Breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa

Dissertation Presented in Partial Fulfilment of the Requirements for the Degree of Master of Medicine in Family Medicine (MMed FamMed) at the University of Cape Town

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DECLARATION

By submitting this dissertation electronically, I – Dr. Ahmad Mahmoud A. Ashwehdi declarethat this thesis with title "**Breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa"** is being presented for the degree of Masters in Family Medicine.

I hereby affirm that this research work is solely my creation and that I am the only author. Except for any explicitly referenced or acknowledged contributions, I completedall aspects of this research independently. The University of Cape Town is free to reproduce and publish this work without violating any rights of third parties.

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Abstract

Background: Breastfeeding is important in supporting the normal growth and development of infants and young children. Evidence shows that breastfeeding is protective against infectious diseases such as upper and lower respiratory tract infections, gastrointestinal illnesses, and otitis media, during the infant period. South Africa has a low exclusive breastfeeding rate. Exclusive breastfeeding for the first six months is the best start for health and development. Adolescent pregnancy is detrimental to the health of mother and child and is a common public health problem worldwide. The identification of factors that promote or inhibit breastfeeding behavior is vitally important for the design of evidence-based policies and interventions. Despite the available knowledge of benefits of breastfeeding, this has not translated into practice in South Africa.

Objective: This study aimed to investigate breastfeeding knowledge, attitudes, and practices among adolescent mothers at Crossroads, Western Cape, South Africa.

Study- Design and Methods: An analytical cross-sectional study was conducted with 77 mothers aged between 16 and 19 years old, attending Crossroads Community Day Centre located in Mitchell's Plain sub-district, Western Cape. A skilled research assistant performed an in-person meeting with each mother in either English or isiXhosa. Closed-ended questions were used to gather information on socio-demographic characteristics, breastfeeding knowledge, attitudes, and practices.

Results: The study analyzed the breastfeeding practices and knowledge of 77 mothers, all of whom reported initiating breastfeeding. However, 31.5% reported discontinuation at the time of the interview. Almost sixty percent of the mothers in this study were unemployed. Most of mothers reported that healthcare workers emphasized the importance of breastfeeding and educated them on appropriate breastfeeding practices. However, only 52.8% of mothers practiced exclusive breastfeeding. Most mothers recognized the benefits of breastfeeding for their babies, including reduced respiratory infections (72.6%), increased intelligence (86.7%), and protection from allergies (94.8%). They also acknowledged benefits for themselves, such as preventing breast

engorgement (79.5%) and lowering the risk of breast cancer (50.0%). However, many mothers were unaware of the benefits of breastfeeding for child spacing (65.5%), and 56.8% of mothers lacked knowledge on breastfeeding and pre-pregnancy weight. The study found a statistically significant difference in mean knowledge scores for breastfeeding benefits to the baby and the mother.

Conclusion: The importance of breastfeeding in babies' lives has been established. However, in low-income communities such as Crossroads, knowledge of the benefits of breastfeeding was variable, and the majority did not practice exclusive breastfeeding. it is important to implement promotional and educational programs in these communities to increase awareness of the vital role of breastfeeding in ensuring optimal development of children.
Keywords: infant feeding practices, adolescent mothers, Crossroads

Breastfeeding knowledge, attitudes, and practices among adolescent mothers at Crossroads, Western Cape, South Africa

Background: Breast milk is naturally developed for infants and is the biologically natural way to feed infants.[1] Numerous studies have reported the importance of breastfeeding for both the mother and the infant.[2,3] Breastfeeding is essential for ensuring proper development and growth of infants.[4] Breastfeeding has been shown to reduce the risk of infectious disorders such as otitis media, gastroenteritis, and upper respiratory and lower respiratory tract infections in infants.[5,6] Immunological properties of breast milk are indicated in pre-term infants and very-low-birthweight infants, with some literature reporting evidence of breastmilk protection against respiratory symptoms and necrotizing enterocolitis.[7,8] Various other research has indicated a relationship between breastfeeding and cognitive development in children.[9] Systematic reviews report probable protection of breastmilk against inflammatory bowel disease (Crohn's disease and ulcerative colitis).[10]

The health benefits of breastfeeding to the mother are also well documented. Research indicates that breastfeeding is vitally important to protect against developing premenopausal and probably postmenopausal breast cancer.[11] Other studies indicate that hormonal changes associated with breastfeeding assist with recovery after childbirth and suppress maternal fertility, and the extent of recovery is dependent on the frequency, intensity, and duration of breastfeeding.[12] Two separate case-control studies by Tung et al. (2003) and Riman et al. (2002) indicated that breastfeeding may protect against ovarian cancer.[13,14]

According to the World Health Organization (WHO), Exclusive breast-feeding (EBF) is defined as infants consuming only breast milk, except for oral hydration solutions (ORS), drops or syrup. Literature reports that exclusive breastfeeding (EBF) for the first six months is the best start for health and development.[15] EBF forms part of a broader definition of optimal infant and young child feeding (IYCF) practices, which also include initiation of breastfeeding within the first hour and continued breastfeeding for two years with the introduction of safe, adequate, and appropriate complementary foods from six months.[16] Trend data suggests the prevalence of exclusive breastfeeding among infants younger than six months in lower income countries increased from 33% in 1995 to 39% in 2010.[17,18] However, the prevalence increased in almost all regions in the developing world, with the biggest improvement seen in West and Central Africa, where the prevalence of exclusive breastfeeding has

doubled from 12% in 1995 to 28% in 2010. Eastern and Southern Africa is reported to have realized improvements in exclusive breastfeeding from 35% in 1995 to 47% in 2010.

South Africa has a low exclusive breastfeeding (EBF) rate.[19] In 2016, South Africa recorded 67.3% of infants initiating breastfeeding within 1 hour of birth, and only 31.6% being exclusively breastfed, with a mean exclusive breastfeeding duration of 2.9 months.[20]

In South Africa, the average EBF rate for infants below six months was estimated to be approximately 32% in 2016.[21] The likely explanation for the low rates of EBF is the country's high HIV prevalence, with 30.8% of mothers attending antenatal care testing positive for HIV.[22] A recent study in KwaZulu-Natal (KZN) found that 76.1% of mothers were mix feeding by 14 weeks post-delivery, although only 32.7% of women intended to mix feed by this stage.[23] In addition to low EBF rates, South Africa's infant mortality rates, although showing some improvement, remain unacceptably high with poor access to healthcare services, malnutrition and poor living conditions being three of the leading contributors to child deaths.[24]

Nieuwoudt, et. al (2019), reported that a large volume of breastfeeding research has been conducted in South Africa, but this has not been systematically reviewed to identify factors that promote EBF.[25] Therefore, the identification of factors that promote or inhibit breastfeeding behavior is vitally important for the design of evidence-based policies and interventions.[26] Literature indicates that despite the available knowledge of benefits of breastfeeding, this has not translated into practice in South Africa.[25]

The South African National Department of Health recognized that promotion of exclusive and extended breastfeeding could play an important role to decrease infant mortality rates. In 2011, the South African Minister of Health committed the government to protect, promote and support breastfeeding.[27] In South Africa, a decision was made that free formula milk would no longer be provided in public health facilities, as part of the PMTCT programme.[28]

There are numerous reasons for the erosion of the breastfeeding culture in South Africa, such as the aggressive marketing of breastmilk substitutes by the infant feeding industry and lack of clarity regarding optimal infant feeding practices in the context of the HIV/AIDS epidemic.[29] It is important to provide knowledge on the benefits of breastfeeding to adolescent mothers, to prevent disinformation from media. It is generally believed that adolescent mothers are likely to have the least self-efficacy

and assertiveness and, more likely to succumb to peer pressure.[30]

Adolescent pregnancy is detrimental to the health of mother and child and is a common public health problem worldwide.[31] It is one of the key issues concerning reproductive health of women not only in lower income countries but also in higher income countries.[32] There is growing awareness that early childbearing has multiple consequences in terms of maternal health, child health and over all well-being of the society. Worldwide, teenage pregnancy rates range from 143 per 1000 in some sub-Saharan African countries to 2.9 per 1000 in South Korea.[32] The Save the Children foundation found that annually, 13 million children are born to women aged under 20 worldwide and this is more than 90% compared to lower income countries.[33] Complications of pregnancy and childbirth are the leading causes of mortality among women aged 15-19 in such areas. Highest risk of maternal death in young girls was shown in Africa, Afghanistan, Bangladesh, Guatemala, Haiti, Nepal, Nicaragua and Yemen.[34]

In 2013, more than 99 000 school-girls fell pregnant in South Africa, at a rate of about 271 per day for that year[35]. While most women initiate breastfeeding, many mothers prematurely discontinue due to difficulties they encounter rather than maternal choice[36].

This study aimed to investigate the breastfeeding knowledge, attitudes, and practices among adolescent mothers at Crossroads, Western Cape, South Africa.

METHODOLOGY

Study Design

The analytical cross-sectional method was utilized to conduct research at the Crossroads Community Day Centre, located in Mitchell's Plain Sub-District, in the Western Cape.

Measurement instruments and Data Collection Techniques

Quantitative data from prospective study participants was collected using a self-designed questionnaire that included new questions and those sourced from previously used questionnaires. The questionnaire was compiled based on established guidelines and tools for monitoring the appraisal and monitoring of baby-friendly hospitals,[37,38,39] as well as the Questionnaires: Breastfeeding and Infant practices-- UNICEF/ WHO Hospital Self Division of nutrition, physical activity and obesity national center for chronic disease, prevention, and health (CDC).[40,41] It aimed to measure the knowledge, attitudes, and practices of adolescent mothers towards breastfeeding. The study was conducted from the 1st of October 2022 to 1st of December 2022, lasting for two months. The questionnaire had closed-ended and open-ended questions that were used to collect quantitative and qualitative data, respectively. It was available in both English and isiXhosa, and for isiXhosa speaking participants, an isiXhosa -speaking staff member assisted in completing the questionnaire. A team of bilingual researchers conducted the translation process to ensure accuracy and cultural appropriateness. The process involved translating the questionnaire from English to isiXhosa by a bilingual researcher, and then a second bilingual researcher reviewed the translation for accuracy.

