



Analysis of the Concept of Successful Breast-Feeding

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ABSTRACT

Background: There is no comprehensive definition of successful breastfeeding that consequently leads to failure in identification of ineffective breastfeeding and clinical problems that, in turn, result in infants' early hospitalization. The present study aimed to describe the concept of successful breastfeeding using Walker and Avant approach. **Data sources:** CINAHL, PubMed, Scopus, Medline and Google Scholar databases were searched for literature published between 1995 and 2015 using the term successful breast-feeding. **Materials and Methods:** To analyse the concept of successful breastfeeding in this study, Walker and Avant approach was used. Primary research was conducted by searching for "successful breastfeeding" and "infant". Finally, 84 resources were selected as the sample. Then, the data were classified as characteristics, influencing factors, incidences, consequences, and empirical referents related to successful breastfeeding. **Results:** Four basic characteristics of successful breastfeeding, as an interactive process, included how to hold the infant while breastfeeding, how to put the breast in the infant's mouth, sucking, and transmission of milk from mother to infant. Moreover, some events related to successful breastfeeding contain "infant's posture during breastfeeding", "physiology and anatomy of the breast", and "physiology and anatomy of infant's mouth". The consequences were also "infant's behaviour when s/he is full", "leaving the breast", "not responding to sucking reflex", "seemingly calm infant", and "lack of pain and discomfort in the breast". **Discussion and Conclusion:** The study results revealed that determining the characteristics, events, and consequences of successful breastfeeding is very essential and important for both clinical application and nursing discipline purposes. In fact, precise definition of the concept of successful breastfeeding leads to identification of the related problems and provision of strategies to solve them.

Keywords: Infant, Successful breastfeeding, Successful breastfeeding concept analysis

INTRODUCTION

Infancy is a critical period in human life regarding growth and development. Nutrition is also of great importance in this period. Breast milk is the most perfect food for infants during the first few months of life [1]. Breastfeeding provides the best nutrition for infant's growth and development and has an exclusive biological and emotional influence on the health of both mother and child [2]. Breast milk contains large amounts of high-quality substances, which can be absorbed easily and provide energy, nutritional balance, easy digestion, and healthy growth [3]. In fact, no substance could replace breast milk. There are more than 400 beneficial materials in breast milk, such as white blood cells and antibodies, which cannot be produced in laboratory. These substances protect infants against diseases [4] and reduce mortality, diarrhoea, intestinal haemorrhage, abdominal colic, asthma, acute respiratory infections, atopic diseases and jaundice, diabetes, and obesity [5]. They are also essential for neurons and brain development [6].

Nowadays, breastfeeding is very important in maintaining infants' health [7]. Breastfeeding has long been important in Iran [8]. Documented history of breastfeeding in Iran goes back to the ninth century; Avicenna emphasized the importance of breastfeeding in his book "Ghanoon" [9].

Exclusive breastfeeding, as a natural nutrition, has been recommended for the first 6 months of life [10]. The results of a cross-sectional study in Canada showed that although nearly 90.3% of Canadian mothers breastfed their children, less than 28% of them did not breastfeed their babies exclusively during the first 6 months of life [11]. In Iran, 86% of children are breastfed up to 4 months and 25% up to 6 months, which is lower than World Health Organization's (WHO) recommendation. In another study, the rate of exclusive breast feeding up to 6 months was reported to be 44% in Iran [10]. Generally, exclusive breastfeeding plays an important role in infant's health. Breastfeeding decreases the risk of acute respiratory infection up to 8 times and the risk of mortality up to 4 times [5]. According to WHO, the rate of breastfeeding should be 68% by 2018 in order to achieve a healthy society [12]. Additionally, WHO and UNICEF recommended that breastfeeding should begin from delivery room in all child-friendly hospitals [13]. Unfortunately, these recommendations are not followed properly in developing countries [14]. Different studies have mentioned different disrupting factors in breastfeeding, including age, job, mother's education level, socioeconomic factors, insufficient breast milk, sick child, singleton pregnancy, type of delivery, and mother's desire for breastfeeding [15]. Investigations have also shown that nutritional problems related to breastfeeding began from hospital. Scubar and colleagues revealed that infants had to be breastfed successfully and continuously to prevent illness and rehospitalization [16]. Similarly, Taylor and Hong found that the complications leading to infant's rehospitalization might be primarily related to insufficient breastfeeding. Hence, proper breastfeeding and regular follow-up may prevent rehospitalization [17]. A survey on hospitalized infants also indicated that one of the primary causes of hospitalization was related to mothers' inadequate knowledge about proper breastfeeding [18].

