

Educational Guidelines on Pregnant Women's Knowledge, Attitude, and Practices regarding Colostrum Feeding

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Abstract:

Breastfeeding is an important practice in Egypt from the first day of childbirth by giving colostrum milk. Colostrum is contained large amounts of IgA antibodies that promoting health, reducing diarrheal disease among neonates, and providing excellent immune support. **Aim:** To evaluate the effect of instructional guidelines on pregnant women's knowledge, attitude, and practices regarding colostrum feeding. **Design:** Quasi-experimental research design was conducted in this study. **Setting:** The current study was conducted at the Antenatal Outpatient Clinic at South Valley University Hospital. **Subjects:** A purposive sample included 100 pregnant women were enrolled in the study. **One tool** was used, a structured interview questionnaire composed of: part I Sociodemographic characteristics: part II: Pregnant women's knowledge assessment sheet about colostrum feeding, part III: Pregnant women's attitude towards colostrum feeding and part IV: Pregnant women's practices of colostrum feeding. **Results:** Most women did not have knowledge about the importance of colostrum and unsatisfactory level of knowledge toward colostrum feeding was reported, negative attitudes and inadequate practices among pregnant women for colostrum feeding were presented by the studied women pre instructional guidelines implementation. Meanwhile, knowledge, attitude, and practices of the pregnant women had improved post one month of the guidelines implementation. **Conclusion:** Instructional guidelines were effective in improving pregnant women's knowledge, attitude, and practices regarding colostrum feeding. **Recommendations:** Educational programs about colostrum feeding should be taught and discussed in the antenatal care follow-up visits to all mothers.

Keywords: *Colostrum feeding, Instructional guidelines, Mothers' knowledge, Attitude & Oractice.*

Introduction:

Breastfeeding is considered an important public health strategy for reducing infant, child, and maternal morbidity and mortality, and control health care costs. Breastfeeding is associated with reduced risk of otitis media, gastroenteritis, respiratory illness, sudden infant death syndrome, necrotizing, enterocolitis, obesity, and hypertension, also breastfeeding is the standard way of feeding for all newborns, and it also enhances sensory and cognitive development (AlBinali, 2016).

Colostrum is the first milk; it is a sticky white or yellow fluid secreted by the mammary glands of mammals in the third trimester of pregnancy near to birth and continuing about three to four days after delivery and is immediately available to the newborn at the birth. It contains some nutrients in higher concentrations than that in mature breast milk, such as vitamin A and E, carotenoids, protein, and minerals, but contains less glucose and urea, also

colostrum contains a high amount of carbohydrates, sodium chloride, and contains fewer amounts of lipids and potassium than mature milk (Joshi & Lamsal, 2018). The first milk is the most suitable food for the newborn, universally acknowledged as the perfect 1st food for infants, and a suggested regimen for expressing and storing colostrum during pregnancy is included with advice about skin-to-skin contact in the first 24 hours to maximize breast milk output in the long term (Phukan et al., 2018).

Most women inaccurately considering colostrum and mature milk as two different types, perceiving only mature milk as true breast milk; they may delay initiation breastfeeding until secretion mature milk, avoidance and discarding colostrum milk. Breast milk is secreted by the woman after birth and had three different stages: colostrum, transitional milk, and mature milk, changes depending on the child's age, colostrum is produced during the first days after childbirth.

It is yellow and thick breast milk and contains more antibodies and a high amount of vitamins A, D, E, and K. Transitional milk is the milk secreted after 3-4 days up to subsequent two weeks (Motee & jeewon, 2014).

The immunoglobulin and protein content decreases while the fat and sugar content increases; mature milk follows transitional milk (Rifat, et al., 2018). Colostrum milk contains different types of immunoglobulins such as Immunoglobulin A (IgA) (reactive to Escherichia coli virulence-associated proteins), Immunoglobulin G (IgG), and Immunoglobulin M (IgM3), and other defense factors that protect newborns from microorganisms of the environment and promote the maturation of the immune system. Breastfeeding is an important practice in Egypt from the first day of childbirth by giving colostrum milk. Colostrum is contained large amounts of IgA antibodies that promoting health, reducing diarrheal disease among neonates, and providing excellent immune support (Golinelli, et al., 2017).

