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'My mother said it is not good, so I poured that one away': mixed methods study on breastfeeding perceptions and practices in Ghana's urban slums

Edward Akolgo Adimazoya[1,3*], John Kumuuori Ganle[2†], Emmanuel Asampong[1†], Franklin Glozah[1†] and Philip Baba Adongo[1†]

Abstract

Background The World Health Organization recommends immediate breastfeeding (putting the child to the breast within one hour) after birth and exclusive breastfeeding to give the newborn a healthy start. This paper examined breastfeeding knowledge and practices in two urban slums in Accra, Ghana.

Methods The data used for this paper comes from a concurrent mixed -methods cross - sectional study conducted from January-June, 2020. The quantitative survey was conducted among 279 randomly sampled mothers aged 15–49 years with neonates 0–28 days old. 14 focus group discussions and 13 in-depth interviews were conducted with women of reproductive age with newborns aged 0–28 days, slum based traditional birth attendants, care givers, community leaders, and public health managers purposively sampled. Descriptive analyses was conducted to describe breastfeeding practices. Bivariate and multiple logistic regression analyses were used to assess factors associated with breastfeeding. Qualitative interviews were tape-recorded, transcribed, coded, and analyzed thematically.

Results Overall, only 47.1% (131/279) of mothers'-initiated breastfeeding within the first hour after delivery. Pre -lacteal feeding within the first three days and twenty-eight days was low at 16.8% (47/279). Mode of delivery was significantly associated with the type of pre-lacteals given to newborns in the first three days ($p=0.002$) and the first 28 days ($p=0.001$) after birth. About 94% (258/273) of mothers surveyed demonstrated poor breastfeeding knowledge and skills in positioning and attachment. The desire to maintain a positive body image among younger mothers affected the duration of breastfeeding. Several myths and misconceptions affect mothers' self-efficacy to successfully breastfeed. Mothers of newborns who initiated breastfeeding for the first time within an hour after birth

†John Ganle, Emmanuel Asampong, Franklin Glozah and Philip Adongo contributed equally to this work.

*Correspondence:
Edward Akolgo Adimazoya
edward.adimazoya@wiuc-ghana.edu.gh; eadimazoya@gmail.com

Full list of author information is available at the end of the article

and between 1 and 3 h after birth (AOR: 3.16, 95% CI: 1.08,9.27) were less likely to report illness in their newborns compared to those that initiated breastfeeding 4 h or more (AOR: 5.02, 95% CI: 1.49,16.87) after delivery.

Conclusion Breastfeeding in Ghana's urban slums is suboptimal. A combination of demographic, socio-cultural, and behavioural factors affect optimal breastfeeding in the slums. Improving timely initiation and exclusive breastfeeding in Ghana's urban slums requires addressing these modifiable socio- behavioural variables and strengthening ANC services.

Keywords Neonate, Exclusive breastfeeding, Early initiation of breastfeeding, Colostrum, Pre-lacteal

Background

The first month of life is the most vulnerable period for newborn survival, with 2.4 million newborns dying in 2020 [1]. In 2020, nearly half (47%) of all under five deaths occurred in the neonatal period (i.e. the first 28 days of life), an increase from 1990 (40%) [1, 2].

Despite investments in interventions to reduce neonatal morbidity and mortality, progress has been especially slow in sub-Saharan Africa, where the risk of dying within the first 28 days after birth for newborns is ten times higher compared to high income countries [3–5]. The first 28 days of an infant's life is crucial, because of vulnerability to infections and illnesses linked to delivery and adaptation of the newborn from uterine to ex-utero life [6].

In 2001, the World Health Organization (WHO) recommended immediate breastfeeding within one hour after birth and exclusive breastfeeding from birth until six months of age for all newborns [1, 7, 8].Substantial evidence exists confirming clear short-term benefits of breastfeeding for newborns' through reduced illness and death from infectious diseases [9], long-term benefits for the infants [10, 11], their mothers and the communities [12].

Breastmilk is a natural and reliable food for newborns. It contains antibodies that protect babies from illnesses [13]. Globally, breastfeeding has been shown to have a strong protective effect on mortality, with exclusively breastfed infants having only 12% risk of death compared with non-breastfed infants [14]. Systematic reviews have shown that optimal breastfeeding practices prevent child morbidity due to diarrhea, respiratory infections and otitis media [14]. Available evidence also suggests that breastfeeding enhances human capital by increasing intelligence, preventing breast and ovarian cancer, and diabetes in lactating mothers, and potential beneficial effects on overweight and diabetes in breastfed children [15, 16]. It is estimated that sub - optimal breastfeeding accounts for about 16% of global child deaths annually [1, 13]. Despite these benefits, current data suggest that only 45% of babies begin breastfeeding within the first hour after birth, globally and only two out of five children under six months are exclusively breastfed [16, 17]. In 2015, the World Health Assembly set a global target of 50% EBR by 2025.

Recent data from Ghana suggests that early initiation of breastfeeding may have an impact on neonatal mortality [18]. Infants who initiated breastfeeding within 24 h of birth were significantly less likely to die in the neonatal period than those who were initiated after 24 h [19]. According to the Ghana Demographic and Health Survey (GDHS, 2022) exclusive breastfeeding among children aged 0–5 months rose from 2% in 1988 to a peak of 63% in 2008, but declined to 52% in 2014, and increased slightly to 53% in 2022 [19]. Many socio-cultural beliefs and norms have been blamed for sub optimal breastfeeding practices and low rates of early initiation and EBF in Ghana, including beliefs about colostrum being dirty and must be discarded among some ethnic groups [20, 21].

Over the last decade, Ghana experienced rapid urbanization, resulting in the spread of slums across major cities. It is estimated that 39.7% of the 5.4 million urban population in Ghana are now residing in slums [22]. Neonatal health outcomes are even worse in resource poor urban slums [23, 24]. Most slums lack adequate health infrastructure, improved water, sanitation, hygiene, and durable housing posing risks to newborn morbidity and challenges for optimal breastfeeding among lactating mothers [23, 24]. In 2018, the Ashaiman Municipality and the Ashiedu-Keteke Sub Metropolitan areas, two large urban slums recorded neonatal mortality rates that were higher than the national average of 25 deaths per thousand live births [25, 26]. The Government of Ghana recognizing the challenge of the high neonatal mortality burden launched several pro newborn initiatives including the Ghana National Newborn and Child Health Advocacy and Communication Strategy (2015–2019), the Ghana National Newborn Health Strategy and Action Plan (2019–2023) and the Ghana National Infant and Young Child Feeding Policy 2019–2024.

