

## Effect of Active Toolkit Training on Nursing Faculty Staff knowledge and Clinical Teaching Skills Related to Breastfeeding Management.

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**Abstract:** Women seek breastfeeding advice from nursing healthcare professionals, lack of nursing professional support with breastfeeding challenges and information is often inconsistent or conveys conflicting messages that inversely can negatively affect their breastfeeding experiences. However future nurses who are the next generation of nursing profession, many studies suggest that their educational breastfeeding knowledge and skills are inadequate and not providing the foundation needed to support breastfeeding women and families and needed new educational strategies to be adequately prepared to assist breastfeeding mothers. **Aims of the study are to** assess the Community Health Nursing and Pediatric Nursing faculty staff knowledge and clinical teaching skills related to breastfeeding management and **to** evaluate the effect of implementing an active toolkit training on faculty staff knowledge and clinical teaching skills related breastfeeding management. Additionally, **to** explore faculty staff satisfaction towards active clinical teaching skills strategies related to breastfeeding management. **Material and methods:** Quasi-experimental pre/post – test was followed to carry out the study. All Community Health Nursing and Pediatrics Nursing staff affiliated to teach breastfeeding contents at the Faculty of Nursing, Damanhour University (43 faculty staff). Three tools were used to collect data includes participant's breastfeeding knowledge structured questionnaire, case studies' scenarios for assessing clinical practice teaching skills regarding breastfeeding management and staff self-reported clinical teaching skills' satisfaction scale. **Results:** The findings of the present study revealed that the implementation of the active toolkit training leads to improve faculty staff breastfeeding total knowledge and clinical teaching skills scores and the majority of them were satisfied with active educational intervention applied as concept map, and flipping the class as prospective method of teaching. **Conclusion and recommendations:** The application of active toolkit training has positive impact on assigned Nursing faculty staff knowledge and clinical teaching skills' scores related to breastfeeding management. The overall results revealed highly satisfaction with the intervention applied as, flipped class and concept mapping. Therefore developing comprehensive evidence based breastfeeding curriculum (theoretical and practical) standard to be applied by concerned nursing faculty departments. Furthermore, the application of innovative active teaching strategies should be emphasized and encouraged in relation to breastfeeding problems, counselling as well as problem solving skills in relation to need to be highlighted in students clinical setting.

**key words:** active toolkit, breastfeeding managements, active learning strategies, flipping the class, oranges and breast .prompt pictures.

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### I. Introduction

The health benefits of breastfeeding are widely known throughout the healthcare community. As breast milk has evolved to provide the best and sole source of nutrition for the first important 6 months of life and beyond, promote and improve the immunological function and regulation of growth, development, and metabolism for the human infant. Also it encourage cognitive and mental development plus help or prevent many acute illness and chronic disease which can be acquired in infant early years or later in life. In addition, it have great economic and environmental advantages as well as psychological and social one<sup>[1-2]</sup>.

Likewise, the benefit not only for the infant but also it may confer both immediate and long term benefit to mothers, especially if recommendation of exclusively breastfeeding and duration are met as required. Such benefits may strength the mother motivation and commitment to continue breastfeeding. There are many benefit has been evident and consider a way to improve a woman's health after pregnancy as it may help her to return to a normal metabolic profile and to facilitate lose the weight she gained during pregnancy as it is

consider to loose around 500 calories /day if exclusively fed and reduce maternal bleeding postpartum. Similarly, it may reduce type II diabetes, cardiovascular risks, postmenopausal breast cancer and ovarian cancer [1-3].

Unfortunately, despite the tremendous benefits of breastfeeding on the universe, the rate of exclusive breastfeeding Worldwide and in Egypt especially, is decreasing as it was 56% at 2000 then declined to 52 % at 2008 then now it is expected to be less than 39% of mother breastfed exclusively at 2018 and it is only 20% of them who even complete it for one year. Also, it is consider lower than WHO global nutritional targets 2025 as it to increase the exclusive breastfeeding rate to more than 50% by 2025 (WHO, UNICEF,EDHS). There are many factors that can contribute in mother decision to breastfed either exclusively or not at all. Among those factors that are the encouragement and support of health care providers, as they assigned to educate and advocate mothers and her families about breastfeeding. Furthermore, they provide optimal clinical support and management of the most challenges facing her during breastfeeding period and may jeopardize the compliance of breastfeeding [4-6].

Moreover, WHO as declared the ten steps of breastfeeding since 1989 and revised it periodically, most of steps were concerned with training and educating of both nursing staff, and mother and for not just providing information but also, to convey practical skills to her to be more confident while, breastfeeding and confront all factors that may hinder the complying [7,8].

Accordingly, it was emphasized by many large organization as WHO, UNICEF, Academy of breastfeeding Medicine (ABM) and American academy of pediatrics (APP) is to ensure and work thoroughly that all health care staff must have sufficient knowledge, competences and be skillful to support breastfeeding. [9-11] However, according to a study done in kyenia (2016) and Saudia 2018 mentioned that more than half of the mothers first learnt or heard about exclusive breastfeeding was from a health care professional [12-13]. While in study conducted in Egypt by Ahmed G.et al. (2014) found that the mothers knowledge sources only was less than 20% from health care professional which is considered one of the barriers to breastfeeding support [14].

To enhance breastfeeding practices Worldwide, nursing support as one of the health care team, has been shown in research to have an important impact on the success of breastfeeding and play vital roles on promoting self-confidence of mothers and their knowledge of breastfeeding. Nurses must use the breastfeeding updates and required skills needed to practice evidence-based breastfeeding problems management which can confronted by mothers [7,15-17].

Undergraduate nursing students considering the corner stone for next generation of future nursing profession in which they should be equipped with needed skills and qualifications for preventing health problems or solving minor one especially in primary health care setting about breastfeeding [16-18].

However, lack of sufficient education and preparation for breastfeeding support and guidance by future nurses has been well documented in the medical literature. It is very often that nurses with different specialties (obstetrics, pediatrics and community health nursing) are supportive of breastfeeding but less aware about specific management strategies. Moreover, their education does not necessarily ensure their graduates have received up-to-date and evidence-based knowledge of breastfeeding management. Thus, these significant deficits in breastfeeding knowledge may result in premature supplementation or cessation of breastfeeding mothers. [18, 19, 20, 21]. In study conducted in Egypt by (Ahmed A, El Guindy SR 2011) mentioned that nursing students' attitudes towards breastfeeding, in Egypt, were neutral with low breastfeeding knowledge scores. He justify the results as the lack of needed knowledge and clinical experience that would potentially, enhance their breastfeeding knowledge, attitude and skills. [18, 19] Also, different studies showed that lack of breastfeeding education has resulted in nursing students not knowing essential information needed to assist a breastfeeding mother [22,23].

Additionally, it was found that there are many factors affecting the level of undergraduate nursing students knowledge and skills acquired throughout their faculties years, as most of nursing programs provide little to no breastfeeding content in curriculums; and even applied through lecturing without any evidence base ,didactic and clinical skills interventions which effect on their clinical skills confidence in assisting and help breastfed mother [17,24,25].

Accordingly, integrating up to date evidence-based breastfeeding practical content, to nursing curricula and give students opportunities to practice breastfeeding management skills before actually caring for clients in a clinical setting, will equip graduate nurses with the knowledge and skills to protect, promote and support breastfeeding mothers and communities they serve. This can be achieved by using different educational modalities, as was mentioned recently by many researchers [18-20] who found that the additional educational strategies as role-play, case studies, online activities improved undergraduate nursing students' learning as well as their confidence in the clinical setting formats [25-27].

The Formats and techniques that assimilate active learning, encourages the use of learner-centered teaching methods actively engage learners in the learning process, has a positive impact on knowledge transfer Cheang K, 2009 [28]. Participation of learners in the learning process and interactions within the class

significantly increases information retention rates by 60%–80% Herreid N 2011<sup>[29]</sup> facilitates critical thinking, problem solving skills and provides better outcome in terms of learning among undergraduate nurses Noohi et al 2013<sup>[30]</sup>.

Though, faculty member who integrate diversity of active teaching strategies encourage students involvement and self-directed learning in order to promote understanding of complex concepts, promoting meaningful learning experiences, result in greater retention of educational concepts, than more passive approaches and thus facilitate the change of practice, by creating a useful and meaningful educational intervention for nurses<sup>[25-27,31]</sup>. Additionally, all students' learning styles can benefit by using all their sense as visual, auditory and tactile learners, encouraging students to learn in a way that most closely simulates real, on-the-job nursing situations, making for a more competent transition into the workforce. Active teaching strategies can be enhanced when integrated into the lecture in relation to clinical practice, to provide effective instruction<sup>[25, 31,32]</sup>. There are a variety of teaching strategies that faculty member can use to improve student learning regarding breastfeeding. It is of great importance to select appropriate teaching strategies in nurse education, to make the training more appealing and more effective<sup>[31]</sup>.

Debriefing & debating, concept mapping, role play, case studies, and scenarios, flipping the class are example of interactive methods that enhance students' learning. Also group work, multimedia, and hands-on learning activities, can be integrated into traditional strategies students in which it can help in reforming traditional teaching methods<sup>[25,27,31]</sup>.