Many articles reveal that bacterial, viral, fungal, and protozoal infection of the newborn baby can be reduced by feeding colostrum and advantages to the mother's health by increasing the postpartum infertility period, helping them return to their pre-gestational weight, and reducing their risk of breast and ovarian cancer. Colostrum feeding is associated with a reduced risk of otitis media, gastroenteritis, and respiratory illness, necrotizing enterocolitis, obesity, and hypertension (Bayissa et al., 2015).

Abuidhail, (2019), found in his study that some mother's believed colostrum is not secreted from the first day after birth, but colostrum will be secreted on the second or third-day afterbirth and the minimal amount of milk was useless. So they gave their infants sugary water or formula milk to calm their infants' crying on the first day because the informants thought that their breast milk had insufficient to satisfy their infants. Because there are still many people thought that colostrum is an unsafe substance that should be discarded, the importance of colostrum is poorly known to the population. Mothers with lower education generally believed that the colostrum should not be fed to the infant and that a pregnant woman's milk is unhealthy for the baby. The majority of women stated that breastfeeding was delayed for three days because of different cultural practices (Khakoni, et al., 2017). A study found that either positively or negatively knowledge, attitude, and practices influenced colostrum feeding (Bisrat & Bossena, 2017).

Maternal and community health Nurses play a vital role in assisting pregnant women to initiate and be successful with breastfeeding. The nurse can provide

information about, and support colostrum feeding. The prenatal nurse can inform the pregnant woman of the benefits of breast and colostrum feeding to herself and her newborn (Adugna, 2018). Also, the world health organization (WHO) recommended initiating colostrum feeding within the first hour after birth, a higher number of mothers avoided their colostrum before giving milk to their neonates (Conneely et al., 2019).

Significance of the study:

It was found that most of the Egyptian women (71.6%) gave their first breastfeed after 36 hours of delivery; this was related to their poor knowledge about the appropriate time for initiating colostrum feeding. Breastfeeding is an important practice in Egypt but pregnant women do not know the importance of giving colostrum milk because of cultural variations (Joshi & Lamsal, 2018). Major neonatal deaths that occurred among newborns in the first week of life can be decreased by the initiation of breastfeeding and colostrum immediately after birth (Phukan et al., 2018).

There was a significant influence of cultural beliefs on breastfeeding practices, where most mothers thought that colostrum should not be fed to the infant and that a pregnant woman's milk is considered unhealthy for the baby (Haider, et al., 2017). Also, an appropriate education with regard to breastfeeding challenges in the first days, would prepare mothers to have a successful breastfeeding (Daabis, et al., 2017). So, the researchers assumed to evaluate the effect of instructional guidelines on pregnant women's knowledge, attitude and practices regarding colostrum feeding.

Aim of the study

To evaluate the effect of instructional guidelines on pregnant women's knowledge, attitude and practices regarding colostrum feeding through:

- Assessing pregnant women's knowledge, attitude, and reported practices regarding colostrum feeding.
- Designing and implementing instructional guidelines for improving pregnant women's knowledge and practices regarding colostrum feeding.
- Evaluating the effect of instructional guidelines on pregnant women's knowledge, attitude, and practice regarding colostrum feeding.

Research hypothesis:

- Instructional guidelines will have a positive effect on improving pregnant women's knowledge, attitude, and practice regarding colostrum feeding; the total knowledge level score among pregnant women will be increased in the post-intervention compared to the pre-intervention.

Subjects and Method:**Research design:**

A quasi-experimental research design, one group (pre and post-test) was used to achieve the objective of the study. This design is important to the nature of the study issue, having one or more group subjects observed on pre and post manipulations (Maciejewski, 2020).

Setting:

The current study was conducted at the Antenatal Outpatient Clinic at South Valley University Hospital. Antenatal Outpatient Clinics are located on the ground floor of the outpatient building. They consist of two rooms for sonar, antenatal examination, gynecological examination and nursing staff. Also, there was a waiting area for women and a lecture room which involved an adequate number of seats, and data show where the researchers interviewed the recruited pregnant women to conduct this study. The antenatal outpatients' clinics provide diagnostic and therapeutic services for pregnant women from Saturday to Wednesday, from 9 a.m. to 1 p.m. These settings were selected due to they had higher women's attendance rate; it serves the biggest region of the population from rural and urban regions in Qena city and also, they provide free services to women who are resident in Qena city.

