

Exploring the Effect of the Umbilical Cord Cutting Experience on Father's Emotional Involvement with Their Infants in Oman

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Abstract

Background: Paternal-infant bonding research has been increasingly investigated as it influences mothers' pregnancy, labour and postpartum period. However, there is lack of research that investigates father-infant bonding in the Gulf peninsula, specifically Oman. Paternal-infant bonding has an important role in promoting cognitive development of infants, stronger parent-children's relationships and social wellbeing. **Aim:** This study aims to explore the effect of umbilical cord cutting experience on fathers' emotional bonding with their infants in Oman. **Methods:** Mixed method design was utilized to understand the fathers' experience in cutting the umbilical cord of their newborns. Infant-Mothers bonding scale was used for the quantitative part of this study. The scale is composed by 12 self-report items in a Likert scale from 0 to 3, according to the emotion towards the newborn's intensity ("very much", "a lot", "a little" or "not at all"). Phone call interview was used to elicit the fathers experience and emotional bonding after being involved in cord cutting of their infants for the qualitative part. **Results:** This study found that fathers experience an encouraging and strong emotional bonding when they are involved in the umbilical cord cutting of their newborn child. Moreover, fathers felt proud and satisfied due to being involved in the process of childbirth. This experience plays a major role in fathers' emotions as they felt joyful and happy after the umbilical cord cutting. Furthermore, allowing a father to cut his infant umbilical cord can facilitate a fatherly sense of establishment and responsibility in infant care with the mother which can subsequently lead to various benefits such as the infant's cognitive, social and emotional wellbeing and growth, as well as improving the mother's emotional status.

Keywords

Bonding, Childbirth, Emotional Involvement, Father's Experience, Umbilical Cord Cutting

1. Introduction

Bonding has been defined as an intense attachment in relationship that develops between the parents and child during the early years of the life [1]. Paternal and infant bonding research has been investigated as it influences mothers' pregnancy, labour and postpartum period. On the other hand, there is lack of research around father-infant bonding in the Gulf peninsula specifically Oman. Paternal-infant bonding has an important role in promoting cognitive development of infants, stronger parent-children relationship and social wellbeing [2]. Studies show that, the presence of fathers during labour influences father-infant attachment, reduces apprehension and stress, increases maternal satisfaction and increases love and respect between the couples [3]. It was reported that their support helped the pregnant women to feel better and calmer [4].

In Oman, the presence of fathers is permitted in few hospitals that are major referral institutions. This in turn demonstrates insufficient immediate support to mothers from their husbands during labour. Moreover, lack of father attendance in labour was found to affect mothers negatively by increasing risk of postpartum depression [5]. Therefore, evidence found a relationship between depression in mothers and lower father-infant bonding [3].

There are multiple studies that focus on specific activities in the labour room which could influence father-infant bonding. A descriptive qualitative study examined fathers and newborns skin-to-skin contact after birth and found that it is an effective approach in developing father's-infant bonding, sense of responsibilities and equal infant care between mother and father [6]. Another quasi-experimental study examined fathers-infant bonding after experiencing umbilical cord-cutting using Mother-to-Infant Bonding Scale at 12 - 48 hours and one month after delivery. They found that emotional bonding in fathers who cut the cord are highest at 12 - 48 hours after delivery which is similar to the fathers who did not cut the cord, but after one month from delivery, fathers who did not cut the umbilical cord had more difficulty maintaining an emotional connection with their infants compared to fathers who were involved in cutting the umbilical cord [7] [8].

Promoting father involvement in umbilical cord cutting can facilitate fathers' sense of establishment and responsibility in infant care. Moreover, infants' cognitive, social and emotional wellbeing, and growth is enhanced. Moreover, the fathers first contact with new-born is crucial in maintaining the father infants bonding. This was supported by Brandão & Figueiredo, [8] that found emotional bonding begins at pregnancy as well as following childbirth. However, the midwife has

a significant role in encouraging fathers to support mothers in labour and enhance father-infant bonding. The aim of the study is to explore the effect of umbilical cord cutting experience on fathers' emotional bonding with their infants in Oman.

