



Cultural and linguistic appropriateness of a web-based breastfeeding educational resource for Saudi women: Consensus development conference approach[☆]

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ABSTRACT

Aim: The purpose of this study was to investigate the cultural and linguistic appropriateness of the content, images and layout of the web-based breastfeeding educational resource for Saudi women using a consensus development approach.

Background: Although the World Health Organization highly recommends exclusive breastfeeding, there is a decline in breastfeeding rates in Saudi Arabia, especially during hospital stay. The combining of health professional support with e-technology tools has been proposed as a method to increase exclusive breastfeeding. However, the cultural and linguistic appropriateness of an e-technology-based approach has not been explored in Saudi women.

Methods: After developing a content draft of the web-based breastfeeding educational resource specific to Saudi culture, an online consensus development conference was organised with ten participants including two university researchers and eight health care providers to investigate the cultural and linguistic appropriateness of the educational content. The participants from Saudi Arabia were Saudi mothers who had breastfeeding experiences and were key maternity health professionals employed at the Maternity and Children Hospital of Dammam, Saudi Arabia. The SQUIRE checklist was used in the reporting of this study.

Results: Feedback received prior to the meeting showed that 81% of the content was acceptable and minor changes were required. Changes were made to the content based on the suggestions and feedback received. The consensus group accepted all the changes and the content was finalised.

Conclusions: The online consensus development conference was found to be a very convenient way to decide on the cultural and linguistic appropriateness of the content of the web-based breastfeeding educational resource allowing the participation of experts from different countries; this was considered a critical step in ensuring the successful implementation of the intervention.

1. Introduction

Breastfeeding is an essential form of feeding that helps a newborn's physical, mental and intellectual development and protects the baby

from various illnesses (Krol and Grossmann, 2018; Lee et al., 2016). Henceforth, the World Health Organization (WHO) highly recommends the early initiation of breastfeeding after birth and the continuation of exclusive breastfeeding until six months (World Health Organisation

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World Health Organization, 2023). Exclusive breastfeeding is defined as "breastfeeding while giving no other food or liquid, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines." (World Health Organization, 2008). In the Kingdom of Saudi Arabia, breastfeeding has a religious value. In the Quran, the Islamic holy book, breastfeeding is recommended from birth to two years (Surah Al-Baqara, 2: verse 233) (Al-Binali, 2012).

Despite all the recommendations and support, the global breastfeeding rate is low (World Health Organization, 2021). For instance, the global breastfeeding initiation rate within the first hour after birth is 48%, while only 44% of infants are exclusively breastfed under six months of age (World Health Organization, 2021). In Europe, the breastfeeding initiation rate is estimated to be around 56–97% at birth, with exclusive breastfeeding falling to approximately 25% after six months (Theurich et al., 2019). A prospective cohort study among 202 participants in Saudi Arabia reported only 29.6% of Saudi women practised exclusive breastfeeding at discharge from the hospital, 11.2% used formula milk and 59.2% used mixed feeding. Subsequently, a sharp rise in the use of formula milk to 21.4% and mixed feeding to 60.2% occurred after one month, while the rate of exclusive breastfeeding declined to 18.4% (Mosher et al., 2016).

Various international strategies have been developed in response to the decline of exclusive breastfeeding (Bonuck et al., 2014; Burgio et al., 2016; Meedya et al., 2017; Mejdoubi et al., 2014). For instance, implementing the Ten Steps towards successful breastfeeding of the Baby-Friendly Hospital Initiative (BFHI) is recommended by WHO as a successful intervention (O'Connor et al., 2018). According to a systematic review of the literature, breastfeeding education during early pregnancy and extending to the late postnatal period is the most effective educational intervention to promote breastfeeding in the long term (Meedya et al., 2017).