**Debates:** The instructor chooses a controversial topic that has a pro and con viewpoint. This active-learning strategy works well in a small class setting but can be used in a large class as well. Debating through logical compelling arguments allows students to become actively engaged in learning the course content while it promotes critical thinking and enhances verbal communication skills through triggers higher order learning, such as analysis, synthesis, and evaluation<sup>[27, 32]</sup>.

**Case Studies/ scenarios:** It include application of knowledge, skills, and attitudes to solve a problem relating to the students course material. This strategy works well in large and small classrooms. They present realistic, complex, and contextually rich situations, and often involve a dilemma, conflict, or problem. It can bridge the gap between theory and practice, and between the classroom and the workplace real situation. Harricharan R 2013<sup>[33]</sup> state that the use of cases allows students to assimilate and apply clinical and basic science knowledge and skills such as clinical reasoning, critical thinking, problem solving.<sup>[31-33]</sup>

**Flipped the class room:** The traditional lecture is substituted by a strategy that integrates technology and active learning activities to help students' to enhance critical thinking skills. Students watch video lectures or video in relation of what going to be discussed next lecture before class and valuable class time is spent on active-learning activities as individual and small group exercises, application activities, case studies, discussions, and role playing.<sup>[34-35]</sup>

**Concept/ mind mapping:** It can be applied in nursing curricula by which faculty instructor can create alternative learning experiences that facilitate reflection, learning, knowledge building, problem solving, inquiry, and critical thinking. Students can illustrate a vision, It has been suggested to encourage nursing students to exhibit their contextual knowledge and creativity, and make associations about a central theme during this activity, think critically, as it stimulates the use of thinking skills such as analysis, inference, and evaluation<sup>[36-37]</sup>.

**Picture to breastfeeding linkage (Prompt pictures) :** An image / figure presented to participant with no explanation, and enquire identification / explanation, and justification about meaning of each. Then to write about it using terms from lecture, or to name the processes and concepts shown. It works well as group activity and summarize the concepts as students can relate pictures to the information. Pictures or images or graphics instead of text, are easier to remember<sup>[38,39]</sup>.

#### **Innovation ways in teaching breastfeeding techniques (position and latching)**

There are many practical activities that can be used to demonstrate breastfeeding techniques and skills. They may sound interesting and will certainly stimulate discussion and participation

#### **Oranges and breasts**

Aim of the activity: to explain to the participants' different ways milk can be obtained from the breast and how effective they are. The infant's role in breastfeeding will be explained and how the infant's whole body needs to be in alignment and facing to promote proper latching and position for. At the end of the activity the reason and description of activity should be explained<sup>[40-42]</sup>.

**Using real life visual guide :Lipstick nipple shape :**

There must be an easy way to facilitate understanding of information to both mother and health professional through using things or objects from real life. As sometimes mothers state that if the baby doesn't latch on properly (shallow nipple latch), unbearable nipple pain and resulting in sore nipples due to improper position and latching techniques. Consequently, the appearance of mother's nipple can be give a sign of problems. So, early diagnosis of the problem is important for prevention and early management<sup>[43-45]</sup>.

**Narrative case study telling ( real life cases) about reality of breastfeeding mothers experience.**

The narrative type of case story telling is the primary form of human understanding and exploration of any concepts or phenomena. Furthermore, it well known within literature the value of narrative in communicating scientific information. In telling these stories by the owner, hoping in helping health care and social service providers to protect, promote, and support breastfeeding<sup>[40, 46, 47]</sup>.

However, breastfeeding education hasn't standardized reference as for an example 20 hours by WHO and in not considered a core element in nursing and professional health education. Providing substantial education in nursing programs will provide future nurses with the foundation needed to support breastfeeding women and families. Practicing nurses need these skills to appropriately mentor new graduates and orientees, as well as nursing students in the clinical setting.

**Significance**

Although there are limited studies that definitely address breastfeeding education in nursing curricula, studies have shown growing in breastfeeding knowledge from educational aspect. Findings have suggested that basic nursing education does not adequately prepare students to assist breastfeeding mother in day to day challenges and lack of practical information in relation to breastfeeding management.

Instructional methods used for teaching breastfeeding consist primarily of readings and lecture, with fewer opportunities for modeling and role-play or any active teaching strategies. So, reforms in nursing education are needed to provide nursing students with learning experiences to prepare them for professional practice. Also, no identified studies that include the integration of active teaching strategies and the effect of it on retention and satisfaction of information acquisition of undergraduate students related to breastfeeding. **So the aims of the study** are to assess the Community Health Nursing and Pediatric Nursing faculty staff knowledge and clinical teaching skills related to breastfeeding management and to evaluate the effect of implementation of active toolkit training on faculty staff knowledge and clinical teaching skills' related breastfeeding management. Additionally, to explore faculty staff satisfaction towards active clinical teaching skills strategies related to breastfeeding management.

**Research Hypothesis:**

- Nursing staff at the Community Health Nursing and Pediatric Nursing departments who receive breastfeeding active toolkit training will exhibit higher knowledge and clinical teaching skills' scores post training implementation than before.
- Nursing staff at the Community Health Nursing and Pediatric Nursing departments who receive breastfeeding active toolkit training will be satisfied with intervention applied.

**II. Material & Methods**

**Material**

**Research design:** Quasi-experimental pre/post – test was followed to carry out the study.

**Setting**

The study was carried out at Faculty of Nursing Damanhour University, Egypt. It has nine different scientific nursing departments including Medical Surgical Nursing, Nursing Education, Nursing Administration, Gerontological Nursing, Psychiatric Nursing departments, and Critical Nursing. Also, **Community Health Nursing, Obstetrics & Gynecological Nursing and Pediatrics Nursing** Departments who are affiliated for teaching breastfeeding contents.

**Subjects:**

It included all Community Health Nursing and Pediatrics Nursing staff affiliated to teach breastfeeding contents at the Faculty of Nursing, Damanhour University (43 faculty staff, 21 Pediatrics and 22 Community) those who accepted to participate in the study.

**Tools for data collection:**

In order to fulfill the objectives of the study 3 tools were used to collect necessary data:

**Tool I: Participant's breastfeeding knowledge structured questionnaire:**

Used to collect data from faculty staff about their basic breastfeeding knowledge. It consist of 2 parts:

- **Part I:** Basic staff personnel and academic data such as: age, gender, last educational degree, last breastfeeding educational session or conference, seminars and how many times for each. Which modalities was used in teaching breastfeeding content in each department (lecture, case study, OSCE etc...). In addition, their perceived role regarding breastfeeding promotion, source of breastfeeding knowledge and practical experience. Also, the areas they would like to have an additional training on related to breastfeeding.
- **Part II: To assess participant’s baseline breastfeeding knowledge:**
  - The questionnaire covers six main areas of knowledge domain, each one consist of several questions was **scored** as follows; Correct answer = 1 & Incorrect answer or no response = zero. Responses are coded on rating scale ranging from (0 to 59), The domain were as follow 1- **Anatomy of breast &physiology of breastfeeding (0-7)**, 2-**Benefit of breastfeeding (0-9)**, 3- **breastfeeding techniques** (position and latching) (0-12) , 4-**Ten steps & the Baby-Friendly Hospital Initiative ( BFHI ) (0-9)**, 5-**Breastfeeding challenges / practice** (0-9) and 6-**breastfeeding Myths and half-truth (0-13)** . It was constructed as true and false and MCQ questions.
  - The combined scores are summed to create a total knowledge scores, which ranged from 0 – 59. A higher score represented higher levels of breastfeeding knowledge, and was categorized as:

<b>Knowledge score</b>
≤ 50% (less than 30) = Poor level of knowledge
51% < 75% (30 to 44) = Fair level of knowledge.
75% <100% (More than 44) = Good level of knowledge.

The Cronbach's alpha coefficient for this tool was > 0.769.

**Tool II: Case studies’ scenarios questionnairefor assessing clinical practice teaching skills regarding breastfeeding management.**

By using case studies scenarios questionnaire with multiple answers choices and illustrated by pictures. It was developed by the researchers after reviewing recent related literature <sup>[9,11,44,48]</sup> to identify staff clinical practical management of breastfeeding problems or challenges. It includes 16 case studies scenarios to cover most common of problems facing breastfed mother, example scenario about: counselling issues, diabetes and breastfeeding, twins feeding, breastfeeding problems as sore or inverted nipple, breast engorgement etc., proper latching and position, mother with infectious diseases as virus C or AIDS. Each one scored as follows; Correct answer = 1 & Incorrect answer or no response = zero. The combined scores are summed to create a total clinical practical management score, which range from 0 – 16. A higher score represented higher levels of clinical practical management skills and was categorized as:

<b>Clinical practical management of breastfeeding</b>
≤ 50% (less than 8) = Poor level of practical management skills.
51% < 75% (8 to 12) = Fair level of practical management skills.
75% <100% (more than12) = Good level of practical management skills.

The Cronbach's alpha coefficient for tool II was => 0.760.