Up-to-now, several studies have reviewed the concept of successful breastfeeding [19]. However, there is no comprehensive definition of the concept that limits the comparability and generalizability of breastfeeding studies [20].

METHODS

The concept of successful breastfeeding was analysed using the Walker and Avant methodology in 1995. Analysing a concept aims at clarifying the meaning and importance of that concept in nursing literature. Concept analysis is a process in which characteristics of a concept is identified and defined. Also, a precise practical definition is provided to improve concept relationships [7,21]. Walker and Avant suggested that concept analysis could provide new clinical interpretations, research tools, and evaluation of the available instruments. Moreover, the existing instruments can be reviewed based on the results of concept analysis to determine if they measure the concept correctly. By using the practical definition of a concept, it may be used as a variable for research purposes, as well [7]. Therefore, our study aimed to analyse the concept of successful breastfeeding using Walker and Avant approach as follows:

Step 1: Selection of "successful breast feeding" as the concept.

Step 2: Determination of the purpose of analysis and clarification of the concept of successful breastfeeding.

Step 3: Identification all use of the concept in previous scientific literature.

Step 4: Determination of the essential attributes of the concept.

Step 5: Provision of a model case (in this model, characteristics of the concept are similar to the model, but the model does not contain all the characteristics of the concept).

Step 6: Identification of the borderline, related, contrary, invented, and illegitimate cases.

Step 7: Identification of antecedents and consequences of the concept.

Step 8: Definition and determination of empirical referents and measuring the concept using the results.

The concept analysis of successful breast feeding will proceed according to these steps:

Step 1: Selection of the concept and purpose of analysis

This study aimed at determining the concept of successful breastfeeding, particularly in nursing literature, during the last 20 years. A literature review was conducted by searching CINAHL, PubMed, Scopus, and Google Scholar databases were Google, databased as well as Persian and medical literature from 1990 to 2015 using the keywords: "successful breastfeeding," "infant," and "successful breast-feeding concept analysis." Finally, 84 resources were selected as the sample. However, limited access to some references led to their exclusion from the study. Then, the data were classified as characteristics, influencing factors or incidents, consequences, and empirical referents related

to successful breastfeeding. Besides, the previous articles on the concept of successful breastfeeding were used for better understanding of the findings, comparison of the data, and clarifying the meaning. All the selected articles were quantitative, qualitative, and review type and most of them did not have a specific conceptual framework. However, the researchers made no judgment about the quality of the papers.

An overview of the resources collected for analysis of successful breastfeeding based on the publication year, country, type, and area has been presented in Table 1. Based on the findings presented in Table 1, it was found that using the concept of successful breastfeeding has increased in the past two decades. In addition, most of the resources were from Iran, USA, Canada and UK. Besides, the majority of the resources were scientific papers (full text - abstract) and nearly half of them were clinical studies.

Table 1 Concept analysis sample references (total n=84)

| Year of publication | No | Present |
|---|-----------|----------------|
| 1990-2000 | 11 | 13 |
| 2001-2010 | 34 | 40 |
| 2011-2015 | 39 | 47 |
| Country of origin | | |
| Iran | 23 | 27 |
| United States of America | 20 | 24 |
| Canada | 21 | 25 |
| United Kingdom | 10 | 12 |
| Australia/New Zealand | 7 | 9 |
| Other | 3 | 3 |
| Reference type | | |
| Best practice implementation article/abstract | 45 | 54 |
| Research report/abstract | 10 | 12 |
| News brief | 6 | 7 |
| Commentary/letter to editor/editorial | 18 | 21 |
| Book/book review | 5 | 6 |
| Domain | | |
| Clinical | 51 | 61 |
| Educational | 28 | 33 |
| Theoretical/conceptual | 5 | 6 |