However, using e-technology-based interventions has increased with the current advanced wireless world, where more women are using electronic devices to access online resources than men (Covolo et al., 2022). The replacement of "human to human" interaction by "human to computer" interaction requires an appropriate framework to ensure its effectiveness. One such model is the Persuasive System Design (PSD), which is defined as "information systems designed to reinforce, change, or shape attitudes or behaviours or both without using coercion or deception" (Oinas-Kukkonen and Harjuma, 2008). PSD is a modern model that has been successfully employed in many health-related educational programmes, such as improving physical activity and improving breastfeeding behaviours (Almohanna et al., 2022; Matthews et al., 2016; Win et al., 2019; Xiao et al., 2017).

One of the key principles of PSD is the tailoring of the educational resources according to the needs, cultural beliefs and values of the end users. A systematic review of e-technology-based interventions demonstrated that many of the different e-technology-based breastfeeding interventions, such as mobile apps or websites for women, were not tailored based on the end user's needs (Almohanna et al., 2022; Meedya et al., 2019). Therefore, we used the PSD model to develop the content of the web-based breastfeeding educational resource in both Arabic and English. The resource was based on the findings of a systematic review with meta-analysis that explored the educational needs and practices of Saudi women, as well as the recommendations of the World Health Organization (Alahmed et al., 2022). We also adopted some information from the Milky Way App content which was based on the persuasive system design and WHO recommendations (Meedya et al., 2021). The Milky Way App is an effective educational intervention where breastfeeding rates increased by nine times at one month, four times at four months and three times at six months among women with multicultural backgrounds (Meedya et al., 2016). The images and layout of the web-based breastfeeding educational resource were chosen based on Saudi culture, which is dominated by the Islamic religion. To ensure the cultural and linguistic appropriateness of the content of the web-based breastfeeding educational resource, we used a consensus development

conference approach.

1.1. Cultural and linguistic appropriateness

The cultural appropriateness of an intervention depends on the cultural awareness and competence of the researcher (Bridge et al., 2008). Therefore, bearing in mind the cultural and linguistic appropriateness of the educational resource, the images and layout were carefully chosen to align with the Ministry of Health of Saudi Arabia. Furthermore, the contents were developed both in English and Arabic. It is also recommended to check the cultural and linguistic appropriateness with the local population before implementing it in the hospital (Bridge et al., 2008).

The educational resource is being tailored to be implemented in one of the hospitals in the Kingdom of Saudi Arabia, which is the destination of one of the largest pilgrimages in the world, the home to many holy sites in Islam (Alasmrai, 2016). The educational system combines theories with Islamic instructions derived from the Holy Book, the Qur'an. Thus, Research in Saudi Arabia must be ethically as well as religiously approved and any intervention must be in line with Islamic philosophy (Alasmrai, 2016). Fortunately, the first author in this study is from Saudi Arabia and understands both the culture and language. However, a consensus method was the most suitable approach to engaging with local service users and providers to ensure the linguistic and cultural appropriateness of the content to be used as a routine breastfeeding educational resource for the women who would attend the study setting for maternity care.

1.2. Consensus methods

Consensus methods have been around for many decades, but they were formalised only around the 1950 s, when they gained popularity in health research and policy development (Halcomb et al., 2008; Murphy et al., 1998). Consensus is not a scientific method to create new knowledge; it allows the development of new guidelines based on available scientific evidence (Halcomb et al., 2008; Murphy et al., 1998). However, evidence-based medicine is important in decision-making among healthcare professionals and the lack of agreement among medical experts has triggered the need for "Consensus" to find the most appropriate solutions to problems (Campbell and Cantrill, 2001).

Formal consensus can be achieved by various methods, including the "Nominal group technique", "Delphi technique", "Research and Development appropriateness method" and the "Consensus Development Conference" (Campbell and Cantrill, 2001; Halcomb et al., 2008; Jacek et al., 2019). The consensus method to be applied depends on the research question and the mode of participant interaction (Campbell and Cantrill, 2001). In the nominal group technique that was developed by Van de Ven and Delbecq (1972), a group of experts is selected based on their expertise and experience in a related field. They are referred to as the target group and are involved in generating and prioritising ideas about a problem (Campbell and Cantrill, 2001; Van de Ven and Delbecq, 1972).

