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Original Research Article

Predictors of short birth interval among women of reproductive age attending the young child clinic at a tertiary hospital in Western Uganda: a cross-section study

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ABSTRACT

Background: Short birth interval continues to increase in sub-Sahara Africa of which Uganda is part. If all birth-to-pregnancy intervals were spaced at least 2 years apart as recommended by the world health organization, most under-five deaths would be avoided. We aim at determining the predictors of short birth interval among women of reproductive age at tertiary hospitals, Uganda.
Methods: A cross-sectional study involving 325 women of reproductive age attending the young child clinic at Fortportal Regional Referral Hospital was conducted from July 2022 to October 2022. Interviewer-administered questionnaires were used to obtain data used for analysis. Descriptive statistics followed by binary logistic regression were conducted to achieve the study objectives using SPSS version 22.0.
Results: Out of 325 participants, 94 (29%) had short birth interval. Maternal age (OR=3.4, 95% CI: 1.15-10.13; p=0.02), no previous pregnancy planning (OR=3.4, 95% CI: 1.23-9.41; p=0.01), duration of breastfeeding less than 12 months (OR=1.9, 95% CI: 0.06-0.58; p=0.003), less or equal to 4 antenatal care visits (OR=8.7, 95% CI: 3.19-23.80; p≤0.001) and not using postpartum contraceptives (OR=5.7, 95% CI: 1.64-19.81; p=0.006) were independently associated with short birth interval.
Conclusions: The prevalence of short birth interval is still high in Uganda as compared to global report. The predictor factors of short birth interval include maternal lack of pregnancy planning, low number of antenatal care visits, breastfeeding for less than 12 months and lack of postpartum contraceptive use. Women of reproductive age should routinely be educated about child spacing by healthcare workers.

Keywords: Predictors, Short birth interval, Young child clinic

INTRODUCTION

The World Health Organization define birth interval as the time between a live birth and a subsequent pregnancy, with a minimum of 24 months recommended (2 years). Short birth intervals of less than 2 years have implications for maternal and child health, while long birth intervals of more than 5 years also have unfavorable effects on maternal and child health.[1]

Global estimates indicate that 25% of births still take place at intervals of less than 24 months with majority of cases of short birth intervals were reported in Central Asia, accounting for 33% of all cases and Sub-Saharan Africa accounting for 20%.[2] Short birth intervals are responsible for up to 4% of infant mortality in Uganda. Preterm birth, low birth weight, congenital malformations, and early neonatal deaths are some of the negative child health outcomes associated with short birth intervals.[3] Birth intervals of less than two years have also been found to increase under-five mortality and are associated with

maternal nutritional deficiency, previa and abruption of the placenta, incomplete healing of caesarean section scars, poor lactation, and cross infection among siblings in women.[4] Furthermore, short birth intervals have been linked to an increased risk of toxemia, anemia, malnutrition, third trimester bleeding, and maternal mortality.[5-8]

Uganda, just like many countries is grappling with a high population growth rate. As of the last country population census in 2014, the population growth rate stood at 3.1% with a population projection of 42.8 million people by mid-year 2021.[9]

This rate of population growth can be attributed in part to an imbalance in infant mortality and fertility. Marriage, postpartum infecundity, contraception, and induced abortion have all been identified as proximate determinants of population growth. Child spacing is also influenced by social factors such as women's education, employment opportunities, and the number and gender of surviving children.[10]

In Uganda, there is a scarcity of information on birth intervals, specifically factors influencing actual and preferred birth intervals and few studies have thoroughly investigated the contextual factors associated with birth intervals and it goes without saying that up to now, little is known about parents' awareness of the dangers of short or long birth intervals.[8,9]

The World Health Organization and other international organizations recommend at least 2–3 years between pregnancies to reduce infant and child mortality and to support maternal health; however, some studies funded by the United States Agency for International Development (USAID) have suggested that 3–5 years of birth spacing may be more beneficial.[11]

Understanding birth intervals and their determinants is therefore critical for a country like Uganda in order to improve and design child spacing programs, which will improve maternal and child health. This study aimed to close this gap by examining short birth intervals and their determinants among women of reproductive age at Fort Portal Regional Referral Hospital (FPRRH).