2. Research Design and Methodology

2.1. Study Design

This study is mixed methodology design using an explanatory sequential approach to investigate the effect of fathers' involvement in umbilical cord cutting of their infants. At first a quantitative approach was conducted using Mother-to-Infant Bonding scale. The Data was collected through survey then for the purpose of gaining more understanding of the data a qualitative approach has been conducted using phone call interview. This method was used as it is the most suitable design to elicit in depth understanding of the data drawn from the quantitative part. This study was conducted in one of the tertiary hospitals in Oman, data collection started from June 2023 to December 2023.

2.2. Sample and Sampling Method

A convenient sampling was applied to recruit fathers who had their babies born at the hospital. In this study, a total of Sixty-four participants were recruited in the quantitative phase. The Green's rule of thumb was applied to calculate the sample size. Sample-to-item ratio based on the items of the survey (12 questions) with a minimum of 5 participants for each item (Gorsuch, 1983; Hatcher, 1994; Suhr, 2006 cited in Memon *et al.* 2020) [9]. Therefore, 64 participants are considered adequate sample for this study. Participants were eligible to participate once they were involved in cutting the cord of their infants; their infants were normal vaginal birth and singleton.

All multiple birth, instrumented deliveries (Forceps, vacuum), pre-term birth, caesarean sections and sick newborns were excluded.

Convenience sampling was selected in this study as it provided easier access to available participants within limited time and resources. In Omani culture, labouring women are usually accompanied by female relatives, and few husbands attend the labour room, making random sampling challenging. A study conducted in Oman reported that the most common companion to the pregnant women in labour was female (60.6%). The mother accounts for 35.7%, followed by husbands (30.5%) then sisters and aunts [4]. This method was practical for recruiting participants who were present and willing to participate. However, it may limit representativeness, as the sample might not reflect the broader population.

2.3. Data Collection Tool/Interview Protocol

2.3.1. Quantitative Data Collection Tool

The scale that was used to elicit the fathers emotional bonding was "Mother-to-Infant Bonding scale" and this scale this scale was initial applied for mothers, then

it was validated for fathers by researchers. The tool is validated with a score of Cronbach alpha = 0.71 and test-retest reliability score was 0.49 with P value = 0.001 [8] [10]. This tool was taken with permission from the primary author [8] [10]. The Mother-to-Infant Bonding Scale was linguistically adapted for Arabic-speaking fathers through a structured translation process. The scale was translated from English to Arabic by a qualified bilingual expert in medical field, who ensured both linguistic and cultural appropriateness. The translated version was then reviewed by the research team for clarity and cultural sensitivity. The Cronbach's α for the current sample was 0.71.

The tool was distributed at first 24 hours after birth by the researchers and the midwives who work in the labour ward after giving them clear instructions and guidance.

Mother-to-Infant Bonding scale included two sections, section one was related to Socio-Demographic data such as age, baby gender, occupational status, and educational level. Section two was the adopted version of Portuguese Mother-to-Infant Bonding Scale [8]. The scale is composed of 12 self-report items in a Likert scale from 0 to 3, according to the emotion towards the newborn's intensity ("very much", "a lot", "a little" or "not at all"). Three subscales will be identified as "Positive bonding", consisting of three items (Loving, Protective and Joyful) while the "Negative bonding" comprises four items (Aggressive, Resentful, Dislike and Disappointed). Not Clear bonding will be identified in the scale in one item (Neutral/Felt Nothing).

2.3.2. Qualitative Data Collection

For the qualitative part, the protocol was developed by the three researchers. Then it was validated by two qualitative expert researchers. was divided into two sections. The first section was age, baby gender, whether the infant is first born, second born etc. Then in-depth questions included father feeling before, during and after cutting the umbilical cord. The interview protocol highlighted the father's willingness to continue with the baby care like clothing, help in feeding and their feelings toward their babies after baby care.

The phone call interview was conducted in Arabic as per the interview protocol. Then two researchers conducted phone call interviews. Each interview lasted for 15 - 20 minutes. All phone calls were audio recorded and transcribed verbatim. A total of Ten participants were recruited according to inclusion criteria and once data saturation was achieved, the qualitative data collection was ended.