In contrast, the Delphi technique involves posting the research problem to the participants and asking them to complete a questionnaire. The statement of the questionnaire is based on evidence from the literature. After each round, participants are given feedback about their responses and are asked to fill out more questionnaires where they can reconsider their previous responses until a consensus is reached (Campbell and Cantrill, 2001). Finally, the research and Development Appropriateness method involves a formal meeting where participants are given statements based on expert opinions and evidence from the literature to debate and rank.

A Consensus Development Conference, which is also known as a consensus development panel, requires a group of experts to synthesise available evidence to debate and validate best practices adopted by the

stakeholders, who are mostly the end users (Halcomb et al., 2008; Jacek et al., 2019; Waggoner et al., 2016). The author has collated the best available evidence and resources from the World Health Organization regarding exclusive breastfeeding and developed the content of a web-based breastfeeding educational resource to promote exclusive breastfeeding in Saudi Arabia. Therefore, for this study, the consensus development conference has been identified as the most convenient method to allow debate between various stakeholders, including Saudi healthcare providers and the supervisory research team (Campbell and Cantrill, 2001; Murphy et al., 1998; Waggoner et al., 2016). The advantages of a consensus development conference are to allow synthesis of the existing evidence to develop the best content, which would be both culturally and linguistically appropriate to a Saudi population. The aim of conducting the consensus development conference was to finalise the content of the web-based breastfeeding educational resource to ensure the images, layout and content are culturally and linguistically appropriate for the Saudi population.

1.3. Objectives

1. To receive feedback and suggestions from the participants regarding the content of the educational resource.
2. To finalise the content based on feedback and suggestions received.
3. To reach a consensus on the cultural and linguistic appropriateness of the educational resource.

2. Methods

2.1. Consensus development conference

A Consensus Development Conference was found to be the most appropriate approach to achieve the objectives of this study. Participants' feedback was used to modify the content of the web-based educational resource. A consensus development conference, with convenience sampling, was then conducted after receiving ethical approval from the University of Wollongong, Australia, registration number 2022/067 and the Maternity and Children Hospital, Dammam, Saudi Arabia, registration number EXT-BF-2022-001. Quantitative data were generated through polling and feedback while qualitative data were generated through suggestions and comments. Standards for Quality Improvement Reporting Excellence (SQUIRE) checklist was used in the reporting of this study (File S1).

The Consensus Development Conference was identified as the best method to reach a consensus about the contents of the web-based breastfeeding educational resource. However, because of the Covid-19 restrictions, a face-to-face meeting was not possible, and it was agreed to have the meeting online using the Zoom platform. Five elements can have impact on the research outcomes and must be considered while using this method (Black et al., 1999). They are a) the approach to the task used, b) the selection of participants, c) the selection and presentation of scientific information, d) the structure of the interaction and e) the method of synthesising individual judgments.

2.2. The approach to the task

Initially, we approached the Director of Academic Affairs and the Research Unit of the Maternity and Children Hospital and informed them about the study details. Then we asked to organise an informal online meeting to discuss the objectives and importance of organising the Consensus Development Conference. An initial meeting was held with the Maternity and Children Hospital on October 7, 2021, to discuss routine breastfeeding education, their role in the consensus development conference, the importance of using additional educational resources and the recruitment process. The committee members were invited to participate in the Consensus Development Conference to debate the contents of the web-based breastfeeding educational resource

developed by the first author.