Despite these initiatives, neonatal mortality marginally declined from 29/1000 live births in 2014 to 17/1000 live births in 2022 [19], clearly suggesting an urgent need for research into the contributory factors fueling the high neonatal deaths. Newborns are especially vulnerable in urban slum neighborhoods due to the overcrowding, insanitary and poor housing conditions that characterize

these areas. Yet, the few studies conducted in slum neighborhoods thus far have focused on the social and economic vulnerabilities rather than population health [27, 28] neglecting maternal newborn and child health. Therefore, this study aimed to assess the breastfeeding knowledge, perceptions and practices in two large urban slums in the southern part of Ghana.

Methods

Study design and population

The data used for this paper comes from a concurrent mixed methods cross sectional study. The quantitative survey was conducted among 279 mothers aged 15–49 years with live neonates 0–28 days old. The qualitative study was conducted among women of reproductive age with live newborns aged 0–28 days, slum based traditional birth attendants who delivered a live baby between 1 January and 30 June 2020, care givers, community leaders and public health managers at national and sub national level.

Study area and sampling

The study was conducted in two large urban slums (Ashaiman and Sodom and Gomorrah) in Accra. These slums are similar, ethnically diverse, mostly poor, barely educated and generally unemployed. Their residents are mostly engaged in odd, non-permanent jobs including female head porterage popularly called Kayayei. They also have poor access to healthcare. The sample for the quantitative survey was 279 women of reproductive age 15–49 years with live births 0–28 days old, who resided in either Ashaiman or Sodom and Gomorrah for at least a year prior to recruitment. Women whose babies did not survive 28 days were excluded. Mother-baby pairs recruited for the qualitative research were also excluded from the survey and vice versa to avoid potential bias and confounding of the findings.

We conducted a household survey of newborn mother pairs using multi-stage stratified simple random sampling. The 2010 Ghana Population and Housing Census (PHC) [29] formed the sample frame. According to the 2010 PHC, the average size of urban enumeration areas (EAs) is (185 households); slightly larger than the average size of rural EAs (114 households) [29]. The sampling frame contained information about the EA's location, type of residence and estimated number of residential households. In each study location, we randomly sampled twenty (20) EAs of clusters of slum settlements, giving a total of 40 EAs. Given that the average size of an urban EA is 185 households, sampling 20 EAs in each study location was sufficient to obtain at least 140 respondents from each site.

In the second stage, a household listing was carried out in all selected EAs to identify women with newborn mother pairs that met the study inclusion criteria. The results of the household listing in each EA subsequently served as a sampling frame for selecting individual respondents in the third stage. A community level enumeration of all women with newborns aged 0–28 days was undertaken using a simple Enumeration Tool. The tool comprised basic information of the participants' name, community, length of stay in the slum, contact number, house address, and whether the woman had a live newborn aged 0–28 days old. Following the identification and enumeration of potentially eligible women and newborns in each EA, we further screened to eliminate mothers who did not meet the study's inclusion criteria after which a register of all eligible respondents in each EA was created [28].The total sample size of 280 was proportionately allocated among the twenty EAs in each study site ensuring that EAs with higher numbers of potentially eligible respondents were sampled more into the survey. Each of the potentially eligible respondents in each EA was given a unique number identifier (e.g., 001 … 00n). The numbered lists were exported into a google-based random number generator programme, where the required number of participants from each study location were randomly selected. Participants who were literate were given a participant's information sheet to help them make an informed decision. Non-literate participants received explanation about the study from trained research assistants in a language that they understood.

For the qualitative arm, we conducted 14 focus groups comprising 108 females and 17 males (8–10 per group) and 13 in-depth interviews following guidelines proposed by Guest et al. and Francis et al. [30, 31] including observation. Recruitment of participants for focus groups and in-depth interviews was purposive, and continued until saturation was reached on major issues that the qualitative component explored [32, 33]. We used the homogenous, expert and maximum variation or heterogenous purposive sampling methods [34] to select participants.

Instruments and data collection

The quantitative data were collected electronically on mobile android devices using the Computer Assisted Personal Interview (CAPI). CAPI is a dependable telemetry device that transmits data to a base station's computer. The data management software (Datacol) facilitated real time data collection. The Datacol application was used to capture and transfer the data to an online central data storage server for live data monitoring, data cleaning and analysis. Data collection was based on an interviewer assisted questionnaire. Upon successful completion of an interview, the data was saved on the mobile device and a new questionnaire automatically opened up for the next interview. The data was collected by trained professional nurses and midwives.

Qualitative data were collected using semi -structured open ended interview guides. Discussions in the FGDs lasted between thirty minutes and 1 h. All discussions were conducted in one of three local dialects *Twi*, *Ewe and Dagbani* depending on the dialect that was mostly spoken and understood by the participants. The in-depth interviews lasted between forty-five minutes and one hour. Discussions and interviews were tape-recorded and notes were taken to document observations about the interview content, the participants and the context.

Prior to data collection, all data collection tools were pre-tested and refined based on the pre-test results. We also trained two supervisors and ten data collectors from January 2–4, 2020. The training offered a hands-on approach on use of the Datacol application, interviewing skills, interpretation of the questions, response categories and anthropometry. The training also covered skills in diagnosing neonatal sepsis, diarrhea, acute respiratory tract infections (ARI), ethics and compliance with research issues on human subjects.

Variables

The primary outcome variables considered included appropriate breastfeeding practices (Timely initiation of the first breastfeed within an hour after birth, exclusive breastfeeding within the first three days and 28 days after delivery i.e. baby is fed only breastmilk, (except vitamins/medicines) but did not receive any other foods, liquid (s) pre-lacteals, concoctions during the first three days and the first twenty-eight days after birth, knowledge of fore and hind milk, and good breastfeeding skills (i.e. proper positioning and attachment).The independent variables included socio-demographics; maternal age, marital status, education, ethnicity, religion, parity, sex of newborn, occupation of mother, socioeconomic status, wealth quintile, mothers age at birth, migration status, ANC attendance, timing of first ANC visit, skilled delivery, home or facility delivery and delivery type, caesarean or normal.

