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Prevalence and Factors Associated with Poor Newborn Home Care Among Postnatal Mothers in Lira City, Northern Uganda

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Abstract*— *Background: Proper newborn care is essential in the fight against neonatal mortality and morbidity among babies. The care practices include delaying bathing of the baby until after 24 hours, initiation of breastfeeding within one hour following delivery, thermal care and clean cord care are essential in the reduction of newborn mortality. This study determined the prevalence and factors associated with poor newborn home care among postnatal mothers in Lira City, Northern Uganda.* ***Method*: This was a descriptive cross-sectional survey employing a quantitative method of data collection from postnatal mothers attending postnatal care in selected health facilities within Lira city. The study was conducted among 422 postnatal mothers. Data was entered and analyzed using SPSS version 23.* ***Results****: The most common newborn care practices reported by the mothers were cleaning the cord with Cool clean boiled water (73.9%), cleaning the cord three times a day (77.55%), covering the baby with blankets (98.1%), feeding the baby on honey (44.3%) and not touching the waist of male babies (74.4%).Overall, the prevalence of good newborn home care was at 46.2% and poor newborn home care was 53.8%.The factors that were associated with poor newborn care were low or no maternal education, delivery from home, marital status, and birth order of the baby.* ***Conclusion****: Poor newborn home care practices are still common among mothers with a low level of education (Primary) or uneducated, mothers who deliver by cesarean section, unmarried, and mothers who give birth at home. Interventions to improve newborn home safety should target low educated and uneducated mothers, unmarried mothers, mothers who deliver by cesarean section, and discourage home delivery among pregnant mothers. This is achievable through policy changes and the implementation of already existing guidelines on essential newborn care.*

***Keywords*— *Prevalence, factors, newborn, home care*.

I. INTRODUCTION

Newborn home care is the care offered to the newborn within 28 days of birth while at home after delivery, either from a health facility or from home. Newborn home care encompasses keeping the room where the baby stays warm, dressing or wrapping the baby during the day, mother sleeping together with the baby or placing the baby where access to it is easy especially when breastfeeding at night, keeping the baby away from direct sunshine, washing the buttocks of the baby when soiled and keeping dry, bathing the baby whenever necessary with warm water, in a warm room and thoroughly drying the baby among others (U. WHO & UNICEF, 2015) and (WHO, 2005). It is very important to understand the newborn home care practices because it plays a vital role in newborn health, reducing newborn morbidity and mortality (Branca & Calado, 2018).

Globally, the infant mortality rate is at 17 deaths per 1000 live births (WHO, 2021). Sub-Saharan Africa still has a high infant mortality rate (IMR) at 27 deaths per 1,000 live births by 2019, this is not any different in Uganda with IMR at 20 deaths per 1000 live births (WHO, 2021), with most of these deaths occurring within the first seven days of life. The sustainable development goal (SDG) 3.2 targets ending preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality and under 5 mortalities by 2030 (WHO, 2021).

The first 28 days of life are very vital to the newborn survival being a phase of multiple adaptations and transition of the infant from intrauterine life to extrauterine life (Aydin, 2017),this period entails several challenges that make it either safe or unsafe for the newborn (Ayete-Nyampong & Udofia, 2020). For these adaptations and transitions to be successful, the newborn caretaker or the mother needs to be more careful and keen on understanding the risks associated with poor newborn homecare (Ayete-Nyampong & Udofia, 2020). Children who die within the first 28 days of birth are mostly because of conditions and diseases associated with unskilled birth attendance, poor quality of care after birth particularly at home (WHO, 2021) with most of these deaths occurring in the first 7 days (Chiwawa, Mhlanga, Munodawafa, & Mutseyekwa, 2020).

Precisely, good newborn home care is very important in the reduction of newborn mortality (Rasaily et al., 2020). Most of the newborn deaths occur at home with causes that can be prevented by good proper newborn home care. For instance, diarrhea as one of the major causes of newborn mortality in Uganda and greater parts of the world can be prevented by good newborn home care like ensuring good maternal and newborn hygiene (Chhetri, Bhandari, Karna, Chaudhary, & Yadav, 2019).