The open-ended questions, namely "what are the benefits of breastfeeding to the infant?", "what does breastfeeding help the mother?", and "what do you know about colostrum?", were intentionally employed to provide participants with an opportunity to express their views in greater detail and depth. The thematic analysis approach was utilized to analyze the responses to these open-ended questions, which entailed identifying common themes or patterns in the participants' answers and subsequently categorizing them, based on their relevance to the research questions. The results from the analysis bolstered the findings from the closed-ended questions and helped

confirm and expand upon them. For instance, the open-ended question, "what are the benefits of breastfeeding to the infant?" had a variety of responses from participants that included, but were not limited to, nutritional benefits, immune system benefits, and bonding. Likewise, responses to the open-ended question, "what does breastfeeding help the mother?" similarly highlighted themes including health benefits, bonding, and convenience. While the open-ended question, "what do you know about colostrum?" drew out various themes such as nutritional benefits, timing, and importance for newborns. The strategic inclusion of open-ended questions in tandem with the use of closed-ended questions allowed for a more comprehensive understanding of the participants' perspectives, attitudes, and practices related to breastfeeding.

The previously used questionnaires contained agree or disagree statements such as "Breastfeeding should be continued up to 2 years":,[42] "Formula feeding is better than breastfeeding":,[43] "Breastfeeding increase mother-child bonding":,[42] "Breast milk is the ideal food for babies":,[42] "Starting complementary foods to a child before 6 months is important":,[44] "Prefer to feed your baby breast milk alone for the first 6 months":,[42] "Breastfeeding will make the mother's breasts sag", "Breastfeeding affects your beauty":,[42] "Breastfeeding can increase the mother's weight",[42] "One of the causes of hair loss is breastfeeding",42 "Pumping breast milk makes it no longer beneficial for the child",[42] "Mothers should stop breastfeeding if they take any type of medication".[42]

The questionnaire was divided into several sections, including:

1. Demographic information: This section collected information on the age, marital status, education level, employment status, number of pregnancies and live births, mode of delivery, and healthcare provider information of the participants.

2. Knowledge about breastfeeding: This section collected information on the participants' knowledge about the benefits of breastfeeding for both mother and baby, as well as their knowledge about common breastfeeding problems and how to address them.

3. Attitudes towards breastfeeding: This section collected information on the participants' attitudes towards breastfeeding, including their beliefs about whether breastfeeding is important for infant health and development.

4. Practices related to breastfeeding: This section collected information on the participants' current practices related to breastfeeding, including whether they had initiated breastfeeding after delivery, how long they had been exclusively breastfeeding their baby if applicable, whether they had experienced any difficulties with breastfeeding or pumping milk at work or school if applicable.

5. Barriers to exclusive breastfeeding: This section collected information on any barriers that may have prevented participants from exclusively breastfeeding their baby for six months or longer if applicable.

The questionnaire was developed using a mixed methods approach that involved three steps. The first step was to establish the theoretical background and literature review, which involved reviewing relevant studies published in peer-reviewed journals and reports from international organizations to identify key concepts and variables related to adolescent mothers' knowledge, attitudes, and practices towards breastfeeding. The second step involved conducting a qualitative study to develop questionnaire items and establish face validity. This involved input from experts in breastfeeding research and healthcare providers who work with adolescent mothers, as well as focus group discussions and cognitive interviews with a small sample size. The third step involved conducting a quantitative study to pilot test the questionnaire, establish its structural validity, and estimate its internal consistency. This step included administering the questionnaire to all participants, estimating internal consistency for each section using Cronbach's alpha, and using exploratory factor analysis to establish the questionnaire's structural validity. Feedback from pilot testing was used to improve the clarity and relevance of questionnaire items.

Study site and population

All eligible participants were recruited using convenient sampling until the required sample size was attained. Prior to recruitment into the study, participants were given a written explanation of the study and asked to sign a consent form. In calculating the sample size, researchers sought to investigate the minimum number of adolescent mothers that were sufficient to understand the difference between knowledge, attitudes, and practices of mothers with respect to breastfeeding. The following statistical parameters were considered in calculating the minimum sample size: medium effect size of 0.15, type 1 error ($\alpha = 0.05$), type 2 error (β) of 0.2, and a statistical power of 80%. Based on the above statistical parameters, the minimum sample size was 77.

Inclusion and Exclusion Criteria

According to the World Health Organization (WHO), adolescents are defined as individuals aged between 13 and 19 years old. For this study, all women between the ages of 16 and 19 who brought their babies (less than 19 weeks old) to the clinic from October to December 2022 met the criteria for inclusion. Mothers aged 13-15 years were not included due to additional consent requirements. An important condition was that all participants should be able and willing to communicate in English or isiXhosa. Furthermore, participants were expected to understand the nature of the study and be able to give informed consent to participate. Mothers who were unable to give consent were excluded from the study. In addition, mothers who had contraindications to breastfeed for medical reasons were also excluded. However, mothers on Antiretroviral therapy were not excluded, as they were encouraged to breastfeed, and the risk was minimal if they were virally suppressed.

Analysis of Data

As applicable, mean, median (interquartile range [IQR]), or standard deviation (SD) were used to describe continuous variables such as age in this study. Categorical variables such as marital status was expressed as proportions. Statistical analyses were performed using Stata (16.1, Stata Corp LLC, College Station, TX) and IBM SPSS Version 27 (SPSS Inc., Chicago, IL, USA). T-tests were used to compare means between groups, such as the difference in breastfeeding knowledge scores

between married and unmarried study participants. Chi-square or Fisher's exact tests were used to investigate associations between categorical variables. The parameters that most accurately predicted an early discontinuation of breastfeeding were identified using multivariate logistic regression analysis. Statistical significance was defined as a p-value < 0.05.

Ethical considerations

a. Approval: The protocol received approval from the Ethics and Research Committee, Faculty of Health Sciences of the University of Cape Town.

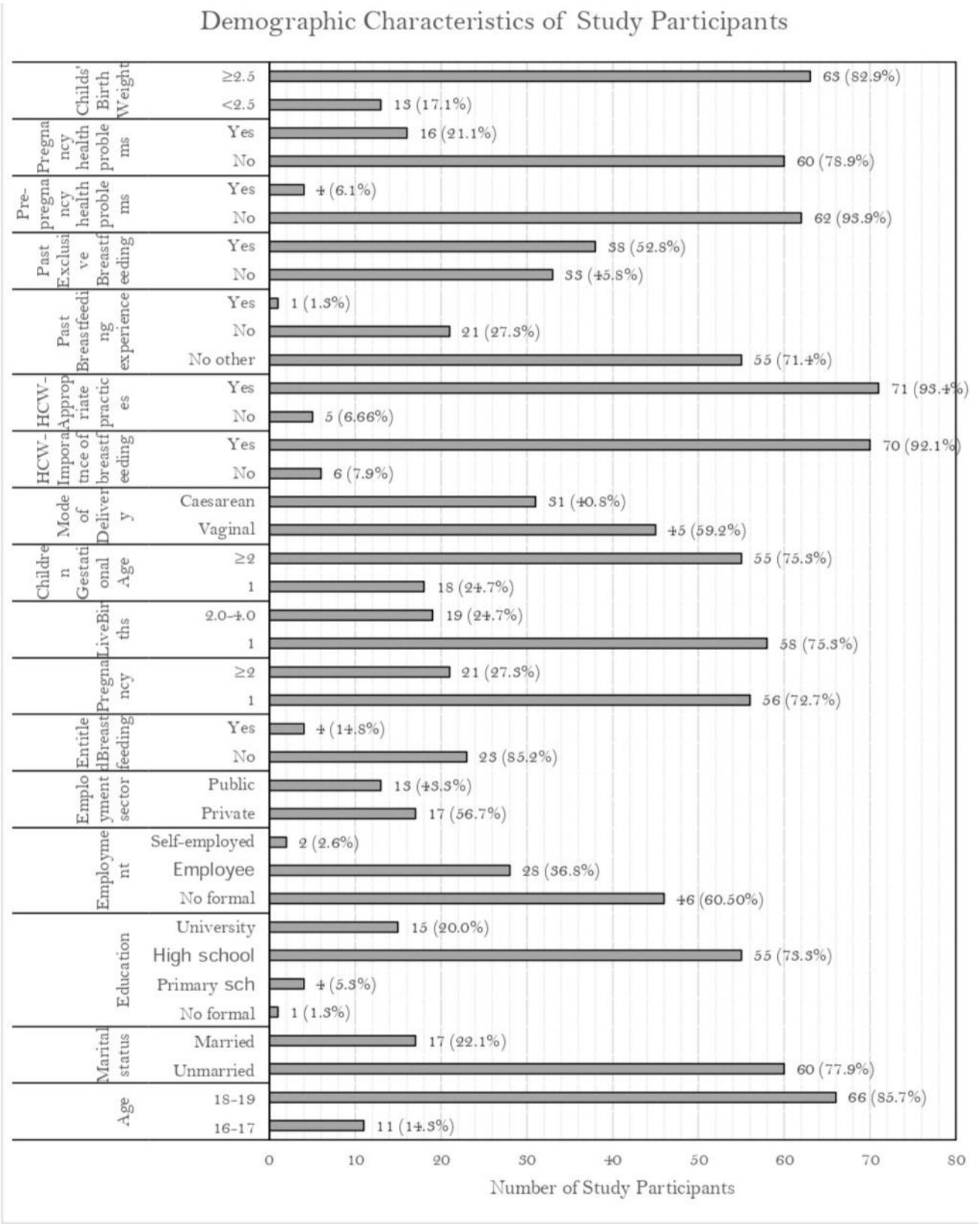
b. Permission: This research received approval from the Provincial Research Committee (Metro Health District), the Director of the Sub-Structure, and the Facility Manager of Crossroads CDC.

c. Informed consent and participation information: Before participating in the study, the study participants received information about the study and provided informed consent. They were also made aware of issues of confidentiality and how their information would be used. The interviews were conducted in consultation rooms at the facility, and the principle of reciprocity was respected by providing participants with progress updates and feedback via email.

