UMBILICAL CORD CARE KNOWLEDGE AND PRACTICE AMONG CAREGIVERS IN YENAGOA, BAYELSA STATE

Abstract

Background and Aim: Umbilical cord care has over the years become more important considering the adverse consequences to the child when umbilical cord infections are allowed to fester. Proper umbilical cord care could however be unattainable if mothers uphold wrong beliefs and methods for the care of the umbilical cord. This study thus aimed at assessing umbilical cord care knowledge and practice among caregivers in Yenagoa, Bayelsa state.

Methods: This was a descriptive cross-sectional study conducted among 285 caregivers in 3 major health care facilities where immunization services are rendered in Yenagoa, Bayelsa state. These included the Agudama Primary Health Centre, Yenizue-gene Comprehensive Health Centre and the Diete Koki Memorial Hospital. Data on cord care knowledge and practices was collected using a self-administered structured questionnaire. Data was analysed using the Statistical Package for Social Sciences (SPSS) version 23, from which descriptive statistics were generated. All necessary ethical considerations were upheld during the conduct of this study.

Results: In this study, it was identified that 252 (88.4%) of the respondents indicated that they knew how to properly care for their children's umbilical cord, 96 (33.8%) were aware of the use of chlorhexidine gel for cord care, 67 (25%) and 236 (82.8%) knew that hand hygiene should be done before and after cord care. Good umbilical cord care knowledge of 51.6% was also obtained. Also, only 45 (15.8%) cleaned cord with water, only 76 (26.7) kept cord exposed and dry with diaper folded below it. In addition, methylated spirit alone was applied to the cord by 125(47.2%) respondents while chlorhexidine gel alone was used by 53 (20.0%) of respondents. Good cord care practice score obtained in this study was 31.3%

Conclusion and Recommendation: Identified umbilical cord knowledge gaps were mainly with the use of chlorhexidine gel and dry cord care and these reflected in their inadequate practice of proper umbilical cord care. There is an urgent need for the improvement of mothers' knowledge and practice of proper umbilical cord care, and there is the need to review the umbilical cord care health education provided to the mothers.

Keywords: Mothers, Caregivers, Umbilical cord care, Knowledge, Practices, Yenagoa

Introduction

Umbilical cord care are actions taken to handle the umbilical cord after delivery to ensure it does not pose a health risk to the infant. Improper care of the cord could lead to infections such as omphalitis, septicaemia, and tetanus. Infection is one of the leading causes of neonatal mortality globally (WHO, 2022). Neonatal sepsis related morbidity and mortality are particularly high in low- and middle-income countries (LMIC) which bears about 99% of global neonatal mortality burden (Lawn et al., 2009; Milton et al., 2022). In Nigeria, neonatal sepsis accounts for up to 44% of neonatal deaths (Odejimi et al., 2022). After delivery, the cord is clamped and severed leaving an exposed umbilical stump attached to the baby which

gradually becomes dry, shrinks, changes colour, and falls off between 1 to 3 weeks. The withering tissue of the stump provides a suitable environment for bacterial colonization and growth, which may lead to umbilical cord infection (omphalitis) and this may become complicated with the development of cellulitis, necrotizing fasciitis, and life-threatening systemic infection. (Stewart et al., 2016). Incidence of about 8% among home deliveries in developing countries has been reported (Painter et al., 2023), and is dependent on factors such as place of delivery, cord care practices and the baby's immune system. A rate of about 22% has been reported among newborn babies delivered at home (Mir et al., 2011).

Omphalitis occurs primarily in the neonatal period and in low-income counties. Clinical features reported to usually start about the 3rd day of life include tenderness, erythema, induration of the umbilicus and surrounding tissues. At certain times, a purulent foul-smelling discharge emanates from the cord which can progress rapidly to systemic infection with potentially fatal outcome.Estimated mortality rate from omphalitis ranges between 7% and 15% (Painter et al., 2023). Neonatal tetanus is another life-threatening infection that can be prevented through adequate cord care and through the application of other precautions including immunisation with tetanus-toxoid-containing vaccines (WHO, 2023). The World Health Organization (2013) recommends that daily chlorhexidine (7.1% chlorhexidine digluconate aqueous solution or gel, delivering 4% chlorhexidine) be applied to the umbilical cord stump during the first week of life for newborns who are born at home in settings with high neonatal mortality (30 or more neonatal deaths per 1000 live births). Clean, dry cord care is recommended for newborns born in health facilities and at home in low neonatal mortality settings. The use of chlorhexidine in these situations may be considered only to replace the application of a harmful traditional substance, such as cow dung, to the cord stump. However, following evidence of chlorhexidine effectiveness in preventing neonatal sepsis for both home and facility births (Hodgins, 2017; Mullany et al., 2017), it has been recommended for umbilical cord care in babies (Zaman et al., 2021). Its use in Nigeria has also been scaled up for both home and facility births. (Federal Ministry of Health, 2016; USAID 2018).