Analysis

The quantitative data set was exported to SPSS version 25.0 for cleaning and generation of derived variables using Stata IC Version 16. Data analysis was done in three stages - descriptive statistics, bivariate and multi-variable logistic regression. Socio-demographic background characteristics and categorical variables were described using frequencies, and percentages. The mean, standard deviation, median and inter-quartile range were used as summary statistics for normally distributed continuous and skewed variables.

In bivariate analysis, various outcome variables were described across independent variables using frequencies and percentages, while the Pearson's chi - square test was performed to assess the significance of association between categorical independent variables and categorical outcome variables. The Fischer's exact test was used to assess associations in situations where the assumptions of the Pearson's chi-square test was violated. A simple binary logistic regression model was used to estimate the crude odds ratios of the outcomes across all the independent variables at 95% confidence interval. A multiple binary logistic regression model was then used to estimate the adjusted odds ratios and their corresponding confidence interval. To select variables into the final adjusted regression model, all variables that had overall p-values of 0.200 and below were first fitted together in a single model. Afterwards, any variable with a p-value greater than 0.3000 was dropped. This step was carried out in an iterative process until the model no longer had a variable with a p-value above 0.300. This process allowed for a reduction of the number of variables in the model to avoid over-fitting and multicollinearity, as well as underfitting. In the final model, all variables with p-values below 0.05 were considered statistically significant.

The qualitative data were analyzed thematically. This involved a number of steps. The audio recordings were transcribed verbatim in the local languages, and translated into English. Back translations were done on selected transcripts to check the accuracy of the translations and to verify inconsistencies. All the transcripts and interview notes were read and reviewed thoroughly, and notes made on hard copies of the transcripts. A preliminary coding structure and code book was developed which led to the next phase. In the second phase, we exported all the transcripts into NVivo 12.x64 windows, where the data were both deductively and inductively coded. Data coding continued until theoretical saturation was reached (i.e., where no new concepts emerged from successive coding of the data). The completed code structure was then applied to develop and report themes with verbatim quotes.

Results

Sociodemographic characteristics of survey respondents

Table 1 shows the essential characteristics of the survey respondents. The age of the mothers of newborns ranged from 15 to 45 years. The mean age of the mothers was 28.1 ± 6.0 years, while the median age was 28.6 years. The majority 56.3% (157/279) of the mothers were aged 25–34 years. More than two-thirds of the mothers were married 60.9% (170/279). In terms of education, 30.5% (85/279) had no formal education, indicating a relatively poor status of maternal education in both slums. In terms of religion, approximately 75% (209/279) were Christians, whereas 19.7% (55/279) were in the poorest wealth quintile. Furthermore, 46.2% (129/279) of the respondents said they travelled distances between 1 and 2 km to the

Table 1 *Sociodemographic* characteristics of survey respondents ($n = 279$)

Characteristic	Ashaiman, *n* (%)	Sodom & Gomorrah, *n* (%)	Total, *n* (%)
N	135	144	279
Age of new-born mother, mean ± SD	29.4 ± 5.9	26.8 ± 5.8	28.1 ± 6.0
Age group of new-born mother			
<25 years	30 (22.2)	52 (36.1)	82 (29.4)
25–34 years	77 (57.0)	80 (55.6)	157 (56.3)
35–44 years	28 (20.7)	12 (8.3)	40 (14.3)
Marital status			
Currently married	88 (65.2)	82 (56.9)	170 (60.9)
Cohabiting	35 (25.9)	38 (26.4)	73 (26.2)
Not in union	12 (8.9)	24 (16.7)	36 (12.9)
Highest level of education of mother of newborn			
No Formal Education	42 (31.1)	43 (29.9)	85 (30.5)
Primary	17 (12.6)	43 (29.9)	60 (21.5)
Middle School/JHS/JSS	44 (32.6)	43 (29.9)	87 (31.2)
Senior High School/SSS/VOC/TECH	26 (19.3)	14 (9.7)	40 (14.3)
Tertiary	6 (4.4)	1 (0.7)	7 (2.5)
Occupation			
Casual Labourer	7 (5.2)	25 (17.4)	32 (11.5)
Petty Trader	75 (55.5)	31 (21.5)	106 (38.0)
Student	3 (2.2)	- (0.0)	3 (1.1)
Salaried Worker	8 (5.9)	35 (24.3)	43 (15.4)
Housewife/Homemaker	17 (12.6)	- (0.0)	17 (6.1)
Apprentice	4 (2.9)	- (0.0)	4 (1.4)
Artisan	17 (12.6)	47 (32.6)	64 (22.9)
Kayayei	4 (2.9)	3 (2.1)	7 (2.5)
Parity median (IQR)	2.0 (1.0, 3.0)	2.0 (1.0, 3.0)	(1.0, 3.0)
1	44 (32.6)	51 (35.4)	95 (34.1)
2	46 (34.1)	42 (29.2)	88 (31.5)
3	30 (22.2)	33 (22.9)	63 (22.6)
>3	15 (11.1)	18 (12.5)	33 (11.8)
Length of stay at current location			
1 year	15 (11.1)	20 (13.9)	35 (12.5)
2–5 years	72 (53.3)	72 (50.0)	144 (51.6)
>5 years	48 (35.6)	52 (36.1)	100 (35.8)
Religion			
Christian	111 (82.2)	98 (68.1)	209 (74.9)
Muslim	20 (14.8)	42 (29.2)	62 (22.2)
Other religion	4 (3.0)	4 (2.8)	8 (2.9)
Ethnicity			
Akan	45 (33.3)	29 (20.1)	74 (26.5)
Ga/Dangme	19 (14.1)	52 (36.1)	71 (25.4)
Ewe	44 (32.6)	15 (10.4)	59 (21.1)
Mole Dagbani	7 (5.2)	14 (9.7)	21 (7.5)
Others	20 (14.8)	34 (23.6)	54 (19.4)
Wealth index quintiles			
Poorest	12 (8.9)	43 (29.9)	55 (19.7)
Poorer	17 (12.6)	39 (27.1)	56 (20.1)
Middle	25 (18.5)	31 (21.5)	56 (20.1)
Richer	36 (26.7)	20 (13.9)	56 (20.1)
Richest	45 (33.3)	11 (7.6)	56 (20.1)
Distance to nearest health facility			
1–2 km	85 (63.0)	44 (30.6)	129 (46.2)

Table 1 (continued)

Characteristic	Ashaiman, *n* (%)	Sodom & Gomorrah, *n* (%)	Total, *n* (%)
3–5 km	39 (28.9)	74 (51.4)	113 (40.5)
>5 km	11 (8.1)	26 (18.1)	37 (13.3)

nearest health facility to access Maternal, Newborn and Child health (MNCH) services, whereas approximately 40.5% (113/279) reported a distance of 3–5 km. In terms of occupational status, approximately 38% (106/279) reported being petty traders, 22.9% (64/279) were artisans, and 15.4% (43/279) reported that they were salaried workers. Approximately 3% (7/279) were head porters *(Kayayei)* (Table 1).