**Tool III: Staff self-reported clinical teaching skills’ satisfaction scale.**

It was created by the researchers to capture the participant satisfaction and feedback. It consist of 15 statement about their satisfaction in relation to the effect of training toolkit on knowledge (key point and concepts) and skills gained, if objectives achieved and future perspective of using and applying the new educational strategies. Satisfaction data was gathered using 5-point Likert scale. For each statement, a score of 1-5 as (1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree.). Summing the score of the scale items and dividing it by the number of items in the scale was computed. The higher score indicating highly satisfied and lowest score indicate dissatisfied. Negative statements with reverse response and its score were taken into consideration.

The cumulative satisfaction total scale scores range from (1 to 75). It was calculated as follows;

<b>Satisfaction</b>
≤ 50% (less than 38) = dissatisfied/ low satisfaction.
51% < 75% (38 to 56) = moderate satisfaction
75% - 100% (56.5 - 75) = highly Satisfied.

Reliability was measured for tool III (evaluation Tool) using the Cronbach’s alpha test, the result indicates that it was: 0.789. This results indicating that the tool was 78.9% reliable.

## **2- Methods:**

1- Official letter was directed to the Dean of Faculty of Nursing, Damanhour University and the three departments in order to clarify the purpose of the study, to set the time for beginning the study and to explain the process of it as well as to gain their cooperation.

2-Tools (I,II &III) were developed and adopted by the researchers after an in-depth review of on the relevant literatures and revised for its' content validity by 5 experts in the field . Necessary modifications were carried out accordingly.

3- Pilot study was carried out on a sample of 5 faculty staff from the three departments (those staff were excluded from the sample).

4- Data was collected during the academic year 2017 -2018, from September till November 2017.

5- Toolkit intervention was executive in the midterm vacation (February 2018).

6- Tools (I, II, III) were used to collect data about breastfeeding knowledge, clinical practice teaching skills regarding breastfeeding management and self-satisfaction of toolkit.

7- Soft copy of the content of the breastfeeding management toolkit training was disseminated to participated staff through email or social media and extra online links also was given for further reading.

### **Developmental Stages of the active toolkit training:**

#### **1- Preparation phase:**

- **Assess breastfeeding course content and actual methods of teaching:**

➤ The assessment conducted by researchers revealed that:

(1) Breastfeeding content is illustrated in three departments with different specialty (Obstetrics, Pediatrics in third year and Community Health in fourth academic year).

(2) There were no standardized learning objectives about breastfeeding for the 3 departments,

(3) Less than 2 hours of class time through lecture was spent on breastfeeding content, and

(4) Content generally focused on breast anatomy, physiology of lactation, benefit of breastfeeding and common problems associated with breastfeeding.

- Pediatrics and Community Health Nursing Departments accepted to participate in the research and were invited to participate in the active toolkit training program. While Obstetrics & Gynecological Nursing department didn't accept the participation .

- **Assessment of the study participants (pretest):**

1-Assessment done by using Tool I, II as pretest questionnaire and was given for each staff assigned for practical clinical students activities related to breastfeeding in the two departments.

2-Consequently the intervention and methods of active teaching was decided accordingly based on relevant and recent literature and participants educational needs.

➤ **Breastfeeding active toolkit training was developed according to the following steps:-**

#### **Step I- Stating clear objectives;**

A- General objective:

At the end of the active toolkit training, faculty staff will be satisfied of the clinical teaching skills related to breastfeeding.

B- Specific objectives:

➤ Identify the updates in breastfeeding

➤ Understand the truth about common breastfeeding myths

➤ Differentiate between proper and improper breastfeeding techniques, latching and positions.

➤ Identify most common used active learning /teaching strategies.

➤ Apply problem based learning in relation to breastfeeding problem management

➤ Comprehend breastfeeding ten steps.

#### **Step II- preparation and organization of the active toolkit training media;**

➤ Preparation of media used in the program application:

1-Prepare the Breastfeeding activity of the most suitable to meet the objectives was incorporated

2-The content was presented by researchers using Prezi desktop software program version 5.2.7.

3-Two media was disseminated video about Breast Crawl Video Initiation first hours and breastfeeding getting a good latch by Dr. Jack Newman <sup>(49,50)</sup> to the assigned staff through social media or email before conducting the session for the objectives of applying **Flipped class room teaching strategies** concepts (as one of the active educational strategies used).

#### **2- Implementation phase:**

➤ The application of the toolkit was conducted in 2 consecutive days

- The study subjects assembled into 4 subgroups each group includes 10-11 participants to promote active participation.
- The researchers gave an overall track of the two days of the training.
- Orientation about each active educational strategies as (Teaching/learning methods, such as discussion, case studies, debating, flipping the classroom linkage pictures) was briefly explained before applying it to facilitate the understanding of its objectives in relation to breastfeeding, agenda.

**The sessions of the toolkit training was implemented as described in following schedule**

**Schedule of the toolkit training sessions**

Days	Session number	Time	Session title and theme	Breastfeeding teaching methods used
First day	One	8.30-9 9-12	Ice breaking and training objectives orientation -Basics and updates about breast feeding  -Updates on Ten steps &BFHI	-Lecture -Discussion and brain storming, concept map - Pictures from real life of unrelated to breastfeeding concepts. - Illustrated pictures of infants stomach size -Illustrated updates of WHO ten steps figure.
	Two	12.30-2pm	Breastfeeding myths and half-truths in the community.	Group discussion, debating and brain storming.
Second day	Three	9-11pm	Techniques ( breastfeeding position and latching)	Discussion video as shown before (flipping the class) real life model : Oranges (cups &straw) / lipsticks
	Four	11.30 - 2.30pm	-Managements of breastfeeding challenges and problems -Breastfeeding communication skills -Breastfeeding and working mother	Case study scenario / through illustrated pictures  2 Real case study of mothers who had problems with BF.

- **The active educational strategies used as follow :**

**Activity I: Concept or mind mapping:**

Each group of staff was provided with markers and a paper and were asked to write the milk composition in the center and work outward from the central focus to create a mind map.

**Time allowed:** was 10 minutes for writing and 20 minutes for discussion for the whole group.

**Activity II: Picture to breastfeeding linkage( prompt pictures ):**

This activities was adopted with modification in the application. Pictures were displayed through presentation with no explanation, and staff were asked to correlate or identify/explain, and justify their answers in relation to of the importance and benefit of breastfeeding andthe risks of formula feeding also in relation to mother, infant, environment and community.

**Time allowed** of this activity is 20 minutes.

Example : Wallet—breastfeeding saves money, as in picture (1)

Tape measure: breastfeeding helps mother lose weight gained during pregnancy,

Tooth brush—breastfeeding promotes healthy tooth and jaw development,

Garbage bag—breastfeeding is environmentally friendly etc..

It was categorized as benefit mother, infant, community and for the Environment.







### Activity V: Real life case study

- To understand the proper counselling techniques

- To differentiate between empathy and sympathy as one of Counselling technique for example.

- Two mother were accepted the invitation to participate in the toolkit training program from faculty of nursing who had not complete exclusive breastfeeding due many factors. Counselling techniques were practiced by participants and researcher were observed. They were invited to share their story and what are their problem / challenge they face with completing exclusive breastfeeding both of them accepted to participate.
- Each mother were assigned to each group and were asked to conclude what was the problem with each one
- Time allowed was 20 minutes.

-After each intervention there was time allowed for discussion and debriefing and to take feedback of applicability of each active teaching strategies used.

### 3-Post intervention Evaluation.

Following the active toolkit training, immediate evaluation by using tools (I, II, III) posttest to assess breastfeeding knowledge, clinical teaching skills related to breastfeeding management and satisfaction self-rating Likert scale were used to evaluate the method of active educational strategies used in the intervention.

**Ethical consideration:** Verbal consent was obtained from the participants after explanation of the aim of the study. Privacy was maintained during process of data collection. Confidentiality and anonymity of caregivers' response were guaranteed.

### Statistical analysis:

After data were collected, they were coded and analyzed. The statistical package for social sciences (SPSS/version 20) software was utilized for data analysis and tabulation. Statistically significant at  $p \leq 0.05$

### The following statistical measures were used:

#### Descriptive statistics:

Count and percentage: used for describing and summarizing qualitative data.

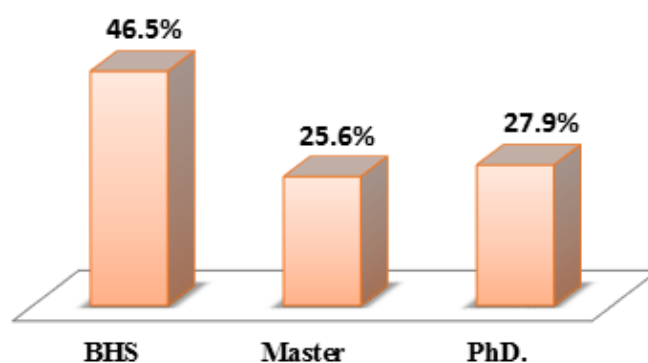
Arithmetic mean ( $\bar{X}$ ), standard deviation (SD). They were used as measures of control tendency and dispersion respectively for normally distributed quantitative data.

#### Analytical statistics:

- **Chi square ( $\chi^2$ ):** it was used to test the association between categories of qualitative variables.
- **One Way ANOVA test:** Parametric statistical tests were used to compare the means for quantitative data of more than two independent groups and detect significant differences.