Unfortunately, harmful cord care practices including application of unsafe materials such as cow dung, sand, engine oil, and herbs, as well as the use of unsafe objects to cut and tie the cord have persisted in developing countries (Abua et al., 2023). Studies have been carried out on umbilical cord care practices in Bayelsa State with poor practice reported (Opara et al., 2012; Duru et al., 2022), These studies didn't assess cord care practice as currently recommended by the World Health Organization (2013) and Nigeria, considering that the use of chlorhexidine was either not assessed alone or was grouped with methylated spirit as good practice. Assessment of cord care knowledge was done in only one of the studies, but the details was not reported limiting understanding of aspects of knowledge gaps that need to be addressed. This manuscript thus assessed the knowledge and practice of current cord care recommendations among mothers and care givers attending immunization clinics of 3 healthcare facilities located in Yenagoa, to identify gaps to be addressed in relation to umbilical cord care.

Materials and Methods

The study was carried out in Yenagoa, the capital city of Bayelsa State which is located within the Niger Delta region of Southern Nigeria and occupying an area of 706km^2. Study sites included the Agudama Primary Health Centre, the Yenizue-gene Comprehensive Health

Centre and the Diete Koki Memorial Hospital, Opolo. These health care facilities, which are all located in Yenagoa, Bayelsa State; were purposively selected considering their strategic locations in Yenagoa and the level of utilization by mothers in large numbers for immunization services. This study adopted the descriptive cross-sectional design in which self-administered structured questionnaires were administered proportionately across the study sites and used to obtain data on the cord care knowledge and practices from caregivers attending the immunization clinics. Data was collected for a period of up to four weeks.

The questionnaire had 4 sections (1 to 4). Section 1 elicited data on the socio-demographic characteristics of the respondents, Section 2 elicited data on the details of the index child including antenatal care and place of delivery, Section 3 elicited data on the umbilical cord care knowledge of the mothers. The section consisted of general umbilical cord care knowledge questions and 6 other questions which were used as measures of umbilical cord care knowledge. Section 4 elicited data on the umbilical cord care practices of the caregivers and also had questions that assessed general umbilical cord care practices and 4 other questions which were used as measures of umbilical cord care practice. A score of 1 was awarded for each correct question and 0 for wrong responses, I don't know, or I am not sure responses. Good umbilical cord care knowledge level for the study population was obtained by summing up the correct from the 6 measures, dividing it by the sum of respondents in to the 6 questions and multiplying it by 100. Same was done with the 4 umbilical cord practice measures to get the umbilical cord care practice level of the study population.

All parents or caregivers at the immunization clinics of the study sites who gave consent to be involved in the study served as the study population and sample size of 285 was calculated using the Cochrane's formula, after considering a previous prevalence of cord care practice reported by Ayub et al. (2022) and a 12% attrition rate. Caregivers who met the inclusion criteria were enrolled consecutively until the desired sample size was met. A research assistant was recruited and adequately trained before the study commenced. The questionnaire was pretested on 30 subjects at a health care facility that was not used for this study to ensure the validity and reliability. The questionnaires were proportionately distributed across the 3 healthcare facilities. Approval for this study was obtained from the Ministry of Health, Bayelsa State before the study commenced. The purpose of the study was written, and the content was read and explained to each parent /caregiver and thereafter a copy handed over to them. They were clearly informed that this study was voluntary and their verbal consent was then obtained. Data obtained was analysed using the Statistical Package for Social Sciences (SPSS) version 23 software, from which descriptive statistics were obtained.

Results

Socio demographic Characterises of parents/caregivers.