Table 2 also shows the maternal characteristics of the survey respondents. The majority 76.3% (213/279) received antenatal care (ANC) for their most recent pregnancy from a public health facility. However, 11.0% (31/279) of the respondents never accessed ANC for their most recent birth. More than half of the respondents 51.6% (144/279) accessed ANC services in the second trimester, whereas two-thirds achieved 4 + ANC visits. Nearly a quarter of the respondents 27.2% (76/279) did not receive tetanus toxoid injections; a similar proportion 24.7% (69/279) did not receive SP/Fansidar, whereas more than a quarter 33.3% (93/279) did not receive iron folate tablet supplementation prior to delivery of their recent birth. Approximately 26% (73/279) and 25% (70/279) were not counselled on newborn danger signs and birth preparedness, respectively, prior to delivery of their most recent birth. In terms of delivery, the majority 79.9% (223/279) delivered in a public facility, 64.2% (179/279) were delivered by skilled attendants, and the majority 95.3% (266/279) had spontaneous vaginal delivery.

With respect to the characteristics of the newborns (not shown), there were slightly more male neonates 52.3% (71/135) in Ashaiman than in Sodom & Gomorrah 47.9% (69/144). Additionally, 63.4% (177/279) of the newborns were aged 7–28 days (late neonates). Again, 85.7% (239/279) of the newborns were vaccinated at birth. Among those neonates who were immunized, 86.4% (241/279) were vaccinated against BCG, whereas 77.4% (216/279) were immunized against poliomyelitis. Approximately one-third 30.5% (85/279) were of low birth weight (i.e., weighing less than 2.5 kg at birth), prior to discharge from the facility. Approximately 74.6% (208/279) newborns were not weighed within 48 h after birth, and 42.7% (119/279) were not counselled on breastfeeding within 48 h after discharge from the health facility (Table 2).

Characteristics of qualitative research participants

For the qualitative research participants, Table 3 shows the essential characteristics of the participants. The ages of the qualitative sample ranged from 15 to 70 years, with approximately 52.2% (72/138) being in the modal age range of 25–34 years. With respect to education, the majority 53.6% (74/138) had no formal education, and only 9.4% (13/138) had tertiary education. Approximately 53.6% (74/138) were currently married, whereas 87% (120/138) were female. With respect to religion, approximately 56.5% (78/138) were Christian, 30.4% (42/138) were Muslim, and 13.1% (18/138) had other faiths (Table 3).

Breastfeeding practices

Of the 279 mothers surveyed, majority 97.8% (273/279) reported ever breastfeeding with only 2.2% (6/279) of the mothers reporting that they had never breastfed their babies. Majority 91.7% (255/279) fed their newborns colostrum. The main reasons why colostrum was not given to the baby included beliefs about it being harmful to the baby, ignorance about the benefits of colostrum to the newborn and the lack of breastmilk or no breastmilk secretion after delivery. However, only 47.1% (131/279) initiated breastfeeding immediately (less than one hour) after delivery with as many as 37.4% (104/279) and 15.5% (43/279) initiating breastfeeding 1–3 h and 4 h and beyond against the WHO recommendation of timely initiation of breastfeeding within an hour after birth.

In FGDs, perceptions about colostrum were mixed. While majority of the mothers argued that colostrum is good, a few reported that they felt it was dirty and should be discarded. One participant said:

> *They said it is very good. When you look at the black nipples, the first day the baby will go to toilet, it comes black. So, I think it is because of the black nipples that the baby sucked that has made the baby pass out that stool; that is why they said it is very good (FGD Participant, Ashaiman).*

Another participant said:

> *First, people were saying it is not good …my mother said it is not good, so I poured that one away before giving the breast to the baby (FGD Participant, Ashaiman).*

Table 2 Maternal characteristics of the respondents

Characteristics	Ashaiman, *n* (%)	Sodom & Gomorrah, *n* (%)	Total, *n* (%)
N	135	144	279
Place received antenatal care during most recent birth			
No ANC visit	20 (14.8)	11 (7.6)	31 (11.1)
Public facility	98 (72.6)	115 (79.9)	213 (76.3)
Private facility	17 (12.6)	18 (12.5)	35 (12.5)
Gestational age at first ANC visit			
No ANC visit	20 (14.8)	11 (7.6)	31 (11.1)
1st trimester	28 (20.7)	65 (45.1)	93 (33.3)
2nd trimester	86 (63.7)	58 (40.3)	144 (51.6)
3rd trimester	1 (0.7)	10 (6.9)	11 (3.9)
Number of ANC visits during most recent birth			
No ANC	20 (14.8)	11 (7.6)	31 (11.1)
1–4	15 (11.1)	40 (27.8)	55 (19.7)
4+	100 (74.1)	93 (64.6)	193 (69.2)
Number of tetanus injections received during most recent pregnancy			
None	37 (27.4)	39 (27.1)	76 (27.2)
1 injection	39 (28.9)	57 (39.6)	96 (34.4)
2 + injections	59 (43.7)	48 (33.3)	107 (38.4)
Number of SP/Fansidar taken during most recent pregnancy			
None	33 (24.4)	36 (25.0)	69 (24.7)
1–2 tablets	6 (4.4)	32 (22.2)	38 (13.6)
3 + tablets	96 (71.1)	76 (52.8)	172 (61.6)
Took Iron Folate Tablet Supplementation during most recent pregnancy			
Yes	91 (67.4)	95 (66.0)	186 (66.7)
No/Don't know/Don't remember	44 (32.6)	49 (34.0)	93 (33.3)
Received counselling on pregnancy and new-born danger signs during most recent pregnancy from health professional			
Yes	102 (75.6)	104 (72.2)	206 (73.8)
No/Don't know/Don't remember	33 (24.4)	40 (27.8)	73 (26.2)
Received counselling on birth preparedness and facility delivery during most recent pregnancy from health professional			
Yes	103 (76.3)	106 (73.6)	209 (74.9)
No/Don't know/Don't remember	32 (23.7)	38 (26.4)	70 (25.1)
Place of delivery			
Home delivery	20 (14.8)	20 (13.9)	40 (14.3)
Public health facility	104 (77.0)	119 (82.6)	223 (79.9)
Private health facility	11 (8.1)	5 (3.5)	16 (5.7)
Had skilled delivery			
Yes	88 (65.2)	91 (63.2)	179 (64.2)
No	47 (34.8)	53 (36.8)	100 (35.8)
Delivered by caesarean section			
Yes	9 (6.7)	4 (2.8)	13 (4.7)
No	126 (93.3)	140 (97.2)	266 (95.3)
Length of stay at health facility after delivery			
None facility delivery	20 (14.8)	20 (13.9)	40 (14.3)
<24 h.	22 (16.3)	29 (20.1)	51 (18.3)
24–71 h.	56 (41.5)	43 (29.9)	99 (35.5)
72 + hrs.	24 (17.8)	38 (26.4)	62 (22.2)
Don't know/Don't remember	13 (9.6)	14 (9.7)	27 (9.7)
Mother counselled on breastfeeding in first 48 h after birth			
Yes	75 (55.6)	85 (59.0)	160 (57.3)