However, poor newborn home care is associated with neonatal sepsis, diarrhea, hypothermia, retarded growth, reduced immunity, increased risk of infections among others which are coupled with increased neonatal mortality (Chhetri et al., 2019).

Good newborn home care is therefore very important in ensuring good neonatal outcomes and reduction of the unacceptably high IMR. However, the prevalence and factors

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associated with poor newborn home care among postnatal mothers in Lira city were not well elaborated. This study, therefore, determined the prevalence and factors associated with poor newborn home care among postnatal mothers in Lira City.

II. METHODS

Study design/setting

We conducted a cross-sectional study that employed a quantitative method for data collection between September-October 2021.

We conducted the study at Lira Regional Referral Hospital (LRRH), Pentecostal Assembly of God (PAG) mission Hospital, and Ober health center III, all located in Lira city, northern Uganda. Lira is approximately 340 kilometers from Kampala, the capital city of Uganda.

Study population

The study participants were postnatal mothers attending postnatal care services in the selected health facilities. All participants were adults (≥18years)

Sample size estimation

The sample size was calculated by following the methods of sample size determination for a cross-sectional study using Kish Leslie (1965) formula:

$$n_o = \frac{Z^2pq}{e^2}$$

Where n_o is estimated sample size, Z is Z-score for 95% confidence interval, e is an absolute error (5%), p is the prevalence of hypothermia in Northern Uganda as an indicator of poor newborn home care (Mukunya, 2020), q is the probability of practicing essential newborn home care. We estimated our study population at 422 participants including an allowance of 10% for non-response.

Sampling criteria

Study participants were recruited in the proportion of postnatal care attendance of each selected health facility. The average monthly postnatal care attendance for LRRH, PAG mission Hospital, and Ober Health Center III was 776, 380, and 180 respectively. Systematic random sampling was used in each selected health facility to get the study participants. Sampling fraction, F^{th} was calculated for each selected health facility: LRRH (F=N/n = 776/245 = 3), PAG Mission Hospital (F=N/n = 380/120 = 3) and Ober Health center III (F=N/n = 180/57 = 3). The first participant was selected by lottery method.

Measurement of variables

Cord care. Cord care was assessed using six questions on the questionnaire. Ideal cord care included cleaning the cord at least three times a day, applying no herbs, keeping the cord dry (U. WHO & UNICEF, 2015)and (WHO, 2005). A correct response to ideal cord care practice in each question was scored one. A response not recommended for ideal cord care was scored zero. A summation of all the scores was made and graded out of six. Scores of 0-3, was considered to be poor cord care practice, scores 3-6 were considered ideal cord care practice.

Thermal care. Thermal care was assessed using eight questions on the questionnaire. Ideal thermal care included keeping the bay away from hot sunshine, covering the baby with warm clothing, not exposing the baby to cold environments, not bathing the baby with cold water (U. WHO & UNICEF, 2015) and (WHO, 2005). A correct response to ideal thermal care practice in each question was a yes, and scored one. A response not recommended for ideal thermal care was scored zero. A summation of all the scores was made and graded out of eight. Scores of 0-4, was considered to be poor thermal care practice, scores 5-8 were considered ideal thermal care practice.

Breastfeeding. Breastfeeding practice was assessed using seven questions on the questionnaire. Ideal breastfeeding practice included breastfeeding at least 12 times a day, feeding the baby on breast milk only for at least 6 months, breastfeeding during newborn illnesses (U. WHO & UNICEF, 2015) and (WHO, 2005). A correct response to ideal breastfeeding practice in each question was scored one. A response not recommended for ideal breastfeeding practice was scored zero. A summation of all the scores was made and graded out of six. Scores of 0-3, was considered to be poor breastfeeding practice, and scores of 4-6 were good or ideal breastfeeding practice.