Step 2: Determination of the purpose of analysis and clarification of the concept of successful breastfeeding

The purpose of the study was to produce an operational definition of successful breastfeeding that can be used in research. Moreover, imprecise definition of successful breastfeeding results in inability to identify ineffective behaviours related to this concept, consequently leading to infants’ clinical problems and hospitalization [22,23]. Now the question arises “what is successful breastfeeding”. To avoid ambiguity and to clarify the concept of successful breastfeeding, concept analysis should be done. Thus, the present study aims to analyse the concept of successful breastfeeding, develop a clear conceptual understanding, and provide a concrete definition of the concept through Walker and Avant approach to be used in nursing research and clinical settings.

Step 3: Identification all use of the concept of successful breastfeeding

Dictionary definition of breastfeeding: The activity of feeding a baby or young child milk from the breast of a lactating woman [24].

Used in other discipline?? In Nursing and Paediatric Breastfeeding, also called nursing, is the process of feeding human breast milk to an infant, either directly from the breast or by expressing (pumping out) the milk from the breast and bottle-feeding it to the infant. Breastfeeding and breast milk provide an infant with essential calories and nutrients [25].

According to the American Academy of Pediatrics (AAP) Policy Statement on Breastfeeding, women who don’t have health problems should exclusively breastfeed their infants for at least the first 6 months of life [26].

Effective breastfeeding a nursing diagnosis accepted by the North American Nursing Diagnosis Association, defined as the state in which a mother-infant dyad/family exhibits adequate proficiency and satisfaction with the breastfeeding process [27].

In different papers, the concept of “breastfeeding” was described as “interactive process” [28], “the product of systematic process” [29], “a series of steps” [30], and “sequential steps process” [31]. Additionally, evidence-based clinical practice guidelines and the Association of Women’s Health defined breastfeeding as the “process whereby the infant receives milk” [32]. Breastfeeding has also been defined as “a technical process that breast milk is transferred to the infant”, “a dynamic interaction”, and “symbolic communication” [16]. Moreover, Johnson, et al. defined breastfeeding as a period of time when infant has oral contact with the mother’s breast [33]. Livingston also called breastfeeding as a process in which breast milk is transferred to the infant’s mouth [17]. Furthermore, Ingram, Johnson, and Greenwood stated that successful breastfeeding referred to “feeding without pain for both mother and the child” [34]. Some other papers defined breastfeeding as a “complicated interactive process with mutual consent which stems from providing the needs of mother and child” [35,36]. In some researches, successful breastfeeding referred to the number of individual sessions of breastfeeding [35,37]. Overall, based on the review of the literature, breastfeeding is an interactive harmless process between mother and infant in which breast milk is directly transferred to child’s mouth and the needs of both mother and child are satisfied.

In summary it can be said, the concept of successful breast-feeding described and explanation in the form of themes “Productive Process”, “Interactive process, Systematic process”, “Technical process”, “Safe feeding”, “Feeding quantity”, “a dynamic interaction”, “symbolic communication”, “interactive process with mutual consent”, “A feeding process”, “Dyadic relationship”.

Step 4: Essential attributes of the concept of successful breast-feeding

Walker and Avant defined the main characteristics of the concept, which differentiate the concept from similar and related concepts [38]. It seems the major feature lies in interactive process and successful breastfeeding is associated with the interactive process during breastfeeding. In all the reviewed papers, “adequate transfer of breast milk to infants to meet the needs of mother and child” was evident. In addition, four basic characteristics of the interactive process of successful breastfeeding that has been mentioned in the majority of the resources included how to hold the infant during breastfeeding, the way breast is put in infant’s mouth, how to suck, and milk transmission from mother to infant.

