



## Effect of Nursing Educational Program on Exclusive Breastfeeding of Pregnant Adolescents Attending Antenatal Clinic at Primary Healthcare Centers, in Zaria Metropolis, Nigeria

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### Abstract

Adolescent mothers are at increased risk of having preterm birth, low-birth-weight babies and low knowledge of exclusive breastfeeding. The study aimed to evaluate the effect of nursing educational programmes on knowledge and practice of exclusive breastfeeding among adolescent mothers attending Antenatal clinics at PHCs in the Zaria metropolis. The study adopted a quasi-experimental study design, the Controlled Interrupted Time Series (CITS) approach; to allow for the evaluation of breastfeeding competence from the third trimester of pregnancy through their various postpartum visits to Primary Healthcare Centers for immunization up to the sixth-month postpartum period. The participants were selected using a multistage sampling technique to obtain data from 302 adolescent mothers assigned to the study and control groups that is; 151 participants to each group. Data were collected using a structured and validated interviewer-administered questionnaire and observation checklist before and after the intervention. Data collected were analyzed using Statistical Package for Social Science (SPSS) version 22. Descriptive statistics of mean and standard deviation were presented on frequency/percentage tables while inferential statistics was used in the form of chi-square and t-test to evaluate the effect and line charts for the trends of the effect. At the pretest, no statistically significant difference in the pretest mean knowledge (p-value =0.837) scores of mothers between the study and control groups. At post-tests, the mean knowledge and practice scores of mothers in the study group improved significantly (P value < 0.05) at the first week, 6th week, 10th week, 14th week and 6th month postpartum. Mothers in the intervention group were more satisfied with their role of exclusive breastfeeding than those in the control group (p-value <0.001). Hence, the a need for continuous technical training and health education for adolescent mothers on exclusive breastfeeding.

**Keywords:** Antenatal Clinic, Exclusive breastfeeding, Nursing educational program, Pregnant adolescents, Primary Healthcare Centers

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### Introduction

Breastfeeding is the optimal method of infant feeding and part of major essential new-born care practices, helps to attain not only the maternal identity and

satisfying experience for both the mother and the baby but also determines infant survival, health, growth and development (Rollins et al., 2016). It was recommended that breastfeeding be initiated within the

first hour after birth, continued exclusively for the first 6 months of life and continued, with safe and adequate complementary foods, for up to 2 years or beyond (Unicef & WHO Scorecard, 2017). Early initiation of breastfeeding within the first hour of life has been shown to be critical to newborn survival and to establishing breastfeeding over the long term (Arts & Begin, 2017). Breastfeeding benefits for general health are well documented as it: protects children from a myriad of illnesses and saves 823,000 lives per year among under five children, prevents half of all diarrhoea episodes and one-third of respiratory infections, reduces the risk of non-communicable diseases and decreases the prevalence of overweight and/or obesity later in life, prevents the mothers' risk for breast cancer and diabetes as well as lowers healthcare costs for families and societies (Bahl et al., 2016).

Adolescent mothers face a lot of challenges in the course of motherhood as they combine both maternal roles and developmental tasks simultaneously (Mangeli et al., 2017). The stress of the need to adapt to the new role can lead to negative consequences such as lack of care for the baby including breastfeeding, inappropriate mother-infant interaction, growth retardation, behavioural problems and cognitive developmental disabilities in the child (Kumar et al., 2018). Kaduna state is one of North-Western Nigeria states with the highest prevalence (522/1000 women) of adolescents with childbearing occurring mostly within marriage and in male-led households (Akombi-inyang et al., 2022; Nigeria Demographic and Health Survey, 2018). Lack of knowledge and practice of exclusive breastfeeding affect adolescent mothers who may lack the ability to make

independent decisions on infant feeding causing their neonates to be in situations that can be threatening to their survival (Acheampong et al. 2022). Adverse infant feeding outcome tends to be more serious among adolescent mothers due to their lack of experience and influence of older women who might not always be the source of correct information (Jama et al., 2018).