RESULTS:

Socio-demographic Characteristics of Study Participants

The study consisted of 77 women, aged between sixteen and nineteen years old. Women were categorized into two groups: ages 16-17 years and 18-19 years, with the following frequencies: 11 (14.3%) and 66 (85.7%), respectively. Most of the women 60 (77.9%) were unmarried. Educational characteristics of the participants indicated that most of the participants had a high school education, and only 15 (20%) of the women had a university education. Almost sixty percent (46 women) of the women in this study were unemployed. Most of the participants 56 (71.8%) had only experienced one pregnancy, with only 21 (26.7%) reporting more than two children. Most participants 58 (74.4%) had only one live birth. Concerning gestational age, 55 mothers (75.3%) reported their babies gestated for more than 37 weeks. Vaginal delivery was the most frequent mode of delivery, with a total of 45 (59.2%) births, while cesarean operation accounted for 31 births (40.8%) of births. Most mothers reported that healthcare workers emphasized the importance of breastfeeding and educated them on appropriate breastfeeding practices. Out of 77 mothers, only 38 (52.8%) reported practicing exclusive breastfeeding. Concerning pre-pregnancy health problems, 62 (93.9%) of the women reported that they did not have any pregnancy-related health problems, while 60 (78.9%) reported pregnancy health problems. Most of the babies (82.9%) had birthweights over 2.5kg, while a minority of the mothers (17.1%) reported that their babies had birth weights below 2.5kg (as shown in Figure 1).



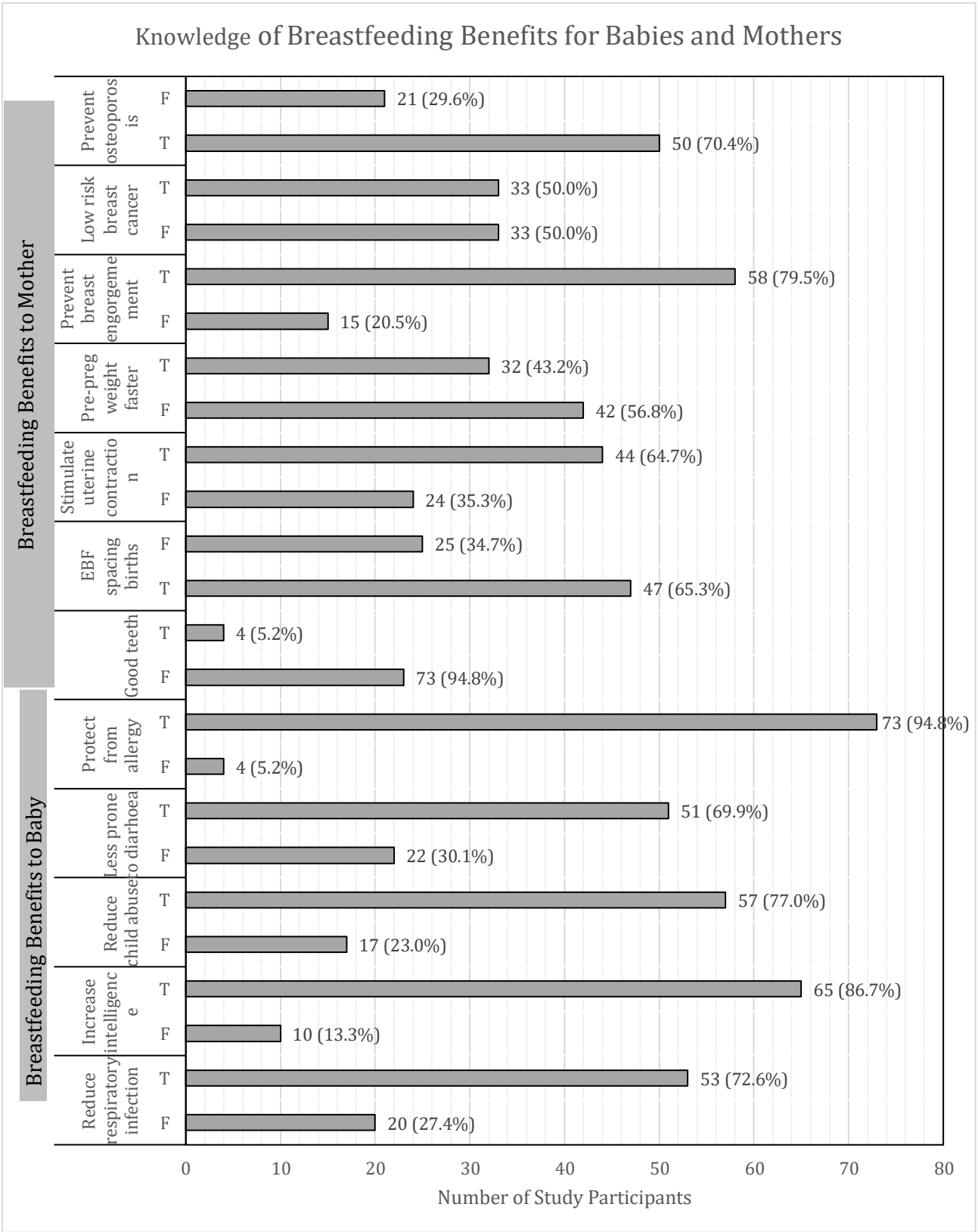
HCW: Healthcare workers

Fig. 1 : Socio-demographic Characteristics of Study Participants (n=77)

Knowledge of Mothers about Breastfeeding

a) Breastfeeding benefits for the baby and mother

Most mothers 53 (72.6%), agreed with the statement that breastfeeding reduces respiratory infections for the baby. Most of the respondents provided True responses to the following questions on the benefit of breastfeeding to babies; breastfeeding increases baby intelligence, reduces child abuse and neglect, baby becomes less prone to diarrhea and protect baby from allergies, with the following percentages 86.7%, 77.0%, 69.9% and 94.8% respectively. However, most of the respondents 73 (94.8%) responded incorrectly to the question on whether breastfeeding promotes healthy tooth and gum development in infants, as shown in Fig. 2 below. The mean score for the benefit of breastfeeding to the baby was 4.97±0.8, compared with mean score for the breastfeeding benefit for the mother, of 3.01±1.40; using an independent T, difference was statistically significant, with a P-- test; the value of 0.0139. As shown in Fig. 1, most of respondents correctly answered the questions on the benefits of breastfeeding to mother, except for the questions on whether breastfeeding cause the mother to achieve her pre-pregnancy weight faster 42 (56.8%) and that breastfeeding results in a low risk of breast cancer for the mother 33 (50%).



EBF: Exclusive breastfeeding. BF: Breastfeeding

Fig. 2: Knowledge of the Benefits of Breastfeeding to the Mother and Baby

Table 1: Mean Knowledge Scores for Breastfeeding Benefits for Mother and Baby

	Variables	True		False		Means±SD	Statement Correct / Incorrect
		freq	%	freq	%		
Breastfeeding benefits to baby	Reduce respiratory infection	53	72.6	20	27.4	0.73±0.45	Correct
	Increase baby's intelligence	65	86.7	10	13.3	0.87±0.34	Correct
	Reduce child abuse and neglect	57	77.0	17	23.0	0.77±0.42	Correct
	Baby less prone to diarrhea	51	69.6	22	30.1	0.70±0.46	Correct
	Baby protected from allergy	73	94.8	4	5.2	0.95±0.22	Correct
	Good development of teeth	73	94.8	4	5.2	0.95±0.22	Correct
	Mean Knowledge Score- Benefit to Baby					4.97±0.8	
Breastfeeding benefits to mother	EBF good for spacing births	25	34.7	47	65.3	0.34±0.50	Correct
	BF stimulates uterine contraction	44	64.7	24	35.3	0.65±0.48	Correct
	Mothers achieve pre-pregnancy weight faster	32	43.2	42	56.8	0.43±0.50	Correct
	Frequent BF prevents breast engorgement	58	79.5	15	20.5	0.79±0.41	Correct

	Mother practicing BF has low risk of breast cancer	33	50	33	50	0.5±0.5	Correct
	BF protects against osteoporosis	21	29.6	50	70.4	0.30±0.46	Correct
	Mean Knowledge Score- Benefit to Mother					3.01±1.40	

EBF: Exclusive breastfeeding. BF: Breastfeeding

b) Knowledge of colostrum, effective breastfeeding, and duration of breastfeeding

i. Knowledge of colostrum

Most of the mothers answered questions regarding colostrum protecting the baby from jaundice (54.8%) and that colostrum is the mother's early milk (81.7%) correctly. However, most mothers did not answer the following questions: whether colostrum causes constipation in babies (58.2%) and whether colostrum is difficult to digest (61.8%). The total knowledge of colostrum was categorized as greater than 50% or equal to/less than 50%, with 34.6% falling in the equal to/less than 50% category.

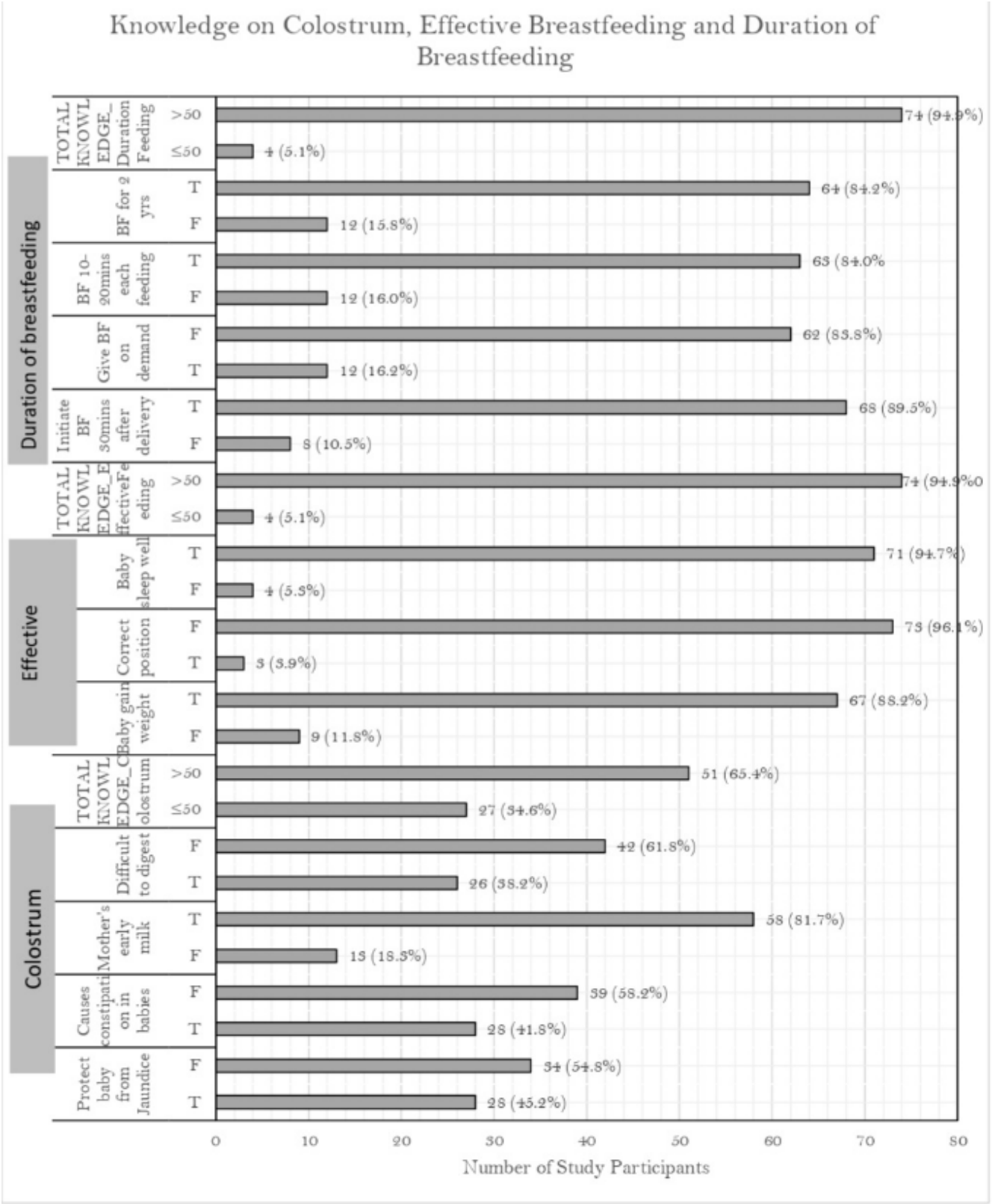
ii. Knowledge of effective breastfeeding

