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The Effectiveness of Exclusive Breastfeeding in the Development of Under-5 Children in Benin Metropolis, Nigeria

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ABSTRACT

Early and exclusive breastfeeding contributes to child survival by enhancing cognitive and sensory development. To evaluate the effectiveness of EBF in the development of children under five in the Benin Metropolis, Nigeria, the study was conducted. A cross-sectional descriptive survey was carried out using a structured questionnaire administered to 100 mothers of children under five, with a reliability coefficient of 0.810. The study data were analysed using SPSS version 22, and hypotheses were tested via the Pearson Chi-square test at the 0.05 level of significance. The majority, 73.0% of mothers, had excellent knowledge of EBF. At the time of data collection, only 68.0% had ever practised EBF, while 54.0% currently breastfed their infants, and 34.0% had breastfed within the first hour after delivery. The benefits of EBF were associated with fewer episodes of diarrhoea during the first year of life ($P < 0.001$), early recognition of familiar voices at 0–2 months ($P = 0.019$), recognition of mother's voice or touch at 3–4 months ($P = 0.038$), sitting upright before six-months ($P = 0.008$), standing independently within 6–12 months ($P = 0.024$), and walking independently within 6–12 months ($P = 0.019$). Early resumption of work (82.6%) and sore or painful nipples (58.7%) were among the key challenges to EBF practice. Therefore, EBF has a positive impact on children's developmental outcomes in Nigeria, and there is good knowledge and practice of it. It is recommended that breastfeeding-friendly workplaces be established to encourage mothers to continue breastfeeding.

INTRODUCTION

Since the United Nations made a global commitment in 2014 to promote breastfeeding, numerous platforms for information and support on breastfeeding have emerged to address factors that specifically hinder breastfeeding ability to breastfeed successfully. One of the global nutrition targets set by the World Health Organization and UNICEF (WHO and UNICEF, 2025) is a 50% country-level exclusive breastfeeding (EBF) rate by 2025. This global endeavour will undoubtedly help achieve the Sustainable Development Goals (SDGs) (WHO, 2015; Moyo *et al.*, 2017). According to Witten, Claasen, Kruger *et al.* (2020), the efficacy of exclusive breastfeeding practices remains low despite these efforts.

Globally, 3 in 5 babies are not breastfed in the first hour of life, and only 41% of infants under 6 months of age are exclusively breastfed (WHO, 2020). In Sub-Saharan Africa, the overall prevalence of EBF is 36.0% (Yalcin, Berde & Yalcin, 2016), while 29% in Nigeria (NPC & ICF, 2019). According to the 2018 national demographic survey, the most direct causes of stunting are inadequate nutrition (not eating enough or eating foods that lack growth-promoting nutrients) (NPC and ICF, 2019). Therefore, optimizing nutrition early in life including the 1000 days from conception to a child's second birthday ensures the best possible start in life, with long-term benefits.

Nigeria has the second-highest burden of stunted

children in the world, with a national prevalence rate of 37 per cent of children under five. An estimated 2 million children in Nigeria suffer from Severe Acute Malnutrition (SAM), but only two out of every 10 children affected are currently reached with treatment (UNICEF, 2020). It is estimated that, at any point in time in the world, 52 million children aged under 5 years are wasted, with 17 million of those estimated to be severely wasted, based on national-level prevalence data. It is important to note that these estimates may miss a relatively large proportion of incident cases of wasting occurring over time and, depending on the timing of the survey on which they are based, seasonal peaks may also be missed. This means that the current global estimates probably underestimate the actual annual burden of wasting (National Nutrition and Health Survey (NNHS), 2018). However, there is a dearth of studies that have evaluated the effectiveness of exclusive breastfeeding in the development of under-5 children in Africa, especially in Nigeria. Hence, this study is being undertaken to fill this gap.

Exclusive breastfeeding (EBF) is the optimal feeding practice to achieve infants' growth and development. It is one of the strategies to improve nutritional status and growth in children (Arage & Gedamu, 2016). The World Health Organization (WHO) recommends that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional

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requirements, infants should receive nutritionally adequate and safe complementary foods while continuing to breastfeed for up to two years or beyond (WHO, 2019). Exclusive breastfeeding means that the infant receives only breast milk. No other liquids or solids are given – not even water – except for oral rehydration solution, or drops/syrups of vitamins, minerals or medicines (Ayalew, 2020). Breastfeeding has many health benefits for both the mother and infant. Breast milk contains all the nutrients an infant need in the first six months of life. Breastfeeding protects against diarrhoea and common childhood illnesses such as pneumonia, and may also have longer-term health benefits for the mother and child, such as reducing the risk of overweight and obesity in childhood and adolescence (WHO, 2019).