## III. Results

**Figure (1)** portrays that nearly half (46.5%) of the participants at Community Health Nursing and Pediatric Nursing departments has Bachelor degree. While, (27.9% and 25.6%) of the participants has Doctorate and Master Degree in Nursing, respectively.



**Figure (1) Educational level of the study participants**

**Table (1)** shows generally, that slightly less than three quarters (74.4%) of the participants received educational sessions regarding BF among them, 44.2% received such sessions only once. Regarding attending conference, seminars and or workshops regarding BF, more than half (51.1%) of the participants stated that they didn't attend any of them. As regard the participant role in breastfeeding promotion as perceived by them, around half (51.2%) of them find their role in teaching students and public on BF, compared to around one quarter (27.9%) who engaged in solving and managing BF problems and the minority (7.0%) of them providing BF support. Finally, this table also portrays that around sixty percent (58.1%) of the participants reported that the source of their practical information regarding BF is their work experience, and the same percent reported that they need extra training on BF problem management.

**Table (1): Distribution of participants according to their previous professional attendance of Breastfeeding Educational Session.**

Items	No.	%
<b>Attend BF. educational session</b>		
Yes	32	74.4
No	11	25.6
<b>Number of sessions</b>		
0	11	25.6
1	19	44.2
2	8	18.6
3	5	11.6
<b>Mean ± SD</b>	<b>1.16± 0.94</b>	
<b>Frequency of attending conference /seminar / workshop</b>		
None	22	51.1
1-3 times	15	34.9
4-6 times	6	14.0
<b>Role of breastfeeding promotion as perceived #</b>		
Teach students and public about BF	22	51.2
Recommend BF	18	41.9
Discuss pro and cons	14	32.6
Help in managing BF problem	12	27.9
Provide BF support	3	7.0
<b>Sources of practical information received #</b>		
Work experience	25	58.1
Faculty education	18	41.8
Friends	10	23.3
Family	10	23.3
<b>Recommendation for breastfeeding upcoming training #</b>		
BF problem management	25	58.1
BF promotion	19	44.2
BF techniques	20	46.5
None	13	30.2

# Multiple response

**Table (2)** presents a significant improvement in the participants' knowledge regarding benefit of breastfeeding where the mean percent score was  $57.8 \pm 12.9$  pre-toolkit training and improved to  $96.3 \pm 5.7$  post- toolkit training, a statistically significant relation were found ( $F=2.382, P=0.049$ ).

**Table (2): Distribution of participants’ according to their knowledge regarding benefits of breastfeeding and disadvantages of bottle feeding. (Pre and Post active toolkit training)**

Knowledge regarding Benefit of breastfeeding	Pre- active toolkit training				Post- active toolkit training				Test of sign.
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Formula fed and breastfed babies have the same health status	3	7.0	40	93.0	0	0.0	43	100.0	F=2.382 P=0.049*
Breast feeding has effect on community and environmental health.	26	60.5	17	39.5	4	9.3	39	90.7	
Breastfeeding help in losing postpartum women weight.	20	46.5	23	53.5	6	14.0	37	86.0	
Breast milk and formula milk provide infant immunological protection.	9	20.9	34	79.1	1	2.3	42	97.7	
Breastfed baby grows faster than a formula fed.	31	72.1	12	27.9	2	4.7	41	95.3	
Breastfed baby has lower incidence of allergy	5	11.6	38	88.4	0	0.0	43	100.0	
Stooling pattern of breastfed babies differ from bottle fed	10	23.3	33	76.7	0	0.0	43	100.0	
Breastfeeding promote normal jaw development	23	53.5	20	46.5	1	2.3	42	97.7	
Effect of Bottle feeding on infant Gut micro biome disappear rapidly	36	83.7	7	16.3	0	0.0	43	100.0	
<b>Mean%±SD</b>	<b>57.8±12.9</b>				<b>96.3±5.7</b>				

F: ANOVA test P: P value of ANOVA test \*Significant at p value ≤0.05

**Table (3)** shows a significant improvement in the participants’ knowledge regarding myths and half-truth regarding BF as follow. The participants’ knowledge regarding that “Adolescent young women do not produce enough milk” was 27.9% pre-toolkit training who correctly answered and improved to 88.4% post-training. Furthermore, their thought about that “A woman with mastitis has to stop breastfeeding, at least from the infected side” was 25.6% pre-toolkit training and improved to 100.0% post-training. Additionally, the participants’ knowledge regarding that newly Breastfed mothers should expect sore nipples as a normal part of breastfeeding” was 30.2% pre-toolkit training correctly respond and compared to 88.4% post-training. Moreover, regarding “A mother who smokes is better not to breastfeed” was 27.9% pre-toolkit training who mentioned it and improved to 67.4% post-training. Furthermore, the participants’ assumption that “Mother who participate in strenuous exercises may effect on her milk production” was 34.9% pre-toolkit training and improved to 90.7% post-training. Finally, the overall knowledge of the participants regarding myths and half-truth improved from 47.2% pre- toolkit training to 88.7% post-training with no statistically significant relation where ANOVA test (F=1.549, P=0.177).

**Table (3) Distribution of participants according to their knowledge regarding breastfeeding any Myths and half-truth. (Pre and Post active toolkit training)**

Knowledge regarding Myths and half-truth	Pre- active toolkit training				Post- active toolkit training				Test of sign
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Breast and formula fed babies fed every fixed hours	4	9.3	39	90.7	0	0.0	43	100.0	F=1.549 P=0.177
Breastfed woman should abstention of certain food.	21	48.8	22	51.2	9	20.9	34	79.1	
An exclusively breastfed infant needs to get water while breastfeeding.	18	41.9	25	58.1	0	0.0	43	100.0	
Any prelacteal feeding is acceptable, until the mother’s milk comes in.	15	34.9	28	65.1	2	4.7	41	95.3	
Adolescent young women do not produce enough milk.	31	72.1	12	27.9	5	11.6	38	88.4	
Women cannot take medication while breastfeeding.	24	55.8	19	44.2	7	16.3	36	83.7	
A woman with mastitis has to stop breastfeeding, at least from the infected side.	32	74.4	11	25.6	0	0.0	43	100.0	
Newly breastfed mothers should expect sore nipples as normal part of breastfeeding.	30	69.8	13	30.2	5	11.6	38	88.4	
Sore nipples due to frequent feeding on breast.	15	34.9	28	65.1	2	4.7	41	95.3	

Breastfeeding a child above 2 years of age is abnormal and child become dependent.	22	51.2	21	48.8	6	14.0	37	86.0
A mother who smokes is better stop breastfeeding	31	72.1	12	27.9	14	32.6	29	67.4
Large breasts produce, on average, more milk than small sized breasts	24	55.8	19	44.2	9	20.9	34	79.1
Mother who participate strenuous exercises may reduce milk production”	28	65.1	15	34.9	4	9.3	39	90.7
<b>Mean%±SD</b>	<b>47.2±14.2</b>				<b>88.7±8.4</b>			

F: ANOVA test P:P value of ANOVA test \*Significant at p value ≤0.05

**Table (4)** displays a significant improvement in the participants’ knowledge regarding BF challenges. The participants’ knowledge regarding the BF challenges facing women with PKU who shouldn’t breastfed their infants was 18.6% pre toolkit training and improved to 69.8% post-training and for mother with hepatitis B or C positive shouldn’t breastfed their babies was 37.2% and improved to 100.0% post-training. Additionally, Their knowledge regarding breast augmentation that can affect breastfeeding latter as one of BF challenges was 0.0% pre toolkit training and improved to 97.7% post-training and regarding ability of women who failed to breastfed her first baby will not be able to feed the next one was 23.3% at pre-toolkit training and improved to 90.7% post-training. Finally, the participants’ overall mean score % of knowledge regarding BF challenges was 34.6% pre-toolkit training and improved to 89.9% post-training with no statistically significant relation where ANOVA test (F=1.927, P=0.113).

**Table (4) Distribution of participants according to their knowledge regarding breastfeeding challenges and common problems. (Pre and Post active toolkit training)**

Knowledge regarding breastfeeding challenges	Pre- active toolkit training				Post- active toolkit training				Test of sign.
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Breastfed babies need to nurse more frequently than formula fed babies.	23	53.5	20	46.5	6	14.0	37	86.0	F:1.927 P:0.113
Women always perceive of not producing enough milk.	24	55.8	19	44.2	0	0.0	43	100.0	
Women with PKU shouldn’t breastfeed their infants.	35	81.4	8	18.6	13	30.2	30	69.8	
Mother with hepatitis B or C positive shouldn’t breastfed her baby	27	62.8	16	37.2	0	0.0	43	100.0	
Mother with Flat or inverted nipple difficult to breastfed her baby	25	58.1	18	41.9	10	23.3	33	76.7	
Nipple pain is due to poor attachment	19	44.2	24	55.8	4	9.3	39	90.7	
Breast augmentation can affect breastfeeding latter	43	100.0	0	0.0	1	2.3	42	97.7	
Mother who delivered cesarean will not be able to breastfeed for next 2 days postpartum	24	55.8	19	44.2	1	2.3	42	97.7	
Mother who failed to breastfed first baby not be able to feed next baby	33	76.7	10	23.3	4	9.3	39	90.7	
<b>Mean%±SD</b>	<b>34.6±14.7</b>				<b>89.9±9.0</b>				

F: ANOVA test P:P value of ANOVA test \*Significant at p value ≤0.05

**Table (5)** illustrates a significant improvement in the participants’ knowledge regarding technique of breastfeeding. The participants’ knowledge regarding lay back breastfeeding as the best position for comfortable feeding (biological nurturing) technique was 37.2% pre-toolkit training and improved to 76.7% post-training. Furthermore, their knowledge regarding the fact that mixed feeding keep mother breast milk the same in amount was 37.2% pre-toolkit training and improved to 88.4% post-training. While, their knowledge regarding nipple confusion among newborns was 25.6% pre-toolkit training and improved to 90.7% post-training. Additionally, the participants’ knowledge regarding proper latching technique was 20.9% pre-toolkit training and improved to 100.0% post-training and regarding the technique of storage of the expressed breast milk was 32.6% pre-toolkit training and improved to 100.0% post-training. Lastly, The overall mean score % knowledge of the participants regarding technique of breastfeeding was 50.9% pre-toolkit training and improved to 94.7% post-training with a statistically significant relation where ANOVA findings (F=2.658, P=0.019).