2.4. Data Analysis

The quantitative data were analyzed using SPSS IBM 23. Descriptive analysis was performed to elicit the frequency, mean and SD for each item score. For the qualitative data, thematic analysis was done using inductive approach. In the thematic analysis, three researchers independently analyzed the transcripts. The researchers followed several steps to ensure the rigors of the data analysis. These steps are familiarization of the data, coding of transcripts, labelling themes and codes, sort-

ing codes, then themes were generated. The rationality of using thematic analysis is found to be organized and described the data set in detail [11].

2.5. Ethical Consideration

Ethical consideration was obtained from the scientific research committee with approval number SRC#3/2023. All interviews were coded, and voluntary participation was maintained. Written informed consent was obtained from each participant. Anonymity of the participants was maintained during data collection and participants were informed regarding their right to withdraw from the study at any time.

3. Result

3.1. Quantitative Section

A total of 64 fathers were involved in the cord cutting of their newborn. The mean age of the fathers was 34 years with SD 6.04. The majority were undergraduates in terms of level of education. For further details (Table 1).

Table 1. Demographic characteristics of participants.

	Frequency (%)	Mean	SD
Age	-	34.14	6.04
Infant Gender			
Girl	35 (54.7)		
Boy	29 (45.3)		
Nationality			
Omani	62 (96.9)		
Non-Omani	2 (3.1)		
Education			
Undergraduate	49 (76.6)		
Postgraduate	15 (23.4)		

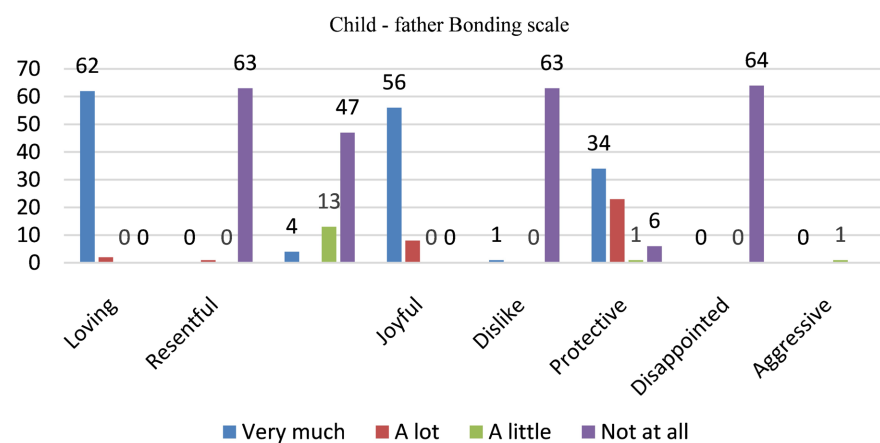


Figure 1. Child-father bonding scale.

Figure 1 shows the immediate emotional effect of cord cutting. Interestingly, all fathers reported it is not at all disappointing or aggressive experience nor resentful. Moreover, the majority (n = 63 and 56) stated that this experience is loving and joyful respectively.

Cross tabulation analysis was performed to measure the difference between those who had boys' deliveries in comparison to girl's deliveries. 15/29 boys' deliveries fathers stated that it is very much a protective experience compared with 19/35 girls' deliveries (**Table 2**).

Table 2. Cross tabulation of gender and protective experience.

	Boy	Girl
Very much	15	19
A lot	9	14
A little	0	1
Not at all	5	1
Total	29	35

Among 64 deliveries and cord cutting involvement, more than half of participants (53.1%) reported that it is very much protective while 1.6% Only stated that this experience is a little protective (**Table 3**).

Table 3. Protective item frequency.

Protective item	Frequency (%)
Very much	34 (53.1)
A lot	23 (35%)
A little	1 (1.6)
Not at all	6 (9.4)

Table 4. Mean and standard deviations of child-father bonding scale (N = 64).