Good nutrition is the bedrock of child survival, health and development. Well-nourished children are better able to grow and learn, to participate in and contribute to their communities, and to be resilient in the face of disease, disasters, and other global crises (Guzzardi *et al.*, 2020). Early initiation of breastfeeding and exclusive breastfeeding help in child survival; they account for healthy brain development, promote cognitive and sensory performance and are noted for enhancing intelligence and academic performance in children (United Nations Children's Fund (UNICEF), 2019). Feeding an infant with only breast milk is advocated by stakeholders in health; it is one of the most important practices in an infant's life and the best way a mother can invest in the well-being of her child. Among the numerous benefits of breastfeeding, UNICEF, in a breastfeeding Campaign in 2013, termed the essence of breastfeeding as a “first immunization and an inexpensive lifesaver (UNICEF, 2019). The first breast milk contains colostrum, which is highly nutritious and has antibodies that protect the newborn from diseases. Early initiation of breastfeeding also encourages bonding between the mother and her newborn, facilitating the production of regular breast milk (National Population Commission (NPC), 2019 and International Confederation (ICF), 2019).

Exclusive breastfeeding is an important aspect of infant care, with numerous benefits for both mothers and children. However, a mother's ability to exclusively breastfeed may be hampered by a variety of factors. Physical barriers, such as breast infections, pain, and anatomical issues, as well as socio-cultural barriers, such as a lack of family support and societal pressure to use formula, can all have an impact on EBF. Economic barriers include insufficient maternity leave, a lack of breastfeeding breaks, and inadequate workplace accommodations. Healthcare barriers such as inadequate breastfeeding support, limited access to healthcare providers, and a lack of information can all have an impact on the promotion of effective EBF practices. Finally, personal barriers include mothers' stress and anxiety about practising EBF. Addressing these barriers is critical to creating an encouraging atmosphere for breastfeeding mothers. Breastfeeding support from lactation experts

or breastfeeding-trained professionals can be extremely helpful in overcoming physical barriers. In addition, pain management techniques, breast infection treatment, and milk expression or pumping can aid in the establishment or increase of milk supply. Socio-cultural barriers can be overcome through education and awareness campaigns that emphasize the benefits of breastfeeding. Support groups for breastfeeding mothers, breastfeeding-friendly public spaces, and partner involvement can all help to create a supportive environment. Implementing paid maternity leave, breastfeeding breaks, and workplace accommodations can help to reduce economic barriers. Employer education on breastfeeding benefits and support is critical. Health care barriers can be overcome by providing training on breastfeeding support and access to lactation specialists.

and consistent evidence-based advice. To address the personal barriers, there should be education and support during pregnancy, positive role models, stress management techniques, and professional lactation support for mothers. Furthermore, community-based support groups, restrictions on formula marketing and breast-friendly policies can help create a supportive environment. Peer counselling programs, online resources, and breastfeeding-friendly hospital policies also contribute to promoting exclusive breastfeeding (Witten, Claasen, Kruger *et al.*, 2020).

Worldwide, wasting accounts for 4.7% of all deaths of children aged under 5 years. Severely wasted children are, on average, 11 times more likely to die than their healthy counterparts (WHO, 2014). Suboptimal breastfeeding is responsible for 96% of deaths among children under 12 months of age in developing countries. However, over 820 000 children could be saved yearly if all children 0-23 months were optimally breastfed (WHO, 2020). Yet, there is a paucity of information in the literature regarding the effectiveness of exclusive breastfeeding in the development of under-five-5 children under five in Nigeria. This is why the study was conducted.

The study was designed to assess the effectiveness of exclusive breastfeeding in the development of children under five years old in a tertiary hospital in Benin Metropolis in Nigeria. The specific objectives of this study are: to assess the level of knowledge of exclusive breastfeeding in the development of children among mothers of under-5 children in a tertiary hospital at Benin Metropolis, Nigeria. Determine the prevalence of exclusive breastfeeding among under-five-5 children in a tertiary hospital in Benin Metropolis, Nigeria. Explore the effectiveness of exclusive breastfeeding on the developmental milestones of children in a tertiary hospital at Benin Metropolis, Nigeria, and identify barriers to exclusive breastfeeding among mothers of under-5 children in a tertiary hospital at Benin Metropolis, Nigeria. The following research questions were further developed: What is the level of knowledge of exclusive breastfeeding in the development of under-five children among breastfeeding mothers in a tertiary hospital at

Benin Metropolis, Nigeria? What is the prevalence of exclusive breastfeeding among under-five children in a tertiary hospital in Benin Metropolis, Nigeria? What is the effectiveness of exclusive breastfeeding on the developmental milestones of under-five children in a tertiary hospital in Benin Metropolis? What are the barriers to exclusive breastfeeding among breastfeeding mothers of under-5 children in Benin Metropolis, Nigeria?