Data collection tool(s)

The study tool was adopted and modified from a study conducted to assess newborn care practices at home and in health facilities in 4 regions of Ethiopia (Callaghan-Koru et al., 2013). The tool was pretested on 42 postnatal mothers in Adyel health center III, also found in Lira city and necessary adjustments were made accordingly.

The questionnaire captured information on the mother's sociodemographic characteristics such as age, address, marital status, level of education, tribe. The tool also captured information on newborn home care practices on cord care, thermal care, breastfeeding, and health-seeking for sick newborns.

Data collection method/criteria

The researchers administered semi-structured interviewer-administered questionnaires individually to selected study participants. Written informed consent was obtained from the study participants before the interview which lasted approximately 10 minutes each.

Data management and analysis.

The interviewer-administered questionnaires were checked for completeness at the end of each interview. The research team from the selected study sites met every day at the end of data collection to cross-check for any missing data in the filled questionnaires.

Data entry screen was created in SPSS version 23, data analysis was also carried out on SPSS version 23. Continuous variables were summarized using mean, frequencies, average. Chi-square tests were performed to determine the relationship between the dependent and independent variables to establish the association between the independent variables and newborn home care. Results were expressed in odds ratios with the 95% confidence interval.

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Ethical clearance

The approval for the study was obtained from Lira University faculty of health sciences research and ethics committee.

Site permission

Site clearance was obtained from the district health officer of lira district, In-charge of Ober health center III, directors of Lira Regional Referral Hospital, and PAG mission Hospital.

III. RESULTS

4.1 Prevalence of newborn home care practices

This study recruited 422 participants with mean age of respondents being 25.63 (±5.81) years. Two hundred sixty-two (62.1%) were unemployed and two hundred fifty-two (59.7%) were married.

Newborn home care practices assessed were: cord care, thermal care, exclusive breastfeeding, and newborn health care seeking to determine the prevalence of poor newborn home care among postnatal mothers. The mothers caring for the newborns practice all these four newborn care practices.

TABLE 1: Sociodemographic and obstetric characteristics of postnatal mothers in Lira city, Northern Uganda.

Characteristic	Category	Frequency	Percentage (%)
Mother's age			
	<20 years	47	11.1
	20-29 years	260	61.6
	>30 years	115	27.3
Mother's employment status			
	Employed	160	37.9
	Unemployed	262	62.1
Marital status			
	Single	170	40.3
	Married	252	59.7
Mother's level of education			
	No education	50	11.8
	Primary	270	64.0
	Secondary	77	18.2
	Tertiary	25	5.9
Place of birth of baby			
	Health facility	407	96.4
	Home	15	3.6
Birth order of the baby			
	First	201	47.6
	Second	109	25.8
	Third	78	18.5
	Forth	7	1.7
	Fifth and above	27	6.6
Mode of delivery			
	Vaginal delivery	281	66.6
	Cesarean section	141	33.4

Newborn care practices

Newborn home care practices assessed were: cord care, thermal care, exclusive breastfeeding, and newborn health care seeking to determine the prevalence of poor newborn home care among postnatal mothers. All these four newborn care practices are practiced by the mothers in caring for the newborns.

Cord care

The most common cord care practices reported by the mothers were cleaning the cord with Cool clean boiled water (73.9%), cleaning the cord three times a day (77.5%). In care for the infected cord at home, the majority (66.8%) of the mothers took their sick babies to the health facility for further management.

TABLE 2: Newborn care practices among postnatal mothers in Lira city, Northern Uganda