Breastfeeding position

Mulford, et al. stated that breastfeeding position refers to physical position of mother and infant during breastfeeding [31]. Shargo, et al. used the term “alignment” instead of position [30]. On the other hand, Henderson and colleagues used the term “hold” [39]. Overall, researchers suggested that the way the infant is kept during breastfeeding is very important [39,40]. In this regard, skin-to-skin contact should be there between mother and infant during breastfeeding [39]. When infant grasps the breast properly, the whole areola would be in the mouth and, consequently decreasing breast stretching [30]. This would also avoid nutritional problems, such as nipple fissure, breast swelling and inflammation, and reduced milk production, and unsuccessful nutrition [34,39,41]. Therefore, mothers need help to fit in the right position during breastfeeding [30]. McArthur suggested that the mothers who used football position during breastfeeding gave more milk to their infants, while mothers who underwent C section and anaesthesia or used drugs needed nursing support in primary positions for breastfeeding [41].

Breast’s position in infant’s mouth

Breast’s position in infant’s mouth has been often assumed as an indicator of successful breastfeeding. Grasping areola [30,34], dependence [30,39], and latch [31] have been mentioned, as well. Overall, breast should be put in infant’s mouth in a way that infant’s mouth, tongue, and gums surround areola and its nose and chin be in close contact with the breast, which leads to less pressure [30,34,42]. In case infant’s mouth does not surround the areola properly and just the gums are involved, the infant will not receive adequate milk and breast fissures will occur [30]. Therefore, correct position of breast in infant’s mouth is necessary for proper sucking and successful breastfeeding [30,34].

Sucking

Organized and measurable sucking behaviour [16,43] is a pre-requisite for successful breastfeeding [44,45]. Sucking

has been defined as lifting the infant's jaw to cover the lower gum. Yet, a more precise definition is pressing the areola [30]. Sucking is divided into nutritive and non-nutritive categories depend on the speed of sucking and milk flow [31]. Factors, such as surgery and trauma to the breast tissue, disability, neuromuscular disorders, prematurity, inconsistent sucking, and drowsiness during breastfeeding, might decrease milk flow [43,45].

Milk transmission

Transmission of milk from mother's breast to infant's mouth is the final essential factor in successful breastfeeding [20,30,45]. Milk transmission has been defined as the time "when milk from mother's breast is transferred, swallowed, and digested by infant which is audible" [30]. Milk transmission depends on milk production reflux, glandular tissue, and mother's appropriate hormonal function [2,30]. Milk transmission is a cumulative process of position, latching on, and sucking [16,30].

Step 5: Providing a successful breastfeeding model

Walker and Avant believe that providing a model for the concept is an appropriate method to analyze the concept because a perfect and clear model helps to clarify the concept [37]. Therefore, based on the characteristics of successful breast-feeding the following model was proposed: there is a mother with a three months baby boy who is exclusively breast-fed, the infant is full-term with a birth weight of 2700 g. Currently he weighs 4500 g.

Mother was observed during breast feeding and following was recorded:

The mother holds baby in cradle style (infant's head and neck in the crook of mother's elbow and bottom of baby on the palm so that the infant's Chest and abdomen is in contact with mother's breast). Mother closes her nipples to infant's, infant opens his/her mouth and puts the whole nipple and alveolar in the mouth. Thus, nipples meet infant's hard palate, infants lower lip flange outward and infant's chin would be close to breast. This process creates sucking. Sucking and swallowing are simultaneous. During sucking process mother and infant make eye contact and mother holds infant's other hand in a gentle caress.

Step 6: Providing related model

Walker and Avant believe that most concepts are not studied individually, and any concept is dependent and associated with similar ones in the same context [46]. In present study the concept of "successful feeding with a bottle" is similar to the concept of successful breast feeding, because in feeding with a bottle also infant should be in a proper position, gasp the tip of the bottle and show sucking behaviour to receive the milk. But, gasping and sucking method and the source of milk is different from breast feeding. Hence the concept of successful feeding with bottle and successful breast feeding are two related concepts.