Maternal health programs should be coordinated such that regulations conform to global standards; this will help eradicate mortality and enhance maternal and newborn healthcare. The study sought to bridge the knowledge gap by assessing the effectiveness of EBF in the development of under-5 children in Nigeria. The study therefore, will be of great importance to individuals, couples and families so that they will be able to understand the importance and the benefits of exclusive breastfeeding in an infant's development. Also, the finding will be useful in the training of nurse midwives and public health practitioners who will, in turn, act as family health counsellors to educate and guard nursing mothers to practice exclusive breastfeeding to enhance their infant development. Furthermore, the findings from this study will be incorporated into the curriculum to improve students' knowledge and improve the practice of exclusive breastfeeding for infants' development. It will be imperative for policymakers, as budgetary allocations will be made by the government, to encourage women and families to practice exclusive breastfeeding. More so, this study will be of great importance to researchers and serve as a reference document when investigating the practice of exclusive breastfeeding

MATERIALS AND METHODS

Study Design

To assess the effectiveness of exclusive breastfeeding in the development of under-five children at a tertiary hospital in Benin Metropolis, Nigeria, a descriptive cross-sectional study design was used. This design is appropriate for describing relationships among phenomena at a fixed point in time (Nwachuchwu, 2011). The study was conducted at the University of Benin Teaching Hospital (UBTH), Benin City, Edo State, Nigeria. The University of Benin Teaching Hospital (UBTH) is a tertiary hospital located in the district and serves as the district's referral medical centre. This study primarily focused on mothers of under-5 children attending the outpatient clinics (Post-natal Clinic, Immunization clinic, and Paediatric Outpatients Clinic) of the hospital. The sample size required for this study was determined using the Cochran formula for sample size calculation for a descriptive study. The Cochran formula is given as:

$$n = (z^2pq)/d^2$$

where n = minimum desired sample size

z = standard normal deviation, usually set at 1.96 at a 95% confidence interval

d = degree of accuracy or precision desired, usually set at

5% level of significance = 0.05

p = proportion of the family members of diabetic patients

In a cross-sectional study to compare the physiological growth of infants including weight, length (height) and head circumference who were exclusively breastfed for 6 months and those who were given bottle-fed or mixed fed and to find percentage of exclusive breastfeeding among infants in Sulaimani city/ Kurdistan region of Iraq by Weli (2021), proportion of exclusive breastfeeding practice was 46.5%. Therefore, $p = 46.5\% = 0.465$

$$q = 1 - p = 1 - 0.465 = 0.535$$

$$\text{Hence, } n = (z^2pq)/d^2 = \{(1.96)^2 (0.465)(0.535)\} / \{(0.05)^2\} = \{3.8416 (0.465) (0.535)\} / \{(0.0025)\} = 382$$

Adjusting for attrition (non-response) rate, $Ar = n/(1 - 10\%) = n/(1 - 0.1)$ where $n = 382$

$$\text{Therefore, } Ar = 382 / 0.9 = 424$$

Hence, the sample size for the study = 424 respondents were selected.

The study's research hypothesis is that there was no significant relationship between knowledge and practice of exclusively breastfeeding among mothers of under-5 children at Benin Metropolis Nigeria, Nigeria.

Sampling Procedure

A convenient sampling approach was adopted to recruit the participants. This sampling method was preferred due to the nature of the participants (McLeod, 2019); it would have been difficult to assemble them to do random sampling since that may delay their being attended to by their physician, and not all of them attend the clinic on the same day. For selecting members of the population for this study, the inclusion criteria - a mother with a child who is less than 5 years of age, who attended any of the selected clinics at the UBTH, available at the time of data collection, and was willing to participate in the study after giving informed consent- were adopted.

Sample Size

The estimated sample size for the study was 100 women, which represented 40% of the target population. When a target population for research study is few hundred, a 40% sample size will be adequate with an accurate level of more than 97%, and if several hundred a 20% sample size will do, if a few thousands, 5% or less of sample will do". Therefore, a sample size of 100, representing 40% of the target population of 250 was used for the study (Nwana Seddoh, 2014).

Data Collection

Data were collected using a structured questionnaire. The questionnaire consisted of 37 questions divided into of five sections – A-E. Section A contained 6 questions which deals on socio-demographic characteristics of the respondents. Section B elicited response on knowledge of exclusive breastfeeding among the respondents and it contained 14 questions. However, section C assessed

the practice of exclusive breastfeeding among the respondents and has 7 questions. Also, section D assessed developmental milestones and had 9 questions. While, Section E assessed barrier to exclusive breastfeeding with a question and multiple subset questions. To ensure the consistency of the research instrument, a pilot study was carried out in the Edo state specialist hospital, which possesses a population comparable to the characteristics of the population of study (Chin and Kramer, 2018). 30 copies of the questionnaire (which represented 30% of the sample size for the study) were distributed to and retrieved from the pilot study participants. According to the rules of thumb, a sample size of 30-50 participants is ideal for a pilot study (Whitehead *et al.*, 2016). The questionnaires were administered by trained research assistants. Each instrument began with an outline and general idea of the research, as well as the aim of the study. The questionnaires retrieved were reviewed for completeness. This process was assisted by two recruited and trained research assistants.

Data Validation

A face (content) validity was ensured. To test for validity, the questionnaire was moderated by two research specialists in measurement and evaluation (Polit and Beck, 2018). The face and content validity of the tool (structured questionnaire) was evaluated by the project supervisor. Their observations were adopted in making

the needed adjustments before the questionnaires were administered.