**Table (5): Distribution of participants according to their knowledge regarding breastfeeding technique (latching on and positioning). (Pre and Post active toolkit training)**

Knowledge regarding breastfeeding technique	Pre- active toolkit training				Post- active toolkit training				Test of sign.
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Lay back position for comfortable feeding (biological nurturing")	27	62.8	16	37.2	10	23.3	33	76.7	F=2.658 P=0.019 *
Mixed feeding keep the amount of breast milk mother the same.	27	62.8	16	37.2	5	11.6	38	88.4	
The infant sucks from a bottle the same way from breast.	7	16.3	36	83.7	2	4.7	41	95.3	
Mother must switch feeding from both breasts each time.	11	25.6	32	74.4	6	14.0	37	86.0	
Mother should empty her breast each breastfeeding session.	7	16.3	36	83.7	0	0.0	43	100.0	
Nipple confusion is newborns difficulty to feed from bottles with different teat shape.	32	74.4	11	25.6	4	9.3	39	90.7	
Babies crying are considering the last sign of feeding cues.	24	55.8	19	44.2	0	0.0	43	100.0	
Breast milk efficiency transfer assured by proper position and good latching	17	39.5	26	60.5	0	0.0	43	100.0	
Proper latching promoted when nose in front of nipple, mouthful of areola, lips flanged outward and wide opening mouth	34	79.1	9	20.9	0	0.0	43	100.0	
Nipple should positioned in the junction of hard and soft palate for good latching	27	62.8	16	37.2	0	0.0	43	100.0	
Expressed breast milk should be stored in deep freezer for 6 month	29	67.4	14	32.6	0	0.0	43	100.0	
Mother should hold the breast in C position	11	25.6	32	74.4	0	0.0	43	100.0	
<b>Mean%±SD</b>	<b>50.9±18.0</b>				<b>94.7±6.3</b>				

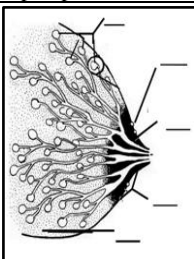
F: ANOVA test

P:P value of ANOVA test

\*Significant at p value ≤0.05

**Table (6)** presents a significant improvement in the participants’ knowledge regarding breast anatomy and physiology of the breastfeeding. The participants’ knowledge regarding prolactin hormone level was 39.5% pre-toolkit training and improved to 86.0% post-training. While, Their knowledge regarding site of breast duct was 32.6% pre-toolkit training and improved to 100.0% post-training and regarding supporting fat and tissue of the breast site was 30.2% pre-toolkit training and improved to 100.0% post-training. Furthermore, the participants’ knowledge regarding presence of areola was 39.5% pre-toolkit training and improved to 100.0% post-training and regarding alveoli position was 34.9% pre-toolkit training and improved to 97.7% post-training. Finally, the overall knowledge of the participants was 40% pre-toolkit training and improved to 97.7% post-training with no statistically significant relation where ANOVA findings ( F=1.954, P=0.098).

**Table (6): Distribution of participants according to their knowledge regarding anatomy and physiology of breastfeeding.(Pre and Post active toolkit training)**

Knowledge regarding anatomy and physiology	Pre- active toolkit training				Post- active toolkit training				Test of sign.	
	Incorrect		Correct		Incorrect		Correct			
	No	%	No	%	No	%	No	%		
Oxytocin promote calm and happiness for both mom and babies	23	53.5	20	46.5	0	0.0	43	100.0	F:1.954 P:0.098	
Prolactin level decreased gradually postpartum	26	60.5	17	39.5	6	14.0	37	86.0		
	Breast duct	29	67.4	14	32.6	0	0.0	43		100.0
	Supporting fat and tissue	30	69.8	13	30.2	0	0.0	43		100.0
	Areola	26	60.5	17	39.5	0	0.0	43		100.0
	Alveoli	28	65.1	15	34.9	1	2.3	42		97.7
	Montgomery follicle	16	37.2	27	62.8	1	2.3	42		97.7
<b>Mean%±SD</b>	<b>40.8±27.2</b>				<b>97.3±7.7</b>					

F: ANOVA test

P:P value of ANOVA test

\*Significant at p value ≤0.05

**Table(7)** portrays a significant improvement in the participants’ knowledge regarding ten steps of breastfeeding and the concept of baby friendly hospital initiatives (BFHI). It was observed from the table that only 2.3% of participants’ correctly answered regarding step 8 pre-toolkit training and improved to 100.0% post-training. Moreover, their knowledge regarding step 10 8.6 % of them responded correctly pre-toolkit training and improved to 74.4% post-training. The participants’ knowledge regarding the fact that all staff should fully comply with the international code of marketing of breast milk substitution was 18.6 % pre-toolkit training and improved to 100.0% post-training. Moreover, correct knowledge concerning about step 9 were stated by 27.9 % pre-toolkit training and improved to 69.8% post-training and for step 1 were 27.9 % pre-toolkit training and improved to 86.0% post- training. While, regarding the advertise of bottle milk is prohibited by international code of marketing of breast milk substitution correct knowledge reported by 37.2 % pre-toolkit training and improved to 90.7% post-training. Finally, the total knowledge of the participant was 27.3% pre-toolkit training and improved to 87.5% post-training with no statistically significant relation where ANOVA findings ( F=1.819, P=0.133).

**Table (7): Distribution of participants according to their knowledge regarding ten steps and baby friendly hospital imitative BFHI. (Pre and Post active toolkit training)**

Knowledge regarding Ten steps , BFHI	Pre- active toolkit training				Post- active toolkit training				Test of sign.
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Comply fully with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.(1)	31	72.1	12	27.9	6	14.0	37	86.0	F:1.819 P:0.133
Discuss the importance and management of breastfeeding with pregnant women and their families.(3)	41	95.3	2	4.7	14	32.6	29	67.4	
Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth (4)	15	34.9	28	65.1	0	0.0	43	100.0	
Support mothers to initiate and maintain breastfeeding and manage common difficulties.(5)	24	55.8	19	44.2	0	0.0	43	100.0	
Support mothers to recognize and respond to their infants’ cues for feeding. (8)	42	97.7	1	2.3	0	0.0	43	100.0	
Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.(9)	31	72.1	12	27.9	13	30.2	30	69.8	
Coordinate discharge so that parents and their infants have timely access to ongoing support and care.(10)	35	81.4	8	18.6	11	25.6	32	74.4	
<b>Baby friendly hospital imitative BFHI.</b>									
All staff should fully comply with international code of marketing of breast milk substitution	35	81.4	8	18.6	0	0.0	43	100.0	
advertise of bottle milk is prohibited by international code of marketing of breast milk substitution	27	62.8	16	37.2	4	9.3	39	90.7	
<b>Mean%±SD</b>	<b>27.3±14.6</b>				<b>87.5±11.1</b>				

F: ANOVA test

P:P value of ANOVA test

\*Significant at p value ≤0.05

**Table (8)** demonstrates a significant improvement in the participants’ clinical practical breastfeeding management problems scenarios. Their clinical practical management regarding mother with type I diabetes and the ability to breastfed or not was 4.7 % pre-toolkit training and improved to 95.3% post-training. While, their management of mother with fussy baby and frequent nursing scenarios was 32.6% pre-toolkit training and improved to 74.4% post-training. Moreover Their response to practical management of mother with sore nipple scenarios and recognizing the poor latching scenario was 34.9 % pre- toolkit training and improved to 93.0% post-training and was 32.6% pre-toolkit training and improved to 100.0% post-training respectively . Also, regarding the management of correction of poor latching was 25.6% pre-toolkit training and improved to 81.4% post-training and their practical management of use of breast pump with mother with chicken box or not scenario was 37.2% pre-toolkit training and improved to 86.0% post-training. Concerning the applicability of re-lactation of six week baby was correctly responded by 20.9 % pre-training and improved to 90.7% post-training. Moreover, the participants response to the picture of poor latching by mouth angle as the most visual aspect as breastfeeding problem scenarios acceptably was 25.6% pre-toolkit training and improved to 95.3% post-training. Moreover, The participants’ clinical practical management of mother who contracts rubella while breastfeeding her 2 month old baby scenarios was 34.9 % pre-toolkit training and improved to 67.4 % post-

training. While regarding the concept of tandem nursing was 16.3 % pre- toolkit training correctly responded and improved to 83.7% post-training. The participants’ clinical practical management about the meaning of empathy as the key to mother counseling was correctly stated by 27.9% pre-toolkit training and enhanced to 74.4 % post-training. Moreover, their clinical response to relation of delayed expulsion of placenta and delay of lactogenesis II scenarios was 37.2 % of them correctly answered pre-toolkit training and improved to 86.0% post-training. Finally, the total participants’ clinical practical management of breastfeeding problem scenarios was 35.0% pre-toolkit training and improved to 88.6% post-training with a statistically significant relation where ANOVA findings ( F=2.980, P=0.010).