Subjects:

Sample type: A purposive sample was used.

Sample size: It included 100 pregnant women were enrolled in the study to achieve the aim of this study.

Sample size calculation:

Joshi et al., (2012) who studied "Colostrum Feeding: Knowledge, Attitude and Practice in Pregnant Women in a Teaching Hospital in Nepal " and sample of the study was 100 pregnant women and this sample was effective. Based on this result in sample size was calculated

at power 80%, the margin of error 5%, and confidence interval 95%. The calculated sample was 100 participants.

Inclusion criteria included:

Women who are in the third trimesters of pregnancy aged from 18 to 40 years, visited the previously mentioned settings, and agree to participate in the study.

Exclusion criteria included: -

Pregnant women suffering from mental and chronic diseases as heart disease, gestational diabetes as well as women with preterm labor were excluded from the study.

Tools of data collection: One tool was used to collect the required data

A Structured interviewing questionnaire: it was developed by researchers and consisted of four parts as follow:

Part (1): It included demographic data of the pregnant women such as age, educational level, occupation, residence, past medical and the obstetrical history.

Part (II): Pregnant women' knowledge assessment sheet about colostrum feeding:

It included questions used to assess pregnant women's knowledge about colostrum feeding. It was included 8 questions (multiple choice questions) about the definition, importance, advantages of colostrum and its effect on the newborn infant and mother's health, time of secreting colostrum, time of initiation of breastfeeding, source of knowledge such as media, health care workers, grandmother, friends).

Scoring system for knowledge:

Assessment of pregnant women's level of knowledge regarding colostrum feeding was calculated as: (2) for the "correct" answer and (0) for the "incorrect" answer. The total score ranges from 0 – 16, a higher score indicates satisfactory knowledge. Total knowledge scores were classified as satisfactory Knowledge if they answered questions correctly equals 60% or above and unsatisfactory knowledge if their answers were less than 60% of the score.

Part (III): Pregnant women's attitude towards colostrum feeding (Geetha, 2015):

It included questions used to assess pregnant women's attitude about colostrum feeding. It was included 4 questions about colostrum feeding is very important for the baby because it is the best food for growth, colostrum feeding is not good because it causes abdominal cramp and diarrhea, colostrum is not good for the child and is forbidden by culture, and colostrum is not important for the baby because of its dirty part of milk

Scoring system for Pregnant women' attitude:

A three-point Likert scale ranging from 1 (disagree), 2 (neutral), to 3 (agree) was applied for the attitude. The scores were summed to obtain total attitude scores ranged 3–12; higher scores reflected that participants had a more positive attitude toward colostrum feeding. Total scores were grouped into the following two categories: Positive attitude when pregnant women responses equal 60% or above and negative attitude if their answers were less than 60% of the score.

Part (IV): Pregnant women's reported practices towards colostrum feeding.

It included questions used to assess pregnant women's reported practices about colostrum feeding. It was included women's reported practices during breastfeeding as (giving breast or bottle feeding, giving any liquid, formula in the hospital before breastfeeding or not, types of fluid given, and time of initiation breastfeeding).

Scoring system for pregnant women's reported practice:

The scoring system was calculated as (0) for incorrect practice and (1) for practices done correctly. The total score of each pregnant woman was categorized into adequate and inadequate practices as follows: inadequate < 50% and adequate \geq 50%.

Validity of the tools:

Face validity was used to test the tool for clarity, comprehensiveness, appropriateness, and relevance and reviewed by five experts in the obstetrics and gynecology nursing field and the community health nursing field. Modifications were done according to the panel judgment to ensure clarity of sentences and appropriateness of the content.

Reliability of the tool:

The reliability of the tool was assessed through Cronbach's alpha test as the reliability of the questions relating to knowledge was 0.89, reliability of the questions relating to attitude 0.85 was, and the reliability of the questions relating to reported practice was 0.88. The tools' reliability was estimated by using the Pearson correlation coefficient test to compare variables.

Method of data collection:**Operational Design:**

The operational design for the current study included three phases named by preparatory, implementation, and evaluation phase. It was designed to evaluate the effect of instructional guidelines on pregnant women's knowledge and attitude and practices regarding colostrum feeding during the third trimester of pregnancy.

