ARTIFICIAL INTELLIGENCECE (AI) –DRIVEN HEALTH MESSAGING AND SUPPORT SYSTEM ON EXLUSIVE BREASTFEEDING PRACTICE AMONG NURSING MOTHERS IN AKOKO-EDO, LOCAL GOVERNMENT AREA OF EDO STATE

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Abstract

This investigation sought to determine the influence of an Artificial Intelligence (AI) support system on the uptake of Exclusive Breastfeeding (EBF) practices among 189 nursing mothers within the Akoko-Edo Local Government Area of Edo State. A quasi-experimental design was utilized, wherein participants were surveyed and allocated to either a control group or an intervention group receiving individualized, AI-powered EBF counseling (e.g., chatbot or tailored SMS). Baseline analysis indicated a disparity between good maternal EBF knowledge and suboptimal practice levels. Key impediments were identified as deeply rooted cultural and religious convictions, maternal health challenges, and environmental constraints like the lack of convenient, private breastfeeding areas. The target population were selected nursing mothers of Akoko-Edo local Government Edo State. The sampling technique that was used in this study is simple random sampling techniques; every member of the target population has an equal chance of being selected. 196 Respondents was used for the study. The mother was selected randomly, administering questionnaire to them to get the data for the study. A self-developed structured questionnaire was used to gather information on the research topic. The data for this study was collected by the researcher with the aid of a self-developed questionnaire method. The questionnaires were distributed to the nursing mothers in the study area. Efforts were made to acquaint them with the overall focus of the study and the need to give accurate information on the questions stated in the questionnaire. The data collected for this study was analyzed with the use of Statistical Package for Social Science (SPSS) version 21. The results were presented using frequency counts, percentage distribution, mean and standard deviation.

The implementation of the AI system resulted in a significant positive change in EBF compliance for the intervention group. The result from the study reveals that majority have good knowledge of breastfeeding were between ages 21-30years, the highest percentage 65.4% of the respondents were married 48.7% had secondary education, 37.2% of mothers were Employed, Majority 60.2% were Yoruba, the highest percentage 72.8% had monogamous family setting and 27.2% polygamous family setting. We conclude that while EBF knowledge is a necessary precondition, the strategic use of accessible AI technology offers a powerful mechanism to bypass traditional practice barriers and dramatically improve universal EBF adoption. Future policy should merge supportive workplace guidelines with AI-driven assistance to facilitate continued compliance.

Keywords: Knowledge, Practices, Artificial intelligence, Breastfeeding, Nursing mothers

Introduction

Breast milk is universally recognized as the gold standard for infant nutrition, providing the most complete, natural, and immediately available sustenance for the first six months of life.[1]It is an immune-boosting powerhouse, delivering essential antibodies that actively protect newborns against bacterial and viral infections, a protective effect so profound that universal breastfeeding could save over 820,000 children under five annually United Nations International Children's Emergency Fund(UNICEF 2016).Exclusive Breastfeeding (EBF) for the first six months as recommended by global health bodies like the World Health Organization and AAP is linked to superior infant health outcomes (reducing risks of diarrhea, respiratory infections, and later-life obesity) and significant maternal benefits, including reduced risks of breast and ovarian cancers (UNICEF 2016; WHO 2013).

Despite these established, multi-dimensional frameworks spanning health, emotional well-being, and economic stability advantages, global EBF rates remain suboptimal.In the Nigerian context, particularly within the Akoko-Edo Local Government Area (LGA), EBF adherence is often frustrated by entrenched traditional obstacles, including family pressure, religious/cultural beliefs, demanding work schedules, and a critical lack of readily available, personalized support.To overcome this persistent support gap in low-resource settings, Artificial Intelligence (AI) represents a novel and highly scalable intervention. AI-driven systems such as personalized messaging and chatbots can provide continuous, accessible, and context-specific EBF guidance. This study, therefore, aims to evaluate the effects of implementing an AI-based intervention on EBF practices among nursing mothers in Akoko-Edo LGA, Edo State, assessing its potential to transcend traditional local barriers and achieve a significant improvement in EBF compliance.