Items	Mean	Standard deviation
Loving	0.03	0.17
Resentful	0.03	0.25
Neutral	0.39	0.79
Joyful	0.13	0.33
Dislike	0.05	0.37
Protective	0.67	0.91
Disappointed	0	0
Aggressive	0.02	0.12

The umbilical cord cutting experience has an impact on fathers' emotions. Analysis of the mean and standard deviation revealed that lowest mean goes to

disappointed feeling where no deviations from the mean ($M = 0$, $SD = 0$) and the highest mean is the protective feeling where majority had reported a lot of protective feeling ($M = 0.67$, $SD = 0.91$). This reflects the positive bonding experience (loving, joyful, protective) overcome the negative bonding experience (resentful, dislike, disappointed, and aggressive) (Table 4).

To explore the knowledge and feelings regarding the implementation of umbilical cord cutting, the researcher conducted semi-structured interviews with husbands via phones.

The qualitative themes expanded and explained the quantitative trends by revealing the emotional depth behind the statistical results. While most fathers reported the cord-cutting experience as loving, joyful, and protective, interviews uncovered initial feelings of fear, hesitation, and uncertainty, helping to clarify the small percentage of negative responses. Additionally, the qualitative data highlighted how cord-cutting strengthened fathers' sense of responsibility and involvement in childcare—insights not captured by the quantitative measures alone. Together, both data sets provided a fuller understanding of the fathers' experiences, demonstrating the strength of a mixed methods approach.

3.2. Qualitative Section

There was a total of 10 participants, coded as P1 to P10. Data was collected through one-to-one interviews conducted via phone calls and audio tape recordings. The authors asked for permission from participants to tape record the interviews. At the end of each interview, the researcher reviewed the transcript with the participant to ensure the accuracy of the data collected and to elicit further data. Three main themes emerged from the study: the husband's feelings regarding umbilical cord cutting, the father's involvement in caring for his wife and the baby, and future recommendations for other fathers in similar situations.

Theme 1: The husband's feelings regarding umbilical cord-cutting

Subtheme 1: Husband feeling before cutting off the umbilical cord.

The husbands' feelings towards cord-cutting varied, showcasing their emotions' strengths and weaknesses. While all of them initially liked the idea and felt excited to be involved, four out of ten ended up feeling shocked.

"I was shocked, and I like the idea" (P1)

They felt strange and scared, and the scissors looked unshaped as they had difficulty cutting the cord.

"It is strange feelings as I was scared because it was difficult to cut. I felt like cutting skin and rubber" (P3)

Some of them felt hesitance and fear of injuring the baby while cutting the cord.

"At the beginning I hesitated and fear" (P6)

One of the participants felt nervous and described his feelings as indescribable.

"Feeling that is honestly indescribable" (P4)

Subtheme 2: Husband's feeling during the cutting of the umbilical cord

During the cord-cutting, the husbands felt it was easy to cut and strange at the

same time.

“Strange feeling because it is first time” (P1)

The other participant stated that he felt it was easy to cut, too, so the results were at the level of his expectations.

“I expect cutting the umbilical cord to be difficult” (P2)

Many husbands experience positive and satisfying feelings during the cord-cutting process. Some express emotions such as confidence, proud, and being overwhelmed. One participant even mentioned his previous experience of cutting the umbilical cord of his last child.

“I felt confident. Normal feelings because I did it before” (P3)

He also added,

“It is a first time I felt proud of myself.” (P3)

However, some other participants expressed negative feelings, including the stress the husband was experiencing at that time and feeling scared.

At the beginning I felt stressed but with the assistance of the nurse I did the job successfully (P5)

He added:

“I felt the bond that connect me with my child” (P5)

On the other hand, one of the participants felt tense and confusion when he started cutting the cord.

“The situation was very difficult” (P7)

Subtheme 3: Husband feeling after cutting of the umbilical cord

The fathers expressed excitement and joy after cutting the umbilical cord during the interviews. They find mixtures of feeling including overwhelming enjoyable.

Excited of the idea and encouraged (P1)

Another participant stated:

It feels natural that I contributed something even if just a little, something light with feelings of joy (P2)

The feelings of joy and proud made the process of cutting the cord much more accessible than expected, and the participants felt they wanted to try it again with the following birth of their children.