Variable	Category	Frequency	Percentage
What do you put on the cord to fasted drying	Nothing	179	42.4
	Shea butter	243	57.6
What do you use for cleaning the cord at home?	Hot water	110	26.1
	Cool clean boiled water	312	73.9
Are you able to notice the infected cord at home?	Yes	305	72.3
	No	117	27.7
How do you care for the infected cord at home?	Apply herbs	63	14.9
	Buy medicine and apply	77	18.2
	Go to the health facility	282	66.8
How frequently do you clean the cord at home?	Twice a day	39	9.2
	Three times a day	327	77.5
	Four times a day	56	13.3
Was the baby put skin-to-skin contact with you after birth?	Yes	213	50.5
	No	209	49.5
How do you keep the baby warm at home?	Skin to skin contact	8	1.9
	Covering with blankets	98.1	98.1
How long did you take to bathe the baby after birth?	Immediately after birth	24	5.7
	Within 24 hours	248	58.8
	After 24 hours	150	35.5
Who bathes the baby in the first week?	Mother	79	18.7
	Grandmother	265	62.8
	Father	8	1.9
	Other members	70	16.6
What did you feed the baby in the first week?	Breastmilk only	406	96.2
	Non-breastmilk	16	3.8
Which non-breastmilk substance was given to the baby? (n=288)	non-breast milk	8	2.7
	Plain water	8	2.7
	Water mixed with sugar	69	24.0
	Tea	16	5.6
	Honey	187	64.9
How many times do you breastfeed the baby in a day?	Less than 8 times	149	35.3
	More than 12 times	273	64.7
Did you squeeze and throw away the first breast milk?	No	300	71.1
	Yes	122	28.9
How often do you wash your hands when breastfeeding?	Every time	153	36.3
	Once in a while	269	63.7

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Newborn thermal care

Table presents the newborn thermal care practices from birth onwards. The majority of the mothers (76.5%) received health education on newborn thermal care. Some of the poor newborn thermal care practices contrary to WHO recommendations were bathing the baby within the first 24 hours of birth (58.8%) and not putting the baby skin to skin with the mother immediately after birth (49.5%).

Breastfeeding practices

The most common good breastfeeding practices were feeding the baby on breast milk only in the first week (96.2%), feeding the baby on colostrum (71.1%) and the majority of the mothers reported to have been health educated on proper breastfeeding practices (60.2%). The most common non-breastmilk substances fed to the baby after one week were honey (44.3%) and sugar mixed in water (16.4%). The majority of the mothers washed their hands before breastfeeding only once in a while (63.7%).

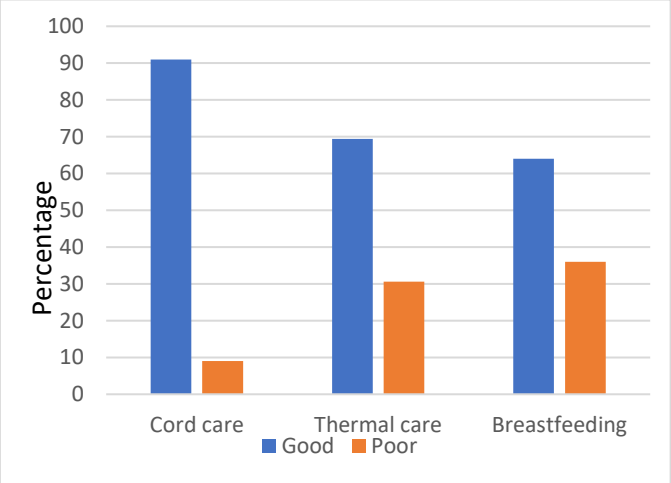

Fig. 1. Newborn home care practices among post-natal mothers in Lira city

Overall newborn home care practice

Cord care, thermal care, and breastfeeding practice were all considered to determine whether a mother had good newborn home care or not. The prevalence of good newborn home care was at 46.2% and poor newborn home care was 53.8%.

Factors associated with newborn home care practices

The factors associated with newborn home care practices were assessed for overall newborn home care practice, not each selected home care practice. These factors associated with the newborn home were the mother's level of education, birth order of the baby, and place of birth.

Post-natal mothers who were single were two times more likely to have poor newborn care practices at home compared to their married counterparts (OR=1.524; 95% CI (1.028-2.260)). Mothers with no formal education were four times more likely to practice poor newborn home care (OR=1.90; 95% CI(1.20-3.01)) than educated ones. The possibility of practicing good newborn home care was 50% less among mothers who had given birth only once than those who had given birth more than once (OR=0.521; 95% CI (0.475-0.572)). Mothers who delivered vaginally were two times more likely to practice good newborn home care practices than those who delivered through cesarean section (OR=1.855; 95% CI (1.224-2.811)).