Mothers' satisfaction with the breastfeeding role is an important factor determining competence in the role. Attainment of competence in breastfeeding knowledge and practice can enhance a sense of satisfaction in role behaviour; in other words competence and satisfaction in role behaviour complement each other. Factors such as high satisfaction with marriage and support during the antenatal period are most likely to result in a higher level of role satisfaction during the postpartum period, and a high level of role satisfaction is in turn predictive of optimal and sensitive practice (Valla et al., 2022). Therefore, neonatal health outcomes could be improved significantly by strengthening advocacy, health education and technical training of adolescent mothers on exclusive breastfeeding. Therefore, this study aimed to evaluate the effect of nursing educational programmes on exclusive breastfeeding knowledge, practice and satisfaction of adolescent mothers attending antenatal clinics at PHCs in Zaria Metropolis of Kaduna state.

### **Materials and Methods**

The study is a quasi-experimental study design that adopted a controlled interrupted time series (CITS), approach. CITS design involves a set of observations on a population, taken repeatedly over time before and after an intervention to

evaluate the impact and sustainability of the intervention (Ewusie et al., 2017). The design therefore allows for the evaluation of maternal knowledge and practice of exclusive breastfeeding among the participants from the third trimester of pregnancy through their various postpartum visits to PHCs for immunization up to the sixth month postpartum.

**Target Population**

The target population for this study were pregnant adolescents who received antenatal care at PHCs in Zaria Metropolis during the study period. It extends and covers the women and their infants up to the sixth month postpartum. They were 1,230 in number, 613 for the study and 617 for the control group (Medical Record in each PHC, 2020).

**Table 1: Target Population of the Studied Groups**

Study group			Control group		
PHC	Pregnant adolescent on ANC	Sample size	PHC	Pregnant adolescent on ANC	Sample size
Samaru	156	39	Kwata	218	54
Jama'ah, zango	37	09	Unguwan Dankali	33	08
Chikaji	26	06	Unguwan Alkali	38	09
Abdu Kwari	36	09	Babbandodo	279	68
Tudun-Wada	358	88	Rimin Doko	49	12
<b>Total</b>	<b>613</b>	<b>151</b>		<b>617</b>	<b>151</b>

**Sample size and Sampling Technique**

The sample size of 302 participants; 151 for each group was determined by using Colton, (1974); and Daly et al., (1991)'s formula for the comparison of two independent populations.

$$n = \left\{ \frac{2(Z\alpha + Z\beta)\sigma}{u_1 - u_2} \right\}^2 \dots\dots\dots (i)$$

Parameters are:

n = minimum required sample size per each group

σ = estimated population standard deviation = 3

u<sub>1</sub> = population mean of study group = 16.3

u<sub>2</sub> = population mean of control group = 15.28

u<sub>1</sub>-u<sub>2</sub> = Difference between the two population means = 1.02

Z<sub>α</sub> = Standard z- value at the desired level of significant = 1.96 at 5% level of significant

Z<sub>β</sub> = Standard z- value at the desired power = 0.84 at 80% power

$$n = \left\{ \frac{2(1.96 + 0.84)3}{1.02} \right\}^2$$

$$n = \frac{141.12}{1.0404}$$

$$= 135.6401$$

$$n = 136 \text{ per group}$$

Jain, Gupta and Deshraj (2015), stated that 10-20% of subjects are required to allow adjustment of other factors such as withdrawals, missing data, and loss to follow-up from the study. Based on previous work from a similar intervention study, the researcher expects that 10% of all the participants would be lost to follow-up or would drop out of the study. The number to enroll with attrition rate was calculated using the formula below:

Number to enroll x % retained = desired sample size

$$\text{Number to enroll} = \frac{\text{desire sample size}}{\% \text{ retained}} \dots$$

..... (ii)

$$\text{Number to enroll} = \frac{136}{0.9}$$

$$= 151 \text{ per group}$$

Therefore, the total sample size with a 10% attrition rate was determined to be 302 for both the study and control groups.