Preparatory phase:

The researchers reviewed the current and past available literature available as textbooks, articles, magazines, and internet searches to develop the tools for data collection and prepare the instructional guideline. The brochure was written in Arabic language, printed out regarding the sample size, and given after implementing the instructional guidelines.

Ethical considerations:

Ethical approval was obtained from the scientific research ethics committees of the faculties of nursing, South Valley University. Written consent was obtained from the pregnant women to gain their cooperation. The aim of the current study was explained to the pregnant women in the first part before starting the study. They assured that the information would be confidential and used for purpose of research only. The participants were informed by the researchers that participating in the study is voluntary; they have the right to withdraw from the study at any time.

A pilot study

A pilot study was conducted on 10% of the pregnant women (10 pregnant). It was excluded from the total sample. The clarity and testing of the feasibility of the research process needed for modifications were done based on the results of the pilot study. Pregnant women involved in the pilot study were excluded from the study.

Implementation phase:

An official permission letter was issued by the Dean of the Faculty of Nursing to the director of antenatal clinics of South Valley University. The study was conducted from the beginning of March 2021 to the end of August 2021. The researchers interview pregnant women during their visit to Antenatal Outpatient Clinic to take routine care for pregnancy. At the beginning the pregnant women were informed about the aim, nature, and expected outcomes of the study.

All the data were gathered to evaluate the effect of the instructional guidelines on pregnant women's knowledge, attitude, and reported practices regarding colostrum feeding during the third trimester of pregnancy. The tool was used twice, firstly; pre-instructional guidelines to assess the pregnant women's knowledge, attitude, and reported practice toward colostrum feeding, then, secondly; repeated after one month during follow-up to evaluate the effect of the instructional guidelines.

The instructional guidelines included simple and clear information about colostrum feeding. It also included the preparation of educational materials, i.e. Photos, videos, and presentations through PowerPoint about colostrum feeding, and the Arabic brochure was designed by the researchers, including instructional guidelines regarding colostrum feeding was introduced to pregnant women at the end of the interview.

This phase included 14 weeks to implement instructional guidelines regarding colostrum feeding. The subject contents have been sequenced through three sessions (two sessions for theory and one session for practices), and each session took 40- 50 minutes. The total time was about 2 hours for each group; pregnant women involved in the study were divided into ten groups. Each group included nine to eleven pregnant women.

Contents of sessions

Session (1): All researchers began with a n introduction about sessions contents then the learning outcomes of the session. The session was performed by the researchers using the Arabic language that is appropriate for women's understanding. The researchers explained the importance of ante-natal care visits and illustrated follow-up importance & provide a referral for severe problems and

complications. The researchers start to assess the knowledge, attitude, and practices of pregnant women regarding colostrum feeding (pretest).

Session (2): The theoretical part was contained knowledge about colostrum feeding such as definition, importance, advantages of colostrum and its effect on the fetus and mother's health, time of secreting colostrum, time of initiation of breastfeeding, source of knowledge such as media, health care workers, grandmother, friends). The average time spent on pregnant women completing the data collection tools was approximately 40-50 minutes. Each pregnant woman involved in the study was informed about the aim of the current study, the components of the tools, and how to answer the online questionnaire and the scales. It was implemented through, Photos, videos, posters, PowerPoint presentations.

The instructional guidelines included knowledge regarding colostrum feeding as follow:

- Definition of colostrum
- Importance of colostrum
- Advantages of colostrum
- Effect on the fetus and mother's health
- Time of secreting colostrum
- Time of initiation breastfeeding

Session (3): The practical part was contained information about current women's practices during

colostrum feeding. It was implemented through lectures, posters, educational films.

The instructional guidelines included practices regarding colostrum feeding as follow:

- Giving breast or bottle-feeding
- Giving any liquid, formula in the hospital before breastfeeding or not
- Types of fluid given
- Time of initiation breastfeeding.
- Breast feeding techniques

The Evaluation phase:

After one month from implementing the instructional guidelines regarding colostrum feeding during the third trimester of pregnancy, evaluation of research sample knowledge, attitude, and practice were done using the same format of tools (tool II, III, and IV) that was used in the pre-test to evaluate the effect of the instructional guidelines.

Statistical analysis:

Data entry and statistical analysis were performed using SPSS for Windows, version 20. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and mean and SDs for quantitative variables. Differences between the two means tests (t-test) were used. Statistical significance was considered at P-value ≤ 0.05 .