Of the three questions on effective breastfeeding, most mothers answered correctly to the following two questions: effective breastfeeding causes the baby to gain weight (88.2%) and effective breastfeeding results in the baby sleeping well (94.7%). However, most mothers answered the following question incorrectly: efficient breastfeeding is achieved with proper positioning (96.1%). The total knowledge about effective breastfeeding was divided into two categories: those who knew more than 50% and those who knew 50% or less. It was found that 5.1% of the participants fell into the category of those who knew 50% or less.

iii. Knowledge of duration of breastfeeding

There were four questions on knowledge of the duration of breastfeeding; most of the mothers responded correctly to three questions as follows: initiating breastfeeding within 30 minutes after delivery (89.5%), breastfeeding for 10-20 minutes during each feeding (84.0%), and breastfeeding for 2 years (84.2%). However, most mothers responded incorrectly (83.8%)

to the question about giving breastfeeding on demand. Total knowledge of the duration of breastfeeding was divided into two groups: individuals who had more than 50% knowledge and those who possessed equal to or less than 50% knowledge. From the study, it was discovered that only (5.1%) of the participants belonged to the latter group.



EBF: Exclusive breastfeeding. BF: Breastfeeding

Fig. 3: Knowledge of Colostrum, Effective Breastfeeding, and Duration of Breastfeeding

The individual mean scores for participants for the four colostrum questions ranged between 0.0 and 1.0, with 8 (10.4%) participants scoring an average of 0, 18 (23.4%) scoring 0.25, 13 (16.9%) scoring 0.50, 23 (29.9%) scoring 0.75, and the remaining 15 (9.5%) scoring the maximum of 1.0. The mean knowledge score for the four questions on colostrum was 2.10 ± 0.90 out of a possible total of 4.00. The mean knowledge scores for questions on effective breastfeeding and duration of breastfeeding were 1.87 ± 0.20 and 1.84 ± 0.40, respectively. Using a one-way analysis of variance (ANOVA), the differences between the above three mean knowledge scores were not statistically significant ($F(2,16) = 0.1798$, $p = 0.839$).

Table 2: Participants' Knowledge Regarding Colostrum, Effective Breastfeeding and Duration of Breastfeeding

	Variables	True		False		Means±SD	Statement Correct / Incorrect
		freq	%	freq	%		
Colostrum	Protect baby from jaundice	28	45.2	34	54.8	0.45±0.50	Correct
	Causes constipation in babies	28	41.8	39	58.2	0.45±0.50	Incorrect
	Mother's early milk	58	81.7	13	18.3	0.82±0.39	Correct
	Difficult to digest	26	38.2	42	61.8	0.38±0.49	Incorrect
	Mean Knowledge Score- Colostrum					2.10±0.90	
Effective Breastfeeding	Baby gain weight	67	88.2	9	11.8	0.88±0.33	Correct
	Correct position	3	3.9	73	96.1	0.04±0.20	Correct

	Baby sleep well	71	94.7	4	5.3	0.95±0.23	Correct
	Mean Knowledge Score- Effective Breastfeeding					1.87±0.20	
Duration of breastfeeding	Initiate BF 30mins after delivery	68	89.5	8	10.5	0.89±0.31	Correct
	Give BF on demand	12	16.2	62	83.2	0.16±0.37	Correct
	BF 10-20 mins during each feeding	63	84.0	12	16.2	0.84±0.37	Correct
	BF for 2 years	64	84.2	12	15.8	0.84±0.37	Correct
	Mean Knowledge Score- Duration of Breastfeeding					1.84±0.40	

BF: Breastfeeding

c) Knowledge of breastfeeding problems, practical aspects of breastfeeding, and complementary feeding

i. Problems of Breastfeeding

Six questions were included in this study investigating the respondent's knowledge on problems of breastfeeding. Of the six questions, most of the women correctly answered the following questions: the size of the breasts affects the amount of milk produced 40 (53.33%), women who have inverted nipples cannot breastfeed their babies 38 (50.7%), breastfeeding must be discontinued if the baby has jaundice 46 (59.7%), breastfeeding must be discontinued if the mother has breast engorgement 42 (55.3%), and engorged breasts may be improved using cold packs 41

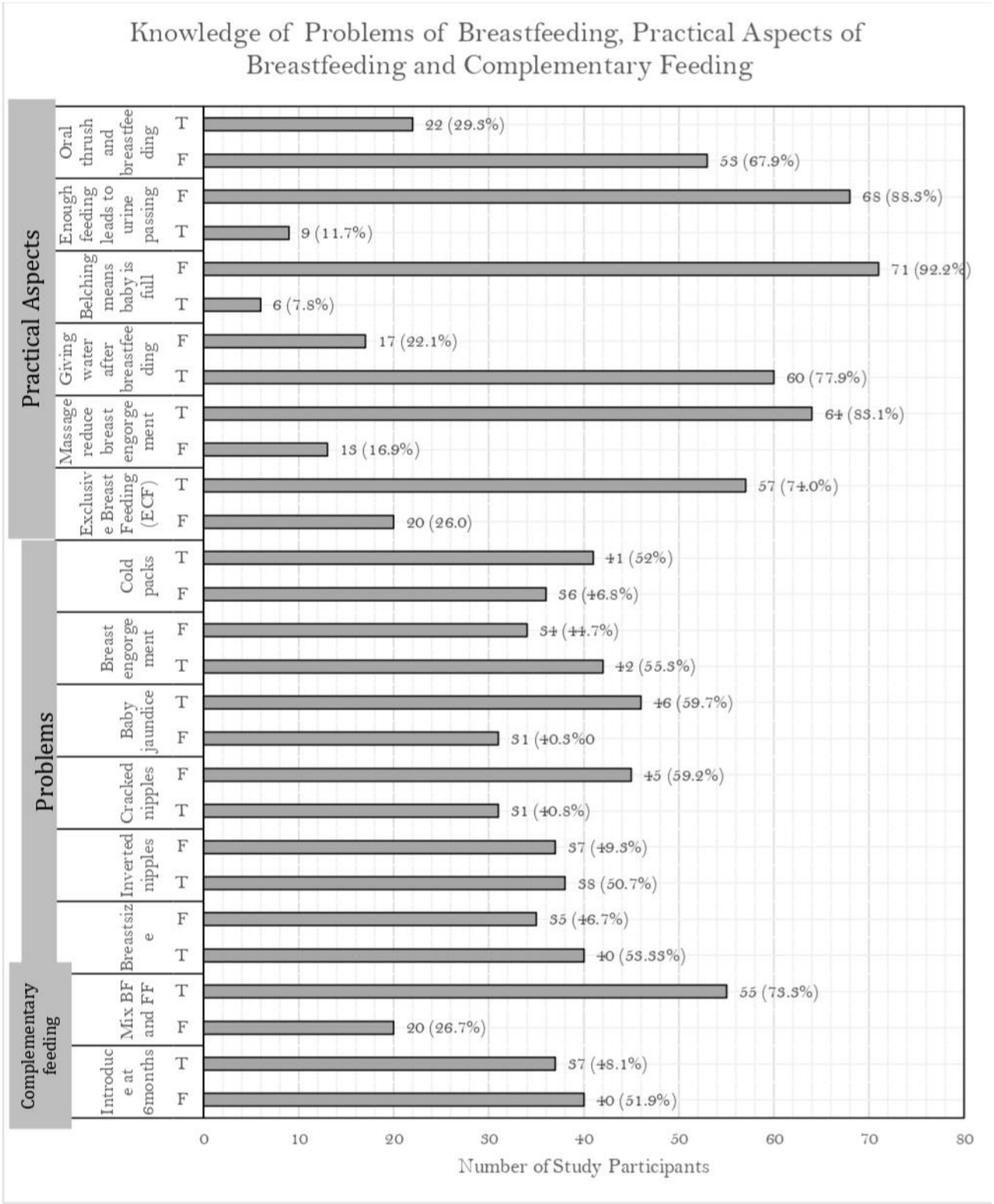
(52.0%). However, most of the respondents answered incorrectly to the following question: breastfeeding must be stopped if the mother's nipples are cracked 45 (59.2%).

ii. Practical Aspects of Breastfeeding

Out of the six knowledge questions on practical aspects of breastfeeding, most mothers correctly answered the following questions: following each breastfeeding, providing the infant with water is recommended 60 (77.9%); it is essential to breastfeed exclusively until the baby is six months old 57 (74.0%); and engorged breast may be lessened with massage 64 (83.1%). For the remaining three questions, most of the study participants answered incorrectly as follows: babies who are breastfed commonly get oral thrush 53 (67.9%); newborns who are adequately fed will urinate more often 68 (88.3%); and when a baby belches after being breastfed, it means that the baby is full 71 (92.2%).

iii. Complementary feeding

Of the two questions, the one regarding combining breastfeeding with formula once the infant begins receiving complementary foods was answered correctly by 55 (73.3%) study participants.