The proportionate sample size per facility was determined using:

$$n_{th} = \frac{N_{th}}{N_{total}} \times \text{Total sample size} \dots$$

..... (iii)

Where,  $n_{th}$  = sample size per facility

$N_{th}$  = population size per facility

$N_{total}$  = total population size

A multistage sampling technique was used. Stage 1: Zaria metropolis was stratified into Sabon Gari LGA (study group) and Zaria LGA (control group). There was a total of 23 (10 from Sabon Gari LGA and 13 from Zaria LGA) functional PHCs that offered comprehensive maternal and child healthcare (MCH) services at the time of the study. Stage 2: five PHCs were randomly selected from each Sabon and Zaria LGAs for study and control groups by simple random sampling technique (balloting). Stage 3: a proportional allocation of participants needed per PHC was done based on the average number of clients that attend the antenatal clinics weekly. Participants per each PHC was determined by adding those who visited the two ANC days per week (booking and

subsequent visits). This register formed their population frame from where proportionate allocation was determined. Stage 4: A systematic sampling technique was used to select the required respondents in each PHC; this was done by selecting every  $n^{th}$  respondent from the target population frame in each antenatal clinic. The  $n^{th}$  (sampling interval) respondent was obtained by dividing the target population by the sample size.

### Instrument for Data Collection

Data were collected using two instruments developed by the researcher: a structured interviewer-administered questionnaire, and an observation checklist. The instruments were developed by the researcher using information gathered from reviewed literature which covered different areas of exclusive breastfeeding knowledge and practice. It was translated into the local language (Hausa) by two secondary school Hausa teachers. The first one translated from English to Hausa language for the purpose of adequate and correct communication, and the second translator back-translated it from Hausa version to English to ensure accuracy and consistency; some inconsistencies noted were corrected and then pre-tested. The instrument was transformed into a software application called Open Data Kit; which is a software application installed on mobile phones and the same was used by all the research assistants in the place of the paper instrument. The interviewer-administered questionnaire was used to elicit information on demographic characteristics, knowledge of exclusive breastfeeding and satisfaction. It contains both open and close-ended questions. An observation checklist was used to elicit information on the practice of exclusive breastfeeding among the participants.

### **Ethical Clearance**

The ethical approval to conduct the research was obtained from Ahmadu Bello University with reference number: VC/SAD/STU/32 and Kaduna State Ministry of Health with reference number: MOH/ADM/744/VOL.1/920. Permission from supervising heads of PHCs and individual participant's informed consent were obtained before data collection. Mothers were assured with the use of informed consent forms that the research would pose no risk or hazard to them and their infants, and their participation in the research was voluntary as they could withdraw from it at any time if they wished. Confidentiality was also maintained throughout the study period. However, the participants were identified by their names and hospital numbers for the purpose of follow-up (post-test) data collection

### **Method of Data Collection**

The data collection process was arranged in three phases as: pre-intervention, intervention and post-intervention.

**Pre-Intervention:** Educational materials (leaflets) containing the main points of instruction on the program and research instruments were prepared. The same was independently translated into the Hausa language for adequate and correct communication. Each PHC was visited, the aim of the study was explained to their unit heads and agreement was made on when to come for the program. Four nursing students and two nurses/midwives/experienced CHEW/CHO from each PHC were trained as research assistants for this study. The formal (i.e. four nursing students) were part-three nursing students from ABUTH School of Nursing and were used throughout the pre-intervention data collection and

administration of interventions in the PHCs. The latter (i.e. two nurses/midwives/experienced CHEW/CHO) were from each PHC and were used throughout post-intervention data collection. The researcher and the research assistants were introduced to the respondents, explained the aim of the study and obtained their informed consent to participate. All research assistants were taught on how to administer each question of the instruments in both English and Hausa. All research assistants were also given Open Data Kit (ODK) software application on their mobile phones as instruments for data collection. Data collection processes were mainly conducted in the Hausa language except for very few who didn't understand Hausa that was interviewed in the English language. Baseline (pre-intervention) data were collected from both study and control groups. Participants included in the study were in at least the 24<sup>th</sup> week of gestation. The data collection process was carried out sequentially from all the PHCs within three weeks based on their days of ANC visit. At each visit, all eligible participants in both study and control groups were interviewed with the questionnaire to assess and evaluate their baseline knowledge of exclusive breastfeeding. This study could not establish pre-intervention practice. This was noted during the pilot study when the majority of the participants were primigravidas with little or no experience in exclusive breastfeeding practice. Baseline (pre-intervention) data collection per each participant took about 30 minutes, and a period of 20 days was used to collect the baseline data from all the selected PHCs. Pre-intervention data collection process covered a period of 3 weeks.