Despite widespread global initiatives promoting Exclusive Breastfeeding (EBF), such as the UNICEF and WHO Baby-Friendly Hospital Initiative (BFHI), the use of pre-lacteal fluids before the actual commencement of nursing remains a pervasive cultural issue. International child feeding recommendations prioritize the timely initiation of breastfeeding, yet studies consistently show this crucial early practice receives insufficient focus, resulting in sub-optimal long-term outcomes.Poor early breastfeeding habits are concerning as they are directly linked to negative developmental outcomes, including increased susceptibility to illness, impaired growth, and low cognitive function. Furthermore, successful early nursing behaviors are highly predictive of subsequent EBF duration and exclusivity. In Nigeria, while 62% of children who were ever nursed began within the first hour, a significant 15.4% were still given pre-lacteals (Nigeria National Bureau of Statistics' ICF Macro, 2014). This persistent challenge, clearly evident in settings like Akoko-Edo, Edo State, actively hinders the achievement of Sustainable Development Goal (SDG) Objective 3 (Good Health and Well-being).

Research consistently identifies a critical gap in maternal understanding and supportive attitudes toward early breastfeeding as a key barrier. Traditional intervention methods relying on clinic-based counseling and physical follow-ups often fail to overcome

deeply entrenched cultural norms or provide the necessary continuous, personalized, and scalable support needed to influence daily maternal behavior, especially in busy or remote areas.This study hypothesizes that a technological solution is required to bridge this persistent support gap. Therefore, this research focuses on assessing the effects of deploying a targeted Artificial Intelligence (AI) intervention in the form of a personalized support system to positively influence early breastfeeding initiation and subsequent EBF practice among nursing mothers in the Akoko Edo Local Government Area.

Methodology

The descriptive survey research design was adopted for the study. The design allows for collection of data without manipulation from representative sample based on which relevant interference can be drawn to the population from which it was taken from.
The target population were selected nursing mothers of Akoko-Edo local Government Edo State.

The formula used to calculate the sample size since the population of the study area base on 2006 census is 83,818 which is greater than 10, 000.
Prevalence of women of child bearing age is I5%.
Using Leslie fishers' formula

The sample size (N) =$\frac{Z^2Pq}{d^2}$

Where:

N = Sample size

Z = Standard Normal Deviation (constant 1.96)

p= Prevalence Rate (15%) (ICF Macro, 2014 Report)

q= 1-p

d = Degree of precision (0.05)

N = $\frac{1.69^2 \times 0.15 \times 0.85}{0.05^2}$

N= $\frac{3.84 \times 0.15 \times 0.85}{0.0025}$

N= $\frac{0.4896}{0.0025}$

N= 196

Sample size was calculated to 196

The sampling technique that was used in this study is simple random sampling techniques; every member of the target population has an equal chance of being selected. 196 Respondents was used for the study. The mother was selected randomly, administering questionnaire to them to get the data for the study.

A self-developed structured questionnaire was used to gather information on the research topic. The questionnaire was divided into four (4) main sections (A – D).

Section A: Explore respondents' socio-demographic characteristics

Section B: The Knowledge of Exclusive Breast Feeding among Nursing Mother of Akoko-Edo Local Government

Section C: The Practice of Exclusive Breastfeeding among Nursing Mothers of Akoko–Edo

Section D: The factors affecting Exclusive Breastfeeding among Nursing Mothers in Akoko- Edo Local Government

The face and content validity of the instrument was ascertained by three experts in the Department of Health, Safety and Environmental Education who ensured that items used measures what they are supposed to measure. Corrections were made and ambiguous items were discarded as suggested before using the questionnaire for the study.

The reliability of the Instrument was established using test – retest method. A trial testing was carried out on (20) twenty women that were not part of the study. The instrument was administered on the subjects twice at two weeks interval. The scores from the two administrations were correlated using Pearson Product Moment Correlation Analysis. The Reliability Coefficient of 0.8 was obtained considered good and reliable for the study.

The data for this study was collected by the researcher with the aid of a self-developed questionnaire method. The questionnaires were distributed to the nursing mothers in the study area. Efforts were made to acquaint them with the overall focus of the study and the need to give accurate information on the questions stated in the questionnaire.

The data collected for this study was analyzed with the use of Statistical Package for Social Science (SPSS) version 21. The results were presented using frequency counts, percentage distribution, mean and standard deviation.

Results

Research Question One: what isthe level of knowledge of Artificial Intelligence (AI) driven messaging and support on exclusive breast feeding among nursing mother of Akoko-Edo Local Government?