2.3. Participants' selection

The head of the breastfeeding department helped in the recruitment of healthcare providers. Emails were sent to key participants from various stakeholders' groups with attached invitation letters, participant information sheets and consent forms. The head of the breastfeeding department then informed that all participants preferred communication through WhatsApp. Therefore, the author started building a rapport using WhatsApp and received all the signed consent forms from a total of eight healthcare professionals working in the obstetrics and gynecology department of the Maternity and Children Hospital (MCH). The Consensus Development Conference consisted of the University researchers and Saudi health care providers, including doctors, nurses and midwives working in the maternity and paediatric departments of the Maternity and Children Hospital (MCH), Dammam, Saudi Arabia. The researchers involved in the study included the author and one supervisor from the University of Wollongong, Australia, both of whom were experts in the field of breastfeeding. Notably, the author, who is originally from Saudi Arabia, possessed bilingual skills and a deep understanding of the local population's culture and practices. The selection of dates and times for the first meeting was made on Doodle (www.doodle.com) and the first meeting was scheduled at a time that was suitable for everyone to attend.

2.4. Inclusion and exclusion criteria

Saudi Health care providers who have Saudi heritage and are involved in antenatal and postnatal care, especially in providing breastfeeding support to women, were included in the consensus development conference. Allied healthcare providers who were not directly involved with breastfeeding support, such as speech therapists, physiotherapists and dentists, were excluded from this consensus development conference. University researchers were experts in breastfeeding with more than ten years of experience in the field.

2.5. Sample size

Although the sample size of the consensus development conference is not clearly defined in the current literature, it is known that the reliability of the decision-making may increase with the number of participants (Black et al., 1999; Halcomb et al., 2008). In general, the number of participants in the consensus development conference varies between eight to twelve and ten participants were reported to be the optimum number (Nair et al., 2011; Waggoner et al., 2016). Therefore, the consensus development conference for this study included ten participants including the two university researchers and eight health care providers.

2.6. The selection and presentation of scientific information

Two weeks prior to the consensus conference, the content of the web-based breastfeeding educational resource, as well as the feedback forms, were sent to the participants for their review and feedback. The questions with a 2-point Likert scale to give feedback on each section, including Section 1 (Benefits of breastfeeding, Hazards of formula milk and Important points about breastfeeding), Section 2 (Normal baby's behaviour, Managing the breastfeeding challenges and expressing & storing the breast milk) and Section 3 (Contraception and breastfeeding) were emailed to the participants (File S2). The agenda of the meeting was communicated to all participants and the meeting was scheduled on Zoom (www.zoom.com).

2.7. The structure of the interaction

There was continuous interaction through email and WhatsApp with all the participants prior to data collection, during and after the first meeting of the Consensus Development conference and until the finalisation of the contents. The structure of the interaction during the consensus development conference was also emailed to all participants.

2.8. The consensus development conference

The Consensus Development Conference was chaired by the author, who started the meeting with a brief introduction of the participants and the study and the aim of the Consensus Development Conference using the Canva Website (<https://www.canva.com>).

Some feedback was received before the meeting and changes were already made to the contents according to their suggestions. The author presented the new version of the breastfeeding educational content to the consensus development conference in both English and Arabic, highlighting the change requests from the feedback received. Polling was undertaken for each section of the content in the Zoom meeting (File S2).

During the online meeting, participants were also encouraged to give suggestions or comments or email the author if they had any more comments to add. The Consensus Development Conference ended with a thank you note to all participants and the committee was not anticipating further meetings unless new comments or suggestions were received.

A week after the meeting, the final version of the educational content, both in English and Arabic versions, was emailed to all participants with the draft report of the consensus development conference asking for clarity and accuracy checks. No further suggestions or feedback were received, and the researcher kept communicating with all the participants to confirm that they were happy with the final version and consensus report.

2.9. Data collection and synthesis

In the Consensus Development Conference, data were recorded in terms of polling, feedback and suggestions for changes. The meeting was also recorded on Zoom to check for accuracy as well as record the additional suggestions or comments from participants. The consensus report was written and distributed to all members to check for accuracy and clarity. The report contained opinions, agreements, or disagreements on certain issues (Campbell, 2003).