**Intervention:** The intervention was given to the study group in a well-ventilated and comfortable room in each PHC during their visits to the routine ANC; it was given in addition to the routine antenatal care. The intervention was only given to participants who came for ANC; they were tracked by their mobile numbers to remind them of their ANC visits and most of the participants were in the same group and often had their visits on the same day. Repeated interventions were done in all the clinics to cover those who missed the first one. The intervention was conducted in two sessions:

The first session involved the introduction and description of details about exclusive breastfeeding, including: when to initiate breastfeeding after birth, early feeding cues, basic breastfeeding technique, breastfeeding positions, breastfeeding benefits, signs of milk sufficiency to infants, how long the mother should breastfeed, common breastfeeding problems and solutions etc. This was presented with the aid of audio-visual materials like slides, videotapes, flip charts and leaflets. The first session took a period of 40 minutes.

The second session was conducted to demonstrate to the mothers how to carry out all the procedures related to exclusive breastfeeding. Doll models (of infants well-dressed with cloth, caps, and socks and wrapped with flannel) were used in the demonstration. Each of the mothers took a turn to demonstrate and pamphlets were given to them. This took a period of 60 minutes. The interval between the two sessions was fifteen minutes. All mothers in the study group were given educational materials (leaflets) after the training, these contained the main points of instruction of the program and diagrams. In addition to

the leaflets, the materials used for the program were sent to their phones; since having a phone is one of the inclusion criteria. They were also given the principal investigator's phone number for follow-up calls where necessary for any clarifications. Mothers in the control group were only exposed to routine antenatal care. PHCs of the study group were visited for the interventions weekly in a sequential manner based on their ANC days until all were covered.

**Post-intervention:** CITS design was used to determine the effect of the nursing educational program on knowledge, practice and satisfaction of the participants. This involved assessment and evaluation of the effect of the intervention on both groups at various stages from pregnancy to the sixth month postpartum (i.e. during pregnancy (pre-intervention); at 1<sup>st</sup> week, 6<sup>th</sup> week, 10<sup>th</sup> week, 14<sup>th</sup> week and at 6<sup>th</sup> month postpartum (post-intervention)). Posttest data collection was in five-time series as follows: at the first week during BCG immunization, 6<sup>th</sup> week during Penta 1, the 10<sup>th</sup> week at Penta 2, the 14<sup>th</sup> week at Penta 3 and at 6<sup>th</sup> month postpartum during measles/Vitamin A immunization. Posttest data was collected by the two trained nurses/midwives/experienced

CHEW/CHO from each PHC. The data was collected from mothers individually based on their time of delivery and days of immunization visits. This phase took place in each PHC during immunization visits on the first, sixth, tenth, and fourteenth weeks and at the sixth month postpartum. Post-test data on knowledge and satisfaction were collected using the same interviewer-administered questionnaire used during pre-test data while observation checklist was used for

practice. The intervention training was given during the antenatal period using a doll model; but at the post-test, the impact of the training was assessed using their life babies. The effect was evaluated by comparing post intervention practice of the intervention group with the control group. Post-test data collection covered both study and control groups. All data were collected using the ODK and were sent to the cloud where it was collated for analysis. The data collection process lasted for 12 months, from June 2020 to May 2021.

**Method of Data Analysis**

Data were analyzed descriptively and inferentially as appropriate using Microsoft Excel and IBM SPSS (version

22) statistical packages. Frequencies, percentages, mean and standard deviation were used to describe respondents' demographic characteristics and the results were presented in tables. Chi-square, independent sample t-test and paired sample t-test were used to test the effect and line charts were used to show the trend of the effect of the program up to the sixth month postpartum. A total of 302 respondents participated in the study; 151 each for both the study and control groups. 287(95%), 284(94%), 278(92%), 275(91%) and 272(90%) responses were documented in the first week, sixth week, tenth week, fourteenth week and 6 months postpartum respectively. The remaining were lost during the follow-up of the selected respondents