Identification of the borderline, related, contrary, invented, and illegitimate cases

Borderline case

A 3-day-old baby was admitted in the neonatal intensive care unit. The nurse called the mother in the ward for feeding her baby. Then the mother with the help nurse using hand milking has three parts, Cover the breast (the nipple and areola breast covered cone Cup (Hand pump (hollow chambers that breast milk takes out (Milk container (a container under the cover breast, which is detachable and the milk is stored in it (milking your breast milk. The nurse puts the NGT for infants and Take the breast milk into the syringe 5 cc. The mother holds baby in cradle style (infant's head and neck in the crook of mother's elbow and bottom of baby on the palm so that the infant's Chest and abdomen is in contact with mother's breast). Then nurse according to the principles of safety, gavage slowly milk into the syringe through NGT for baby. This process creates sucking. Sucking and swallowing are simultaneous. During sucking process mother and infant make eye contact and mother holds infant's other hand in a gentle caress.

Contrary case

A 30-year-old mother, who has recently given birth, has inappropriate physical and mental condition. Her breasts have inflamed, swollen and painful, also her infant is hungry and cried all the time. The Mother holds their child in lying on the side position, and while his hand is under the infant's neck, raises baby's head and neck and squeezes her nipples in the baby's mouth. Therefore, infant sucking occurs very short and fast, His cheeks sunken and are heard *mulch mulch* voices. Also, the infant is restless and occasionally left breast and cries and again his mouth close to the breast,

and sometimes refuses to take the breast. The mother is restless, and breastfeeding is painful for her

Step 7: Antecedents and consequences of successful breastfeeding

Antecedents and consequences are events which occur prior to or after occurrence of the concept but do not determine the characteristics of the concept [46]. A number of characteristics known in the literature may be related to antecedents of successful breast-feeding as an interactive process including: infant's position during breastfeeding, sucking reflex, mother's knowledge of breastfeeding, mother's relaxed and comfortable position while breastfeeding, physiology and functional anatomy of breast, physiology and functional anatomy of infant's mouth.

Infant's position plays an important role in successful breast feeding [28,30,31]. Infant's position usually described as a continuum of consciousness, from a deep sleep to cry. Thus, sleepy infant may be hungry but is not awake to get enough feeding, and needs to be aroused gently whereas a frantically crying infant should first be consoled before feeding [28]. So, the ideal state is the one in which infant is relaxed and responsive [30]. Karl suggests that "Quiet alertness" is the ideal state for breast feeding although new-borns rarely achieve this state [28]. Therefore, identifying the relationship between infant and successful breast feeding in the first few days after birth is very important, because in the first few days after birth, the infant is very sleepy and may even be necessary to wake him up to meet his nutritional needs [46]. Rooting reflex is a behaviour that is assessed in new-borns after birth, mother stimulates infant's lip and mouth with finger or nipples, and Infant turns his head to the source of stimulation, opens his mouth and is ready to take the breast in the mouth. So rooting reflex stimulates sucking reflex [47]. This reflex also affects infant's status and it shows that infant is hungry. Therefore, rooting reflex is considered an important antecedent for successful breast feeding because it makes the infant to grasp the alveolar tightly [30,34]. If this reflex is weakened due to prematurity, central nervous system and neuromuscular injuries caused by using drugs by mothers, successful breast-feeding would be difficult to achieve [47]. Mother's knowledge about breast feeding is one of antecedents of successful breast feeding [20,48]. Mothers also should perform necessary steps of breast feeding despite absence of hunger symptoms during awakening time [28]. In order to achieve successful breast feeding, mothers should receive education on topics such as proper breastfeeding position, correct alveolar grasp, sucking and rooting reflex and transmission of milk to infant's mouth, before discharge from hospital [30,34]. Mother and infant's situation affect successful breast feeding. If mother suffer from adverse psychological (anxiety) and physical (sore nipples, fatigue and anaemia) conditions, secretion and transmission of milk reflex would be impaired and consequently successful breast feeding would be impossible to achieve [20]. Anatomy and physiology of mother and infant also are considered as antecedents of successful breast feeding [31]. Anatomical abnormalities related to infant's mouth make sucking process difficult and also lead to nipple sores and the whole process of breast feeding and infant's weigh gain would be disturbed [49]. Moreover, both breast augmentation and breast reduction surgery, removal of breast tissue, decreased milk ducts, pituitary and endocrine glands disorder, caused by postpartum haemorrhage impair lactation process [16]. Walker and Avant describe the consequences of a concept as: events that occur as a result of the concept [7]. Based on the literature review consequences of successful breast feeding include the following: being full related behaviour, not latch on to breast, not responding to rooting reflex, absence of pain and discomfort in the breast and Seemingly calm infant [31,48]. According to International Breastfeeding Consultation Guide, full term and healthy infants exclusively breast fed lose more than seven percent of their weight in the first few days of birth, and fourteen days after birth gains their initial weight. It also suggests that adequate breast-feeding criteria include: Six wet diapers and at least three bowel movements per twenty-four hours in four days and gaining weight as four to eight ounces a week [50]. In some other researches the indicators of successful breast feeding are:

- 1) Infant grasp breasts firmly in the mouth and began to suck and swallow milk at least eight times in twenty-four hours.
- 2) In every nursing session, only one breast should completely drain and the breast should be drained in the next session.
- 3) Infant is happy and satisfied one or two hours after breast feeding.
- 4) Normal infant stool.
- 5) Infant should enjoy sleep and wakefulness cycle more than seven times in twenty-four hours [51,52].

Mothers with healthy and full-term infants are expected to identify their infant’s reaction and behaviour during exclusive breastfeeding to respond appropriately. Also, there should not be any painful breast or nipple sore during breast feeding period [53]. Suggested relationship between factors and events, essential characteristics and consequences of successful breastfeeding is presented in Figure 1.

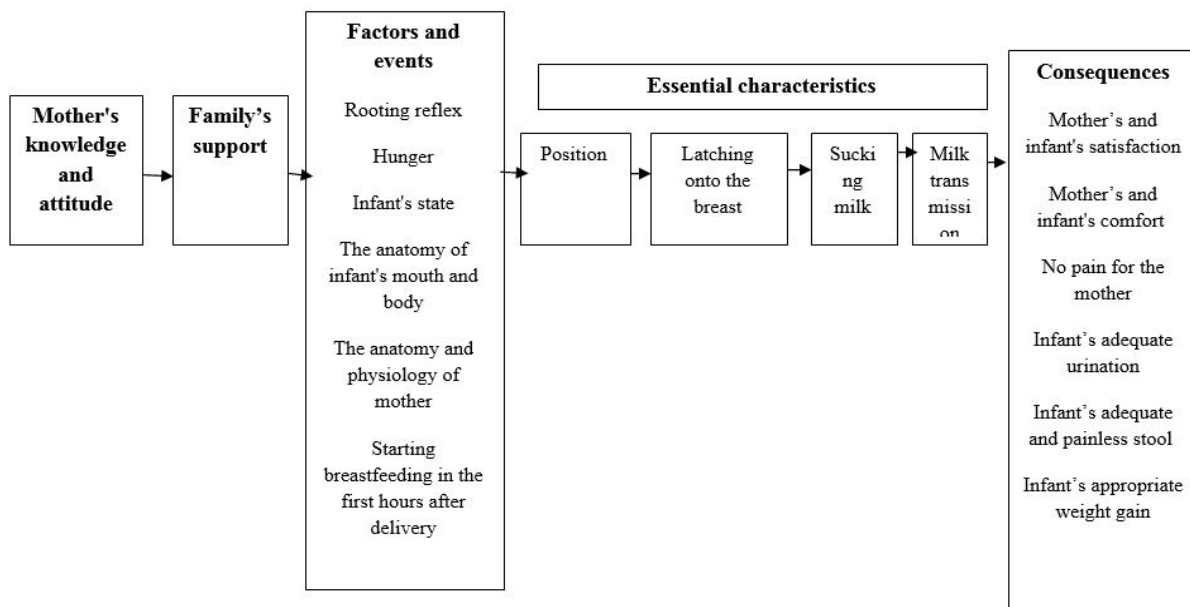


Figure 1 Relationship between factors and events, essential characteristics and consequences of successful breastfeeding