Table 2 (continued)

Characteristics	Ashaiman, *n* (%)	Sodom & Gomorrah, *n* (%)	Total, *n* (%)
No	60 (44.4)	59 (41.0)	119 (42.7)
Child weighed again within the first 48 h of birth			
Yes	57 (42.2)	14 (9.7)	71 (25.4)
No	78 (57.8)	130 (90.3)	208 (74.6)
Mother counselled on new-born danger signs that require immediate care from health facility			
Yes	47 (34.8)	19 (13.2)	66 (23.7)
No	88 (65.2)	125 (86.8)	213 (76.3)
Received postnatal checks in first 48 h of birth			
Yes	119 (88.1)	125 (86.8)	244 (87.5)
No	16 (11.9)	19 (13.2)	35 (12.5)

Table 3 Characteristics of qualitative research participants

Characteristics	National *n* (%)	Ashaiman *n* (%)	Sodom & Gomorrah *n* (%)	Total *n* (%)
N	2	65	71	138
Age of qualitative participants mean ± SD		29.4 ± 5.9	26.8 ± 5.8	28.1 ± 6.0
Age group of participants				
<25	-	17 (26.1)	22 (31.0)	39 (28.2)
25–34	-	35 (54.0)	37 (52.1)	72 (52.2)
35–44	-	4 (6.1)	3 (4.2)	7 (5.1)
45–54	-	4 (6.1)	4 (5.6)	8 (5.8)
55–64	1(50.0)	5 (7.7)	5 (7.1)	11 (8.0)
65–74	1(50.0)	– (0.0)	- (0.0)	1 (0.7)
Marital status				
Currently married	2 (100)	40 (61.5	32 (45.1)	74 (53.6)
Cohabiting	-	20 (30.8)	20 (28.2)	40 (29.0)
Not in union	-	5 (7.7)	19 (26.7)	24 (17.4)
Highest level of education		29 (44.6)	32 (45.1)	61 (44.2)
No Formal Education				
Primary	-	9 (13.9)	10 (14.1)	19 (13.8)
Middle School/JHS/JSS	-	8 (12.3)	9 (12.7)	17 (12.3)
Senior High School/SSS/VOC/TECH	-	13 (20.0)	15 (21.1)	28 (20.3)
Tertiary	2 (100)	6 (9.2)	5 (7.0)	13 (9.4)
Sex				
Male	1(50.0)	8 (12.3)	9 (12.7)	18 (13.0)
Female	1(50.0)	57 (87.7)	62 (87.3)	120 (87)
Religion				
Christian	2 (100)	37 (56.9)	39 (54.9)	78 (56.5)
Muslim	-	15 (23.1)	27 (38.0)	42 (30.4)
Other religion	-	13 (20.0)	5 (7.1)	18 (13.1)

For mothers who gave colostrum to their babies, some reported that they now understand that.

it is the first immunization for the baby; that is why it is medicine for the baby (FGD Participant, Sodom & Gomorrah).

> *They said it is medicine; and when you give it to the baby it helps the baby. They said it gives them strength. It makes them strong. It is medicine (FGD Participant, Sodom & Gomorrah).*

Although it was evident during qualitative interviews that mothers were receiving health talks on breastfeeding at prenatal and child welfare clinics, this education needed to be intensified. For instance, the data showed that exclusive breastfeeding (EBF) in the first three days after delivery and in the first 28 days after delivery 83.2% (232/279) was below an optimal level (see Table 4).

Table 4 Breastfeeding practices among slum-based mothers

Characteristics	Ashaiman	Sodom & Gomorrah	Total
N	135	144	279
Child ever breastfed			
Yes	135 (100.0)	138 (95.8)	273 (97.8)
No	0 (0.0)	6 (4.2)	6 (2.2)
Timing of first breastfeeding			
Immediately	74 (55.2)	57 (39.6)	131 (47.1)
1–3 h	42 (31.3)	62 (43.1)	104 (37.4)
4 + hours	18 (13.4)	25 (17.4)	43 (15.5)
Newborn fed with colostrum (Yellowish milk)			
Yes	123 (91.8)	132 (91.7)	255 (91.7)
No/Don't Know/Don't Remember	11 (8.2)	12 (8.3)	23 (8.3)
Child given drink other than breast milk in first three days			
Yes	26 (19.3)	21 (14.6)	47 (16.8)
No	109 (80.7)	123 (85.4)	232 (83.2)
Name of drink if given other than breast milk in the first 3 days (N = 47)			
Cow milk	3 (11.5)	0 (0.0)	3 (6.4)
Plain water	3 (11.5)	3 (14.3)	6 (12.8)
Gripe water	4 (15.4)	0 (0.0)	4 (8.5)
Infant formula	15 (57.7)	18 (85.7)	33 (70.2)
Others	1 (3.8)	0 (0.0)	1 (2.1)
Child given drink other than breast milk to drink in first 28 days			
Yes	26 (19.3)	21 (14.6)	47 (16.8)
No	109 (80.7)	123 (85.4)	232 (83.2)
Name of drink if given other than breast milk in the first 28 days (N = 47)			
Cow milk	3 (11.5)	0 (0.0)	3 (6.4
Plain water	2 (7.7)	3 (14.3)	5 (10.6)
Gripe water	5 (19.2)	0 (0.0)	5 (10.6)
Fruit juice	0 (0.0)	1 (4.8)	1 (2.1)
Infant formula	14 (53.8)	17 (81.0)	31 (66.0)
Honey	1 (3.8)	0 (0.0)	1 (2.1)
Others	1 (3.8)	0 (0.0)	1 (2.1)