3. Results

Recruitment through email was the most difficult challenge and no response was received. The best communication method was WhatsApp, where the response rate was very high, and the author found it easier to engage and build a rapport with the participants. A total of ten participants were recruited who gave their formal consent and they consisted of consultants in breastfeeding, doctors, nurses and midwives from MCH. Only eight of those participants could attend the Consensus Development Conference, making a total of ten participants as the other two still sent their feedback through email.

3.1. Feedback

In general, the information in the educational material was found to be adequate, relevant and suitable for a mother who wants to breastfeed her baby. Furthermore, they found the content very attractive, simple and easy to read. Most agreed (81%) about the questions that were sent to them, asking for feedback (Table 1).

However, a few optional suggestions were received through the feedback questions that were raised in the meeting. For example, they

Table 1
Feedback Prior to Meeting.

Statement	Agree (%)	Disagree (%)
1. The information on each page is simple and reader-friendly for Saudi women.	70	30
2. The information is clear and easy to understand for Saudi women.	60	40
3. All information is relevant to supporting Saudi women to initiate and continue breastfeeding.	80	20
4. The content is culturally appropriate for Saudi women.	100	0
5. The images are culturally appropriate for Saudi women.	100	0
6. The layout of the presented information is acceptable and appropriate.	100	0
7. The content can be integrated into the Maternity and Children Hospital (MCH) breastfeeding educational programme	80	20
8. Is there any information that has been missed?	40	60
9. In your opinion, what can be done to encourage women to use the web based educational resource ?		
10. In your opinion, what would be the barriers to this educational programme?		
Any Suggestion		

asked to add links to the content to allow access to some additional information or videos regarding skin-to-skin contact or feeding by the cup from a credible source such as the WHO. They also requested to add the contact information and location of the breastfeeding clinic at the MCH on the last page of the content for mothers to visit or contact if they need any help.

From the feedback that was received prior to the meeting, the most common ones were about changing the structure of the statement and a few words in Arabic on various pages to make it easier for the mothers to read and understand. For example, certain jargon, such as "cluster feeding," was replaced by "frequent feeding" on request.

One of the participants suggested adding the statement, "breast-feeding can decrease tooth decay in babies." This was not accepted as current evidence (Victoria et al., 2016) demonstrated that this statement was not true, and the committee rejected this suggestion unanimously.

The statement "counselling mothers to avoid using bottles, teats, or pacifiers before establishing milk production, "as recommended by WHO, is not currently used by the hospital as this will endorse the use of these methods after breastfeeding has been established. Therefore, it was suggested to replace it with the following sentence: "counselling mothers to avoid using bottles, teats, or pacifiers to prevent nipple confusion" to be in line with the hospital policy.

Most participants did not like the information about the use of dummies and pacifiers and how they can interfere with nipple attachment. The page also mentioned when it is advisable to start using dummies and to avoid dipping them in sugar, jam, or honey. Although they agreed that the information was correct, they did not want to use it in the hospital as this may encourage mothers to start using dummies or pacifiers. Therefore, this page was omitted from the educational content.

The suggestion was made to delete the sentence about "babies can attach to the breast by themselves" on a page titled "Attachment," as some mothers may feel frustrated if their babies cannot attach to the breast by themselves. Therefore, this sentence was modified, mentioning that some babies may need help with attachment, which was agreed unanimously.

Another important suggestion was adding another image regarding the attachment to the breast during breastfeeding to clearly show the correct and incorrect attachment for mothers to understand.

Regarding the expression and storage of milk, the committee demanded to change the image showing bottled milk to make it less confusing by removing the attached nipple and replacing it with a proper storage bottle with a cover. Other suggestions have been

summarised in Table 2.

Table 2
Additional feedback from the participants.