A total of 285 respondents were interviewed among which most of them were female 277 (97.2%), aged between 19 and 29 years 119 (49.8%) with a mean age of 29.1±6.3 years, were married 204 (72.1%), were Christians 275 (97.9%), and were of the Ijaw ethnic group 160 (57.3%). It was also identified that 99 (37.6%) of the respondents were either petty traders, labourers, or messengers and 125 (46.3%) of the respondents had received up to secondary school education. The details are shown in Table 1.

Table 1: Socio-demographic characteristics of parents/caregivers

Variable	Frequency	Percentage (%)
Sex (n=285)		
Male	8	2.8
Female	277	97.2
Age (years) (n=239)		
<19	9	3.8
19-29	119	49.8
30-39	100	41.8
40-49	10	4.2
>49	1	0.4
Mean age: 29.1±6.3 years		
Marital status (n=283)		
Single	63	22.3
Married	204	72.1
Cohabiting	14	4.9
Widowed	2	0.7
Religion (n=281)		
Christianity	275	97.9
Islam	6	2.1
Ethnic group (n=279)		
Ijaw	160	57.3
Igbo	63	22.6
Yoruba	13	4.7
Hausa	3	1.1
Others	40	14.3
Occupation (n=263)		
Senior public servant/ managers/contractors/large scale trader	52	19.8
Intermediate grade public civil servant/ Senior school teachers	18	6.8
Junior school teachers / artisans	31	11.8
Petty trader/ labourers/messengers	99	37.6
Unemployed/ homemaker/student	63	24.0
Education (n=270)		
No formal education	4	1.5
Primary	19	7.0
Secondary	125	46.3
Post-secondary	29	10.7
University/higher institution	93	34.4

Index child characteristics

Regarding the characteristics of the index children of the parents involved in this study, it was identified that 162 (56.8%) of them were males, and most of them were less than 12 months of age 211 (74.0%). Majority of the caregivers had received antenatal care (ANC) for this index child 268 (97.1%), which was mostly received in government health facilities 194 (70.0%). Also, most of the women delivered the index child at government health care

facilities 155 (55.6%), and this index child was the first child of the largest proportion of the respondents 103 (36.5%). The details are shown in Table 2.

Table 2: Index child characteristics

Variable	Frequency	Percentage (%)
Sex of child (n=285)		
Male	162	56.8
Female	123	43.2
Age of child (months) (n=271)		
<12	211	74.0
12-60	59	20.7
>60	1	0.4
Received antenatal care (ANC) for child (n=276)		
Yes	268	97.1
No	8	2.9
Where ANC was received (n=277)		
Government health facility	194	70.0
Private health facility	71	25.6
Traditional Birth Attendant	10	3.6
Church	1	0.4
Others	1	0.4
Where child was delivered (n=279)		
Government health facility	155	55.6
Private health facility	62	22.2
Traditional Birth Attendant	24	8.6
Church	7	2.5
Home	31	11.1
Birth order of index child (n=282)		
1st	103	36.5
2nd	81	28.7
3rd	36	12.8
4th	33	11.7
5th	18	6.4
6th	10	3.5
7th	1	0.4

Umbilical cord care knowledge

Regarding general cord care knowledge (Table 3a), 252 (88.4%) of the respondents indicated that they knew how to properly care for their children's cord, 243 (85.6%), of them had been taught how to care for the cord, and out of these, 163 (68.2%) were taught by a nurse, and 161 (66.3%) respondents were taught cord care during the antenatal care. On the use of methylated spirit, 269 (94.4%) respondents were aware that this was used for cord care.

On the 6 measures of good cord care knowledge (Table 3b), 213 (82.6%) of the respondents knew that proper cord care helps prevent cord infection and child death, only 40 (15.5%) knew that the cord should be left exposed and dry with the diaper folded below it, 96 (33.8%

) were aware of the use of chlorhexidine gel for cord care, 67 (25%) respondents knew that no other substance apart from hexedine should be applied to the cord after it is cleaned, 177 (69.4%) knew that redness, yellowish discharge from cord and foul-smelling cord may be signs of cord infection, and 236 (82.8%) knew that hand hygiene should be done before and after cord care.

Good umbilical cord care good knowledge score obtained after analysing the 6 cord care responses of the respondents was 51.6%.