In a bivariate analysis of maternal, neonatal characteristics, breastfeeding practice and illness occurrence, we found a statistically significant association between the timing of first breastfeeding and illness occurrence in the neonates. Specifically, the prevalence of neonatal illnesses (i.e. diarrhoea, cough, fever and/or acute respiratory infections) was 9.2% (12/131) among 131 neonates who were fed breastmilk immediately after birth compared to 18.3% (19/104) prevalence among 104 neonates who were breastfed 1–3 h after birth and 27.9% (12/43) prevalence among 43 neonates who were breastfed 4 or more hours after birth ($\chi^2 = 9.70$, $p = 0.008$) (Table 5).

From the bivariate analysis in Table 5, only one independent variable (i.e.; timing of first breastfeeding) was statistically associated with neonatal illness. To further determine the direction of the association, confounders were controlled for in a multiple logistic regression model and odds ratios were estimated. The results are shown in Table 6.

In a binary logistic regression model, newborns who were breastfed immediately after birth (i.e., less than an hour and prior to delivery of the placenta) were less likely than those who were breastfed 1–3 h after birth (COR: 2.22, 95% CI: 1.02, 4.81) and 4 or more hours after birth (COR: 3.84, 95% CI: 1.57, 9.37) to experience any neonatal illness.

After controlling for potential confounders in a multiple logistic regression model, the adjusted odds of illness occurrence were still significantly higher among those that delayed initiating breastfeeding until after 4 h or more (AOR: 5.02, 95% CI: 1.49,16.87), compared to newborns who were breastfed within an hour after birth and between 1 and 3 h after birth (AOR: 3.16, 95% CI: 1.08, 9.27).

In FGDs, one mother reported giving her newborn gripe water to assuage pain in the stomach.

> *First when the cord fell off, the baby was having stomach pain, so I used to buy Aunty Mary gripe water for the baby (FGD participant, Ashaiman).*

Table 5 Bivariate analysis of maternal, neonatal characteristics, illness and breastfeeding

	Total	No illness	Illness	Chi-square value	*P*-value
Characteristics	***N***	***n* (%)**	***n* (%)**		
N	279	235 (84.2)	44 (15.8)		
Age of newborns				χ = 1.11	0.293
1–6 days (Early Neonates)	102	89 (87.3)	13 (12.7)		
7–28 days (Late Neonates)	177	146 (82.5)	31 (17.5)		
Sex of newborn				χ = 0.13	0.723
Male	140	119 (85.0)	21 (15.0)		
Female	139	116 (83.5)	23 (16.5)		
Child received BCG vaccination at birth				χ = 0.92	0.336
Yes	241	205 (85.1)	36 (14.9)		
No	38	30 (78.9)	8 (21.1)		
Child received Polio vaccination at birth				χ = 0.66	0.417
Yes	216	184 (85.2)	32 (14.8)		
No	63	51 (81.0)	12 (19.0)		
Place of delivery				χ = 1.27	0.529
Home delivery	40	33 (82.5)	7 (17.5)		
Public health facility	223	190 (85.2)	33 (14.8)		
Private health facility	16	12 (75.0)	4 (25.0)		
Person assisted with delivery				χ = 3.21	0.073
Skilled birth attendant	179	156 (87.2)	23 (12.8)		
Unskilled birth attendant	100	79 (79.0)	21 (21.0)		
Delivered by caesarean section				Ψ	0.438
Yes	13	10 (76.9)	3 (23.1)		
No	266	225 (84.6)	41 (15.4)		
Timing of first breastfeeding				χ = 9.70	**0.008**
Immediately (Less than one hour)	131	119 (90.8)	12 (9.2)		
1–3 h	104	85 (81.7)	19 (18.3)		
4 + hours	43	31 (72.1)	12 (27.9)		
Exclusive breastfeeding practiced in first 28 days				χ = 0.49	0.486
Yes	47	38 (80.9)	9 (19.1)		
No	232	197 (84.9)	35 (15.1)		

χ: Pearson's chi-square test value. Ψ: Fischer's exact chi-square tests

Table 6 Logistic regression analysis of factors associated with illness occurrence in newborns

	Illness in the first 28 days among neonates					
	Total	**Ill**	**Unadjusted binary logistic regression model**		**Adjusted binary logistic regression model**	
Characteristics	***N***	***n* (%)**	**COR (95% CI)**	***P*-value**	**AOR (95% CI)**	***P*-value**
N	**279**	**44 (15.8)**				
Timing of first breastfeeding						
Immediately	131	12 (9.2)	1.00 (reference)		1.00 (reference)	
1–3 h	104	19 (18.3)	**2.22 (1.02, 4.81)**	**0.044**	**3.16 (1.08, 9.27)**	**0.036**
4 + hours	43	12 (27.9)	**3.84 (1.57, 9.37)**	**0.003**	**5.02 (1.49, 16.87)**	**0.009**

COR: crude odds ratio. AOR: adjusted odds ratio

Mothers reported giving other substances to their babies including cod liver oil, milk of magnesia, NAN and water. One mother reported that her landlord's wife gave her newborn baby water, as soon as she was discharged from hospital. Some mothers also reported that they were compelled to give water to their newborns because of "insufficient milk supply".

I know a neighbour who gave her neonate of two-weeks old water because the breastmilk was not coming. Some have more breast milk and some too nothing; you will give birth and within a week you press your nipple and you won't see anything. So, when you give it to the baby, then the baby will be crying (FGD participant, Sodom and Gomorrah, GAR).

Some of us when we give birth, we don't have breastmilk. It is not enough (FGD participant, Amuidjor Sub Municipal, Ashaiman).