**Results**

**Table 2:** *Distribution of Socio-Demographic Characteristics of the Studied Groups*

Item	Study (n= 151)		Control (n = 151)		Test
	F	%	F	%	
<b>Age group (years)</b>					$X^2 = 0.134$
15 -17 (middle adolescent)	49	32.45	52	34.44	$P = 0.714$
18-19 (late adolescent)	102	67.55	99	65.56	
Mean age	17.93 ± 1.63 years		17.95 ± 1.61 years		
<b>Ethnic group</b>					$X^2 = 5.088$
Hausa	139	92.05	144	95.36	$P = 0.165$
Fulani	6	3.97	6	3.97	
Yoruba	1	0.66	1	0.66	
Others	5	3.30	-	-	
<b>Religion</b>					$X^2 = 0.337$
Islam	149	98.68	150	99.34	
Christianity	2	1.32	1	0.66	$P = 0.562$
<b>Marital status</b>					$X^2 = 0.337$
Married	150	99.34	149	98.68	
Single	1	0.66	2	1.32	$P = 0.562$
<b>Major occupation</b>					$X^2 = 11.792$
Petty trading	49	32.45	36	23.84	
Tailoring/hairdressing	17	11.26	9	5.96	$P = 0.008^*$
Teaching	4	2.65	-	-	
Not working	81	53.64	106	70.20	

<b>Monthly earnings</b>					X <sup>2</sup> =0.036
N1000 -N5000	63	90.00	40	88.89	
N6000 -N10000	7	10.00	5	11.11	P = 0.850
<b>Parity</b>					
Nulliparity	111	73.51	109	72.19	X <sup>2</sup> = 3.012
Para-one	26	17.22	31	20.53	P = 0.556
Para-two	11	7.28	7	4.64	
Para-three	2	1.32	4	2.65	
Greater than three	1	0.66	-	-	
<b>Highest education attained</b>					X <sup>2</sup> = 0.689 P = 0.952
Tertiary education completed	2	1.32	2	1.32	
Secondary education completed	38	25.17	38	25.17	
Primary education completed	72	47.68	66	43.71	
Quranic education	26	17.22	30	19.87	
No formal education	13	8.61	15	9.93	

**\* Denotes statistically significant difference**

Table 2 presents the socio-demographic characteristics of 302 respondents who participated in the study. The finding showed no statistically significant difference in most socio-demographic characteristics between the study and control groups except in occupation where more women in the control group (70.20%) than the study group (53.64%) (P=0.008) are not working; this confirmed the homogeneity of the groups. Their age ranged from 15 to 19 years, with a mean age of 17.93 ± 1.63 years and 17.95 ± 1.61 years for the study and control groups respectively. The respondents were predominantly Hausa (p-value = 0.165) and of Islam faith (p-value = 0.562). The

majority (99.34% for the study and 98.68% for control groups) (p-value =0.562) are married. Their average monthly earnings are about ₦ 4000 for the study and ₦ 6000 for the control groups (p-value = 0.850). So also, educational attainment is similar between the groups (p-value = 0.952) in which some (47.68% and 43.71%) in the study and control groups respectively completed primary education, 25.17% in both groups completed secondary education and (17.22% and 19.87%) in study and control groups respectively attended only Quranic education, meanwhile, 8.61% and 9.93% in study and control groups respectively had no formal education.

**Table 3: Knowledge of Exclusive Breastfeeding before and after the Intervention**

<b>Knowledge of Exclusive Breastfeeding</b>	<b>Before</b>		<b>After</b>	
	Study (n =151)	Control (n =151)	Study (n= 136)	Control (n= 136)
Mean±SD	5.41±2.35	5.34±3.17	11.99±0.09	7.88±2.34
t-value	0.206		20.458	
P-value	0.837		<0.001	



Table 3 presents the knowledge of exclusive breastfeeding of the studied groups before and after the intervention. The aggregate mean scores of the study and control groups before the intervention are  $5.41 \pm 2.35$  and  $5.34 \pm 3.17$  with t-test and P-values of 0.206 and 0.837 respectively. This implies that no statistically significant difference in the knowledge of the studied groups before

the intervention. However, after the intervention, the aggregate mean scores of the study and control groups are  $11.99 \pm 0.09$  and  $7.88 \pm 2.34$  with t-test and P-values of 20.458 and  $<0.001$  respectively. This implies there is a statistically significant difference in the knowledge of the studied groups after the intervention.