METHODS

This was a cross-sectional study conducted from postnatal ward of Fort Portal regional referral hospital. FRRH is a tertiary and teaching hospital of both undergraduates and postgraduates medical students of different Universities. It is located in Fort portal town of Kabarole district, western Uganda with the in-patient bed capacity of 350 beds distributed in all departments with 105 beds within the obstetrics and gynecological department with equipped labor and postnatal wards. Sample size was determined using Kish Leslie formula (1965) where there prevalence of 25.9% was used at 95% CI, with maximum error of 5% which gave the minimum sample size of 325 participants including 10% of none response.[13]

325 mothers were systematically enrolled (sampling interval of 7) from July 2022 to October 2022, and provided all information about the study followed by consent. We included all mothers aged between 15-49 years who were attending young child clinic. Mothers who had less than two births, those who were emotionally and psychological unstable were excluded from the study. Data collection was done by trained midwives together with principal investigator using patient interviews, charts and records. Structured questionnaire was used and pretested from Kampala International University. Data was compiled in Microsoft excel and transferred in statistical package for the social sciences (SPSS) version 22.0 for analysis.

The prevalence of short birth interval was calculated as number of mothers with birth interval less than 24 months out of all mothers recruited in this study, expressed as frequency and percentages and presented using a pie chart. The factors associated with short birth interval were determined using binary logistic regression at 95% confidence interval. Factors with p value less or equal to 0.2 were taken to multivariate analysis to remove confounding factors. Factors which turned up with p value less or equal to 0.05 were considered significant in this study.

RESULTS

A total of 325 mothers were recruited from postnatal ward of FRRH with a response rate of 100%. Majority of study participants were between 20-30 years of age 168 (51.7%), from rural areas 203(62.5%), married 295 (90.8%), attained secondary education level 139 (42.8%), peasants 200 (61.5%) and earning less than 200,000 Ugandan shillings (Table 1).

Out of 325 mothers enrolled in the study, 94(29%) had a short birth interval of less than 24 months. This is illustrated in the Figure 1.

Univariate analysis of the factors associated with short birth interval revealed that age, residence, level of education, Religion, parity, number of living children, previous pregnancy planning, previous ANC attendance, previous pregnancy outcomes, previous breastfeeding duration, Decision maker about child birth, child spacing discussion, specific child sex preference, postpartum contraceptive use were significant (Table 2).

Further analysis done at multivariate level revealed that maternal age, place of residence, education level, prior pregnancy planning, number of previous antenatal care contacts, duration of breastfeeding in previous birth, child spacing discussion with partner, specific child sex preference and postpartum contraceptive use were independently associated with short birth interval. Rural

residence, education level and couple's discussion about child spacing were protective factors of short birth interval. Women older than 30 years were 3.4 times likely to have short birth interval than younger women (OR=3.4, 95% CI: 1.15-10.13; p=0.02), no previous pregnancy planning were 3.4 times (OR=3.4, 95% CI: 1.23-9.41; p=0.01) and duration of breastfeeding less than 12 months in previous birth is 1.9 times (OR=1.9, 95% CI: 0.06-0.58; p=0.003) more like to have short birth interval. Women who had 4 or less antenatal care visits had odds of 8.7 likely to have short birth interval (OR=8.7, 95%CI: 3.19-23.80; p≤0.001) and those who did not use postpartum contraceptives were 5.7 times the odds of having short birth interval (OR=5.7, 95% CI: 1.64-19.81; p=0.006) (Table 2).

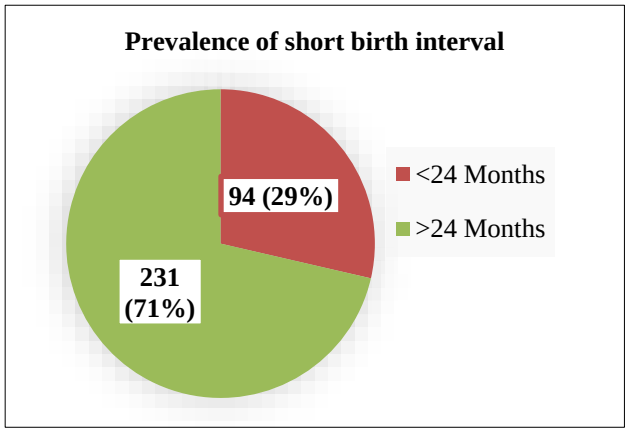

Figure 1: Prevalence of short birth interval among study participants.

Table 1: Baseline characteristics of study participants.

Characteristics	Frequency (n)	Percentages (%)
Age		
20-30	168	51.7
<20	44	13.5
>30	113	34.8
Residence		
Urban	203	62.5
Rural	122	37.5
Marital status		
Single	24	7.4
Married	295	90.8
Divorced	4	1.2
Widow	2	0.6
Education level		
Tertiary	34	10.5
Secondary	139	42.8
Primary	133	40.9
None	19	5.8
Occupation		
Teacher	11	3.4
Peasant	200	61.5
Civil servant	21	6.5
Business	93	28.6
Monthly income (Ugx)		
> 500,000	11	3.4
200,000-500,000	51	15.7
<200,000	263	80.9

Ugx: Ugandan shillings

Table 2: Multivariate analysis of factors associated with short birth interval among women of reproductive age attending the young child clinic at FRRH.