Table 3a: General Umbilical Cord Care Knowledge

Variable	Frequency	Percentage (%)
Knows how to care for child's umbilical cord (n=285)		
Yes	252	88.4
No	6	2.1
I am not sure	27	9.5
Ever taught how to care for child's umbilical cord (n=285)		
Yes	244	85.6
No	33	11.6
I don't know	8	2.8
Who taught you how to care for your child's cord (n=239)		
A Nurse	163	68.2
A TBA	1	0.4
A Neighbour /Friend	4	1.7
Mother /Mother-in-law/Grandmothers	61	25.5
Doctor	8	3.3
Others	2	0.8
When were you taught how to care for your child's umbilical cord (n=243)		
During antenatal care	161	66.3
After I delivered my child	66	27.1
I cannot remember	16	6.6
Awareness of the use of methylated spirit for cord care (n=285)		
Yes	269	94.4
No	16	5.6

Table 3b: Umbilical Cord Care Knowledge measures of respondents

Variable	Frequency	Percentage (%)
Proper cord care helps to prevent cord infection and child death. (n=258)		
Yes	213	82.6
No	6	2.3
I don't know	39	15.1
Umbilical cord should be kept dry and exposed,		

with the diaper folded below it. (n=258)		
Yes	40	15.5
No	183	70.9
I don't know.	35	13.6
Awareness of the use of Chlorhexidine gel for cord care. (n=284)		
Yes	96	33.8
No	188	66.2
No other substance apart from chlorhexidine should be applied to the cord after cleaning it. (n=268)		
Yes	67	25.0
No	92	34.3
I don't know	109	40.7
Redness, foul-smelling cord and yellow discharge from cord may be signs of cord infection (n=255)		
Yes	177	69.4
No	14	5.5
I don't know	64	25.1
Knowledge of Hand Hygiene before and after Cord Care (n=285)		
Yes	236	82.8
No	3	1.1
I don't know	46	16.1

Umbilical Cord Care Practices

On the assessment of general cord care practices (Table 4a), 187 (71.6%) responded that a pair of hospital scissors was used to cut their children's cords, and 245 (92.8%) indicated that a cord clamp was used to clamp their children's cord. Regarding actual cord care practices by the respondents, 177 (62.1%) washed hands before cord care. It was also found that 102 (35.8%) respondents practiced hot water massage/compress for cord care, 184 (70.0%) covered the cords after cleaning, and this was done using diapers by 108 (58.7%) respondents.

Regarding the 4 umbilical cord care practice measures used (Table 4b), it was found that 177 (62.1%) respondents practiced hand hygiene before and after cord care, only 45 (15.8%) cleaned cord with water only, only 76 (26.7) kept cord exposed and dry with diaper folded below it. Chlorhexidine gel alone was used by 53 (20%) of respondents. Other substances applied to the cord are shown in Table 5. Also, methylated spirit alone was applied to cord by 125 (47.2%) respondents. Good cord care practice score obtained in this study was 31.3% after analysing the 4 umbilical cord care practice measures.

Table 4a: General Umbilical Cord Care Practices

Variable	Frequency	Percentage (%)
Instrument used to cut child's cord (n=261)		
Sterile scissors	187	71.6

Razor	17	6.5
Surgical blade	13	5.0
Others	1	0.4
I don't know	43	16.5
Material used to tie/clamp child's cord (n=264)		
Cord clamp	245	92.8
Piece of cloth	3	1.1
Thread	9	3.4
Others	7	2.7
Hot water massage / compress (n=285)		
Yes	102	35.8
No	5	1.8
I don't know	178	62.5
Cover cord after cleaning (n=263)		
Yes	184	70.0
No	69	26.2
Sometimes	10	3.8
If yes, item used to cover it (n=184)		
Bandage	20	10.9
Diaper	108	58.7
Gauze	24	13.0
Piece of cloth	32	17.4

Table 4b: Cord Care Practice measures

Variable	Frequency	Percentage (%)
Perform Hand hygiene before and after cord care (n=285)		
Yes	177	62.1
No	2	0.7
I don't know	106	37.2
Ever used chlorhexidine for cord care (n=250)		
Yes	108	37.9
No	177	62.1
Clean cord with gauze and water only (n=285)		
Yes	45	15.8
No	127	44.6
I don't know	113	39.6
Keep cord dry and exposed with diaper folded below it. (n=285)		
Yes	76	26.7
No	87	30.5
I don't know	122	42.8
Materials applied to cord after cleaning (n=265)		
Methylated spirit only	125	47.2
Chlorhexidine gel only	53	20.0
Vaseline	32	12.1
Menthol	23	8.7
Herbs	7	2.6
Toothpaste	3	1.1