“I wanted to try again” (P8)

Theme 2: the father’s involvement in caring for his wife and the baby

This theme will describe the role of the man as a husband and a father who cares for his family. The continuation of care for the family is considered an essential role of them.

“All the time I continued caring for the baby” (P1)

Another participant pointed out that involvement in caring for the child is accessible in the mother’s role and creates cooperation and understanding.

“I participated in helping the mother, which eased the mother’s burden” (P2)

This made the father carry the responsibility to ensure the mother is relying on his help and collaboration in caring for the child.

“The father is responsible for collaborating with the mother” (P3).

The husband, whose wife is a working woman, will put him in a situation of planning with her to find strategies to care for their child. The majority of the participants understand that caring for the child is part of their responsibilities as fathers.

“When she is at work, I will hold the child” (P6)

The obligation towards the family is felt by husbands as indescribable joy and increases love and affection.

“I felt that I am obliged to proceed” (P7)

Theme 3: future recommendations for other fathers in similar situations

All the participants welcomed the idea of involvement in umbilical cord cutting. They verbalized their encouragement to continue doing the procedure.

“Yes, I like the idea” (P1)

Another participant added:

“I encouraged all parents to cut the umbilical cord” (P2)

However, few participants stated that the person cutting the cord depends on his strength in the procedure.

“I don't feel each person would be able to cut the cord; it is according to the strength of the parent's heart” (P1)

The participants described participating in cord-cutting as new, nice, beautiful, and exciting trial.

“The trial was nice, and I advise all fathers to participate. It is an easy thing and a beautiful trial, and it is not scary.” (P3)

“I felt new trial” (P10)

The majority of the participants are happy to repeat the trial in the future. They consider it a good trial.

“Good trial I would like to repeat it” (P4)

Cutting the umbilical cord was described as cutting off the link between the mother and the baby. On the other hand, they consider it the start of a new life for the child and being independent.

“I cut the link between the mother and the baby, which is the beginning of a new life” (P9)

4. Discussion

4.1. The Father's Feelings Regarding Umbilical Cord-Cutting

Father's involvement in some of the childbirth activities such as the cutting of the umbilical cord promotes their emotional attachment with their infants as well as being joyful and loving experience. This could be due to attachment theory and nurturing relationship the fathers develop as a result of their caring for their infants [12]. This is supported in previous research that found that fathers convert from being observers during childbirth to active participants through the involvement in cutting the umbilical cord [8]. Therefore, the fathers feel their presence is a useful and essential part in defining the moments with his wife and child [8]

[13].

The father's experience during their involvement in the umbilical cord cutting showed it encouraged and promoted their feeling towards their infant care. They feel proud and satisfied at the arrival of the newborn particularly given their involvement in the process of childbirth [13]. This experience played a major role in their emotions as they felt joy and happy after being involved in this occasion of umbilical cord cutting.

On the other hand, few fathers reported that they felt scared and hesitant before and during the trial of this experience. This could be explained as having the mixed feelings that parents have when they get newborns [14]. This evidence is supported by Coutinho *et al.* [13] that there are numerous advantages for the father-child bonding in the presence of the father during childbirth, therefore, this can be presented by encouragement of the fathers attending the training planned by the healthcare professional for the positive and gratifying experience. The fathers revealed that the experience was unexpected and indescribable as they thought it would be different. Researchers found that during childbirth, fathers felt disappointment and unexpected situations [15]. Therefore, they could not control their fears.

However, to overcome these feelings, it would be appreciated if the fathers can be involved during antenatal period in regular classes of childbirth.

4.2. The Father's Involvement in Caring for His Wife and the Baby

Father's involvement in childbirth is essential to support the mothers in infant care either soon after delivery or extended throughout their life. This can be facilitated by taking responsibility for infant care. According to Bogdan *et al.* [16], it is reported that husbands who are involved in household activities relieved mothers' stress and increase mothers' satisfaction. Therefore, it is highly recommended to involve the fathers in childbirth to for a stronger involvement in decision making regarding their infant care. Moreover, the husband feels positively promoted if given priority in involvement of maternal and child health care especially in the first day of their infant birth.