Other reasons why mothers could not initiate breastfeeding early is related to mothers undergoing cesarean operation; if the mother was sick; and if there was sickness in the breast. Another important finding in this study is that some young girls refused to breastfeed because they did not want their breast to sag and make them unattractive to the opposite sex:

Some will say that they are young girls so they do not want their breast to sag, so when they give birth, they will not breastfeed the baby. The young girls feel that when they breastfeed the baby, the breast will not stand again like first (FGD participant, Ashaiman).
My little sister… when she delivered, she said that she will not breastfeed the baby because when she breastfeeds, her breast will be ugly, so she will not breastfeed the baby (FGD participant, Ashaiman).

Some mothers also explained that they are unable to breastfeed because of the kind of work that they do.

Like one of my aunties, she used to work at the office so when she gave birth, she could not take the baby to the office, so she pumps her breastmilk and put it in the fridge then they give to the baby (FGD participant, Tsinagber Sub Municipal, Ashaiman).

Community perceptions about breastfeeding

Community members had varied perspectives about breastfeeding. Community members believe that the kind of food, liquids and liquor consumed by mothers can cause illness in the newborn particularly when they are breastfeeding. One community leader opined that:

Some nursing mothers also smoke cigarettes, they smoke Indian hemp [cannabis sativa] and some consume alcohol while breastfeeding their newborn babies and I believe that this will worry the baby's brain (FGD participant, Community Leader, Sodom and Gomorrah).

Another issue affecting breastfeeding in slums is wet nursing of newborns. One community leader posited that:

Some mothers also leave their babies with other people while they go and work. They give the person some money to buy food for their babies. Some of these caregivers breastfeed the babies meanwhile that is not their own children. How will the baby grow well or know who the real mother is? (FGD participant, Community Leader, Sodom and Gomorrah).

Community members, while acknowledging the utility of breastmilk as the best food for the newborn, were also challenged with breastfeeding on demand and exclusively due to the nature of the work that mothers were engaged in. Some mothers indicated that they were educated about the importance of breastfeeding while attending prenatal services but could not follow the prescriptions because of demands of their work. This was more pronounced in Sodom and Gomorrah than in Ashaiman. For example, some mothers from both Sodom and Gomorrah and Ashaiman shared their perspectives on the reasons why some mothers breastfeed their babies for shorter durations.

The nurses taught us that as for breastmilk; it contains all the food or nutrients that the baby needs and so what you can do is to ensure that you are neat, you keep the baby neat and if that is done, God will protect you and your baby and then at 6 months you can now start giving solid food (FGD participant, Sodom and Gomorrah).
Some mothers also do not have time for their babies; some of these mothers are unemployed but they have no time to breastfeed their children (FGD participant, Community Leader, Sodom and Gomorrah).
Okay so for my third born, when I came home from the hospital, I had something on my nipple, they call it asram, the elders said that someone intended to hurt my baby with asram but it came to me rather. My nipple was swollen for almost one month and so when that happened, we had to give food (FGD participant, Niiman Sub Municipal, Ashaiman).

Mothers' knowledge and breastfeeding skills

To understand mother's knowledge and skills in breastfeeding, trained female professional nurses/midwives observed mothers while breastfeeding their newborns to assess their understanding of fore milk and hind milk as well as nipple suckling and proper positioning and attachment techniques using these four signs: chin touching breast, mouth wide open, lower lip turned outward and more areola visible above than below the mouth (Table 7).

Of the 273 mother-infant dyads that were observed, 94.5% (258/273) demonstrated poor breastfeeding knowledge. Mothers in both slums also demonstrated poor breastfeeding skills as manifested in improper positioning and attachment for effective breastfeeding. Of the 273 mothers assessed, 81.2% (108/133) in Ashaiman

Table 7 Mothers knowledge and skills on breastfeeding

Characteristics	Ashaiman	Sodom & Gomorrah	Total
N	133	140	273
Breastfeeding knowledge			
Good	10 (7.5)	5 (3.6)	15 (5.5)
Poor	123 (92.5)	135 (96.4)	258 (94.5)
Breastfeeding skills			
Good positioning and attachment	25 (18.8)	31(22.1)	56 (20.5)
Poor positioning and attachment	108 (81.2)	109 (77.9)	217 (79.5)

and 77.9% (109/140) in Sodom and Gomorrah were not breastfeeding properly.

Discussion

Immediate and exclusive breastfeeding has been found to be beneficial to infants and newborns. This study explored breastfeeding perceptions and practices in urban slums in the southern part of Ghana.

The study found equal proportions of male and female neonates with slightly more late neonates at 63.4% compared to early neonates. This finding contrasts with the study conducted in La Dadekotopon in Accra where more early neonates were observed [35].

In terms of vaccination, the study found higher rates of BCG at birth at 86% compared to poliomyelitis at 22.6%. The low vaccinations for poliomyelitis may be attributable to home deliveries, vaccine stockouts, or the inability of mothers to present their newborns' for polio vaccinations due to fear or other barriers. The findings confirm earlier studies that established gaps in immunisations nationally and in the Upper West region [36, 37].

The WHO recommends early initiation of breastfeeding (EIBF) for newborns within one hour after birth because it protects against newborn illnesses including gastro-intestinal diseases; aids in uterine contractions, expulses retained placenta and reduces postpartum hemorrhage [38, 39]. We found a high proportion of respondents, about 98% reported ever breastfeeding, yet only 47% reported putting their newborns to the breast within the first hour after birth, lower than the national average of 52% [19]. Delayed initiation of breastfeeding has been blamed for increasing the risk of neonatal morbidity and mortality [39, 40].

The findings in this study are similar to those reported in a study in Ethiopia where about 48.7% of respondents'-initiated breastfeeding within the first hour after birthing their infants [41]. The findings however contrasts with other studies in rural Ghana in Lawra and Sagnerigu, where higher levels of infants were initiated to breastfeeding within the first hour after birth at 97% and 72% respectively [37, 42]. The low levels of EIBF in this study may be attributable to inadequate caregiver knowledge and awareness of the benefits of immediate breastfeeding. The finding suggest that mothers in the urban slums of Accra are yet to fully appreciate the importance of immediate breastfeeding to newborns.

The respondents in this study are migrant itinerant headload porters popularly called "Kayayei" and petty traders. In an urban setting where survival is key, some mothers may have missed ANC sessions where talks on breastfeeding and counselling was provided to expectant and new mothers, hence the possible knowledge gaps.