Suggestions	Actions
<ul style="list-style-type: none"> To add one more benefit to the mother with regards to uterus contraction and return to normal size. 	This was accepted and added to the list.
<ul style="list-style-type: none"> To add one more disadvantage of using formula milk with regards to tooth decay. 	This was agreed by the committee and was added.
<ul style="list-style-type: none"> To paraphrase the sentence to make it clearer and easier for Saudi women to understand. 	All agreed with the paraphrasing.
<ul style="list-style-type: none"> To place the information regarding "when and how often to feed a baby" first on the page titled "Frequency and length of breastfeeding" as many Saudi women always ask those questions. 	This was agreed by the committee and was amended accordingly.
<ul style="list-style-type: none"> To replace the word "naturally" with "wider" in the third sentence explaining the attachment process to make it clear. 	This was agreed by the committee and was amended accordingly.
<ul style="list-style-type: none"> To amend the fifth sentence regarding the "baby's position to facilitate attachment" making it more specific and clearer. 	This was agreed by the committee and was amended accordingly. This was agreed by the committee and amended as required.
<ul style="list-style-type: none"> To add the word "full term" in the first sentence and to make it clear regarding the baby's behaviour on the first day regarding sleeping and feeding. 	All suggestions were agreed by the committee and were amended accordingly. This was agreed by the committee and sentences were added.
<ul style="list-style-type: none"> To add one sentence with regards to "wet nappy" as an indication of "sufficient milk" being given to baby 	
<ul style="list-style-type: none"> To add the same sentence regarding the number of "Wet Nappy" for day two and day three as on page 19 	This was agreed by the committee and sentences were added.
<ul style="list-style-type: none"> To add a sentence regarding "frequent breastfeeding" that happens later when the baby is having a growth spurt so that mothers will be aware of this sudden change in the feeding pattern. 	This was agreed by the committee and the sentence was added.
<ul style="list-style-type: none"> To simplify the title for the "indication that baby is having enough milk." 	This was agreed by the committee and was amended accordingly.
<ul style="list-style-type: none"> To add a sentence with regards to "breastfeeding at night to increase the release of prolactin, which is the milk hormone." 	This was agreed by the committee, and a sentence was added.
<ul style="list-style-type: none"> To add a sentence regarding "frequent feeds and milk expression as a way to reduce breast engorgement." 	This was agreed by the committee and amended accordingly
<ul style="list-style-type: none"> To amend the statement in the definition of engorgement regarding "difficulty in attachment due to breast engorgement" to make it clearer and easier to understand 	This was agreed by the committee and the sentence was added.
<ul style="list-style-type: none"> To add a sentence about "washing hands before milk expression or breastfeeding" to maintain good hygiene. 	This was agreed by the committee and sentence was added.
<ul style="list-style-type: none"> To add a sentence about the "proper storage of milk in appropriate bottles including small glass or plastic containers with a tight-fitting lid marked with one of the following numbers on the bottom of the container: LDPE4-HPE2-PP5" 	This was agreed by the committee and amended accordingly. This was agreed by the committee and amended accordingly.
<ul style="list-style-type: none"> To specify the volume of empty space in the bottle as 1/3 before freezing milk, as described in the fifth sentence. 	
<ul style="list-style-type: none"> To remove the sentence with regards to "storage of the leftover expressed breastmilk" as they are worried about the risk of infection and to change the image showing bottled milk. 	This was agreed by the committee, and the sentence was removed. The image was changed accordingly.

3.2. Finalisation of the content of web based breastfeeding educational resource

All the changes were made based on the feedback received prior to the meeting, where 81% of the participants demonstrated agreement with the content. During the meeting, the changes were presented to the participants and a consensus was reached on various aspects of the content, including its cultural appropriateness, images and layout. Consensus was also reached on the clarity of the language and information provided, which is clear and easy to understand for Saudi women.