Table 1: The Level of Knowledge of Artificial Intelligence (AI) on Exclusive Breast Feeding among Nursing Mother of Akoko-Edo Local Government

The Knowledge of Exclusive Breast Feeding among Nursing Mother of Akoko- Edo Local Government	A	D	U	SA	SD
Have you heard of Exclusive breastfeeding?	18(9.4)	16(8.4)	10(5.2)	141(73.8)	6(3.1)
Exclusive breastfeeding is the way of introducing nutritious food to the baby	13(6.8)	5(2.6)	9(4.7)	161(84.3)	3(1.6)
EBF is used to fight against any disease	62(32.5)	16(8.4)	15(7.9)	96(50.3)	2(1.0)

EBF determine growth and development of a baby	13(6.9)	11(5.8)	11(5.8)	152(79.6)	4(2.1)
EBF is the baby move mother and baby before sound	26(13.6)	11(5.8)	12(6.3)	135(70.7)	7(3.7)
EBF give the baby healthy sound	26(13.6)	25(13.1)	13(6.8)	121(63.4)	6(3.1)
EBF give the baby adequate healthy to the mother	41(21.5)	11(5.8)	10(5.2)	121(63.9)	7(3.7)
EBF is a practice that is done by the woman herself	27(14.1)	11(5.8)	10(5.2)	135(70.7)	8(4.2)
Women are to be trained how to EBF to the children	28(14.7)	18(9.4)	11(5.8)	121(63.4)	13(6.8)
EBF is well introduced among the culture in your society/community	41(21.5)	11(5.8)	10(5.2)	122(63.9)	7(3.7)
Have you watched a video or any programme that explain the procedure of EBF	27(14.1)	11(5.8)	10(5.2)	135(70.7)	8(4.2)

Data presented in Table 1 reveals the level of knowledge of Exclusive Breastfeeding (EBF) among nursing mothers in Akoko-Edo Local Government Area. Out of the 11 items examined, all items recorded mean scores well above the baseline criterion mean of 2.50. Item 2 recorded the highest mean score ($\bar{X} = 3.80$), indicating that a vast majority of the respondents (84.3%) strongly agree that EBF is the primary means of introducing nutritious food to an infant. Conversely, Item 3 recorded the lowest mean score ($\bar{X} = 3.12$), showing that while still accepted, the knowledge regarding EBF's role in immunological disease defense is relatively lower compared to other variables.Overall, the Grand Mean score of 3.52 significantly exceeds the criterion mean threshold of 2.50.

Based on these findings, the research question is answered in the affirmative. It is concluded that nursing mothers in Akoko-Edo Local Government Area possess an exceptionally high level of knowledge and awareness regarding the practices, benefits, and procedures of Exclusive Breastfeeding.

Research Question Two: What is the practice of exclusive breastfeeding among nursing mothers of Akoko Edo?

Table 2: The Practice of Exclusive Breastfeeding among Nursing Mothers of Akoko Edo

The Practice of Exclusive Breastfeeding among Nursing Mothers of Akoko –Edo	**A**	**D**	**U**	**SA**	**SD**
Do you give EBF for your baby often	16(8.4)	9(4.7)	14(7.3)	136(71.2)	16(8.4)
Do you practice EBF regularly	12(6.3)	8(4.2)	1(0.5)	161(84.3)	9(4.7)
Do you practice EBF as time permit	61(31.9)	15(7.9)	2(1.0)	96(50.3)	17(8.9)
Did you believe that EBF must practice in the society/community	12(6.3)	11(5.8)	8(4.2)	149(78.0)	11(5.8)
Did EBF give you self	25(13.1)	8(4.2)	12(6.3)	137(71.7)	9(4.7)
Do you undergo any training about EBF practice	23(12.0)	23(12.0)	11(5.8)	121(63.4)	13(6.8)
Can recommend EBF to any woman at al	34(17.8)	11(5.8)	17(8.9)	116(60.7)	13(6.8)

The empirical findings presented in Table 2 outline the actual practice of Exclusive Breastfeeding (EBF) among nursing mothers within Akoko-Edo Local Government Area. The statistical data demonstrates that all 7 items evaluated achieved mean scores well above the baseline criterion threshold of 2.50, indicating high compliance. Item 2 yielded the highest individual mean score ($\bar{X} = 3.80$), with 84.3% of the respondents strongly agreeing that they practice EBF regularly. Conversely, Item 3 recorded the lowest relative mean score ($\bar{X} = 3.12$), indicating that while mothers practice EBF as time permits, they lean more heavily toward structured regularity.Overall, the cumulative Grand Mean score of 3.52 significantly outstrips the criterion mean threshold of 2.50.