EBF: Exclusive breastfeeding. BF: Breastfeeding

Fig. 4: Knowledge on Problems of Breastfeeding, Practical aspects of breastfeeding and complementary feeding

The mean knowledge scores for the two questions on complementary feeding, six questions on problems of breastfeeding, and six questions on practical aspects of breastfeeding were 1.21±0.50, 2.92±0.50, and 3.86±0.90, respectively. Using a one-way analysis of variance (ANOVA), the differences between the above three mean knowledge scores were statistically significant ($F(2, 13) = 10.70$, $p = 0.0026$, i.e., $p < 0.0001$).

Table 3. Participants' knowledge regarding Problems of Breastfeeding, Practical Aspects of Breastfeeding and Complementary Feeding

	Variables	True		False			Statement Correct / Incorrect
		freq	%	freq	%	Means±SD	
Complementary Feeding	Introduce complementary feeding at 6 months	37	48.1	40	51.9	0.48±0.50	Correct
	Mothers may mix BF and FF when baby starts complementary feeding	55	73.3	20	26.7	0.73±0.45	Correct
	Mean Knowledge Score- Complementary feeding					**1.21±0.50**	
Problems of breastfeeding	The size of the breasts affects the amount of milk produced	40	53.3	35	46.7	0.53±0.50	Correct
	Women who have inverted nipples can not breastfeed their babies	38	50.7	37	49.3	0.41±0.49	Incorrect
	Breastfeeding must be stopped if the mother's nipples are cracked	31	40.8	45	59.2	0.40±0.49	Incorrect
	If the infant develops jaundice, breastfeeding must be stopped	46	59.7	31	40.3	0.60±0.49	Incorrect

	If a mother experiences breast engorgement, she should stop breastfeeding	34	44.7	42	55.3	0.45±0.50	Incorrect
	Engorged breast may be improved using cold packs	41	53.2	36	46.8	0.53±0.50	Correct
	Mean Knowledge Score- Problems of Breastfeeding					**2.92±0.50**	
Practical Aspects of Breastfeeding	Exclusive breastfeeding must be practiced until the infant is 6 months old	57	74	20	26	0.74±0.44	Correct
	Massage may reduce breast engorgement	64	83.1	13	16.9	0.83±0.38	Correct
	Following each breastfeeding, providingthe infant with water is recommended	17	22.1	60	77.9	0.22±0.42	Incorrect
	When a baby belch after being breastfed, it means that the baby is full	71	92.2	6	7.8	0.92±0.27	Correct
	Newborns who are adequately fed will urinate more often	68	88.3	9	11.7	0.88±0.32	Correct
	Babies who are breastfed commonly get oral thrush	22	29.3	53	70.7	0.27±0.45	Incorrect
	Mean Knowledge Score- Practical Aspects of Breastfeeding					**3.86±0.90**	

BF: Breastfeeding. FF: Formula feeding

Attitudes of Mothers towards Breastfeeding

The attitudes of mothers were assessed, indicating that most women agreed with several statements on breastfeeding. Specifically, 64 (82.1%) agreed that breastfeeding is easier than artificial feeding, 68 (89.5%) agreed that breastfeeding reduces family expenses, 45 (59.5%) agreed that the community favors breastfeeding over artificial feeding, 66 (88.0%) agreed that healthcare workers encourage breastfeeding, 57 (76.0%) agreed that breastfeeding should be continued up to 2 years, 58 (75.3%) agreed that breastfeeding should be on demand, 61 (79.2%) agreed with adhering to the vaccination schedule, 62 (82.7%) agreed that health and hygiene are important for breastfeeding, 69 (89.6%) agreed that breastfeeding increases mother-child bonding, 60 (78.9%) agreed that they were prepared for breastfeeding, 53 (68.8%) agreed that they would breastfeed their child later in the future, 65 (85.5%) agreed that breastmilk is the ideal food for babies, 56 (74.7%) agreed that breast milk alone is preferred for the first six months, and 55 (71.4%) expressed an intention to breastfeed future children. Conversely, most of the mothers disagreed with the following statements: 48 (64.0%) believed that formula feeding is better than breastfeeding, 46 (59.7%) believed that breastfeeding affects their beauty, and 50 (64.9%) believed that breastfeeding is one of the causes of hair loss.

Table 4: Attitudes of respondents towards breastfeeding

Variables	Agree		Unsure		Disagree	
	Freq	%	Freq	%	Freq	%
Breastfeeding is easier than artificial feeding	64	82.1	7	9.0	5	6.6
It is difficult for breast feeder to take care of her family	35	46.7	6	8.0	34	45.3
Breastfeeding has no effect on marital relationship	34	45.3	19	25.3	22	29.3
Breastfeeding reduces family expenses	68	89.5	4	5.3	4	5.3
Artificial feeding preserves woman's body and prevents obesity	26	34.2	44	57.9	6	7.9
The community prefers breastfeeding over artificial feeding	45	59.2	19	25.0	12	15.8
Healthcare workers encourages breastfeeding	66	88.0	6	8.0	3	4.0
A vacation for 3 months is enough for successful breastfeeding	24	32.0	36	48.0	15	20.0
Workplace offer suitable private places for breastfeeding	24	32.0	38	50.7	13	17.3
Breastfeeding should be continued up to 2 years	57	76	4	5.3	14	18.7
Breastfeeding should be on demand	58	75.3	8	10.4	11	14.3
Giving pre-lacteal feeds to babies is an important practice	38	50.7	20	26.7	17	22.7
Following a vaccination schedule is an important practice	61	79.2	8	10.4	8	10.4
Breastfeeding should be stopped when child has diarrheal episodes.	30	39.0	20	26.0	27	35.1

Formula feeding is better than breastfeeding	16	21.3	11	14.7	48	64.0
Health and hygiene are more important for breastfeeding	62	82.7	8	10.7	5	6.7
Breastfeeding causes changes in body shape	42	54.5	23	29.9	12	15.6
Breastfeeding increases mother child bonding	69	89.6	4	5.2	4	5.2
You know all it takes to breastfeed	30	39.0	41	53.2	6	7.8
You are prepared for breastfeeding	60	78.9	10	13.2	6	7.9
You will breastfeed your child later in the future	53	68.8	19	24.7	5	6.5
It is difficult for breast-feeders to take care of their family	37	48.1	6	7.8	34	44.2
Breast milk is ideal food for babies	65	85.5	7	9.2	4	5.3
Starting complementary foods to a child before 6 months is important	37	48.7	16	21.1	23	30.3
Prefer to feed your baby breast milk alone for the first 6 months	56	74.7	6	8.0	13	17.3
Breastfeeding will make the mother's breasts sag	41	53.2	22	28.6	14	18.2
Breastfeeding affects your beauty	13	16.9	18	23.4	46	59.7
Breastfeeding can increase the mother's weight	17	22.7	24	32.0	34	45.3
One of the causes of hair loss is breastfeeding	3	3.9	24	31.2	50	64.9
Pumping breast milk makes it no longer beneficial for the child	15	19.7	31	40.8	30	39.5
Mothers should stop breastfeeding if they take any type of medication	27	35.5	26	34.2	23	30.3

Intention to breastfeed future children	55	71.4	19	24.7	3	3.9

Breastfeeding Practices of Study Participants

In this study, most mothers reported taking advice from lactation counsellors/healthcare workers before breastfeeding, with 67 individuals constituting 88.2%. Additionally, 47 participants or 62.7% admitted to giving pre-lacteal feeds to their infants, while 70 mothers or 93.3% believed that breastfeeding should commence within the first hour of life following birth. The study also found that 49 mothers, constituting 72.1%, provided exclusive breastfeeding to their last child for the first six months and planned to breastfeed their current child exclusively until six months of age. However, it is noteworthy that most mothers, constituting 66 participants or 86.8%, did not agree with attending a breastfeeding class during pregnancy.

Most mothers indicated that the first feed given to their last child was breast milk, accounting for 71 (95.9%) of the sample. Moreover, 65 (86.7%) of mothers began breastfeeding within an hour of giving birth to their last child. As per the responses gathered, the frequency of breastfeeding was dependent on demand for 58 (76.3%) of the mothers. Additionally, the data indicated that 55 (73.3%) mothers consumed galactagogues once a day to enhance their milk production.

Table 5: Breastfeeding Practices of respondents

Variables	No		Yes	
	Freq	%	Freq	%
Did you take advice from lactation counsellor (healthcare worker??) before breastfeeding	9	11.8	67	88.2
Did you give pre-lacteal feeds to the infant?	28	37.3	47	62.7
Breastfeeding must be commenced during the first hour of the baby's life following birth	5	6.7	70	93.3
The last baby is already breastfeeding, and plan is to be continued until the baby is ≥24 months old	23	31.9	49	68.1
The last child was on exclusive breastfeeding in the first six months	19	27.9	49	72.1
The current plan is to breastfeed the last child exclusively until the baby is six monthsold	16	22.2	55	76.4
Attended breastfeeding classes during pregnancy	66	86.8	10	13.2

	Breast milk		Honey		Sugar water	
What was the kind of feed your last child received first?	71	95.9	1	1.4	2	2.7
	After 1 hour		After 2-6 hours		After 24 hours	
When did you start breastfeeding after delivering your last child?	65	86.7	9	12.0	1	1.3
	On-demand		Specific intervals		At random	
How frequently do you breastfeed?	58	76.3	13	17.1	5	6.6
	Daily		Weekly		Never	
How frequently do you consume galactagogues foods (foods that increaseand improve milk production)	55	73.3	5	6.7	15	20.0

Discussion:

Across the world, there is an increasing emphasis on encouraging and supporting mothers to breastfeed their babies.[45] The benefits of breastfeeding are well known, but there is a growing need to ensure that mothers are educated about these benefits.[46] The focus of this study was to investigate the knowledge, attitudes, and practices of adolescent mothers regarding breastfeeding at Crossroads, a high-density township in the Western Cape, South Africa.