**Table (8): Distribution of participants according to their clinical practical management of breastfeeding problem scenarios. (Pre and Post active toolkit training)**

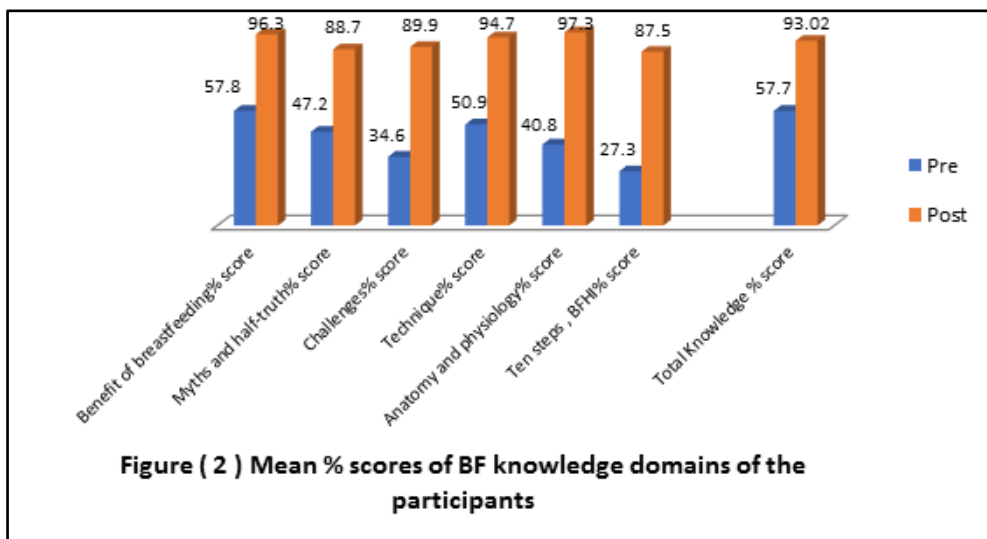
Items	Pre- active toolkit training				Post- active toolkit training				Test of sign.
	Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	
Mother with type I diabetes and being able to breastfed or not	41	95.3	2	4.7	2	4.7	41	95.3	F:2.980 P:0.010*
Mother with fussy baby and frequent nursing	29	67.4	14	32.6	11	25.6	32	74.4	
Mother with twins	22	51.2	21	48.8	4	9.3	39	90.7	
Management of mother with sore nipple	28	65.1	15	34.9	3	7.0	40	93.0	
Mother complain of engorgement in the first three days postpartum	14	32.6	29	67.4	0	0.0	43	100.0	
Management of blocked ducts	19	44.2	24	55.8	0	0.0	43	100.0	
Recognizing the poor latching	29	67.4	14	32.6	0	0.0	43	100.0	
Management of poor latching	32	74.4	11	25.6	8	18.6	35	81.4	
Breast pump should not be used with mother with chicken box	27	62.8	16	37.2	6	14.0	37	86.0	
Re-lactation of six week baby possibilities.	34	79.1	9	20.9	4	9.3	39	90.7	
The angle of mouth is the most visual aspect of baby’s latching	32	74.4	11	25.6	2	4.7	41	95.3	
Difference between closed and opened questions	18	41.9	25	58.1	0	0.0	43	100.0	
Mother contracts rubella while breastfeeding her 2 month old baby should complete breastfeeding?	28	65.1	15	34.9	14	32.6	29	67.4	
Concept of tandem nursing	36	83.7	7	16.3	7	16.3	36	83.7	
Difference between Empathy and sympathy in counselling.	31	72.1	12	27.9	11	25.6	32	74.4	
Delayed of expulsion of placenta can delay of lactogenesis II	27	62.8	16	37.2	6	14.0	37	86.0	
Mean%±SD	35.0±13.7				88.6±8.09				

F: ANOVA test

P:P value of ANOVA test

\*Significant at p value ≤0.05

It was noticed from **Figure (2)** that there is a significant improvement in all knowledge domains regarding BF among the participants pre-toolkit training compared to post-training scores. In relation to participants’ knowledge regarding benefit of BF, it was 57.8% pre-toolkit training and improved to 96.3% post-training. Concerning to participants’ knowledge about BF myths and half-truth, it was 47.2% pre-toolkit training and improved to 88.7% post-training. In relation to participants’ knowledge regarding BF challenges, it was 34.6% pre-toolkit training and improved to 89.9% post-training. In relation to participants’ knowledge regarding technique of BF, it was 50.9% pre-toolkit training and improved to 94.7% post-training. Regarding participants’ knowledge about anatomy and physiology of the breast, it was 40.8% pre-toolkit training and improved to 97.3% post-training. In relation to participants’ knowledge regarding ten steps of BF and BFHI it was 27.3 % pre-toolkit training and improved to 87.5% post-training. Relates to participants’ total knowledge mean score regarding BF it was 57.7% pre-toolkit training and improved to 93.02% post-training.



Figure(3) portrays that the total mean score of the participants’ clinical practice management of breastfeeding problem scenario was 35% pre-toolkit training and improved to 88.6% post-training.

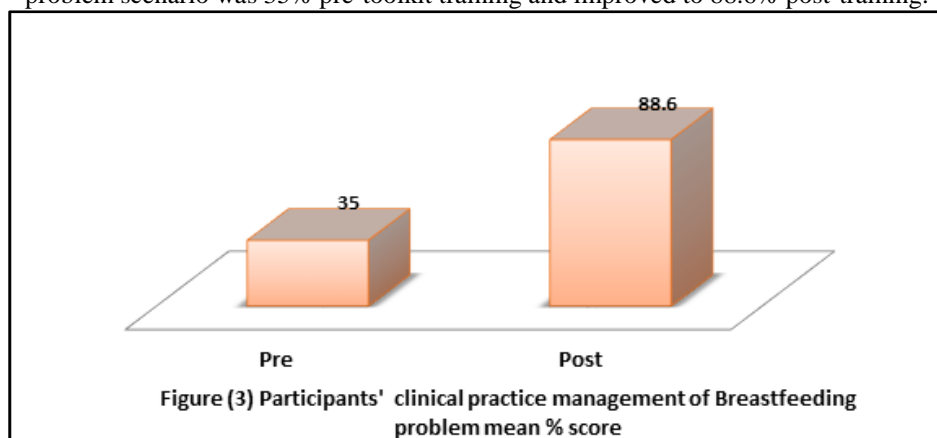


Table (9) displays the participants’ self-reported satisfaction of clinical teaching skills and toolkit training. Regarding their evaluation for the training key points and concepts; around two third (65.1%) of the participant strongly agreed that the information provided has contributed to improve their knowledge and less than two third (58.1%) of the participants strongly agreed that the toolkit training met their needs and the duration of the session was adequate to fulfill the concepts (58.1% for both). Additionally, more than half of the participants strongly agreed that the information provided was up to dates and information was clear, precise and realistic (53.5%, 51.2% respectively)

In relation to the participants’ self-reported satisfaction about the teaching methods used in toolkit training; slightly less than three quarters (72.1%) of the participants agreed that the teaching methods stimulate active participation of the learner. Less than two thirds of the participants strongly agreed that the active teaching methods used were suitable to the objectives of the training and the teaching methods were different than one used in teaching with undergraduate students (65.1% and 62.8% respectively). Also, more than sixty percent of the participants were disagreed that the clinical teaching methods used irrelevant and out-of-date, and the teaching / learning method were time consuming (55.1%, 65.8% respectively).

Furthermore, this table shows the future application of presented active teaching method as self-reported by the participants. Where, the majority (81.4%) of the participants strongly agreed that if such educational intervention was offered once more they would like to participate again. More than two thirds (67.4%) of the participants strongly agreed that they will use this teaching method in next scholastic years with undergraduate students. More than half (55.8%) of the participants strongly disagreed that post-training they consider have gained minimal updates in information and clinical practical about breastfeeding managements. Finally, the total mean % of the participants’ self-reported satisfaction was 91.5%.