Reliability

To ensure the reliability of the instrument, it was pretested using split-half and the data obtained were computed in SPSS version 22 to estimate the reliability using Cronbach's alpha. A coefficient of 0.755 was obtained before it was administered to the participants.

Data Analysis

The raw data retrieved were coded and imputed into a computer for easy analysis using Statistical Package for Social Science (SPSS) version 22.0. Descriptive data were expressed as percentages, and frequency counts. Data were presented on frequency distribution tables and words. $P < 0.05$ was considered the level of significance for all measured variables.

Ethical Consideration

An application for ethical clearance was made to the ethics committee of the University of Benin Teaching Hospital, and ethical clearance with approval number: ADM/E 22/A/VOL.VII/14835138 (Appendix II) was obtained from the study institution. The participants were given a detailed explanation of the study purpose, and their informed consent was obtained before they were enlisted to participate in the study.

Table 1: Showing social-demographic characteristics of the respondents (n = 420)

Variables		Frequency	Percent
Age	18-27years	76	18.0
	28-37 years	193	46.0
	38-47 years	118	28.1
	>47 years	33	7.9
	Mean $\pm$ SD = 29 $\pm$ 4.23years		
Level of education	Primary	84	20.0
	Secondary	92	21.9
	Tertiary	202	48.1
	No formal education	42	10.0
Family setting	Monogamy	311	74.0
	Polygamy	109	26.0
Number of children	1-2	135	32.1
	3-4	218	51.9
	More	67	16.0
Employment status	Civil servant	105	25.0
	Student	21	5.0
	Self-employed	193	46.0
	Employed in private setting	67	16.0
	Full time house wife	34	8.0
Estimated family monthly income	<#30,000	118	28.1
	#30,000-#50,000	210	50.0
	> #50,000	92	21.9

Table 4.1 shows that 76(18.0%) of the respondents were within 18-27years, 193(46.0%) were within 28-37years, 118(28.1%) were within 38-47years while 33(7.1%) were able 40years. The mean age was 29 ± 4.23 years. Respondents with tertiary educational qualification were more 202(48.1%) followed by those with secondary qualifications 92(21.9%), and those with primary qualification 84(20.0%) while 42(10.0%) of them did not have any form of formal education. With respect to family setting, 311(74.0%) were from monogamous settings while 109(26.0%) were from polygamous setting. Over

half 218(51.9%) of them had 3-4 children, 135(32.1%) of them had 1-2 children while 67(16.0%) have more than 4 children. Those who were self-employed were more 193(46.0%) followed by civil servants 105(25.0%) and those employed in private setting were 67(16.0%). Full time house wives and students were 34(8.0%) and 21(5.0%) respectively while with respect to estimated monthly income, half 210(50.0%) of the respondent have an estimated monthly income within #30,000-#50,000, 118(28.1%) have less than #30,000 while 92(21.9%) have above #50,000

Table 2: Knowledge of exclusive breastfeeding in the development of under-five-5 children among the respondents (n = 420)

S/N	Statement	Responses	
		True (%)	False (%)
1.	Exclusive breastfeeding refers to feeding infants only breast milk in the first 6months of life	328 (78.1)	92(21.9)
2.	First breast milk contains colostrum, which is highly nutritious and has antibodies that protect the newborn from diseases	344 (81.9)	76(18.1)
3.	Breast milk composition changes according to the baby's changing needs, especially during the first six months of life.	395 (94.0)	25(6.0)
4.	Babies should be breastfed on demand (≥ 8 times/day during the first six months)	286 (68.1)	134 (31.9)
5.	Breastfeeding duration is ≥ 15 minutes from each breast during the first month	386 (91.9)	34(8.1)
6.	Breastfeeding is beneficial for both the mother and the child	395 (94.0)	25(6.0)
7.	Early initiation of breastfeeding encourages bonding between the mother and her newborn, facilitating the production of regular breast milk	386 (91.9)	34(8.1)
8.	Children should receive breast milk until 2years old	361 (86.0)	59(14.0)
9.	Breastfeeding protects against diarrhoea and common childhood illnesses such as pneumonia	370 (88.1)	50(11.9)
10.	Complementary food should be introduced at 6 months of age	344 (81.9)	76(18.1)
11.	Breast milk is superior to formula milk in fulfilling a child's necessary dietary requirements	227 (54.0)	193 (46.0)
12.	Breast milk is sufficient for a child in the first 6 months of life	244 (58.1)	176 (41.9)
13.	Breast milk does not lose its benefits when it is pumped out or stored	176 (41.9)	244 (58.1)
14.	Exclusive breastfeeding saves time and money	353(84.0)	67(16.0)
15.	Manual expression of breast milk is a necessity to maintain baby-exclusive practice	302(71.9)	118 (28.1)

