



Impact of attitude and knowledge on intention to breastfeed: Can mHealth based education influence decision to breastfeed exclusively?



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ABSTRACT

Background: Exclusive breastfeeding has been endorsed as the healthiest feeding choice for newborns. This study aims to assess impact of expecting mothers' knowledge and attitude toward intention to breastfeed exclusively. Utilizing mobile health (mHealth) as educational tool can offer a widely distributed and affordable platform to promote exclusive breastfeeding.

Research aims and questions: This study aims to assess impact of expecting mothers' knowledge, attitude and beliefs on decision to breastfeed exclusively. Furthermore, it purposes mobile health (mHealth) as educational tool offering a widely distributed, affordable and accessible platform to promote exclusive breastfeeding.

Methods: The study was conducted in prenatal clinics' waiting areas to interview expecting mothers utilizing a translated version of Infant Feeding Practices Survey II (IFPS II, CDC). After completing the survey, an educational video was shown utilizing a tablet and the question was re-asked about intention toward breastfeeding exclusively.

Results: Most expecting mothers indicated having some awareness about breastfeeding (67%) but only 46.1% intended to initiate exclusive breastfeeding early in life prior to the intervention. Moreover, only 53.7% believed breastfeeding is the best nutritional choice. Actually, 39.5% of participants considered breastfeeding equal to formula. Most working mothers complained of lack of workplace support to breastfeed. Also, they were not comfortable breastfeeding in front of others except spouse. Additionally, most participants found nurses and media as poor information resources. Resources utilizing social media and Internet were found useful. After watching the educational video, the majority expressed positive intention to breastfeed exclusively (80.8%). Positive intentions were associated with advance maternal age, prior breastfeeding knowledge and willingness to hear experts' opinions.

Conclusion: Saudi women have limited knowledge about exclusive breastfeeding and early initiation. They feel unprepared, unsupported, lack resources and socially challenged. An educational material utilizing mHealth can alter intentions to breastfeed exclusively.

1. Introduction

WHO and UNICEF have endorsed exclusive breastfeeding as the healthiest feeding choice for newborns [1]. Exclusive breastfeeding is recommended at least for six months and should be started within first hour of life [2].

Breastfeeding is a choice made by mothers based on many circumstances and factors. Among the leading factors are knowledge, attitude and perceptions of expecting mothers toward importance of breastfeeding [3].

Worldwide, initiatives have been created to promote breastfeeding in unique and innovative ways. Mobile phone-based tools, or "mHealth," are becoming highly popular for uses beyond means of communication. Utilizing mHealth as educational tools can offer a

widely distributed, affordable and accessible platform to promote public health [4].

In Saudi Arabia, there has been reluctance in practicing exclusive breastfeeding [5]. With sparse data about exclusive breastfeeding for six months in Saudi Arabia, it has been reported to be as low as 12%–14% despite high initiation rate [5]. [6] A study conducted in central Saudi Arabia uncovered that only 36.8% of surveyed mothers viewed exclusive breastfeeding as the best feeding choice for their newborns [7]. Exclusive breastfeeding might become even less popular with unlimited formula advertisement [8]. Currently, mixing formula with breastfeeding is the most popular infant feeding choice in Saudi Arabia [9]. Mixing formula with breastfeeding might limit health benefits gained by breast milk especially antibacterial factors [10]. There has not been extensive research to explore reasons regarding

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popularity of mixed feeding as far as we know. Saudi Arabia would be a good example of breastfeeding practice in a conservative developing country.

This study aims to assess impact of expecting mothers' knowledge, attitude and beliefs about exclusive breastfeeding toward intention to breastfeed. It was designed to cover expecting mothers' knowledge, attitude and beliefs about breastfeeding. Then, knowledge and attitude toward breastfeeding were compared between different educational level, social and employment status. At a final stage, an education platform based on mHealth was tested to assess ability to alter intention to breastfeed. We hypothesize that despite poor knowledge and negative attitude, an educational platform utilizing mHealth can alter intention to breastfeed and augment a positive decision to initiate early exclusive breastfeeding for six months. The main goal of the study is to propose an innovative tool to support exclusive breastfeeding at low cost and scalable measure. Additionally, the study predicts identifying demographic and culturally sensitive factors that can support exclusive breastfeeding in Saudi Arabia.

2. Methods

2.1. Study population

This was a cross sectional study held in antenatal clinics' waiting areas to survey third trimester pregnant women (beyond 24 weeks gestational age). Inclusion Criteria included expecting mothers following at King Saud University Medical Center (KSUMC) antenatal care clinics, able to give an informed consent, Saudi citizenship, willingness to finish the study. On the other hand, initial Exclusion Criteria contained expecting mothers who does not speak Arabic, non-communicative expecting mothers, expecting mothers with improper cognitive function, not willing to participate and finish the study. The survey along with nine minutes video lasted 25 min and participants were informed about the invested time while obtaining consent. Demographic data were collected as part of the survey involving age, level of education, employment status and economic class. At the end, sample size was determined after calculating a minimum power of 80% and confidence interval of 95% to be 245 participants.