Dusting powder	2	0.8
Religious Oil (olive oil,	2	0.8
Breastmilk	1	0.4
Salt	1	0.4
Others	16	6.0

Discussion

The finding from this study that more than half of the study respondents had good cord care knowledge is close to the finding of 48.1% reported by Ndikom et al (2020), but higher than 21.65% reported by Mohammed et al. (2020) and remarkably lower than over 70% reported by some other researchers (Ango et al., 2021; Owusu et al., 2023; Afolaranmi et al., 2018). Good cord care knowledge results obtained in studies depends to a large extent on measures used for the assessment which was found to vary varied in the studies and may have impacted on results obtained. It was also found in this study that although 88.4% of the respondents indicated having had proper cord care knowledge, a finding comparable to the response of 83.3% reported by Nwonwu et al (2017), this did not translate to proper knowledge following assessment with specific parameters highlighting the need for in dept assessment of actual knowledge by researchers. Of note among the cord care measures assessed was the low awareness of chlorhexidine gel, the only currently recommended antiseptic for cord care, by only 33.8% of respondents in the present study. This finding is however higher than the rather low values of 11.7% and 2.8% reported by Nwonwu et al. (2017) and Onubogu et al (2022) respectively. Israel et al. (2023) and Aitafo et al (2021) reported chlorhexidine gel awareness of 60.7% and 63.3% but good knowledge scores of 47.1% and 34.2% respectively following further evaluation. These results differed from the high chlorhexidine cord care awareness 80.2% reported by Owusu et al. (2023). Awareness of the use of methylated spirit in this study by most of the respondents is in line with findings made by many other studies (Onubogu et al., 2022; Ayub et al, 2022; Dathini et al, 2018; Afolaranmi et al, 2018; Owusu et al, 2023 &Nwonwu et al., 2017; Mohammed et al., 2020) .

Also worrisome is the low knowledge of the need to keep the cord exposed to air and dry by a very low proportion of the respondents in this study which is similar to poor knowledge of this activity reported in other studies (Afolaranmi et al., 2018; Onubogu et al., 2023; Ayub et al.,2022). Dry cord care involves keeping the cord clean without application of anything and leaving it exposed to air or loosely covered by a clean cloth (WHO, 2013). High awareness of dry cord care was however reported by Owusu et al., (2023), Dathini et al., (2018) and Asiegbu et al (2018)**.** It is however encouraging to find that most of the respondents in this study knew the importance of good cord care which was similar to the finding by many researchers (Owusu et al., 2023; Aforlarnmi et al., 2018., Onubogu 2022; Mohammed et al., 2020). It however differed from the findings from some studies where low knowledge of the importance of good cord care was reported (Ayub et al., 2022 & Easter et al.,2017). The finding in this study that 69.4% of respondents were aware of signs of cord infection is comparable to the high rate reported by Ango et al (2021) but higher than lower values Ayub et al 2022. The knowledge that hands hygiene should be performed before and after cord care is also commendable and agrees with the finding of other studies (Onubogu et al., 2022; Ango et al., 2022; Ango et al., 2021).

The low awareness of chlorhexidine cord care and dry cord care in this study where over 90% of the respondents received antenatal care from either a government or private hospital, and about 85% taught cord care mainly during antenatal care raised concerns over the content of cord care education they received. This study identified that nurses were the main source of umbilical cord care knowledge as reported by other studies (Ndikom et al., 2023; Opara et al., 2012; Onubogu et al, 2023) and highlights the need for front-line health educators to be adequately informed and continuously updated on current best practices for health care. This is to enable them appropriately educate others. This finding however differs from those of Easter et al. (2017) from Nigeria; Ayub et al. (2022) from Tanzania, and Ans et al. (2023) from Pakistan where relations, mothers and mothers-in-law were the main sources of cord care knowledge. Abhulimhen-Iyoha et al. (2015) in their study highlighted the importance of adequate health education contents given to mothers in hospitals.