**Table 4:** Knowledge of Exclusive Breastfeeding within the Study Group

Knowledge of Exclusive Breastfeeding	Study group	
	Before (n=151)	After (n=136)
Mean±SD	5.41±2.35	11.99±0.09
t-value	32.781	
P-value	<0.001	

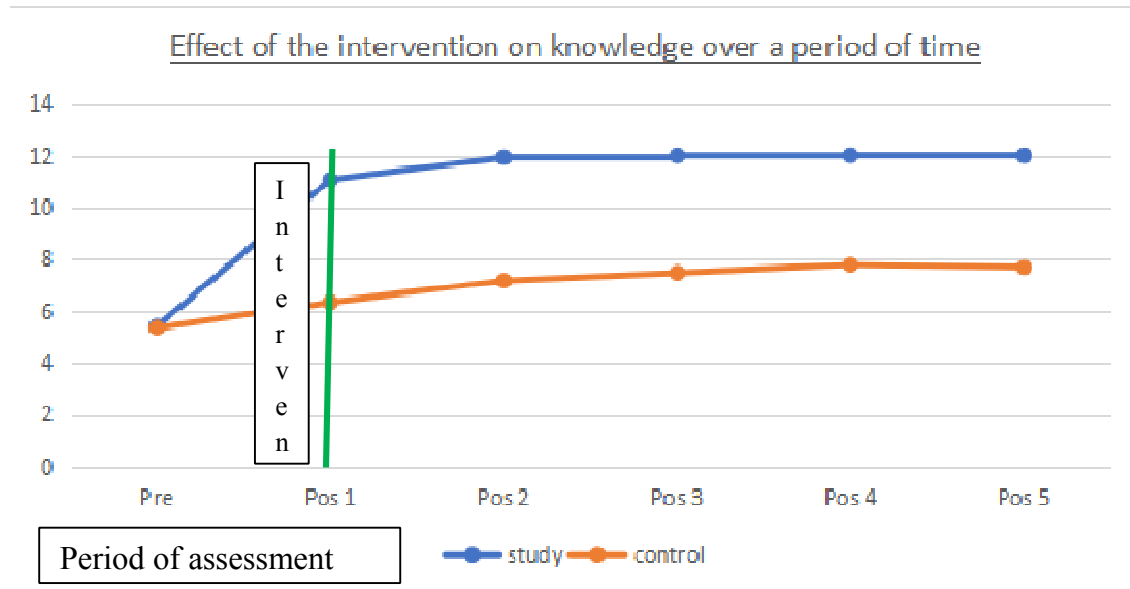
Table 4 presents the knowledge of exclusive breastfeeding within the study group. The aggregate mean scores before and after the intervention are  $5.41 \pm 2.35$  and  $11.99 \pm 0.09$  with t-test and P-values of

32.781 and  $<0.001$  respectively. This implies a statistically significant difference in the knowledge before and after the intervention.

**Table 5:** Knowledge of Exclusive Breastfeeding within the Control Group

Knowledge of Exclusive Breastfeeding	Control group	
	Before (n=151)	After (n=136)
Mean±SD	5.34±3.17	7.88±2.34
t-value	8.071	
P-value	0.304	

Table 5 presents the knowledge of exclusive breastfeeding within the control group. The aggregate mean scores before and after the intervention are  $5.34 \pm 3.17$  and  $7.88 \pm 2.34$  with t-test and P-values of 8.071 and 0.304 respectively. This implies that no statistically significant difference in the knowledge before and after the intervention.



**Figure 1:** Line chart showing the effect of the intervention on knowledge over six months postpartum

Figure 1 presents the line chart showing the effect of the intervention on knowledge over six months postpartum. Both the study and control groups have almost the same baseline mean knowledge before the intervention. After the intervention, there was a great increase in the knowledge in the study group which was steady throughout observation except for a slight decline from the 14<sup>th</sup> week to the 6<sup>th</sup> month postpartum. However, for the control group, there was a slight and gradual increase in knowledge which was maintained till the end of the observation and also experienced a slight decline from the 14<sup>th</sup> week to the 6<sup>th</sup> month postpartum. By implication, the intervention program has greatly improved and sustained the knowledge over a long period; the decline