2.2. Questionnaire development and implementation

A modified version of Infant Feeding Practices Survey II (IFPS II, CDC) validated questionnaire was adopted. The questionnaire was translated to Arabic which affected its validity. At the end of survey, expecting mothers were asked about their intention to breastfeed exclusively and duration of exclusive breastfeeding. A pilot study was carried toward the end of 2016 Over two months (November to end of December 2016) to assess questionnaire clarity and general quality. The pilot study surveyed 20 expecting mothers prior to implementing both questionnaire and educational video. Their feedbacks helped in restructuring our questionnaire and adjusting video length. Later, the questionnaire was finalized and data collection was started.

2.3. mHealth based educational video

An educational video was designed in a tablet platform with Arabic narrator. The video included recommendations from WHO, UNICEF and Saudi Ministry of Health. Then, it was reviewed by Saudi senior pediatrician and Saudi lactation consultant. Later, the educational video was tested along with utilized questionnaire in a pilot study. The pilot study explored voice clarity, image haziness and tablet applicability. As most participants criticized video length, it was condense by 2 min without jeopardizing envisioned educational message. After pilot study, the video was adopted and viewed after finishing the questionnaire. The final length was nine minutes. The educational video addressed value of exclusive breastfeeding, early initiation, health

benefits, technics of successful breastfeeding and latching. Following filling questionnaire and watching the educational video, questions about intention to breastfeed and duration were re-asked.

2.4. Statistical analysis

To assess expecting mothers' characteristics and attitudes toward breastfeeding, student t- Test, chi square along with one-way ANOVA were employed. To explore relationships between expecting mothers' characteristics, attitude and knowledge to their intention to breastfeed, multivariate linear regression analysis was adopted. Furthermore, standard deviations and relative importance indices were recruited to analyze questions utilizing likert scale.

2.5. Research ethics

The study was approved by research ethics board of King Saud University for one year starting November 2016 until November 2017, project number **E-16-2038**. All participants were offered an informed consent with clear explanation of lack of impact on their prenatal care and freedom to withdraw at any moment prior to data analysis.

3. Results

3.1. Expecting mothers demographic information and characteristics

This study enrolled 245 expecting mothers at various stages of their pregnancy. Participants' ages were distributed as following: 16 expecting mothers were aged below 22 years (6.5%), the majority (n = 147, 60%) were aged between (23–30) and the remainder were aged older than 30 years (n = 82, 33%). Only 22 participants (9%) were diagnosed with gestational diabetes. Their educational backgrounds were either high school diploma and less (n = 55, 22.4%), a bachelor's degree (n = 178, 72.7%) or higher educational degrees (n = 12, 4.9%). Most of participating pregnant women were unemployed or housewives (n = 145, 59.2%). The number of employed participants was 99 expecting mothers representing 40.4%. Among employed participants, 6.1% were not satisfied with their salaries. On the other hand, 29% employed women had medium satisfaction and 5.7% had high satisfaction in their jobs' payments. Regardless of job status, majority of expecting mothers did not contribute to their families' monthly incomes (n = 157, 64.1%). Furthermore, only 68 expecting mothers stated they have a paid maternity leave (27.8%). Among the 68 expecting mothers whom have paid maternity leave, only 51 (75%) have their leave extending beyond 6 weeks. Additionally, 57% of expecting mothers anticipate returning to work within first year of giving birth (Table 1).

3.2. Knowledge and attitude toward breastfeeding

Among all participants, only 132 expecting mothers (53.7%) considered exclusive breastfeeding as the best nutritional choice for their babies. but, only 37% of expecting mothers were confident regarding sustainability of exclusive breastfeeding. Moreover, 39.5% participants considered formula and breastfeeding are equal in quality. Luckily, relative importance indices revealed that more than 80% of participants believed breastfeeding could protect their babies from otitis media, obesity, diarrhea and respiratory infections (Fig. 1). In general, 165 expecting mothers (67.3%) indicated that they have enough information about breastfeeding. Also, 156 participants (63%) admitted they have been exposed to at least one educational material about breastfeeding. However, Saudi expecting mothers are not comfortable breastfeeding in front of others. They are very uncomfortable breastfeeding their babies in front of female family members (52%), male family members (78%), female friends (60%) and strangers (83%). Their highest comfort level was to breastfeed in front of their spouse

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