Results:

Table (1): Distribution of the studied pregnant women regarding their demographic characteristics (n=100)

Items	No.	%
Age in years		
18 < 30	83	83
30 – 40	17	17
Mean ±Stander deviation	24.23 ± 6.64	
Educational level		
- Read and write	23	23
- Secondary education	39	39
- University education	38	38
Occupation		
- Working	24	24
- Housewives	76	76

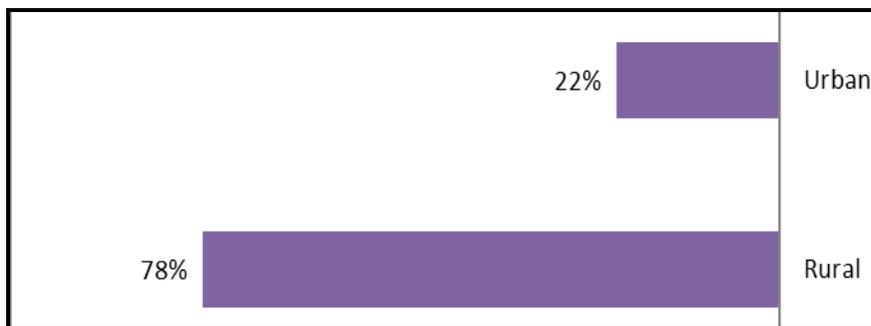
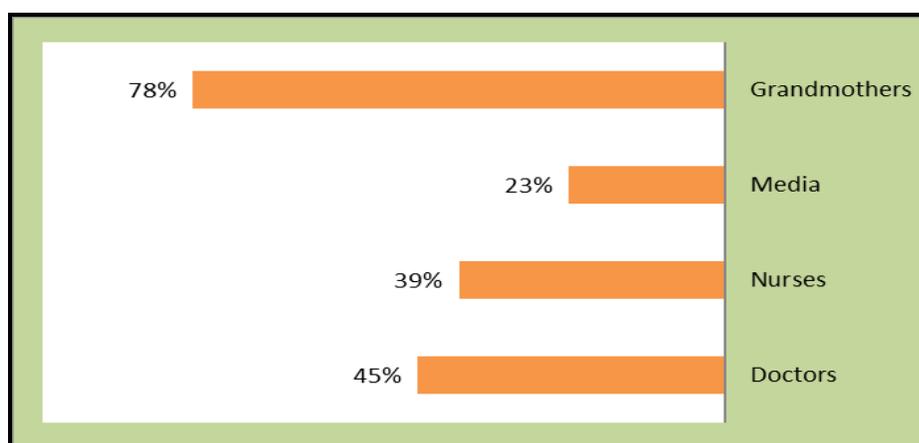


Figure (1): Distribution of the studied pregnant women according to their residence (n=100)

Table (2): Distribution of the studied pregnant women regarding their medical, family history, and obstetrical history (n=100)

Item	No.	%
Presence of chronic illness as a family history		
- Yes	57	57
- No	43	43
Gestational age		
- 28<32	10	10
- 32-36	90	90
Previous use of contraceptive methods		
- Yes	0	0
- No	100	100
Abortion		
- Yes	15	15
- No	85	85
Regulatory antenatal follow-up		
- Yes	89	89
- No	11	11

**Figure (2): Distribution of the studied pregnant women according to their source of knowledge regarding colostrum feeding (n=100)****Table (3): Distribution of the studied pregnant women' knowledge regarding colostrum feeding pre and post instructional guidelines' implementation**

Pregnant women' knowledge	No =(100)		P-value
	Pre (No/%)	Post (No/%)	
Definition of colostrum	0 (0)	94 (94)	<0.001*
Importance of colostrum	25(25)	92(92)	<0.001*
Advantages of colostrum	29(29)	89(89)	<0.001*
Effect on the newborn and mother's health	33(33)	87(87)	<0.001*
Time of secreting colostrum	23(23)	90(90)	<0.001*
Time of initiation of breast feeding	39(39)	89(89)	<0.001*

*highly significance at 0.001 levels

-Chi-square test

Table (4): The total knowledge score level of the studied pregnant women regarding colostrum feeding pre and post instructional guidelines' implementation

Total knowledge	Pre instructional guidelines implementation		Post instructional guidelines implementation		X ²	P-value
	No	%	No	%		
Satisfactory	27	27	96	96	5.023	<0.001*
Unsatisfactory	73	73	4	4		

