources to seek supportive information about breastfeeding found that about 8.2% of the sample used Twitter to support breastfeeding practices [7].

There are several concerns regarding the quality of health information in mobile health, including online sources [8]. The Australian Breastfeeding Association (ABA) decided to establish closed professional care Facebook breastfeeding support groups monitored by breastfeeding counsellors, adherent to the ABA codes of ethics [9]. The U.S. Preventive Services Task Force [10]

found that providing maternal health information guided by healthcare professionals via online sources during pregnancy was an effective way to encourage breastfeeding intention. However, the current study found that less than one-half of the women reported that their doctors had recommended using trustworthy online sources for breastfeeding information, because the online sources have not been thoroughly evaluated for quality, and doctors might not feel comfortable recommending them [11,12].

The women in the current study who used online sources overwhelmingly trusted the available information. These findings suggest that reliable online sources might be used by mothers and healthcare professionals to enhance clinical care and improve breastfeeding rates [13].

Some empirical studies have indicated a serious need to design breastfeeding applications to help motivate women to engage in and continue breastfeeding [14]. At the healthcare services level, our study's results highlight the importance of several factors to increase the likelihood of EBF. The most important factor is the great window of opportunity to educate and give information to women about breastfeeding support during the prenatal period and health contact care visits since most of the study participants (82%) used online and SNS information before giving birth.

Kallem et al. [15] found that participants who used online sources believed they were getting reliable information. On the other hand, Asiodu et al. [16] reported that one of the possible weaknesses of using online sources was the difficulty in finding and recalling information about infant feeding. The finding of our study was that the women who obtained enough information, even though online resources and SNS, had a higher rate of EBF compared to non-users.

Some common issues that arise for breastfeeding mothers include breast engorgement, milk supply, and correct uses of medications and supplements. Lack of education and support

from breastfeeding programs and the absence of lactation consultant services and postpartum support programs may be factors contributing to mothers' use of online sources [17].

## STRENGTHS AND LIMITATIONS

The strength of this study is its value in improving our understanding of the influences of online breastfeeding resource use. Our results provide important data to help policymakers and healthcare professionals formulate and implement programs to encourage non-users to become users of online resources. Because online access (internet connectivity and hardware, i.e., a smartphone or tablet/laptop) is a requisite precondition, research should additionally examine the acceptability, feasibility, and cost-effectiveness of implementing trustworthy online sources dedicated to breastfeeding issues for mothers and their infants.

Despite its contributions, this study has some important limitations to consider when interpreting the results. First, the sample comprised 181 pregnant women in their third trimester planning to give birth as outpatients at the JUH clinic. As participants were recruited through convenience sampling, generalizability is limited. Second, although the participants were assured that their information would remain confidential, we asked the women to provide their names for purposes of the follow-up interviews, possibly leading some to skip questions or provide insincere answers, which might have led to social desirability bias. Other concerns are that the data may include some recall bias and that the participants' psychosocial and cultural characteristics were not included in the analysis.

## CONCLUSION

Our study suggests the need for caution regarding vancomycin concentration in patients with CDI because their blood concentration may be abnormally high even after the administration of the usual dose of vancomycin. Differences in pharmacokinetics may be an important consideration, to develop the best dosing for each pediatric patient.

## ACKNOWLEDGEMENT

The authors would like to thank Dr. Qusai abo, Saleem, for data collection, Sabika Allehdan for her effort to do the statistical analysis. as an expert and Dr. Saif Bawaneh for his efforts and elucidations of our manuscript, and we are grateful to all the women who participated in this study.

## DATA AVAILABILITY

The authors declare that there is no conflict of interest.

## FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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