Table 2 shows that 328(78.1%) knew that exclusive breastfeeding refers to feeding infants only breast milk in the first 6months of life, 344(81.9%) agrees that first breast milk contains colostrum, which is highly nutritious and has antibodies that protect the newborn from diseases, 395(94.0%) agrees that breast milk composition changes according to the baby's changing needs, especially during the first six month of life, 286(68.1%) admits that babies should be breastfed on demand (≥ 8 times/day during the first six month), 386(91.9%) agrees that breastfeeding

duration is ≥ 15 min from each breast during the first month, 395(94.0%) admits that breastfeeding is beneficial for both the mother and the child, 386(91.9%) agrees that early initiation of breastfeeding encourages bonding between the mother and her newborn, facilitating the production of regular breast milk, 361(86.0%) agrees that children should receive breast milk until 2years old, 370(88.1%) admits that breastfeeding protects against diarrhoea and common childhood illnesses such as pneumonia, 344(81.9%) agree that complementary food

should be introduced at 6 months of age, 227(54.0%) agree that breast milk is superior to formula milk in fulfilling child's necessary dietary requirements, 44(58.1%) agrees that breast milk is sufficient for child in the first 6 months of life, only 176(41.9%) agree that breast milk

does not lose its benefits when it is pumped out or stored, 353(84.0%) agree that exclusive breastfeeding saves time and money while 302(71.9%) believes that manual expression of breast milk is a necessity to maintain baby exclusive practice.

Table 3: Showing composite knowledge of factors influencing infant's development (n = 150)

Level of knowledge	Percentage score value	Frequency	Percent
Good	>70	73	73.0
Moderate	50-70	20	20.0
Poor	<50	7	7.0
Total		100	100.0

Table 4.3 is an abstract of Table 4.2, and it shows that 73(73.0%) of the respondents had excellent knowledge of exclusive breastfeeding, 20(20.0%) had moderate knowledge, while 7(7.0%) had poor knowledge. Table 4.3

is an abstract of Table 4.2, and it shows that 73(73.0%) of the respondents had excellent knowledge of exclusive breastfeeding, 20(20.0%) had moderate knowledge, while 7(7.0%) had poor knowledge. Table 3 shows only

Table 4: Showing prevalence of exclusive breastfeeding among the respondents (n = 420)

S/N	Statement	Responses	
		Yes (%)	No (%)
1	Ever practiced exclusive breastfeeding	247 (58.8)	173 (41.2)
2	Duration of ever exclusively breastfeeding practice (n = 247)		
	• less than one month	-	-
	• 1-3 months	36(14.6)	211 (85.4)
	• 4-5 months	22(8.9)	225 (91.1)
	• ≥ 6 months	189 (76.5)	58(23.5)
3	Exclusively breastfed for current baby? (n = 247)	133(54.3)	113(45.7)
4	Breastfed within the first one hour after delivery (n =420)	143(34.0)	277(66.0)
4	Number of times of daily breastfeeding (n = 420)		
	• 1-4times	86(20.5)	334(79.5)
	• 5-8times	84(20.0)	336(80.0)
	• On demand	250(59.5)	170(40.5)
6	Method of feeding when separated from baby (n = 420)		
	• Expressed breast milk	250(59.5)	170(40.5)
	• Artificial milk	136(32.4)	284(67.6)
	• Complimentary food such as pap	34(8.1)	386(91.9)

247(58.8%) have ever practiced exclusive breastfeeding of which (14.6%) practiced it for 1-3 months, (8.9%) practiced it for 4-5 months while (76.5%) practiced for ≥ 6 months. Only 133(54.3%) practiced exclusive breastfeeding for their current baby and only 143(34.0%) breastfed their baby within the first one hour after delivery.

On frequency of daily breastfeeding, 86(20.5%) breastfed for 1-4times, 84(20.0%) for 5-8times while 250(59.5%) on demand. During separation, 250(59.5%) feed their babies through expressed breast milk, 136(32.4%) through artificial milk while 34(8.1%) through complimentary food such as pap.

Table 5: Effect of exclusive breastfeeding on developmental milestone of under-five-5 children (n = 420)

Developmental milestones		Exclusively breastfed		Total (%)	Test statistics	P
		Yes (%)	No (%)			
Age at recognizing familiar voices	0-2 months	133(68.9)	60(31.1)	193(100)	$\chi^2 = 25.086$	.000
	3-4 months	69(60.5)	45(39.5)	114(100)		
	>4months	45(39.8)	68(60.2)	113(100)		