4. Discussion

The main objective of this consensus development conference was to confirm the cultural and linguistic appropriateness of the contents of the web-based breastfeeding educational resource to be used in the promotion of breastfeeding among Saudi women. The translation of the contents from English to Arabic was confirmed to be accurate, but a few minor changes had to be made to ensure the content was aligned with the local hospital policies. The panel found the content very easy to read and understand. However, various suggestions were made to make minor changes based on the feedback received prior to the meeting. The author made all the changes as per request with highlights and during the meeting, the changes were accepted by polling. This is the first time a web-based breastfeeding educational resource has been developed in English and Arabic with the help of a consensus development conference to ensure the cultural and linguistic appropriateness.

Only one online meeting was sufficient to reach a consensus, as the decision to use online educational intervention was already decided in the first informal meeting. Participants of the consensus group were carefully selected to ensure a good representation of all the grades of staff involved in child and maternal care (Kea and Sun, 2014). Communication through email was found to be very challenging until a WhatsApp group was set up by the head of the breastfeeding department, which enhanced the communication between the researcher and the participants. This was very helpful in planning and scheduling the online consensus development conference (CDC). Prior to the meeting, information regarding the consensus, the draft content to be debated and the main objective of the study was given to all participants. This was an essential component of the Consensus Development Conference, as it helped them make a decision, which they expressed through the feedback form (Kea and Sun, 2014). Care was also taken not to overload the participants with too much information. Although the author is bilingual and has cultural competence, several amendments had to be made based on the various suggestions and comments from the participants, as they have more experience in breastfeeding education. Even though the information regarding dummies and pacifiers was from the WHO, it was rejected unanimously as they wanted to avoid misleading the mothers and encourage them to use pacifiers in line with the hospital policy. However, most of the recommendations and suggestions were accepted and the contents were amended accordingly, except for one with regard to the protective role of breastfeeding against tooth decay.

4.1. Credibility, applicability, auditability and confirmability

Consensus methods offer very limited ways to establish validity, reliability and rigour and the criteria are not well established in the existing literature. However, it is recommended that the four key criteria of credibility, applicability, auditability (Dependability) and confirmability, which are commonly associated with qualitative research, can be applied to the consensus methods (Hasson et al., 2000; Kaiser et al., 2020; Lincoln and Guba, 1986).

Credibility is similar to internal validity and this relates to the trustworthiness of the data (Forero et al., 2018). This can be achieved in several ways, including prolonged engagement and repeated

observations. Triangulation as well as peer debriefing, can be used to reinforce credibility (Lincoln and Guba, 1986). In this study, the author had continuous engagement with all participants before and after the consensus meeting to confirm their agreement on the content.

Applicability is the transferability of the findings to a different setting (Forero et al., 2018). To ensure that the consensus statement can be generalised and that the final product will be suitable for other settings, the author selected participants from a wide range of professional backgrounds (Polit and Beck, 2017; Squires and Dorsen, 2018). The author confirmed that consensus was reached to ensure both linguistic and cultural appropriateness of the educational content to benefit the general population of Saudi Arabia.

Auditability is related to the stability of data over time and conditions in a world which is constantly changing. The author made a detailed record of all the meetings and feedback forms, which were used as an audit trail when changes were being implemented to the educational content (Polit and Beck, 2017).

Confirmability is the process of linking the consensus statement to the original source of information or arguments during the debate (Lincoln and Guba, 1986). To achieve confirmability, the author recorded the meeting proceedings and kept notes, which were combined to generate the draught CDC report. Continuous reflection on the report as well as re-writing the draught report, ensured accuracy (Halcomb, 2005). Two weeks after the meeting, the draught report of the CDC was emailed to all participants to confirm the accuracy of the content and no amendment was made as they all agreed with the report.