TABLE 3: Factors associated with poor newborn home care among postnatal mothers in Lira city, 2021

Factors	Category	Newborn care practice		P-Value
		Good	Poor	
Age (in years)	<20	17	30	0.339
	20-29	124	136	
	≥30	54	61	
Employment status	Employed	77	83	0.381
	Unemployed	118	144	
Marital status	Single	127	125	0.036*
	Married	68	102	
Level of education	No education	14	36	0.006*
	Primary	134	136	
	Secondary	44	33	
	Tertiary	3	22	
Place of birth	Health facility	195	212	<0.001*
	Home	0	15	
Birth order	First	91	110	0.713
	Second	50	59	
	Third	46	32	
	Fourth	2	5	
	Fifth and above	6	21	
Mode of delivery	Vaginal delivery	144	137	0.003*
	Cesarean section	51	90	

*Statistically significant.

IV. Discussion

Newborn home care is very important in the healthy thriving of the neonate. The majority of the mothers had overall poor newborn home care practices (53.8%). This is contrary to a study done in La Dade Kotopon Municipality, Ghana where few mothers(27%) had poor essential newborn care practices(Ayete-Nyampong & Udofia, 2020). This was attributed to newborn care practices contrary to WHO guidelines for newborn home care. These practices included discarding of colostrum, application of herbs to the cord, bathing the baby immediately or within 24 hours of birth. This finding agrees with other studies done in similar settings where a greater majority of postnatal mothers had poor newborn home care (Callaghan-Koru et al., 2013).

Although the majority of the others had good cord care (72.3%), a greater number (117/422) practiced poor cord care. This was attributed to cord care practices contrary to WHO and Uganda's national guidelines for cord care(MOH-Uganda, 2016). These contradicting cord care practices were applying shea butter, powder to the cord, and cleaning with hot water. Application of these substances to the cord predisposes the newborn to infections, delays the drying of the cord(Turyasiima et al., 2020).This finding is consistent with other studies where mothers applied other substances to fasten cord drying(Coffey & Brown, 2017).The fact that some mothers (27.7%) are not practicing the ideal cord care shows that more needs to be done to reduce the health risks their newborns are exposed to. Possible measures to improve cord care practices among

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postnatal mothers include extensive health education, home visits by health care providers or community health workers among others(Edmond et al., 2018), (Namazzi et al., 2017).

The prevalence of poor thermal care practices among postnatal mothers was 38.4%. This was common among postnatal mothers who did not have their babies put skin to skin with them after delivery, bathed their babies within twenty-four (24) hours, covering the baby with just any cloth which was not considered warm. Bathing the baby immediately after birth or within 24 hours, covering the baby with light clothes leads to neonatal hypothermia(Bayih, Assefa, Dheresa, Minuye, & Demis, 2019), (Demissie, Abera, Chichiabellu, & Astawesegn, 2018). Neonatal hypothermia disrupts the neonatal developmental milestone, causes mental retardation among other effects(Matsuda et al., 2021). All these are avoidable if mothers offer ideal thermal care to the newborns(Mukunya et al., 2021). Supporting the mothers through health education, provision of warm blankets, discouraging bad practices such as bathing the baby immediately is born will help improve thermal care practices.

Ideal breastfeeding practices was at 57.6% while poor breastfeeding practice was at 42.4%. Mothers with poor breastfeeding practices were feeding the newborns on honey, water mixed with sugar within the first month, expressing and throwing away colostrum, and infrequent handwashing before breastfeeding. This finding agrees with others where mothers fed their babies on honey, water mixed with sugar, expresses and threw away colostrum(Napyo et al., 2020), (Wataka, Tumukunde, Kawala, Nekaka, & Nteziyaremye, 2021). Denying the baby colostrum on the first day of life possibly makes the baby have lowered immunity and miss the opportunity of developing reinforced gut lining (Napyo et al., 2020). Feeding the newborn on non-breast milk substances increases the risk of infections to the baby, increasing the risk of conditions like necrotizing enterocolitis, diarrhea, and even undernutrition among others (Schuster et al., 2020).Poor breastfeeding of newborn babies has consequences including mental retardation, poor growth, recurrent sicknesses(Victora et al., 2016).