*highly significance at 0.001 levels

-Chi-square test

Table (5): Distribution of the studied pregnant women' attitude regarding colostrum feeding pre and post instructional guidelines' implementation

Pregnant women' attitude	No =(100)						p-value
	Pre (No/%)			Post (No/%)			
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	
Colostrum feeding is important for the baby because it is the best food for growth	60 (60)	15 (15)	25 (25)	95 (95)	5 (5)	0 (0)	<0.001*
Colostrum feeding is not good because it causes abdominal cramps and diarrhea	25 (25)	15 (15)	60 (60)	0 (0)	0 (0)	100 (100)	<0.001*
Colostrum is not good for the child and is forbidden by culture	28 (28)	12 (12)	60 (60)	0 (0)	3 (3)	97 (97)	<0.001*
Colostrum is not important for the baby because of its dirty part of milk	63 (63)	7 (7)	30 (30)	0 (0)	2 (2)	98 (98)	<0.001*

*highly significance at 0.001 levels -Chi-square test

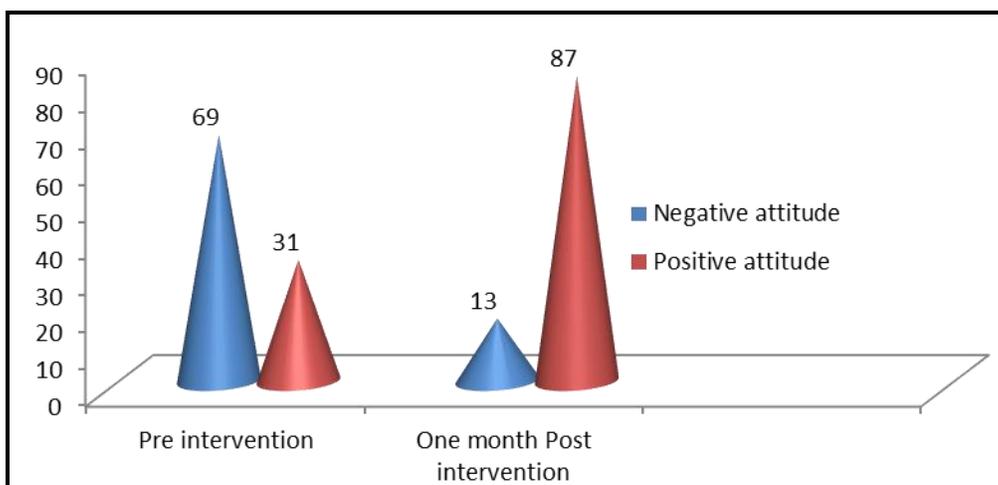


Figure (3): The total attitude score level of the studied pregnant women regarding colostrum feeding pre and post-one-month instructional guidelines' implementation (n=100).

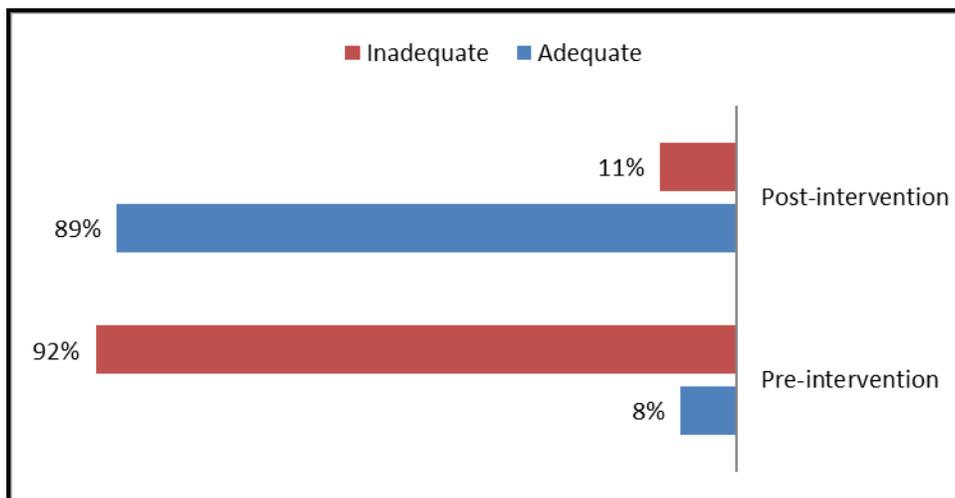


Figure (4): The total practices score level of the studied pregnant women regarding colostrum feeding pre and post-one-month instructional guidelines' implementation (n=100).