The presence and support of fathers during childbirth has a significant positive impact on their wives' birth experience, reducing stress and increasing the chance of protective and safe birth. This evidence is supported by Vischer *et al.* [17].

On the other hand, the first-time fathers' experience of being involved in childbirth are joyful and loving experience; this involvement could help the father to support the mother during childbirth and childcare. This evidence is supported by Premberg *et al.* [18], that the involvement of fathers for the first time in childbirth is described as linked process between euphoria and agony.

4.3. Satisfaction

This study also highlighted the reaction of fathers while they are involved in caring for their newborn. The fathers who have been involved in childbirth are satisfied

and it is a loving experience, and they are happy to return to playing an active role in cutting the umbilical cord. Similar findings found in previous research [2] [17]. This positive and loving experience by fathers during the first birth can be considered as a positive re-enforcement. Therefore, fathers reported that being involved actively in cutting the umbilical cord encouraged other fathers to have experience these moments. Moreover, the fathers reported their satisfaction after being involved in childcare, especially at the first day of their babies' life, this could be due to feeling a sense of responsibility towards childcare and wives support during childbirth, this evidence was supported by Mprah *et al.* [19]. Therefore, sharing responsibility of childcare between parents is crucial for better attachment and development of the infant.

Fathers' involvement in childbirth is increasingly appreciated, as the fathers who were involved in this study recommended to repeat the same experience and encouraged the fathers to participate in this experience, this can support fathers feeling gratitude by being involved in the childcare, this is support by Coutinho *et al.* [13]. Therefore, practicing the experience of umbilical cord cutting experience during childbirth can increase father's satisfaction and feeling gratitude.

5. Limitations

This study has several limitations that should be considered when interpreting the findings. The small number of participants may affect the transferability of the results to a broader population, as it may not fully represent the diversity of paternal experiences. Although efforts were made to ensure the accuracy and credibility of the data such as obtaining consent to audio-record interviews, conducting member checking with participants, and involving a team of four researchers with expertise in both qualitative and quantitative analysis, the limited sample size may have restricted the range of perspectives captured. As a result, the findings should be interpreted with caution and within the specific cultural context of the study. Future research with larger and more diverse samples is recommended to strengthen the generalizability of results.

6. Conclusions

This study highlights the significant role midwifery practice can play in enhancing the childbirth experience for parents. Encouraging the presence of fathers in the labour room fosters a sense of responsibility and accomplishment, supports their wives, and promotes emotional bonding at first contact with their infants. The findings emphasize the importance of involving fathers in activities such as cutting the umbilical cord, which was shown to strengthen their connection with their newborns. Fathers in the study experienced mixed feelings initially, including hesitation and fear of harming the infant, but ultimately reported satisfaction and pride in their involvement. The majority expressed enthusiasm and a willingness to repeat the experience in future childbirth. The act of umbilical cord cutting positively influenced fathers' satisfaction, bringing them joy and a sense of pride

as contributors to the childbirth process. Additionally, fathers expressed a greater willingness to support their wives in infant care, highlighting the broader impact of their involvement on family dynamics. However, a limitation of this study was the small sample size. Cultural traditions in Oman, where female relatives often attend childbirth instead of fathers, also influenced participation. Despite this, the findings provide valuable insights for stakeholders in tertiary hospitals in Oman, suggesting that implementing this intervention could enhance parental satisfaction and foster early bonding between parents and their infants. Further evidence-based research is recommended to refine midwifery practices and improve the overall childbirth experience for families.

7. Recommendation

The study recommends extension of further research to include a re-evaluation of father-child bonding one year after birth. They suggest that policymakers develop maternity support policies that encourage fathers' involvement during childbirth. Additionally, guidelines should be established to support and facilitate the presence of fathers during labour and delivery. Furthermore, it is strongly recommended to implement training sessions for fathers during the antenatal period, integrated into standard prenatal programs, to enhance their preparedness and involvement.

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Conflicts of Interest

The authors declare no conflict of interest.

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