In this study, the benefits of breastfeeding to the baby were acknowledged by most mothers, where they stated that breastfeeding reduces respiratory infections in babies 53 (72.6%), increases baby intelligence 65 (86.7%), reduces child abuse and neglect 57 (77.0%), babies are less prone to diarrhea 51 (69.9%), breastfeeding protects the baby from allergies 73 (94.8%), and that breastfeeding ensures the development of good baby teeth. Our findings regarding knowledge of breastfeeding and its importance in preventing respiratory diseases are consistent with findings from other studies, such as Cascone et al. (2019)[47] in a study conducted between January and June 2016 in the Campania region of Italy among mothers who attended six public vaccination centers. Cascone et al. (2019) reported that 57.5% of the mothers in their study knew about the use of breastfeeding in preventing communicable diseases. Another study conducted in Rwanda by Jiayou Luo et al. (2021) reported that 92.3% of the mothers understand that breastfed babies are healthier than formula-fed babies.[48] A study conducted in KwaZulu-Natal in South Africa among mothers attending a baby clinic by Pillay et al. (2018) reported that 79.4% of mothers stated that they were advised about the benefits of breastfeeding for protecting and preventing diseases.[29]

Furthermore, in our study, participants agreed that there were benefits of breastfeeding to mothers. Specifically, 44 (64.7%) stated that breastfeeding stimulates uterine contraction, 58 (79.5%) believed breastfeeding prevents breast engorgement, and 33 (50.0%) agreed that breastfeeding results in a low risk of breast cancer. However, based on their responses, mothers did not understand the importance of breastfeeding in child spacing, with 47 (65.3%) stating that the statement that breastfeeding was good for child spacing was false. Most mothers also indicated a lack of knowledge on breastfeeding and pre-pregnancy weight. Specifically, 42 (56.8%)

believed that the statement that mothers who breast-feed achieve pre-pregnancy weight faster was false. Overall, our study found a statistically significant difference in mean knowledge scores for breastfeeding benefits to babies and the mother, using an independent t-test (p=0.0139).

According to the investigation, which included four questions about colostrum, mothers' knowledge was limited. Most mothers correctly answered one question, which asked whether colostrum was their early milk; 58 (81.7%) answered this question correctly. However, most mothers inaccurately disagreed with the other three questions. Only 34 (54.8%) of mothers knew that colostrum protects babies from jaundice, while 39 (58.2%) incorrectly believed that it causes constipation in babies, and 42 (61.8%) thought that colostrum is difficult to digest.

Regarding knowledge about effective breastfeeding, most mothers answered only two out of three questions correctly. The two questions answered correctly were that effective breastfeeding results in the baby gaining weight (88.2%) and that effective breastfeeding ensures that babies sleep well (94.7%). However, most of the mothers incorrectly disagreed with the statement that correct positioning helps achieve effective breastfeeding (96.1%). Our study's findings were compared with research articles such as Sohail et al. (2017) in Pakistan. Their study reported that 70.1% of their participants had some knowledge about the benefits of colostrum, while only 29.9% had no knowledge of the health benefits of colostrum.[49] Luo et al. (2021) reported in Rwanda that the importance of colostrum was understood by 87.6% of their study participants.[48]

Investigating mothers' knowledge of the duration of breastfeeding revealed that, out of four questions, most mothers responded correctly to three questions. The correct responses were as follows: initiating breastfeeding 30 minutes after delivery 68 (89.5%), breastfeeding duration should be between 10-20 minutes during each feeding 63 (84.0%), and breastfeeding should continue for two years 64 (84.2%). However, most of the mothers did not answer whether breastfeeding should be given on demand correctly 62 (83.2%). A study by Luo et al. (2021) conducted in Rwanda found that 86.0% of the mothers in their study stated that breastfeeding should be initiated within an hour after delivery.[48]

This study also investigated mothers' knowledge of problems related to breastfeeding, practical aspects of breastfeeding, and complementary feeding. The majority of mothers responded correctly to all questions, except for the following questions where most of the study participants answered incorrectly: "Breastfeeding must be stopped if the mother's nipples are cracked 45 (59.2%)," "breastfeeding must be discontinued if the mother has breast engorgement 42 (55.3%)," "providing the infant with water is recommended following each breastfeeding 60 (77.9%)," and "babies who are breastfed commonly get oral thrush 53 (70.7%)."

Comparing the mean frequencies of correct responses related to various aspects of knowledge of breastfeeding among the participants the analysis revealed that the mean frequency of correct answers for statements pertaining to the benefits of breastfeeding for infants and mothers was 82.58%. This indicates that most of the participants provided correct responses to the statements related to the benefits of breastfeeding, which means a high level of awareness among the participants.

On the other hand, the mean frequency of correct responses for statements pertaining to the benefits of breastfeeding for mothers was found to be 50.3%. This suggests that participants were less aware of the benefits of breastfeeding for mothers compared to their awareness of the benefits for infants. However, the mean frequency percentage of the given colostrum questions was approximately 61.75%, which indicates a moderate level of awareness among the participants regarding the importance of colostrum in breastfeeding.

Moreover, the mean frequency percentage for effective breastfeeding statements was observed to be 62.267%, which suggests that participants possessed moderate knowledge on how to breastfeed effectively. Additionally, the mean of the frequency percentages for the correct answers to the duration of breastfeeding statements was the highest, at approximately 73.475%, which indicates that the participants possessed a good level of knowledge regarding the appropriate duration of breastfeeding.

Furthermore, the study found that the average frequency of correct responses for the given breastfeeding problems statements was determined to be 51.7%. This indicates that participants had a moderate level of awareness regarding the problems faced during breastfeeding and how to overcome them. Lastly, the mean value of 81.05% for the correct responses related to the practical aspects of breastfeeding suggests that participants were highly knowledgeable about the practical aspects of breastfeeding.

An investigation of mothers' attitudes to breastfeeding indicated that more than 80% of the women agreed with the following statements: "Breastfeeding reduces family expenses 68 (89.5%)," "Breastfeeding is easier than artificial feeding 64 (82.1%)," "healthcare workers encourage breastfeeding 66 (88.0%)," "health and hygiene are more important for breastfeeding' 62 (82.7%)," "breastfeeding increase mother-child bonding 69 (89.6%). Additionally, the study found that 65 (85.5%) participants believed that breast milk is the ideal food for babies."

Regarding mothers' breastfeeding practices, the study showed that most participants sought advice from lactation counselors/healthcare workers before breastfeeding, with 88.2% reporting doing so. However, 62.7% admitted to giving pre-lacteal feeds to their infants. Most mothers believed that breastfeeding should commence within the first hour of life following birth, with 93.3% reporting so. The study found that 72.1% of mothers provided exclusive breastfeeding to their last child for the first six months and planned to breastfeed their current child exclusively until six months of age. However, most mothers, constituting 86.8%, did not agree with attending a breastfeeding class during pregnancy. The frequency of breastfeeding was dependent on demand for 76.3% of the mothers, and 73.3% consumed galactagogues once a day to enhance milk production.

The proportions of correct answers were compared between the knowledge, attitudes, and practices of breastfeeding using a chi-squared test. The mean proportion of correct answers was 0.729 for the knowledge section, 0.758 for the attitudes section, and 0.702 for the practices section. The results of the chi-squared test showed that there was no significant difference in correct frequency between the knowledge and attitudes sections ($\chi2(1) = 0.22$, $p = 0.641$). However, there was a significant difference between the knowledge and practices sections ($\chi2(1) = 5.00$, $p = 0.025$) and between the attitudes and practices sections ($\chi2(1) = 4.67$, $p = 0.031$). These findings indicate that the adolescent mothers in the study had similar levels of knowledge and attitudes towards breastfeeding, but their actual breastfeeding practices may have varied from their knowledge and attitudes.

Furthermore the researchers compared the knowledge, attitudes, and practices of mothers who exclusively breastfed their babies and those who did not in the given study sample size. While this

type of analysis can be beneficial in identifying factors that are associated with exclusive breastfeeding, it has certain limitations. The study proceeded to use multivariate logistic regression analysis as a means of determining which parameters accurately predicted early discontinuation of breastfeeding. This method enabled the researchers to examine the interplay between multiple predictor variables while controlling for other variables. The researchers found that this type of analysis was more effective in identifying the factors most strongly associated with early discontinuation of breastfeeding and in developing targeted interventions to address these factors. So multivariate logistic regression analysis allows researchers to develop a more comprehensive understanding of the complex interplay between multiple factors that contribute to early discontinuation of breastfeeding.

It was found that there was no statistically significant difference in KAP between mothers who exclusively breastfed their babies and those who did not, indicating using an independent t-test that there was no statistically significant difference in mean knowledge scores between mothers who exclusively breastfed and those who did not, in terms of breastfeeding benefits to baby (P-value = 0.29), benefit to mother (P-value = 0.96), knowledge of colostrum (P- value = 0.54), effective breastfeeding (P-value = 0.13), duration of breastfeeding (P-value = 0.14) and knowledge on complementary feeding (P-value = 0.51). However, an investigation into the association between socio-demographic characteristics of mothers and whether they exclusively breastfed or not, using a chi-squared test, showed a statistically significant association between the following, mother's marital status and exclusive feeding (P=0.013), mother's educational status and exclusive breastfeeding (P- value = 0.013), and the number of live births (children) and propensity to breastfeed (P-value = 0.001).

The null hypothesis for this study was that there is no statistically significant difference between the knowledge, attitude, and practices of breastfeeding in adolescent mothers. The findings of this study rejected the null hypothesis for the comparison between the knowledge and practices sections and between the attitudes and practices sections. However, the null hypothesis is not rejected for the comparison between the knowledge and attitudes sections.

The strengths of this study include the fact that the study investigated knowledge, attitudes, and practices concerning breastfeeding among adolescents as defined by the World Health Organization (WHO). Furthermore, mothers' knowledge of the advantages of breastfeeding to both the mother

and the baby was assessed. The study also sought to understand mothers' knowledge concerning breastfeeding problems and the practical aspects of effective breastfeeding. In addition, this study investigated mothers' KAP towards complementary feeding.

Even though this study comprehensively assessed KAP concerning breastfeeding amongst adolescent mothers, the authors feel it would have been valuable to investigate mothers' (ages 13-16) breastfeeding KAPs. However, due to the vulnerability of the latter group, researchers decided not to include them in this study.