Table (6): Correlation coefficient between total studied pregnant women's knowledge and practice scores pre and post-one-month of instructional guidelines implementation

Knowledge	Practice			
	Pre instructional guidelines implementation		After one -month instructional guidelines implementation	
	R	P	R	P
- Total knowledge pre-test	0.050	0.802 (N.S)	---	---
- Total knowledge post-test	---	---	0.373	0.000**

(*) Statistical significant difference

Table (1): Represented that 83% of the pregnant women their age ranged between 18 < 30 years with mean \pm SD 24.23 \pm 6.64, (39%) of them had secondary education, meanwhile, and also, it is pointed out that 76% of the pregnant women were housewives.

Figure (1): Demonstrated that (78%) of the pregnant women are living in rural areas and 22% of them were from urban areas.

Table (2): Represented the medical and obstetric history of the studied pregnant women, It was noticed that (57%) of the pregnant women had a family history of chronic illness, 90% of them were between 32-36 weeks of gestational age. All of the pregnant women reported that they do not previously use contraceptive methods, (85%) of them had no abortion, and (89%) them had a regular antenatal follow-up.

Figure (2): Illustrated that 78% of the studied pregnant women reported that their main source of information regarding colostrum feeding was a grandmother.

Table (3): Demonstrated frequency and percentage distribution of the studied pregnant women's knowledge regarding colostrum feeding. It was observed that there was an improvement with a highly statistically significant difference between pregnant women' knowledge regarding colostrum feeding pre/post one month of instructional guidelines implementation ($P < 0.001$).

Table (4): Portrayed that the highest percentage of the pregnant women had satisfactory knowledge regarding colostrum feeding in all items post guidelines implementation than pre-implementation with statistically significant difference.

Table (5): Showed frequency and percentage distribution of the studied pregnant women's attitude regarding colostrum feeding. It was observed that the highest percentage of the pregnant women had a positive attitude regarding colostrum feeding in all items post guidelines implementation than pre-implementation there was an improvement with a highly statistically significant difference between pregnant women' knowledge regarding colostrum feeding pre/post one month of instructional guidelines implementation ($P < 0.001$).

Figure (3): Clarified that the total attitude scores of the pregnant women regarding colostrum feeding pre and one-month post-intervention. It observed that 69% of pregnant women had a negative attitude toward colostrum feeding pre-intervention and decreased to become 13% one-month post intervention. Additionally, 31% of the pregnant women had a positive attitude toward colostrum feeding pre-intervention in comparison to 87 % one-month post-intervention.

Figure (4): Clarified the total practices score of the pregnant women pre and one-month post-intervention. It was noticed that majority of the pregnant women (92%) had inadequate practices toward colostrum feeding pre-intervention and decreased to become 11% one-month post-intervention. Reversely, 8% of the pregnant women had adequate practices regarding colostrum feeding pre-intervention comparing to 89 % one-month post-intervention.

Table (6): Showed that there was a positive correlation ($P = 0.002$) between pregnant women's knowledge scores and their practice post-one-month of instructional guidelines implementation regarding colostrum feeding.

Discussion:

The best source for infant nutrition is breastfeeding. Colostrum and its composition consist of specific anti-infective factors, which protect neonates from infection and give immunological and psychological benefits (Sujatha & Prasad, 2019). The results of the study indicated that the instructional guidelines were effective in improving pregnant women's, and practices regarding colostrum feeding. So, the researchers were conducted this study to evaluate the effect of instructional guidelines on pregnant women's knowledge, attitude, and practices regarding colostrum feeding.

The results of the present study indicated that more than three-quarters of the pregnant women are living in rural areas. This may be attributed to knowledge deficit and resources in rural areas. From the researchers' point of view, this may be due to a lack

of awareness and knowledge deficit regarding the research topic.