Step 8: Definition and determination of the empirical referents to measure the concept

Empirical referents are used to measure a concept and have been defined as “a way of measuring or determining its existence in the real world” [7]. Since most of the defined characteristics of breastfeeding are abstract, empirical referents are effective in understanding the concept [31]. Empirical referents related to the concept of successful breastfeeding, which were mentioned in the literature, were mother’s and infant’s position, mother’s breast in infant’s mouth, sucking, and transmission of milk [20,48]. Considering the empirical referents for mother’s and infant’s position, infant’s head should be aligned with its trunk and its mouth should face mother’s breast, infant’s head and neck should be relaxed with no muscular rigidity to prevent excessive traction on mother’s nipple and to facilitate milk transmission [30], and mother should be comfortable [47]. With respect to the empirical referents related to infant’s mouth position, mother should feel comfortable with no pain or sore nipples [20], infant’s tongue should be on the nipple and cover the lower alveolar ridge, and its lips should be flanged outward [20,54].

The empirical referents for sucking included mother’s report of strong sucking by the infant and non-rhythmic non-nutritive sucking followed by nutritive sucking [20]. Finally, the empirical referents for milk transmission consisted of infant’s visible and audible sucking, visible milk in infant’s mouth during breastfeeding, milk secretion from mother’s breast, and change in sucking pattern from rapid and non-rhythmic to slow, rhythmic, and strong sucking [52]. At this stage, mother should also report reduction of uterine cramps, vaginal discharge, tingling in nipples, fatigue, drowsiness, and thirst [52,54].

DISCUSSION

Findings of present study describe characteristics, antecedents and consequences of successful breast feeding related to nursing discipline. Concept’s importance depends on its ability in innovation and problem solving [55-57]. Hence, precise definition of successful breast feeding leads to identification and solving related problems. Most of the scientific papers describe the concept in similar terms but the main difference is in classification, determination and emphasis on successful breast-feeding process [22,26,44,56,58,59]. Moran, et al., evaluated characteristics, prone and cons of 6 breast feeding evaluating instruments including infant and mother’s behaviour, infant and mother’s health, breast’s health, position, dependence and successful feeding. They found little correlation in determination of an approach to evaluate successful breast feeding; they also declared that based on undeveloped evidence based researches the

present instruments are different in quality, also only three instruments measure the eight items related to concept [19]. Riden and Cohen reported that 3 breast feeding related instrument are available: 1) Successful breast feeding in first hours after birth instrument, 2) Mother and infant evaluation instrument, 3) Charted system for putting breast in infant's mouth, are not reliable for clinical settings [60].

More in his study evaluated some aspects in breast feeding instrument including infant's preparation for awakening, rooting reflex, position and sucking pattern, also parent's experience of breast feeding instrument and skin to skin contact between mother and infant during breast feeding instrument (SCC) are valid and reliable [1,61-63].

CONCLUSION

Breast feeding behaviour assessment tool was used in 2003 by Radzimirski to evaluate the capacity of anxiousness and adaptation behaviour of infant [64]. In previous literature position, nipple grasp and sucking of milk and milk transmission are mentioned repeatedly as characteristics of interactive process of successful breast feeding [1,61,65-67]. However, all these terms should be defined and developed more specifically. Clinical investigators need to define important characteristic of successful breast feeding, mother and infant health improvement practically. The limitations of present study consist of omitting some research papers due to lack of convenience, or non-English or Persian language. Based on findings of present study, development of the breast feeding's concept and application, is considered as an important aspect in clinical nursing care. So, development of this concept and assessment of its consequences seems necessary.

DECLARATIONS

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Conflict of Interest

There are no known conflicts of interest for any of the authors of this manuscript which would interfere with the integrity of this research.

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