Good cord care practice level using chlorhexidine of 31.3% obtained in this study is low but comparable to 34% reported by Duru et al. (2022), is higher than 21% reported by Ayub et al. (2022) in Tanzania and lower than the finding in studies in which good cord care practice was found (Ango et al.2021; Afolaranmi et al., 2018; Udosen et al. 2019; Kyololo& Kipkoech, 2023). Good cord care practice level is also dependent on parameters assessed which may affect the results obtained. The finding of poor cord care practice despite good knowledge of slightly above 50% suggests that knowledge does not always translate to good practice. Still on measures of good cord care practice measures, it was found that only 53 (20.0%) of the respondents applied chlorhexidine gel alone to their children's cord which is poor though not surprising considering the low knowledge level of chlorhexidine for cord care obtained. This finding is in line with low practice level reported by Aitafo et al. (2021), Duru et al. (2022) and Aku et al (2023) and other studies in which chlorhexidine use of less than 10% was reported. (Dathini et al. 2018 ; Nwonwu et al.,2017 ; Ochoga et al.,2020 ; Onubogu et al., 2022). Low rate of 46.1% was also reported by Astatkie et al (2022) even after a national scale up in Ethiopia. However, its use was reported to be 64% by Kyololo& Kipkoech (2023) in Kenya and Olubiyi et al. (2023) in Nigeria, reported a utilisation rate of 84.8% and suggested an improvement in its use. This however was not corroborated by findings in this study. Methylated spirit was the most common substance applied to the cord in this study, and this was done by almost half of the respondents. It is sad to find in this study that several other unsafe materials were still used for cord care. This is in line with the findings made by Coffey & Brown (2017) that many mothers and caregivers in Low- and middle-Income Countries (LMICs) desire to actively apply something other than chlorhexidine to the cord and Abua et al. (2023) showed a range of various materials applied.

In this study, the practice of keeping the cord dry and exposed with diaper folded below it by only 26.7% of the respondents is low and correlates with the finding that about 70% of the respondents cover their children's cord. This is like the report from the studies conducted by Duru et al. (2023), Nwonwu et al. (2017) and Udosen et al. (2019) where this practice was also low. However, most of the respondents in the studies by Ayub et al (2022) in Tanzania, and Kyololo& Kipkoech (2023) in Cameroun practiced this. Commendable, though with room for improvement is the practice of hand hygiene by over 60% of the respondents in the present study which is in line with the findings of other studies (Ango et al., 2021; Onubogu et al., 2021; Duru et al, 2022; Ans et al., 2023). Poor hand hygiene has however been reported by Afolaranmi et ai (2018) and Udosen at al., (2019). The finding that about 75% of

the babies had their cords cut with sterile scissors or surgical blade and that over 90% of the cords were clamped with cord clamps is also commendable and in keeping with findings in many studies in which the cords were mostly with scissors or surgical blades (Opara et al., 2012; Ochoga et al., 2020; Duru et al., 2022), and cord clamped with cord clamps (Ochoga et al.,2020; Ango et al., 2021; Udosen et al.,2019). Our finding differ from findings from studies where razor blade was most commonly used (Ango et al., 2021; Udosen et al., 2019) as well as in studies where materials such as hair and sewing thread, and strings of cloth, rubber band were most commonly used to tie the cord (Abhulimhen-Iyoha et al., 2011; Afolaranmi et al, 2018;) The use of the two instruments may not be completely under the control of the mothers, but are important components of cord care that could contribute to cord sepsis if not properly done. Warm compress for cord care continues to be practiced by many as shown in this study where it was done by 35.8% of the respondents which is comparable to the rates reported by Dathini et al. (2018) and Onubogu et al. (2022) but lower than the practice by up to 87.0% of respondents reported by Duru et al. (2022).

Conclusion

Identified umbilical cord knowledge gaps were mainly with the use of chlorhexidine gel and dry cord care and these reflected remarkably in their practice, with knowledge level better than practice level. Fortunately, most of the mothers had antenatal care and delivered in health care facilities and these are expected to provide platforms for health education.

Of concern however was the low practice level and modest knowledge level of umbilical cord care in a study population where most respondents had access to antenatal care, and this calls for urgent improvement of caregivers on umbilical cord care. It also shows the need for the review of the knowledge level of frontline health educators on proper umbilical cord care, as well as the need to review the umbilical cord care health education given to the mothers to ensure adequate information is passed across. Persisting practice gap after identified knowledge gaps have been addressed will however require further research to establish any other apparent causes.

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