The results of the present study revealed that the highest percentage of the pregnant women had satisfactory and improvement in their knowledge regarding colostrum feeding in all items post guidelines implementation with a highly statistically significant difference between pre/post one month of instructional guidelines implementation ($P < 0.001$). These findings are in the same line with results in a study conducted by **Abdelmenam et al., (2018)** who studied "Knowledge and Practices Among Immediate Post-Partum Women About Colostrum at Women's Health Hospital" and reported that about half of women had a poor level of knowledge about colostrum feeding, this lack of knowledge may be due to lack of attending antenatal care visits. This result is not similar with **Geetha, (2015)** at Puducherry who studied knowledge and practices of colostrum and exclusive breastfeeding among pregnant women of children less than six months, they reported that about one-third of their sample had adequate knowledge toward colostrum feeding. Also, the present study is in agreement with **Rifat, et al., (2016)** who conducted her study in Pakistan to assess knowledge, attitude, and practices toward colostrum feeding among pregnant women in Military Hospital Rawalpindi of Pakistan, and reported that knowledge of the women toward colostrum feeding importance was not enough. These differences may be due to the size of the sample and the place of residence of the studied women.

These findings do not agree with **Afrose et al., (2018)** who studied "Factors associated with knowledge about breastfeeding among female garment workers in Dhaka city," and found that more than three-quarters of women knew about colostrum feeding. **Also, not similar to the study done in Nepal by Joshi et al., (2019) about** "Colostrum feeding: knowledge, attitude, and practice in pregnant women in a teaching hospital," which showed that almost three-quarters of women were knowledgeable. This study is in line with the study conducted in Mizan Tepi, by **Sisay et al., (2018)** about "Assessment of knowledge, attitude and practice towards colostrum feeding among antenatal care" which mentioned that more than two-thirds of women knew about colostrum feeding. This result reflects the positive effect of instructional guideline implementations, which met the pregnant women's needs and provide them with sufficient knowledge.

The results of the present study indicated that the highest percentage of pregnant women had a positive attitude regarding colostrum feeding in all items post guidelines implementation than pre-implementation. From the researchers' point of view, this reflects the

importance and effectiveness of instructional guidelines implementation that are commonly associated with improving knowledge and a better understanding of colostrum feeding among the studied pregnant women.

These findings are supported by **Addisu et al., (2020)** who conducted a study about Knowledge, Attitude, and Associated Factors towards Colostrum Feeding among Antenatal Care Attendant Mothers in Gununo Health Centre" and indicated that among study participants less than three-quarters of pregnant women had a positive attitude towards colostrum feeding.

The present study results revealed that more than two-thirds of pregnant women had a negative attitude toward colostrum feeding pre-intervention and decreased to become 13% one-month post-intervention. This indicates the actual need of the studied pregnant women for this study.

The present study results revealed that less than ten percent of the pregnant women had adequate practices toward colostrum feeding pre-intervention comparing to the majority one-month post-intervention. From the researchers' point of view, it reflected the positive impact of the instructional guidelines in improving women's practices. These are confirmed the effective modifications in the pregnant women practices that reflected the success of the main goals of the implementation of the instructional guidelines.

The present study revealed that there was a positive correlation ($P = 0.000$) between pregnant women's knowledge scores and their practice post-one-month instructional guidelines implementation. This reflected the importance of improving pregnant women's knowledge and practices to help them learn and acquire good knowledge and apply it. This association is explained by that when women had sufficient knowledge that can help them practice well which reflected on their attitude.

The findings of the present study have supported the aim and hypothesis of the study and the knowledge, attitude, and practices among the studied women have improved. From the researchers' point of view, this is reflected in the success of instructional guidelines implementation and its positive effects. Also, reflects the importance and effectiveness of introducing those guidelines for pregnant women regarding colostrum feeding that associated with improving practice.

Conclusion:

Based on the findings of the current study, aim, and hypotheses, it was concluded that the majority of pregnant women had unsatisfactory knowledge, a negative attitude and inadequate practices toward colostrum feeding pre instructional guidelines

implementation while improved after instructional guidelines implementation.

Recommendations:

Based on the findings of the present study, the following recommendations were suggested: -

- The continuous health education program should be provided to improve knowledge and practices of pregnant women toward colostrum feeding through health care providers, the media, local magazines, and pamphlets in local languages.
- Replication of the current study on a larger probability sample is recommended for generalized results.
- A simplified illustrated booklet regarding colostrum feeding should be available to pregnant women during the antenatal period of pregnancy as a reference.

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