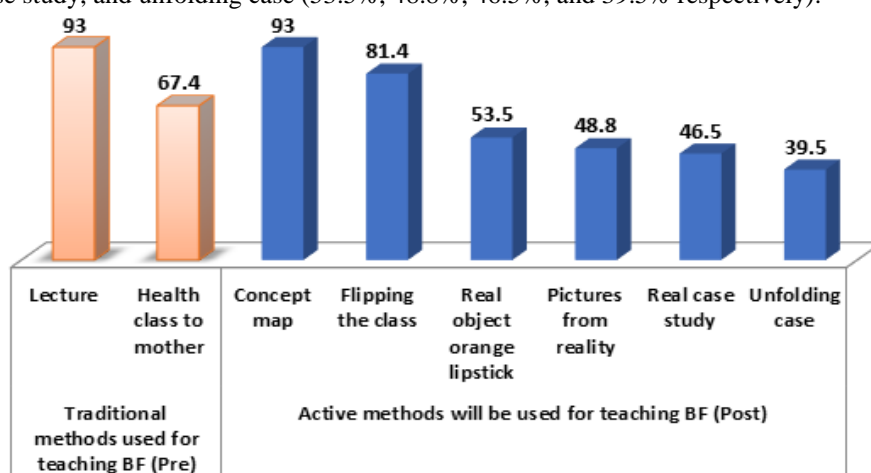
**Table (9): Distribution of participants according to their self-reported satisfaction of clinical teaching skills and training toolkit. ( Post active toolkit training)**

Evaluation	Participants' responses									
	Strongly disagree		Disagree		Nether agree or disagree		Agree		Strongly agree	
	No	%	No	%	No	%	No	%	No	%
<b>Key points and concepts</b>										
1-Educational intervention met my needs	0	0.0	0	0.0	0	0.0	18	41.9	25	58.1
2-Duration of the session was adequate to fulfill the concepts	0	0.0	0	0.0	0	0.0	18	41.9	25	58.1
3.Information provided was clear , precise and realistic	0	0.0	0	0.0	4	9.3	17	39.5	22	51.2
4.Information provided has contributed to improve my knowledge	0	0.0	0	0.0	4	9.3	11	25.6	28	65.1
5- Information provided was up to dates	0	0.0	0	0.0	0	0.0	20	46.5	23	53.5
*6-Information provided have minimal contribution in improving my breastfeeding practice related to clinical teaching skills.	20	46.5	14	32.6	9	20.9	0	0.0	0	0.0
*7-The quality of media used in the applying toolkit training was inappropriate and unsuitable.	22	51.2	21	48.8	0	0.0	0	0.0	0	0.0
<b>Teaching methods used</b>										
8-Teaching methods stimulate active participation of learner	0	0.0	0	0.0	0	0.0	12	27.9	31	72.1
9-Teaching methods were different than one used in teaching with undergraduate students	0	0.0	0	0.0	0	0.0	16	37.2	27	62.8
10-Active teaching methods were suitable to objectives of the training.	0	0.0	0	0.0	0	0.0	15	34.9	28	65.1
*11-The teaching / learning method were consuming time	24	55.8	19	44.2	0	0.0	0	0.0	0	0.0
*12-Clinical teaching methods are irrelevant and out of dated	28	65.1	15	34.9	0	0.0	0	0.0	0	0.0
<b>Future application of presented active teaching methods</b>										
13-If such educational intervention was offered again, would like to participate again	0	0.0	0	0.0	0	0.0	8	18.6	35	81.4
14-I well use teaching method in next scholastic years with undergraduate students	0	0.0	0	0.0	3	7.0	11	25.6	29	67.4
*15-Post training I consider have gained minimal updates in information and clinical practical about breastfeeding managements	24	55.8	19	44.2	0	0.0	0	0.0	0	0.0
<b>Mean %±SD</b>	<b>91.5±3.8</b>									

\*Negatively stated statements

Figure (4) presents the difference in participants' different teaching methods used pre-toolkit training and willing to be used in teaching BF as a future plan. Only two teaching methods were used as mentioned by them pre-toolkit training includes as lecture that was used by the majority (93.0%) of the participants compared to more than two thirds (67.4%) who used health class to mothers as way of conveying knowledge. In contrast the participants reported that they planned to use different active teaching methods as gained by toolkit training, where the majority of them reported to use concept map, followed by flipping class (93.0% and 81.4%

respectively). Moreover, around half of the participants will be used real objects (orange/lipstick), picture from reality, real case study, and unfolding case (53.5%, 48.8%, 46.5%, and 39.5% respectively).



**Figure (4) Different teaching methods used/ will be applied for teaching BF**

**# Multiple response**

**IV. Discussion**

Despite numerous studies that promote the benefits of breastfeeding and its relation to the level of education of nurses, undergraduate students and mother and their family, no studies have targeted knowledge and clinical practical skills of breastfeeding management of nursing faculty staff and their educational strategies used in teaching undergraduate nursing students. Therefore, this study was performed to acknowledge the level of knowledge and clinical practice skills related to breastfeeding management and application of active toolkit training on nursing faculty staff and to examine their satisfaction about various active methods used in teaching while implementing breastfeeding management toolkit training.

To increase the efficacy of undergraduate students breastfeeding management knowledge and practices, different methods should be applied simultaneously with traditional methods to include more active teaching strategies to promote self-directed and active learning and promote the students' confidence and problem solving skills when dealing with breastfed mothers [18-19].

To increase the efficiency of toolkit training applied, and to acknowledge the nursing faculty staff about the latest active educational strategies, different methods were applied simultaneously to enhance active learning and to give an account about each method in each educational session and its benefits. Consequently, in the present study, it was revealed that the faculty staff reported using lectures and health class in teaching breastfeeding for students and mothers. This was in agreement with Shindell D 2011 [51], Shu-fei Yang et al. 2018 [18] and Folke C. 2018 et al [24] that traditional educational methods were the main way for teaching nursing students. This may be related to either staff perception of lack of time to fulfill curricula requirements and objectives or an over-burdened curriculum leaves little time for implementation of new educational strategies, or due to faculty staff shortages with large number of students which can limit the use of active strategies. Or may be due to lack of clear consensus in the literature supporting most appropriate methods for facilitating learning about breastfeeding.

Concerning the participants' point of view regarding the intention of using the most suitable active strategies with undergraduate students from the applied, the majority of them stated that concept map, and flipping the class respectively as prospective methods of teaching, this result was congruent with Yacout D, and Shosha A. 2016 [34] and Ghoneim A, and El-Lakany 2017 [35], followed by real live visual guide (orange and lipstick activities), prompt pictures, real life case narrative. This result also was in agreement with Turenne P. et al. 2016 [52] who confirm the effectiveness of an active-learning approach for the implementation of an evidence-based practice in applying. Correspondingly, this result was confirmed with the results of Costa M. 2012 [53] who found that more than three quarters of students preferred using active strategies rather than the traditional one in teaching (lectures).

Moreover, it was found that almost three quarters of faculty staff reported attendance of breastfeeding educational sessions and more than half of them gained their knowledge either from attending a conference or training workshop. While regarding their practical skills, they mentioned it was from either working experience or faculty education. This was in agreement with Shindell D 2011 [51] who mentioned that nurses' faculty staff knowledge main sources were throughout attending conferences or workshops.

It was well known that many researches addressed that there are specific areas in which undergraduate nursing students lacked fundamental knowledge and clinical practical skills related to breastfeeding [18,19 ,24 ,53] . Accordingly, It was revealed from the present study that regarding total knowledge mean %score that more than half of participants' answered correctly pre intervention and this was in agreement with findings of research conducted in Egypt by Ahmed A, El Guindy SR 2011 [19] who mentioned that a weak mean knowledge score of 52%, which most of the students in research answered half of the questioning incorrectly. Although, the mean % scores was highly improved after the application of the active toolkit intervention as the majority of them responded correctly regarding breastfeeding.

The nursing faculty staff knowledge on breastfeeding management was also compromised by several misconceptions, myths that are common among them. That the present research found that nearly three quarters of participants mentioned incorrectly that ,adolescent women can't produce enough breastmilk, women with mastitis should stop breastfeeding from the affected breast, sore nipple is normal with primipara, mother who smoke better to stop breastfeeding and practicing extraneous exercise may affect the amount of produced breastmilk. these results may be justified due to lack of participants' regarding sophisticated issues and it's updated evident research findings. This was in agreement with Laanterä, et al., 2011 [54]. who described that Some nurses might rely on their own supposition about the woman's capability to breastfeed and other misconceptions practices do not support breastfeeding .

Also, the misconception of pre lacteal feeding as it's wrong practice was mentioned correctly by about two third of participants and more than half of them correctly mentioned no need of infant to get water while exclusively breast fed. This was contradict with Shu- Fei 2018 [18] and Ahmed A. &El Guindy SR 2011 [19] and who find that less than half of his participants correctly answered the risk of pre- lacteal feeding in the first week of newborn life.