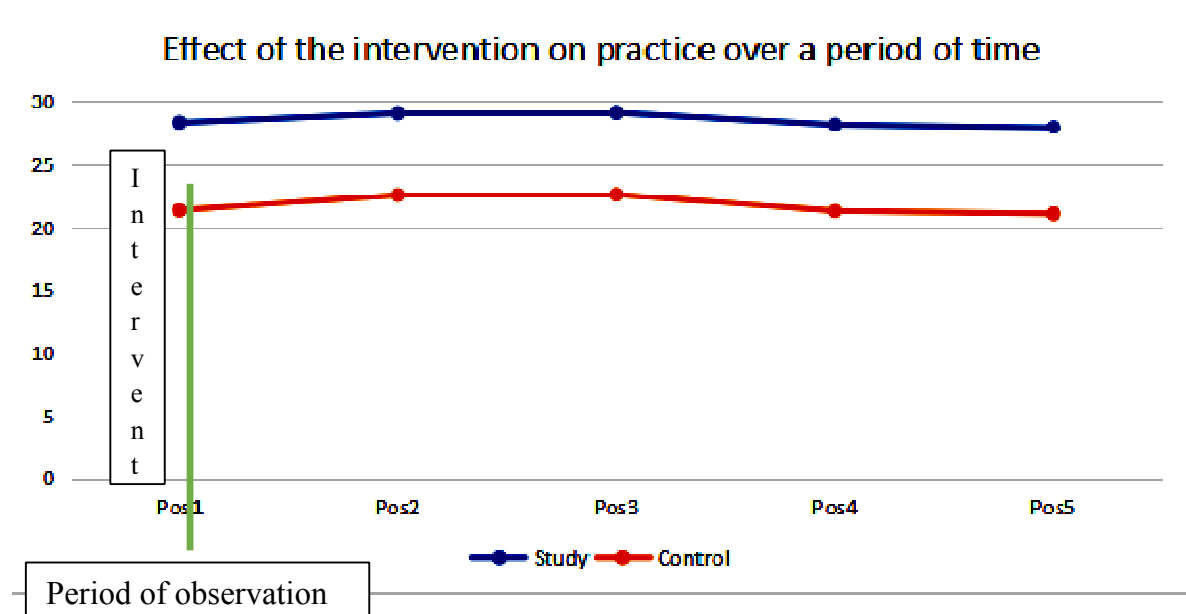
at the later stage of the observations confirms the nature of human beings of their possibility of experiencing extinction in knowledge after some period which now give room for continuous education of mothers. The result also implied that even in the subsequent deliveries of the respondents in the study group, there is a high tendency that they would still have good knowledge which will only need to be updated through continuous health education. Part of the strength of this design is that it can distinguish the impact of the intervention from the secular trend; which can be observed from the groups in which some levels of knowledge increase was observed in the control group which was slight and minimal compared to the high study group.

**Table 6: Practice of Exclusive Breastfeeding after the Intervention**

Practice of Exclusive Breastfeeding	After	
	Study (n=136)	Control (n=136)
Mean±SD	28.03±2.45	21.15±3.54
t-value	19.04	
P-value	<0.001	

Table 6 presents the practice of exclusive breastfeeding of the studied groups after the intervention. The aggregate mean scores of the study and control groups are 28.03±2.45 and 21.15±3.54 with t-test and

P-values of 19.04 and <0.001 respectively. This implies a statistically significant difference in the practice of the studied groups after the intervention.



**Figure 2:** Line chart showing the effect of the intervention on practice over six months postpartum

Figure 2 presents the line chart showing the effect of the intervention on practice over six months postpartum. After the intervention, there was a great improvement in the practice in the study group which was steady throughout the period of observation except for a slight decline from the 14<sup>th</sup> week to the 6<sup>th</sup> month postpartum. However, for the control group, there was a slight and gradual increase in practice which also experienced a slight decline from the 14<sup>th</sup>

week and 6<sup>th</sup> month postpartum. By implication, the intervention program has improved and sustained the optimal practice of exclusive breastfeeding among mothers in the study group over a long period. They have a high tendency to maintain optimal practice in their subsequent deliveries only needs to be updated by continuous health education.