Age at place objects in the mouth	0-2 months	58(61.1)	37(38.9)	95(100)	$\chi^2 = 12.696$	.005
	3-4 months	117(65.7)	61(34.3)	178(100)		
	5-6months	42(56.0)	33(44.0)	75(100)		
	>6moths	30(41.7)	42(58.3)	72(100)		
Age at recognizing mother's voice or touch	0-2 months	31(56.4)	24(43.6)	55(100)	$\chi^2 = 26.773$	.000
	3-4 months	117(73.1)	43(26.9)	160(100)		
	5-6months	69(44.5)	86(55.5)	155(100)		
	>6moths	30(60.0)	20(40.0)	50(100)		
Age at sat down unaided	< 6months	135(71.4)	54(28.6)	189(100)	Fisher's Exact = 25.332	.000
	6 - 12 months	110(49.5)	112(50.5)	222(100)		
	> 12months	2(22.2)	7(77.8)	9(100)		
Age at crawling	< 6months	33(70.2)	14(29.8)	47(100)	$\chi^2 = 19.980$	.000
	6 - 12 months	201(61.3)	127(38.7)	328(100)		
	> 12months	13(28.8)	32(71.2)	45(100)		
Age at standing by support	6 - 12 months	195(62.7)	116(37.3)	311(100)	$\chi^2 = 7.491$	.007
	> 12months	52(47.7)	57(52.3)	109(100)		
Age at standing independently	6 - 12 months	198(63.7)	113(36.3)	311(100)	$\chi^2 = 11.666$	.001
	> 12months	49(45.0)	60(55.0)	109(100)		
Age at walking independently	6 - 12 months	98(74.2)	34(25.8)	132(100)	$\chi^2 = 21.251$	.000
	13 - 18 months	141(53.0)	125(47.0)	266(100)		
	>18months	8(36.4)	14(63.6)	22(100)		
Incidences of diarrhea within first year of life	Nil	135(74.2)	47(25.8)	182(100)	Fisher's Exact = 33.497	.000
	Once	95(48.0)	103(52.0)	198(100)		
	Twice	15(46.9)	17(53.1)	32(100)		
	Thrice	2(25.0)	6(75.0)	8(100)		

Table 4 shows that (68.9%) of exclusively breastfed children recognizing familiar voices at 0-2months compared to (31.1%) of children that were not exclusively breastfed. This was found to be statistically significance ($P < 0.001$). Similarly, more exclusively breastfed children (65.7%) placed objects in the mouth within 3-4 months compared to (34.3%) of non-exclusively breastfed children and it was statistically significant ($P = 0.005$).

Also, (73.1%) of exclusively breastfed children recognized mother's voice or touch at 3-4 months while only (26.9%) of non-exclusively breastfed children did at same age. This was significant ($P < 0.001$).

With respect to age at sitting up, more exclusively breastfed children (71.4%) sat up unaided in less than 6months compared to (28.6%) of non-exclusively breastfed children. This was found to be statistically significant ($P <$

0.001). Similarly, (61.3%) of exclusively breastfed children crawled within 6-12 months while only (38.7%) of the non-exclusively breastfed children crawled at that age. It was significant ($P < 0.001$). Furthermore, (62.7%) of the exclusively breastfed children stood up with support within 6-12 months as against (37.3%) of the non-exclusively breastfed children at that age. It was significant ($P = 0.007$). However, (63.7%) of the exclusively breastfed children stood up independently within 6-12 months as against (36.3%) of the non-exclusively breastfed children at that age. It was significant ($P = 0.001$). Moreover, (74.2%) of the exclusively breastfed children compared to (25.8%) of non-exclusively breastfed children walk independently within 6-12 months. This was also

statistically significant ($P < 0.001$). Furthermore, (48.0%) of exclusively breastfed children compared to (52.0%) of the non-exclusively breastfed children experienced one episode of diarrhea within first year of life, (46.9%) of exclusively breastfed children compared to (53.1%) of the non-exclusively breastfed children experienced two episodes of diarrhea within first year of life. These were statistically significant ($P < 0.001$). The finding implies that exclusive breastfeeding has a strong impact on the developmental milestones of children.

Table 5 shows that resumption of work 143(82.7%) and Sore or painful nipples 102(59.0%) were the major barriers to exclusive breastfeeding practice.

Table 6 : Barriers to exclusive breastfeeding among the respondents (n = 173)

S/N	Variables	Response		Remark
		Yes (%)	No (%)	
	Barriers to EBF**			
1	Health challenges	68(39.3)	105(60.7)	Minor barrier
2	Multiple delivery (i.e. having twins or triplets)	22(12.7)	151(87.3)	Minor barrier
3	Aesthetic reason	7(4.0)	166(96.0)	Minor barrier
4	Exclusive breastfeeding is difficult	41(23.7)	132(76.3)	Minor barrier
5	Resumption of work	143(82.7)	30(17.3)	Major Barrier
6	Insufficient breast milk	60(34.7)	113(65.3)	Minor barrier
7	Sore or painful nipples	102(59.0)	71(41.0)	Major barrier

Table 7 : Relationship between respondents' level of knowledge and practice of exclusively breastfeeding using Pearson chi-square at 0.05 level of significance

			Exclusive Breastfed		Total (%)	df	χ^2	P	Decision
			Yes (%)	No (%)					
Level of knowledge	Good		41(56.2)	32(43.8)	73(100)	2	1.911	.421	Don't reject null hypothesis
	Moderate		11(55.0)	9(45.0)	20(100)				
	Poor		2(28.6)	5(71.4)	7(100)				
Total			54	46	100				

Rule: when the computed chi-square is greater than or equal the table value of chi-square, the Null hypothesis (H_0) is to be rejected and the alternate hypothesis is to be accepted. But where the computed Chi-square is less than the table value, the reverse will be the case.