5. Strengths and limitations

The committee not only looked at the evidence-based content but also considered the personal experience of staff involved in facilitating breastfeeding education and practice as well their own experience as mothers of their children. The lack of personal experience was always highlighted as a weakness of the Consensus Development Conference, which is rather dominated by evidence-based opinions (Waggoner et al., 2016). Furthermore, the Saudi participants were enthusiastic about their involvement in the development of the educational intervention and they took ownership of ensuring the cultural and linguistic appropriateness of the content.

Due to the Covid-19 restrictions, resulting in travel restrictions, it was difficult to organise a face-to-face consensus development conference meeting. On the one hand, one could argue that the consensus development conference was carried out online and therefore was a weakness of this study. But on the other hand, organising a meeting to include representatives from Australia and Saudi Arabia would have been very challenging in terms of cost and time. This is also good for the environment as none of the participants had to travel to attend the meeting. The online meeting offers a very convenient alternative if it is planned and scheduled appropriately considering the time differences between participating countries (Steeb et al., 2021; Werner et al., 2014).

One of the biggest advantages of having online meetings was the convenience for all participants, especially at a time when hospital staff is very busy due to the COVID-19 restrictions. One of the disadvantages was that the staff had different shifts making it challenging to organise a meeting and sometimes they had to sacrifice their free time to be able to participate. The author was continuously trying to engage with all the participants and encouraged them to put any comments in the chat during the meeting. Sometimes, the online connection was very poor and consequently, the author was worried about the limited contribution from some. However, the author was in continuous contact with all the participants during and after the conference to encourage them to give any further input to the discussion. Another possible limitation that one could argue about is the lack of representation from the study population targeted for the intervention. However, all Saudi participants of the consensus were mothers with breastfeeding experience, and they not only represented the target population but also shared a lot of their

personal experiences that were useful in reaching the final decision.

6. Conclusion

The SARS-CoV-2 restrictions stimulated the use of online consensus conferencing, which is a more modern, feasible and broadly accepted way to reach consensus in the development of evidence-based intervention. The online consensus development conference was very useful in ensuring the cultural and linguistic appropriateness of the content of the web-based breastfeeding educational resource to be used in the Maternity and Children Hospital, Dammam, Saudi Arabia. This study has demonstrated that online consensus conference offers the most appropriate alternative to traditional face-to-face consensus conferences, allowing the participation of experts from different parts of the world at a convenient time without the need for high travel costs and venue. Evidence-based breastfeeding educational intervention must be tailored according to mothers' needs as well as due consideration must be given to their cultural and linguistic aspects and preferences to ensure successful implementation. Various aspects must be taken into consideration while developing an educational intervention.

6.1. Recommendations

- It was recommended to create the educational intervention in a language to suit the local population and facilitate understanding.
- The panel should include experts in the field as well as representative from the local population sharing the same culture and language.
- Educational materials must be from credible sources and evidence-based resources.
- To facilitate access to the educational materials, it is recommended to allow online access as it is more convenient and popular way to provide health education.
- It is recommended to include links to other additional resources such videos and other websites from credible sources, which can be easily accessed by the target population.
- Further research is needed to evaluate the effectiveness of the Web-based breastfeeding educational resource in promoting early breastfeeding initiation and improving exclusive breastfeeding rates and duration among service users.

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Authorship statement

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Ethical statement

Ethical approval was received from both the University of Wollongong, Australia (Approval No. 2022/067) and the Maternity and Children Hospital, Dammam, Saudi Arabia (Approval No. EXT-BF-2022-001).

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original draft, Writing - review & editing. **Khin Win**: Methodology, Supervision, Writing - review & editing. **Steve Frost**: Methodology, Supervision, Writing - review & editing. **Ritin Fernandez**: Methodology, Supervision, **Abbas Al Mutair**: Methodology, Supervision, **Shahla Meedya**: Conceptualization, Methodology, Supervision, Writing - original draft, Writing - review & editing.

Declaration of Competing Interest

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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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.nepr.2023.103717](https://doi.org/10.1016/j.nepr.2023.103717).

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