**Table 7: Satisfaction of Studied Groups after the Intervention**

Satisfaction with Exclusive Breastfeeding	After	
	Study (n=136)	Control (n=136)
Mean±SD	14.24±0.56	9.01±1.16
t-value	47.23	
P-value	<0.001	

Table 7 presents the satisfaction of the studied groups after the intervention. The aggregate mean scores of the study and control groups are 14.24±0.56 and 9.01±1.16 with t-test and P-values of 47.23 and <0.001 respectively. This implies a statistically significant difference in the satisfaction of the studied groups after the intervention.

### Discussions

Findings from this study revealed low and no significant difference in the knowledge of exclusive breastfeeding between the study and control groups before the intervention. The findings of the current study mean that a greater percentage of the respondents lack knowledge of exclusive breastfeeding which could predispose their neonates to a wide range of adverse consequences such as respiratory and GI infections, malnutrition and mortality; hence the need for health promotion among the pregnant adolescents to prevent these problems. However, after the educational program, the finding revealed the highest mean scores of knowledge among the respondents in the study group and statistically significant differences between the groups throughout the stages of the post-test. This implies that the nursing educational program has improved and sustained their knowledge of exclusive breastfeeding. This finding is contrary to the result of a descriptive study in Nigeria by Ihudiebube-splendor

et al., (2019) which revealed poor knowledge of exclusive breastfeeding among most participants; but reflects quasi-experimental studies by Mohamed et al., (2020) in Egypt and Seyyedi et al., (2021) in Iran which found statistical improvement in mothers' posttest knowledge of exclusive breastfeeding after the educational intervention.

The finding of this current study indicates that more adolescent mothers were better educated about exclusive breastfeeding which could result in full implementation and practice of exclusive breastfeeding, hence healthier and smarter infants. Also, the study revealed optimal exclusive breastfeeding practice in the study group and statistically significant differences between the study and control groups throughout the stages of the post-test. The finding of a control group of this study is similar to a descriptive study in Nigeria by Benova et al., (2020) who discovered the consistently low practice of exclusive breastfeeding among adolescent mothers. However, the current study is in line with the study conducted in Egypt by Mohamed et al., (2020) which showed a significant improvement in the general practice of exclusive breastfeeding techniques in the posttest group of mothers compared to the pretest. The current finding also follows the same trend with a study in Thailand by Bootsri, (2017) where there is a significant difference in the practice of the study and

control groups such that 29% and 5% of adolescent mothers in the study and control groups respectively practised exclusive breastfeeding at sixth month postpartum. The variations in the percentage difference between the two studies might be due to differences in the socio-cultural background of the participants and the settings of the studies. Finally, developing a sense of satisfaction in the maternal role is a key indicator of maternal role adaptation which has a significant impact on the quality of parenting behaviours and the healthy development of the child. Findings of this study showed that more mothers in the study than the control group were satisfied with the exclusive breastfeeding experience and a statistically significant difference existed between the study and control groups at the sixth month postpartum. This finding is similar to the result of a descriptive study by Awaliyah et al., (2019) in Indonesia where maternal breastfeeding satisfaction was only similar to the control group of the current study.

### **Conclusion**

Based on the findings of this study, it was concluded that the adolescent mothers who were subjected to the educational program had improved knowledge, practice and satisfaction at the posttest than those in the control group. Hence the a need for continuous technical training and health education of adolescent mothers on exclusive breastfeeding.

### **Recommendation**

Technical training and health education of all pregnant adolescents by nurses/midwives on exclusive breastfeeding is imperative for these young mothers to attain competence in their motherhood role. Training and supporting all nurses/midwives to provide

healthcare services to adolescent mothers in a friendly and appropriate manner and modifying health facilities to respond to the needs expressed by adolescent mothers. This study showed that there is a tendency for a slight reduction in their knowledge and practices in their subsequent deliveries, hence the need for continuous health education for all pregnant women.

### **Limitation**

The study could not establish the baseline data for the practice of exclusive breastfeeding of the respondents because the pretest data collection started during pregnancy and most of them were primigravida; who do not have any experience with exclusive breastfeeding practice. Attrition was also a challenge in this study.

### **Conflict of Interest**

The authors declared that there is no conflict of interest

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