Decision: Since the computed chi-square value $\chi^2 = 1.911$ at degree of freedom (df) 3 is greater than the critical value of 5.99 at 0.05 level of significant, there is no statistically significant evidence to reject the null hypothesis. This means there is no statistically significant relationship ($P = 0.421$) between knowledge and practice of exclusively breastfeeding among mothers of under-5 children in the University of Benin Teaching Hospital (UBTH).

Discussion

Recently, there have been global commitments to improving successful exclusive breastfeeding (EBF) practices in providing lactating mothers with information

and support. Despite these efforts, the effectiveness of EBF remains low, at 36%. The benefit of breastfeeding has been well-established. In comparison to partial breastfeeding, exclusive breastfeeding has even more benefits. Breastfeeding is very important for public health and epidemiological studies because it has an important role in many different countries (Boccolini, Carvalho & Oliveira, 2015). Hence, the present study evaluated the effectiveness of exclusive breastfeeding in the development of under-five-5 children at Benin Metropolis, Nigeria. Exclusive breastfeeding is widely recognized as the optimal feeding practice for infants, offering numerous benefits for both mothers and children. However, despite its benefits, various factors may affect a mother's ability to breastfeed exclusively (Witten, Claasen, Kruger *et al*, 2020).

The findings highlighted the importance of socio-demographic variables on EBF. Findings showed that the predominant age range of the participants was 28-37years

(mean = 29 ± 4.23 years), while the most represented educational qualification was tertiary qualifications. The age distribution in the present study is similar to that reported by Dhakal *et al.* (2017) among mothers of children under 5 in Kwango District, DR Congo. A study conducted in a City (Benin) that has several institutions of higher academic learning, it is not surprising that tertiary academic qualification is predominant. Similar academic qualification distribution was reported by Eke *et al.* (2019) among mothers attending immunization clinic in a tertiary health facility in Enugu, Nigeria. Over two-thirds of participants in the present study were from monogamous family settings. Present-day economic reality, coupled with the high cost of living, has made a large family size less attractive. Despite the predominance of tertiary academic qualifications, over one-third (46.0%) of the participants in the present study were self-employed. This may be a reflection of the current unemployment rate in Nigeria. And this could have accounted for (50.0%) of the respondents having an estimated monthly income within ₦30,000 - ₦50,000.

The study's results on the knowledge of exclusive breastfeeding among the respondents. The majority (73.0%) of the respondents had excellent knowledge of exclusive breastfeeding. This finding is at variance with (45.8%) reported by Mogre *et al.* (2016) from Ghana, (59.7%) reported by Anacleto *et al.* (2021) from Kinondoni, Dar es Salaam, and (31%) reported by Oche *et al.* (2011) from Sokoto State, Nigeria. The difference may be due to the variability of the study setting. For instance, the Ghana and the Sokoto State studies were done in rural and semi-urban settings, respectively, while the present study was done in an urban setting. Another plausible reason may be due to the level of education of the participants. While the majority of the participants in the present study possess higher academic qualifications, participants with no formal educational background were more prevalent in the above two studies. However, the proportion (78.0%) of the participants who knew that exclusive breastfeeding (EBF) refers to feeding infants with only breast milk in the first 6 months of life is lower compared to (95.3%) reported in Enugu's study by Eke *et al.* (2019). According to a study done in Zimbabwe to identify factors that influence breastfeeding practices of lactating mothers of children between 0-6 months, findings showed that the main enablers were information from nurses and spousal support. Mothers reported that the desire to have healthy babies, family support and education made it easier to practice EBF. However, breast pain, the need to give water and other concoctions due to religious beliefs, made it difficult to practice EBF. Some mothers believed that the disadvantages of breastfeeding were time constraints and an increase in workload. (Moyo *et al.*, 2020)

The highlighted findings on the prevalence of exclusive breastfeeding practice showed that over two-thirds (68.0%) of the participants have ever practised exclusive breastfeeding, of which only 76.5% practised EBF for

≥ 6 months. This is higher compared to the national prevalence rate of Nigeria (29.0%) (NPC & ICF, 2019) and the national pooled prevalence of Ethiopia (59.3%) (Alebel *et al.*, 2018). Other studies had equally reported a low level of EBF rate. For instance, Al-Ketbi *et al.* (2018) reported (16.9%), and Weli (2021) reported (46.5%). The high level of EBF in the present study could be attributed to the level of education the participants received and the possible effective health education received during antenatal visits, since the study was conducted in a teaching hospital. However, the prevalence of the EBF in the present study is lower than (74.1% and 77.5%) reported by Hunegnaw *et al.* (2017) and Ayele (2021), both from Ethiopia. Despite the high level of ever-practised EBF in the present study, only 54.0% exclusively breastfed their current baby, and only 34(34.0%) breastfed their baby within the first hour after delivery. This is lower compared to (74.2%) that initiated breastfeeding within one hour after delivery in the study conducted in Kinondoni municipality, Tanzania (Anacleto, Frank & Dedius, 2021). In the present study, EBF was not associated with its knowledge ($P = 0.421$). This finding is at variance with the finding of Mogre, Dery and Gaa (2016).