Factors associated with poor newborn home care

The factors found to be associated with poor newborn home care among postnatal mothers in Lira city were; mother's marital status, level of education, place of birth, and mode of delivery. Unmarried mothers were more likely to practice poor newborn home care practices, unlike their married counterparts. This is consistent with another finding where marital status was a significant factor associated with essential newborn care(Teferi, Teferi, & Ayalew, 2020), (Ayete-Nyampong & Udofia, 2020). However, it is contrary to a study done in North-West Ethiopia where marital status was not significantly associated with essential newborn home care(Tafere, Afework, & Yalew, 2018). The poor newborn care practices among unmarried mothers could be because they lack necessary support for newborn care at home from the husbands unlike the married. This support could include reminders on essential care practices, financial support to buy essential items like blankets for covering the baby, enough food for the mothers among others. The absence of this support can hinder the practicing of essential newborn care while at home.

Poor newborn care practices were also common among the low educated and uneducated mothers. This finding agrees with other studies done elsewhere(Alamneh, Adane, Yirga, & Desta, 2020), (Saaka, Ali, & Vuu, 2018). Very little or no education does not give enough exposure to the mother about what could go wrong with the baby if not taken care of well at home. Secondly, having no education could hinder the mothers' ability to understand or follow the instructions on the essential newborn care at home.

Home delivery was also associated with poor newborn home care. Mothers who delivered from home were more likely to have poor newborn home care practices compared to their counterparts who delivered from the health facility. This agrees with other studies where essential newborn care was common among mothers who deliver from home(Saaka et al., 2018), (Ayete-Nyampong & Udofia, 2020). Mothers who deliver at home possibly miss out on the instructions and health education on how to keep the baby at home after birth unlike those who deliver from the health facility. Home delivery does not only hinder essential newborn care at home, but also increases the risk of maternal death in case of any obstetric complications like postpartum hemorrhage, uterine rupture, obstructed labor, puerperal sepsis among others(Hutton, Reitsma, Simioni, Brunton, & Kaufman, 2019; Sageer et al., 2019), (Sageer et al., 2019).

Lastly, mode of delivery was another factor associated with poor newborn home care. Mothers who delivered through cesarean section were more likely to have poor newborn home care practices compared to those who delivered vaginally. This matches another finding where cesarean delivery was significantly associated with poor newborn home care(Tongun et al., 2018). Those who delivered through cesarean section had poor newborn home care possibly due to the inability to fully care for the baby as they nurse their wounds. This leaves the baby to be taken care of by those who did not attend newborn care health education during ANC and possibly the post-natal period. This ends up in poor newborn home care among these postnatal mothers.

V. CONCLUSION

Poor newborn home care practices are still common among mothers with a low level of education (Primary) or uneducated, mothers who deliver by cesarean section, unmarried, and mothers who give birth at home. Interventions to improve newborn home safety should target low educated and uneducated mothers, unmarried mothers, mothers who deliver by cesarean section, and discourage home delivery among pregnant mothers. This is achievable through policy changes and the implementation of already existing guidelines on essential newborn care.

AUTHOR CONTRIBUTION

DJO: Concept development, proposal development, data collection, data analysis, manuscript writing.
SW: Data analysis, manuscript writing.
AK: Proposal development, data analysis

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NA: Proposal development, manuscript writing.
All authors read and approved the manuscript for publication.

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ABBREVIATIONS

PNC	Post-natal Care
PNM	Postnatal Mother
SPSS	Statistical Package for Social Sciences
NHCP	Newborn Home Care Practice
IMR	Infant Mortality Rate
PAG	Pentecostal Assembly of God
SDG	Sustainable Development goal
WHO	World Health Organization
LRRH	Lira Regional Referral Hospital

Declaration of conflict of interest

The authors declare no conflict of interest arising from this study.

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