Our recommendations include conducting this study in a rural environment in the WesternCape to compare the findings with those obtained from an urban area, such as Crossroads. We also recommend that more educational and promotional endeavors should be conducted by policymakers, both government and non-profit-making organizations (NPOs), to ensure that adolescent mothers are better informed on the advantages of breastfeeding their infants.

Conclusion:

The importance of breastfeeding in babies' lives has been established. However, in low-income communities such as Crossroads, knowledge of the benefits of breastfeeding was variable, and the majority did not practice exclusive breastfeeding. it is important to implement promotional and educational programs in these communities to increase awareness of the vital role of breastfeeding in ensuring optimal development of children.

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APPENDICES

Annexure 1

Informed Consent Document- for Participants =>18 years old

Study Title: Breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa

Date:…….

Dear prospective participant

Introduction: My name is Dr. Ahmad Mahmoud A. Ashwehdi. I am a medical doctor practicing at Crossroads Day clinic, I am doing research on Breastfeeding knowledge,attitudes and practices among adolescent mothers. The aim of the study is tomeasure the knowledge, attitudes, beliefs and practices of breastfeeding amongst adolescent women.

Invitation: I am inviting you to participate in this research study. The knowledge generatedfrom this study through your participation may benefit you and other adolescent women within the district of Mitchell's Plain Health District, Western Cape.

What is involved in the study: The study is to be carried out by a questionnaire survey. Approximately 30 minutes of your time will be required to answer the questions on the questionnaire, as accurately as possible. The responses on the questionnaire will be collated and analyzed for me (Dr. Ahmad) to get the answer to the research question.

Risks: There are no foreseen risks in this study as it does not involve any physicallyinvasive procedures.

Benefits: The knowledge generated from this study through your participation may benefityou and other mothers, in the Mitchell's Plain Health District of the Western Cape.

Nature of Participation: Participation in this study is voluntary. There is no monetary reward for participating in the research. You will not be penalized in any way for refusing totake part. You are free to withdraw from the study at any time.

Confidentiality: The results will be confidential. Your name will not appear on the questionnaire and efforts will be made to keep personal information confidential. Absolute confidentiality cannot be guaranteed as personal information may be disclosed if required by law although this is unlikely in a study such as this. When this study is complete, you willreceive a summary of the results so that you will know the outcome of this study that you have participated in.

Contact details: If you have any questions regarding this study, or study related adverseeffects, please contact me, Dr. Ahmad Ashwehdi on (0812570061)

Contact details of BREC Administrator or Chair – for reporting of complaints/ problems:**Human research ethics committee:** E53 - Room 46, Old Main Building, Groote Schuur Hospital, Observatory, 7925.

Sign this form only if you:

- have understood what you will be doing for this study,
- have had all your questions answered,
- have talked to your parent(s)/legal guardian about this project, and
- agree to take part in this research

Your Signature Printed Name

Date

Researcher explaining study Signature. Printed Name Date

ASSENT FORM FOR MINORS (Aged 16-17 years old)

TITLE OF THE RESEARCH PROJECT: Breastfeeding knowledge, attitudes andpractices among mothers at Crossroads, Western Cape, South Africa.

RESEARCHERS' NAME(S):

Dr. Ahmad Mahmoud A. Ashwehdi

SUPERVISOR:

Dr. Abdul Aziez Isaacs, Department of Family Medicine

CO-SUPERVISOR:

Dr. Tasleem Ras, Department of Family Medicine

RESEARCHER'S CONTACT NUMBER:

Cell Number: 081 257 0061

I am (Dr. Ahmad Ashwehdi) from the University of Cape Town. I am doing a study to figureout what adolescents think about breastfeeding. We are asking you to take part in the research study because you recently had a baby.

For this research, we will ask you some questions about how you feel about breastfeeding or bottle-feeding your child. We will keep all your answers private and will not show them toanyone outside of the research team.

We don't think that any big problems will happen to you as part of this study, but you mightfeel uneasy when we ask certain questions.

You can feel good about helping us to better understand how adolescent girls feel about breastfeeding. You should know that:

• You do not have to be in this study if you do not want to. You won't get into any troublewith the staff of Crossroads Clinic if you say no.

• You may stop being in the study at any time. (If there is a question you don't want to answer, just leave it blank.)

• You may ask your parent(s)/guardian(s) if it is OK for you to be in this study and even ifthey say it's OK, it is still your choice whether to take part.

• You can ask any questions you have, now or later. If you think of a question later, you oryour parents can contact me at 081 257 0061.

Sign this form only if you:

- have understood what you will be doing for this study,
- have had all your questions answered,
- have talked to your parent(s)/legal guardian about this project, and
- agree to take part in this research.

Your Signature. Printed Name Date

Researcher explaining study Signature Printed Name Date

PARENT CONSENT FORM

We would like to invite your child to take part in our research project titled "Breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa".

Please take some time to read the information below which will explain the details of this research project. Please feel free to contact the researchers about any part of thisproject that you do not fully understand.

It is very important that you are completely satisfied that you clearly understand whatthis research is about and how your child could be involved.

Your child's participation is completely voluntary, and your child is free to decline to participate. In other words, your child may choose to take part, or may choose not totake part.

Your child is free to withdraw from the study at any point, even if your child agrees to take part initially. The **Ethics and Research Committee, Faculty of Health Sciencesof the University of Cape Town** has approved this study.

The study will be conducted by **Drs. Ahmad Mahmoud A. Ashwehdi, Abdul Aziez Isaacs and Tasleem Ras**, from the **Department of Family Medicine, University ofCape Town.**

Your child will be invited as a possible participant because her participation will improve the health outcomes for adolescent mothers and babies in South Africa.

1. PURPOSE OF THE STUDY

The purpose of this study is to investigate the breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa

2. WHAT WILL BE ASKED OF MY CHILD?

If you consent to your child taking part in this study, the researcher will then approach the child to ask whether they would like to take part in the study, or not.

If the child agrees to take part in the study, he/she will be asked to spare only 30 minutes of his/her time to answer the questions on the questionnaire, as accurately as possible. By questionnaire, we mean a set of questions with a choice of answers.

3. POSSIBLE RISKS AND DISCOMFORTS

There are no foreseen risks in this study as it does not involve any physically invasive procedures.

4. POSSIBLE BENEFITS TO THE CHILD OR TO THE SOCIETY

The knowledge generated from this study through **your participation may benefit you and other adolescent mothers,** in the Mitchell's Plain Health District of the Western Cape.

5. PAYMENT FOR PARTICIPATION

There will be no monetary payment for participation in this study.

6. PROTECTION OF YOUR AND YOUR CHILD'S INFORMATION, CONFIDENTIALITY AND IDENTITY

Any information you or your child will share with the researchers during this study and that could possibly identify you or your child will be protected. This will be done by ensuring the results of this study are confidential. The name of your child will not appear on the questionnaire and efforts will be made to keep personal information confidential. However, when this study is complete, you will receive a summary of the results so that you will know the outcome of this study that you have participatedin.

7. PARTICIPATION AND WITHDRAWAL

You and your child can choose whether to be part of this study or not. If you consentto your child taking part in the study, please note that your child may choose to withdraw or decline participation at any time without any consequence. Your child may also refuse to answer any questions they don't want to answer and remain in the study.

8. RESEARCHERS' CONTACT INFORMATION

If you have any questions or concerns about this study, please feel free to contact**Dr. Ahmad Mahmoud A. Ashwehdi** on the following e-mail: doctor.amaa@gmail.com or Cell 081 257 0061

9. RIGHTS OF RESEARCH PARTICIPANTS

Your child may withdraw their consent at any time and discontinue participation without penalty. Neither you nor your child are waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questionsregarding your or your child's rights as a research participant, contact Dr. Ahmad Mahmoud A. Ashwehdi on the following e-mail: doctor.amaa@gmail.com.

DECLARATION OF CONSENT BY THE PARENT/ LEGAL GUARDIAN OF THE CHILD-PARTICIPANT

As the parent/legal guardian of the child I confirm that:

- I have read the above information and it is written in a language that I am comfortable with.
- I have had a chance to ask questions and all my questions have been answered.
- All issues related to my child's privacy, and confidentiality and use of the information have been explained.

By signing below, I_____(name of parent) agree that the researcher may approach my child to take part in this research study, as conducted by **Dr. Ahmad Mahmoud A. Ashwehdi.**

_____ _____

Signature of Parent/Legal Guardian **Date**

DECLARATION BY THE PRINCIPAL INVESTIGATOR

As the principal investigator, I hereby declare that the information contained in this document has been thoroughly explained to the parent/legal guardian. I also declare thatthe parent/legal guardian was encouraged and given ample time to ask any questions.

_____ _____

Signature of Principal Investigator **Date**

APPENDIX 3: FORM A AS PUBLISHED IN THE REGULATIONS FOR RESEARCH WITHHUMAN PARTICIPANTS

DEPARTMENT OF HEALTH APPLICATION FOR MINISTERIALCONSENTFOR

NON-THERAPEUTIC RESEARCH

WITH MINORS

---

1. INSTRUCTIONS

1.1 This application form must be completed for all protocols that are classified as "non- therapeutic" and involve the participation of minors. Non-therapeutic research is defined in the regulations relating to research on human participants as "research thatdoes not hold out the prospect of direct benefit but holds out the prospect of generalizable knowledge". Minors are defined as persons under the age of 18 by section 17 of the Children's Act (No. 38 of 2005).

1.2 This application form should be submitted with a copy of the protocol andsupporting documents.

1.3 This application should be submitted to the Minister of Health or the delegatedauthority in terms of section 92(a) of the Act.

1.4 This application form should describe how 'non-therapeutic' research protocols with minors meet the conditions set out in section 71 (3)(b) of the Act (described below).

1.5 All sections of the form must be completed in full.

1.6 Ministerial Consent may be granted for non-therapeutic health research with minorswhen certain conditions set out in section 71 (3)(b) of the Act are met and these conditions are:

a) The research objectives cannot be achieved except by the enrolment of minors.

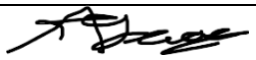
b) The research is likely to lead to an improved scientific understanding ofconditions, or disorders affecting children.

c) Any consent given to the research must be in line with public policy; and

d) The research does not pose a significant risk to minors, and if there is somerisk, the benefit of the research outweighs the risk assessment.