The result on the effectiveness of exclusive breastfeeding on developmental milestone of under-five children found an association between EBF and early recognition of familiar voices at 0-2 months ($P = 0.019$), recognition of mother's voice or touch at 3-4 months ($P = 0.038$), sitting up at less than 6 months ($P = 0.008$), and stood up independently within 6-12 months ($P = 0.024$). Moreover, walking independently within 6-12 months and an episode of diarrhoea within the first year of life were equally associated with exclusive breastfeeding ($P = 0.019$) and ($P < 0.001$), respectively. The benefits of breastfeeding have been well-established. In comparison to partial breastfeeding, exclusive breastfeeding has even more benefits (Boccolini *et al.*, 2015). The present finding is in line with the recent findings by Weli (2021), who reported that infants who were breastfed for the first six months of life have a higher weight, height and head circumference than infants who were exclusively formula-fed. In the study to assess the prevalence of diarrheal morbidity and associated factors among under-five children in Bahir Dar, northwest Ethiopia, Shumetie, Gedefaw, Kebede, and Derso (2018) reported non-exclusive breastfeeding as one factor that was independently associated with diarrheal morbidity. Guzzardi *et al.* (2020) also reported that exclusive breastfeeding is associated with higher hearing-language development in five years old girls, independent of maternal IQ, age and BMI (body mass index), and it is a positive predictor of cognitive development in preschool-age girls.

The major barriers to EBF practice reported by participants in the present study include early resumption of work and Sore or painful nipples. Research highlights the importance of addressing physical barriers, such as breast infections, pain, and anatomical issues. A study on barriers to exclusive breastfeeding in low-and middle-

income countries emphasizes the need for breastfeeding support from lactation consultants or breast-feeding specialists to overcome these challenges (Moyo *et al*, 2017). Additionally, pain management techniques, treatment of breast infections, and milk expression or pumping can help establish or increase milk supply (Kakietek *et al*, 2017). A similar finding of working status as a barrier to EBF practice was reported by Gayatri (2021). Employment and economic factors such as inadequate maternity leave and lack of breastfeeding breaks and workplace accommodations have been noted to mitigate the effectiveness of breastfeeding; therefore, employment education about breastfeeding benefits and support is essential (Witten, Claasen, Kruger *et al*, 2020). Community-based support groups and breast-friendly policies can create a supportive environment for breastfeeding mothers. Peer counselling programs, online resources and breastfeeding-friendly hospital policies can contribute to promoting EBF (Kavle *et al*, 2017).

Implications for nursing

Midwives and nurses are key health providers who care for women and children before and during pregnancy and birth, and throughout early childhood. They may work in a variety of settings, including communities, health centres and hospitals. All midwives and nurses can endorse the importance of breastfeeding, provide support and protect mothers from practices that can be a barrier to breastfeeding. Providing breastfeeding support is an essential competency for midwives and nurses, not an additional function. Midwives and nurses support breastfeeding as an integral part of respectful, quality care. Midwives and nurses provide personalised information and care to build a trusting relationship with mothers that enables them to nourish and nurture their children. The findings from this study indicated the need for nurses who work with ill children to have a clear understanding of how children differ from each other at various stages. This awareness is essential to allow nurses to create developmentally appropriate plans of care to meet the needs of their young patients.

Study's Limitations

Throughout the process, we made an effort to be conscious of our assumptions. We are aware of the method of using questionnaires. The information provided by the respondents might be limited by errors arising from recall bias or prejudice. Hence, the level of practice of exclusive breastfeeding reported in the study may not be the true prevalence rate. This may need to be evaluated through a longitudinal study. Nevertheless, there is reason to believe that our results can be applied to other midwifery services in Nigeria and abroad because they concur with some international studies. We discovered that there was a good range of experience and education among the mothers, and we gathered a wealth of data. This study, therefore, has added to the body of knowledge regarding the effect of exclusive breastfeeding on developmental milestones

of children in Benin, Nigeria

CONCLUSION

This study explored the effectiveness of exclusive breastfeeding (EBF) in the development of children at Benin Metropolis, Nigeria. The research was conducted at the tertiary hospital, which met the study's requirements. A sample population consisted of mothers with under-five children in Benin, and data were collected using a structured questionnaire with a reliability of 0.810. The findings of this research showed that there is good knowledge, practice and positive effect of exclusive breastfeeding on the development of children under 5 in Benin City, Nigeria. The knowledge and practice of Exclusive Breastfeeding was hampered by several factors, such as physical, sociocultural, health care, personal and economic and thus, to tackle these problems, this study recommends that the government establish a breast-friendly workplace to encourage mothers to breastfeed their newborns.

Recommendations

Following the outcomes of the study, the considerations and implications drawn from it, the following recommendations were made: Healthcare providers should provide breastfeeding education to all women during their antenatal follow-up visits, especially women with low educational qualifications. Also, employers of labour (government and private institutions) should make the work environment exclusively breastfeeding-friendly to make mothers breastfeeding compliant.

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