While , regarding the possibility of postpone or stop breastfeeding misconception , it was observed from the present study that more than three quarters of participants' knowledge related the breastfeeding contraindication responded incorrectly regarding women with PKU who can feed her baby with special precautions, and mother with hepatitis C or B or acquiring any infectious disease should be contraindicated as fact. This finding was incongruent with Hatamleh W, Abu Sabeeb Z 2015 [55] and Marie M et al. 2011 [56] who found that Only 42% of the their participant thought mother shouldn't keep breastfeeding even if she becomes sick or gets an infection. This finding may be due to lack of knowledge about immunological characteristics of human milk and also lack of the update guidelines and research finding related to this points. The concern that breast milk may transmit the disease from a mother to her child could be the reason for this misconception

Furthermore, it was observed improvement in faculty staff knowledge regrading breastfeeding myths, that more than three quarters of participants improved knowledge post intervention this may be due to inherited deeply rooted believes and culture as in rural communities in spite of their educational background. This emphasis the need to improve cultural awareness and sensitivity while providing knowledge and practical skills to undergraduate students.

Knowledge deficits regarding anatomy and physiology of breastfeeding is consider an issue for many healthcare professionals and this was obvious in the current study participants, that more than half of them answered correctly to this factual mean % domains. This was in agreement with Marie M et al. 2011 [56] and Marie M 2010 [57]. The normal function of oxytocin and prolactin as major hormone for production and let down reflex respectively was realized while the other important function of them was not well known. Moreover, this may be related that memorizing physiology and anatomy information is difficult and should be taught in away facilitate learning and it is important be familiar with anatomy of breast in management of breastfeeding problems as mastitis, abscess, bleb as it can facilitate understanding and explanation for mother through education about the benefit of hormonal effect of oxytocin and prolactin to promote breastfeeding.

Regarding knowledge of benefits of breastfeeding VS bottle feeling , it was recognized from the study that more than three quarters of the participants were unaware of the health benefits of breastfeeding on environment and community. Also, nearly the majority of them respond incorrectly related to the deleterious health effect of at least one supplemental feeding on newborn Gut microbiome and on infant growth and development. This finding was in agreement with Marie M. 2010 [57] and Dytrych C 2013 [2]. This may be related to lack of knowledge regarding the hazards effect of supplementation with infant formula even for once on infant health. While the majority were ascertained of the benefit of human milk on prevention of allergy, infant health and immunological protection. The current study highlights that the implementation of the active toolkit intervention leads to a statistically significant improvement in participants mean percent of total knowledge score regarding benefit of breastfeeding domains (p= 0.049)

Nurses has valuable roles in enhancing breastfeeding practices as they must have clinical competences and technical skills and understood the clinical management of breastfeeding problems to take the appropriate actions and supportive care for the establishment of breastfeeding, maintain milk production, treatment and prevention of associated problems. This can be achieved by continuing education and being update with

evidence based management and knowledge. This management approach results from the breastfeeding process, and is not limited to guidance on breastfeeding, but covers a set of practices that involves the understanding of physiology, anatomy, psychology and communication techniques [16-18,22].

Accordingly, the present study revealed that less than two third of the participants highlighted about needed additional upcoming training include management of breastfeeding through emphasizing in-depth through active education strategies problems followed by less than half of them in need about BF promotion and techniques. This is to justify the result of only more than quarter of the participants perceive their role in managing breastfeeding problems .

This can explained the unexpected total mean scorepercent of clinical practical breastfeeding managements as only more than two third of participants' responded accurately to scenarios cases study showed. This results was in -agreement with Dytrych C 2013 [2]and Ahmed A. &El Guindy SR 2011[19] and Marie M. 2010 [57] who found that the lowest percent was related to practical management of breastfeeding problems and that "breastfeeding techniques" as an area they felt they needed additional training, there was a trend toward general knowledge, advanced knowledge/scenario and combined scores being significantly lower. This can be justified as they perceived their role mainly in educating students and may be mothers in clinical setting.

Moreover ,it was obvious from study that participants' mean score % of clinical practical breastfeeding managements was improved from more than two third pre intervention to more than three quarters has replied correctly post interventionand was statistically significant results was found as(p=0.010). This may be justified as learning based on didactic method may improve knowledge immediately but not enough to change professionals' behaviors and practice in long time, and required more in depth , focus and condensed training to have effect.

Furthermore ,regarding breastfeed techniques (latching and positioning) the present study shows that, the participants correctly answer regarding proper infant mechanism of sucking , mother should switch the breast in each feed and the breast must be emptied each feeding to promote breast milk supply and maintained as it is main fact of technique. Nonetheless, they were unable to identify the most comfortable breastfeeding position , nipple confusion signs, and how the proper latching is promoted , presence of nipple against soft and hard palate and proper storage temperature of expressed milk that nearly two third responded incorrectly responded. These finding was similar with Marie M 2010 [57],Caassandra L. 2013 [2] , Ahmed A. & El Guindy SR 2011[19]. The current study points that the implementation of the active toolkit intervention leads to a statistically significant improvement in participants mean percent of total knowledge score regarding breastfeeding techniques domains pre and post intervention (p= 0.019)

Ten Steps to Successful Breastfeeding and the BFHI focuses on providing optimal clinical care for new mothers and their infants. There is substantial evidence that implementing the Ten Steps significantly improves breastfeeding rates. There was updated implementation guidance in 2018 and was intended for all those who set policy for, or offer care to, pregnant women, families and infants in general, and of breastfeeding- and BFHI-related programs in particular and health-facility at different levels. The new revision of the guidelines (ten Steps) as the topic of each step is unchanged, but the wording of each one has been updated in line with the evidence-based guidelines and global public health policy. For example :full application of the International Code of Marketing of Breast-milk Substitutes5 and relevant World Health Assembly Resolutions (the Code),<sup>[9]</sup> as well as ongoing internal monitoring of adherence to the clinical practices, have been incorporated into step 1 on infant feeding policies.<sup>[8]</sup>

Accordingly , unexpected results was found in relation to the participants' knowledge regarding ten steps and BFIH that only more than quarter of the study participants were correctly answered the question related to ten steps pre intervention. This result was in agreement with , Marie M (2010) [57] and Kakrani V et al. 2015 [58] who found that knowledge deficit was found among related ten steps and applied polices in relation to breastfeeding. This may be justified as that participants was not updated by the new version of ten steps & BFHI or as researchers pre assessment phase this outline was not adequately covered in either breastfeeding curricula for the assigned departments or as one of the content outlines which is consider the most crucial tool for better practices by undergraduate students in the future.

Of concern, in the present study the participants' self-reported satisfaction was stated to gain participants' immediate feedback regarding post active toolkit training in relation to breastfeeding key points and concepts gained, teaching methods used and their willingness for applying the active teaching methods used in clinical setting with undergraduate students. It was found that the majority of the participants' satisfied in general with the applied active toolkit intervention that either gained new knowledge on breastfeeding or felt that the information refreshed their prior knowledge, and this is promising results that they have the readiness to change and applied the advanced educational strategies into future educational practices. This result was in the line with Peña M. et al.2015 [59] and Turenne J. et al. in 2016 [52] who stated that the rate of satisfaction was high for all levels of intervention conducted (content, modality, and duration, as well as active teaching/learning

methods). This may be attributed to strength of the educational intervention as new point and the use of active learning approaches is another strength that allowed for a more dynamic teaching focusing on the active participation between participants in the acquisition, updating their knowledge, facilitated the change of practice in the clinical teaching setting and gave them the enthusiasm for applying it latter with students to increase attention and clinical skills.

Finally, if the Egyptian national health authority would like to meet the WHO nutrition health target 2025 there must be regular monitoring and emphasizing on building the concept of breastfeeding imitative nursing faculties to provide competent ,well educated, skillful nursing graduate in relation to breastfeeding support, promote and culturally skillful managements as basic breastfeeding knowledge is imperative and of vital importance.

## V. Conclusion

It was obvious from the present study that there was lack in faculty staff knowledge in relation to breastfeeding myths and half-truth, challenges and common problems, application of ten steps and BFHI, anatomy and physiology domains and clinical practical management of breastfeeding problems.Using active based teaching strategies is feasible for updating the knowledge and practice of them in related to breastfeeding which in turn well help in developing the required knowledge and skills of undergraduate students.Moreover, the application of active toolkit training has positive impact and improvement on assigned nursing faculty staff knowledge and clinical teaching skills' scores percent related to breastfeeding management post intervention. Accordingly, based on the present study results it was clear that majority of faculty staff were satisfied with most of educational strategies applied in a combination of dynamic teaching/learning methods that engage them in active participation practices. Flipping the class, and concept mapping were the most active strategies were satisfied with and has the well to apply it next semester with undergraduate students as it seem to help in improve knowledge ,expertise and skills related to breastfeeding problem management.

## VI. Recommendations

Based on the current study , the following recommendation are suggested :

- A thorough assessment and revision of undergraduates breastfeeding curricula outlines should be initiated by faculty staff.
- Developing comprehensive evidence based breastfeeding curriculum (theoretical and practical )standard to be applied by concerned nursing faculty departments.
- Application of innovative active teaching strategies should be emphasized and encouraged in relation to breastfeeding problems, counselling as well as problem solving skills in relation to need to be highlighted in students clinical setting.
- Encouraging faculty staff to be more oriented and culturally aware with the most debatable breastfeeding issues among community though reviewing evident based research results.
- Continued faculty nursing education, workshops and seminars and conference by lactation specialists about the updates in breastfeeding managements
- Facilitating active learning environment in both classes as well as in clinical areas in near future
- Further research about the most beneficial and effective educational methods in teaching breastfeeding curricula.

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