Updated 16th February 2022

2. INVESTIGATORS' DETAILS

Name of principal investigator	Dr. Abdul Aziez Isaacs
Title of research protocol	Breastfeeding knowledge, attitudes and practicesamong adolescent mothers at Crossroads, Western
Institutional affiliation	Department of Family MedicineUniversity of Cape Town
Postal Address	Department of Family Medicine University of CapeTown
Physical Address	Department of Family Medicine University of CapeTown
Email Address	abdul.isaacs@westerncape.gov.za
Phone	0027718762257
Fax	N/A
Date of Application	9 September 2022
Signature of Applicant	

3. APPLICATION

3.1 Condition 1: The research objectives cannot be achieved except by theparticipation of minors.

- Describe the scientific justification for the enrolment of minors. Explainwhy this research must be done with minors as participants:

16th February 2022

3.2 Condition 2: The research is likely lead to an improved scientific understanding of certain conditions, diseases or disorders affectingminors.

- Describe how the research might, or aims to, advance knowledge affecting the health and welfare of minors as a class. Note that 'condition' is defined in the Regulations as 'physical and psycho- social characteristics understood to affect health' allowing that this research does not only involve children with an

illness.

3.3 Condition 3: Any consent given to the research is in line with public policy. Consent given by authorized persons must be in line with public policy considerations.

- Describe how consent to the research will be in line with public policy or wouldbe acceptable, for example, show how the research poses acceptable risks and promotes the rights of minors:

3.4 Condition 4: The research does not pose a significant risk to minors;and if there is some risk, the benefit of the research outweighs the risk.

- Describe how the potential risks from the research procedures and/or intervention to minor participants will be minimized and describe any possible benefits from the research to society in the form of knowledge:

16th February 2022

Marsh

Fagma Jordaan
Divisional Manager

Marsh Proprietary
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8000South Africa
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fagma.jordaan@mars
h.com
www.marsh.com

ADDRESSEE ONLY

To whom it may concern

18 May 2022

University of Cape Town : Confirmation of Clinical Trial Insurance

STUDY TITLE: Breastfeeding knowledge, attitudes and practices among adolescent mothers at Crossroads, Western Cape, South Africa.

Marsh (Pty) Ltd acts as insurance brokers to University of Cape Town and confirms cover as follows:

INSURED	UNIVERSITY OF CAPE TOWN
CLASS	No fault compensation for clinical trials
PERIOD OF INSURANCE	01 March 2022 to 1 March 2023 (both days inclusive)
NUMBER OF PARTIPANTS	50
INSURER	Lloyds
POLICY NUMBER	BOWLT2200115
LIMIT OF INDEMNITY	USD 5 000 000 any one claim and in the aggregate perannum
PRINCIPLE INVESTIGATORS	Dr. Abdul Aziez Isaacs
TERITORIAL LIMITS	Worldwide

We trust that you will find this to be in order, should you require any additional information, please do nothesitate to contact the writer.
Sincerely,

Fagma Jordaan
Divisional Manager

An authorised financial
services provider FSP
Licence no.: 8414
Registration no.: 1999/000348/07

Annexure 2

Questionnaire

Sociodemographic Characteristics

Parameter	Categories
Age-group	
	16-17
	18-19
Marital status	Unmarried
	Married
Education Background	No formal schooling
	Primary school
	High School
	University education
Employment	No

	Yes
	Self-employed
Employment sector	Private
	Public
Entitled to breastfeeding hours by employer	No
	Yes
Household Income	
Number of pregnancies	1
	2
	≥3
Number of live births	1
	2-4
	≥5
Last child’s gestational age at birth (weeks)	<37
	≥37
Mode of delivery of last child	Vaginal
	Cesarean section

Healthcare provider explained importance of breastfeeding before or after delivery of last child	No
	Yes
Healthcare provider explained the appropriate practices of breastfeeding for last child	No
	Yes
Do you exclusively breast feeding?	No
	Yes
Past breastfeeding experience	No other children
	No
	Yes
Past exclusive breastfeeding experience	No other children
	No
	Yes
Pre-pregnancy health problems	No

	Yes
Pregnancy health problems	No
	Yes

Child's body weight (kg)	<2.5
	≥2.5

Knowledge regarding breastfeeding

	No	Yes
Benefits to babies		
Breastfeeding reduces the risk of respiratory infection among babies		
Breastfeeding increases the baby's intelligence		
Breastfeeding helps to reduce the incidence of child abuse and neglect		
Baby who received breastfeeding is less proneto get diarrhea		
Breast milk provides baby with more protection from allergy compared to formula milk		
Breastfeeding causes good development of baby's teeth and gum		
Benefits to mothers		
Exclusive breastfeeding is beneficial in spacingbirth		
Breastfeeding helps to stimulate uterine contraction		

Mothers who practiced breastfeeding may achieve pre- pregnancy weight faster		
Frequent breastfeeding may prevent breast engorgement		
Mother who practiced breastfeeding has a lowrisk of getting breast cancer		
Breastfeeding may protect against osteoporosis		
Colostrum		
Colostrum is the mother's early milk, which is thick, sticky, and yellowish		
Colostrum is difficult to digest and needs to be discarded		
Colostrum causes constipation among babies		
Colostrum is not able to protect babies from jaundice		
Effective feeding		
Babies will gain weight if they receive effective feeding		
Correct positioning helps to achieve effective breastfeeding		
Babies sleep well after they receive adequate breastfeeding		
Duration of feeding		

Breastfeeding should be initiated within 30 minutes after delivery		
Breastfeeding should be given on demand		
Baby should be allowed to breastfeed for at least10-20 minutes for each feeding		
Breastfeeding should be continued up to 2 yearseven though the baby has received foods or drinks other than breast milk or infant formula, referred to as complementary food		

Complementary feeding		
Complementary feeding should be introduced at6		

months of age		
Mothers may mix breastfeeding and formula feeding once baby starts taking complementary food		
Effective feeding		
Babies will gain weight if they receive effective feeding		
Correct positioning helps to achieve effective breastfeeding		
Problems		
Breast milk production is influenced by breastsize		
Mothers with inverted nipples cannot breastfeed their babies		
Breastfeeding must be discontinued if motherhas cracked nipple		
Breastfeeding must be discontinued if baby has jaundice		
Breastfeeding must be discontinued if motherhas breast engorgement		
Breast engorgement may be reduced with cold packs		
Practical aspects		

Exclusive breastfeeding must be practiced untilthe infant is 6 months old		
Massage may reduce breast engorgement		
Giving water to baby is encouraged after every breastfeeding		
Belching after feeding shows that the baby is full		
Babies who get enough feeding will pass urine more frequently		
Oral thrush frequently happens to babies who breastfeed		

Attitudes of mothers towards breastfeeding

	Agree	Not sure	Disagree
Breastfeeding is easier than artificial feeding			
It is difficult for breast feeder to take careof her family			
Breastfeeding has no effect on marital relationship			
Breastfeeding reduces family expenses			
Artificial feeding preserves woman's body and prevents obesity			

The community prefers breastfeeding over artificial feeding			
Healthcare workers encourages breastfeeding			
A vacation for 3 months is enough for successful breastfeeding			
Workplaces offer suitable private placesfor breastfeeding			
Breastfeeding should be continued up to2 years			

Breastfeeding should be on demand			
Giving pre-lacteal feeds to babies is an important practice			
Following vaccination schedule is an important practice			
Breastfeeding should be stopped when child has diarrheal episodes			
Formula feeding better than breastfeeding			
Health and hygiene are moreimportant for breastfeeding			
Breastfeeding causeschanges in body shape			

Breastfeeding increases motherchild bonding			
You know all it takes tobreastfeed			
You are prepared forbreastfeeding			
You will breastfeed your child later in the future			
It is difficult for breast feeders to take care of their family			
Breast milk is ideal food for babies			
Starting complementary foods to a child before 6 months is important			
Prefer to feed your baby breast milk alonefor the first 6 months			
Breastfeeding will make the mother's breasts sag			
Breastfeeding affects your beauty			
Breastfeeding can increase the mother's weight			
One of the causes of hair loss is breastfeeding			
Pumping breast milk makes it no longer beneficial for the child			

Mothers should stop breastfeeding if they take any type of medication			
Intention to breastfeed future children			

Breastfeeding practices

Did you take advice from lactation counsellor (healthcare worker??) before breastfeeding	No	Yes	
Did you give pre-lacteal feeds to the infant?	No	Yes	
What was the type of the first feed given to your last child?	Breast milk	Honey	Sugar water
When did you start breastfeeding after delivering your last child?	After 1 hour	After 2-6 hours	After 24 hours
How frequently do you breastfeed?	On-demand	Specific intervals	At random
How frequently do you consume foods that boost production of breast milk, called galactagogues forimproving milk production?	Daily	weekly	never
Initiation of breastfeeding immediately and within the firsthour of life	No	Yes	
Currently breastfeeding the last child and intending tocontinue until the age of ≥24 months	No	Yes	
Exclusively breastfed last child for 6 months	No	Yes	

Planning to continue exclusively breastfeeding last childuntil 6 months of age	No	Yes	

Attended breastfeeding classes during pregnancy	No	Yes	
Open Ended Questions			
What are the benefits of breastfeeding to the infant?			
What does breastfeeding help the mother?			
What do you know about colostrum?			

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-submissions@uct.ac.za
Website: https://health.uct.ac.za/home/human-research-ethics

26 September 2022

HREC REF: 465/2022

Dr A Isaacs
Division of Family Medicine
Falmouth Building- FHS
Email: Abdul.isaacs@westerncape.gov.za
Student: doctor.amaa@gmail.com

Dear Dr Issacs

PROJECT TITLE: BREASTFEEDING KNOWLEDGE, ATTITUDES AND PRACTICES AMONG ADOLESCENT TEENAGE MOTHERS AT CROSSROADS, WESTERN CAPE, SOUTH AFRICA- (MMED CANDIDATE-DR AHMAD M ASHWEHDI)

Thank you for your response letter, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 September 2023.

Please submit a progress form, using the standardised Annual Report Form (FHS016) if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Dr Ahmad Ashwehdi will also be involved in this study.

Please quote the HREC REF 465/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637. Institutional Review Board (IRB) number: IRB00001938 NHREC-registration number: REC-210208-007
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2020), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

HREC/ref 465.2022