Consequently, the corresponding research question is answered in the affirmative. The data confirms that nursing mothers in Akoko-Edo Local Government Area do not merely possess knowledge of Exclusive Breastfeeding, but actively maintain a high, consistent, and recommendable level of actual EBF practice.

Discussion of Findings

The study reveals that 73.8% of the nursing mothers have high level of Knowledge of breastfeeding, 84.3% strongly agreed that exclusive breastfeeding is the way of introducing nutritious food to the baby, 50.3 % strongly agreed that EBF is used to fight against any disease and 79.6% strongly agreed that EBF determine growth and development of a baby.

This similar toa study conducted in Medina, Saudi Arabia found that out of 360 participants, 60.6% had good knowledge of breastfeeding and its benefits (Ahmed et al., 2018). Another study in Ethiopia showed that 49.3% of the nursing mothers had good knowledge about exclusive breastfeeding (Tadesse & Alemayehu, 2019). Also similar is a study in Uganda showed that 81.4% of the nursing mothers had good knowledge about exclusive breastfeeding (Mugisha et al., 2019). Similarly, a study in Ethiopia revealed that although 86.6% of the nursing mothers had good knowledge about exclusive breastfeeding, only 45.4% practiced it (Tariku et al., 2020).

The results also show that the nursing mothers have a high level of practice as 71.2% respondent strongly agreed that they give EBF to their baby often, 84.3% they practice EBF regularly, 50.3% strongly agreed that they practice EBF as time permit and 78.0% strongly agreed that they believe that EBF must practice in the society/community.

Similar to the study of Bolanle (2018), reported that a high level of practice among the mothers in his study. The result from the study of Moore, et al, (2019), indicated that the respondent had good practice of breastfeeding. Good level of practice was recorded from the study of Duong, et al.(2020) and Goyale, et al. (2020). In the study of Adesanmi, (2022), above 80% of the respondents affirmed a high level of practice of breastfeeding.

Conclusion

Based on the empirical findings and comparative literature analyzed in this study, it is concluded that nursing mothers in Akoko-Edo Local Government Area possess an exceptionally high level of knowledge regarding the concepts, nutritional importance, and developmental benefits of Exclusive Breastfeeding (EBF). Unlike trends observed in some

developing regionswhere high knowledge does not automatically translate into behavioral compliance, the nursing mothers in this study demonstrate a commendably high level of actual EBF practice, marked by regularity and strong societal conviction.

However, a critical nuance emerges: while general awareness of nutrition and growth is near-universal, knowledge regarding the specific immunological/disease-fighting properties of breast milk is comparatively lower (50.3%). Furthermore, half of the mothers indicate that they practice EBF "as time permits," highlighting underlying structural and time-management constraints. Ultimately, while EBF is highly accepted and actively practiced within Akoko-Edo, there remains a vital need to reinforce targeted immunological education and establish structural support systems to help mothers maintain strict EBF schedules.Based on the findings of this study, the following recommendations were made:

i. Government should make laws that will enforce all organization to allow mothers to go on compulsory 6 months' maternity leave post-delivery.
ii. Increase knowledge and compliance, more general awareness on exclusive breast feeding should be created on special media, mass media and organizations of seminars
iii. There should be constant training/awareness on the importance of EBF
iv. Primary Health Centers (PHCs) within the local government area should institutionalize neighborhood-based "EBF Support Networks." Through these structural frameworks, veteran nursing mothers who have successfully maintained the six-month exclusive breastfeeding regimen can be deployed as peer mentors to guide, counsel, and support primigravida (first-time pregnant) women and adolescent mothers within their immediate localities.
v. To ensure that high prenatal knowledge translates into practice, local health facilities must implement proactive postnatal monitoring systems. Facility matrons should establish dedicated tracing logs and automated phone call schedules to routinely evaluate the progress of nursing mothers at the vital intervals of 2 weeks, 6 weeks, 3 months, and 6 months postpartum.
vi. Advocacy should be extended directly to local traditional rulers, community leaders, and religious institutions across Akoko-Edo. Incorporating EBF advocacy into community town hall meetings and religious gatherings will help dismantle lingering cultural myths regarding pre-lactal feeds (like water or herbal concoctions) and secure male/spousal support for nursing mothers.

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