In qualitative focus groups, we found that young mothers were concerned about their body shape, particularly the shape of their breast and thus were reluctant to initiate and sustain breastfeeding for longer durations. The motivation behind this behaviour stems from the fact that they do not want their breast to sag in order to remain attractive to the opposite sex. Important contextual variables such as supportive community norms, access to media and social support within the family and community are critical for improving breastfeeding outcomes. In the qualitative themes, we found favorable community norms supporting younger mothers to not breastfeed. Inadequate social support for sustained breastfeeding through social networks and mother support groups in the slums may be contributing to this trend. Desire to maintain a positive body image among young mothers were reported in studies in Northern Ghana [21] and elsewhere [13]. The finding in this study confirms the assertion that younger mothers are less likely than older women to initiate and sustain breastfeeding for longer durations [43, 44].

Exclusive breastfeeding for the first three days and twenty-eight days was 83.2% which suggests that the majority of respondents practiced exclusive breastfeeding as evidenced by other studies in Ghana [35, 45]. However, the findings contrasts with a study conducted in the urban slums of Anand Gujarat, India where low rates of exclusive breastfeeding was reported [46, 47].

The WHO recommends that newborns are fed colostrum, as the perfect food for newborns [8]. In this study, about 91.7% of respondent mothers reported giving colostrum to their newborns. It appears health education on colostrum feeding is yielding positive results. Similar findings were reported by Samayam & Krishna [48]. The findings however contrasts with a study in southern Ethiopia where colostrum was discarded by more than half of the respondents [49].

Another important barrier to optimal breastfeeding is pre lacteal feeding. Pre- lacteal feeding increases the risk of infections and hospitalizations in infants [50]. We found a prevalence of pre- lacteal feeding at (16.8%) which is higher than Ghana's national average of 15% [19], however, it compares with earlier studies in Ethiopia where prevalence of 20.6% of pre- lacteal feeding was reported [43]. The findings also compares with studies

conducted in Nepal [51] where a prevalence of 23.1% was reported; and in the Lawra district where a prevalence of 18.0% was observed [37]. Common pre- lacteals fed to newborns included cowmilk, gripe water, infant formula and plain water. Some reasons advanced for introducing pre- lacteals included insufficient breastmilk and the belief that breastmilk alone does not satisfy the newborn.

In a multiple logistic regression analysis, we found a significant association between breastfeeding and the occurrence of neonatal illness. The crude odds of a newborn that was fed breastmilk within an hour after birth was twice significantly less likely than those who were breastfed between 1 and 3 h after birth (COR: 2.22, 95% CI: 1.02, 4.81) to experience any neonatal illness and three times significantly less likely than those breastfed four or more hours after birth (COR: 3.84, 95% CI: 1.57, 9.37). We recommend that the Ghana Health Service should launch a comprehensive infant and young child feeding behaviour change campaign targeting urban slums.

Such a programme must have a strong component of capacity building for service providers in breastfeeding knowledge, skills and practice. This is important because of the existing knowledge gaps identified among caregivers and service providers. It is also recommended that stakeholders must tackle the reluctance of young mothers initiating and sustaining breastfeeding and work to improve the counselling skills of service providers through capacity building in lactation management. Young mothers should be prioritised for education and counselling on breastfeeding.

Conclusions

Overall, the findings were mixed. While EBF in the first 3 and 28 days after birth were high at 91.7% and 83.7% respectively, timely initiation of breastfeeding within the first hour after birth was low at 47.1%. Newborns who were breastfed for the first time within an hour after birth and between 1 and 3 h after birth were less likely to suffer from newborn illnesses compared to newborns whose initiation to breastmilk was delayed until after 4 h or more. Pre-lacteal feeding within the first three days and twenty-eight days was low at 16.8%. Mode of delivery was significantly associated with type of pre-lacteals given to the new-born babies in the first 3 days ($p = 0.002$) and the first 28 days ($p = 0.001$) after delivery. Several myths and misconceptions affect especially younger mother's self-efficacy, confidence and duration of breastfeeding.

Addressing social norms, gender, cultural beliefs and practices, myths and misconceptions that serve as barriers to early initiation and exclusive breastfeeding must be a critical part of breastfeeding promotion campaigns and strategies. It is recommended that the Ghana Health Service/Family Health Division should strengthen the "pregnancy school" concept to allow for peer learning and opportunities for older more experienced mothers to counsel younger less experienced mothers on the benefits of EIBF and EBF for six months. Strong emphasis must be placed on early ANC and completion of the recommended visits prior to delivery in order to benefit from health education on skilled delivery, immediate breastfeeding and exclusive breastfeeding.

Abbreviations

ANC	Antenatal Care
EIBF	Early Initiation of Breastfeeding
EBF	Exclusive Breastfeeding ENBC-Essential Newborn Care
FGD	Focus Group Discussion
GAR	Greater Accra Region
GDHS	Ghana Demographic and Health Survey
LBW	Low Birth Weight
MICS	Multiple Indicator Cluster Survey
SP	Suphurdoxine pyrimethamine
WHO	World Health Organisation

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Author contributions

EAA conducted the study, designed and developed the data collection tools, collected the data, and analyzed the results to prepare the draft manuscript. JKG, EA, FG, and PBA provided scientific advice on the study design, data collection, and analysis. All the authors read and approved the final version of the manuscript.

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Data availability

The dataset(s) supporting the conclusions of this article are available from the lead author upon request.

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the Ghana Health Service Ethics Review Committee registration number GHS–ERC: 024/05/19). The study was conducted in accordance with the terms of the Helsinki Declaration. All study participants either thumb printed or signed informed consent forms before participating in the study. All interviews were conducted in private rooms, whereas focus group discussions were held in open spaces in either churches or classrooms. All the participants were assured of confidentially. They were informed that participation was voluntary and that they could refuse to answer any sensitive question/s or withdraw from the study at any point without any consequences. All ethical protocols regarding the handling of newborn babies, such as weighing and temperature, were adhered to in accordance with the guidelines for research with human subjects.

Consent for publication

Not applicable.

Competing interests
The authors declare no competing interests.

Author details
[1]Department of Social and Behavioural Sciences, College of Health Sciences, School of Public Health, University of Ghana, Legon, Accra, Ghana
[2]Department of Population, Family and Reproductive Health, College of Health Sciences, School of Public Health, University of Ghana, Legon, Accra, Ghana
[3]Department of Nursing, School of Nursing and Midwifery, Wisconsin International University College, Accra, Ghana

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