Variables	Number (N=325)	Actual birth interval in month n (%)		cOR (95% CI)	P value	aOR (95% CI)	P value
		<24 (n=93)	>24 (n=252)				
Age							
20-30	168	69 (41.1)	99 (58.9)	Ref		Ref	
<20	44	7 (15.9)	37 (84.1)	3.7 (1.55-8.74)	0.003*	3.09 (0.48-20.08)	0.237
>30	113	17 (15)	96 (85)	3.9 (2.16-7.17)	<0.001*	3.42 (1.15-10.13)	0.027**
Residence							
Urban	203	35 (17.2)	168 (82.8)	Ref		Ref	
Rural	122	58 (47.5)	64 (52.5)	0.2 (0.14-0.38)	<0.001*	0.16 (0.06-0.40)	<0.001**
Education level							
Tertiary	34	3 (8.8)	31 (91.2)	Ref		Ref	
Secondary	139	33 (23.7)	106 (76.3)	0.31 (0.09-1.08)	0.066	0.71 (0.13-3.95)	0.693
Primary	133	43 (32.3)	90 (67.7)	0.20 (0.06-0.69)	0.012*	0.42 (0.07-2.35)	0.322
None	19	14 (73.7)	5 (26.3)	0.03 (0.01-0.17)	<0.001*	0.03 (0.002-0.31)	0.004**
Religion							
SDA	12	6 (50)	6 (50)	Ref		Ref	
Catholic	153	44 (28.8)	109 (71.2)	2.47 (0.76-8.09)	0.133*	1.11 (0.18-6.93)	0.912

Continued.

Variables	Number (N=325)	Actual birth interval in month n (%)		cOR (95% CI)	P value	aOR (95% CI)	P value
		<24 (n=93)	>24 (n=252)				
Anglican	98	28 (28.6)	70 (71.4)	2.50 (0.74-8.41)	0.139*	0.68 (0.10-4.49)	0.689
Muslim	17	3 (17.7)	14 (82.3)	4.67 (0.87-25.14)	0.073*	1.97 (0.08-47.89)	0.677
Pentecostal	45	12 (26.7)	33 (73.3)	2.75 (0.74-10.19)	0.130*	2.09 (0.28-15.68)	0.470
Parity							
5+	142	29 (20.4)	113 (79.6)	Ref		Ref	
1-4	183	64 (35)	119 (65)	0.48 (0.29-0.79)	0.004*	0.46 (0.18-1.19)	0.109
Number of living children							
5+	150	32 (21.3)	118 (78.7)	Ref		Ref	
1-4	175	61 (34.9)	114 (65.1)	0.51 (0.31-0.83)	0.008*	0.55 (0.23-1.31)	0.178
Previous pregnancy planning							
Yes	211	76 (36)	135 (64)	Ref		Ref	
No	114	17 (14.9)	97 (85.1)	3.21 (1.78-5.78)	<0.001*	3.40 (1.23-9.41)	0.019**
Previous ANC attended							
5+	199	70 (35.2)	129 (64.8)	Ref		Ref	
1-4	126	23 (18.2)	103 (81.8)	2.43 (1.42-4.16)	0.001*	8.71 (3.19-23.80)	<0.001**
Previous pregnancy outcome							
Alive baby	301	90 (29.9)	211 (70.1)	Ref		Ref	
Stillbirth/END	24	3 (12.5)	21 (87.5)	2.99 (0.87 10.26)	0.082*	1.15 (0.13-9.78)	0.900
Duration of breastfeeding (months)							
>12	226	57 (25.2)	169 (74.8)	Ref		Ref	
<12	99	36 (36.4)	63 (63.6)	0.59 (0.36-0.98)	0.042*	1.91 (0.06-0.58)	0.003**
Decision about child birth							
Couple's decision	257	53 (20.6)	204 (79.4)	Ref		Ref	
Husband/wife only	59	35 (59.3)	24 (40.7)	0.18(0.097-0.32)	<0.001*	1.15 (0.38-3.47)	0.807
Father/mother in-law	9	5 (55.6)	4 (44.4)	0.21 (0.05-0.80)	0.022*	1.90 (0.21-17.38)	0.572
Specific child sex preference							
Yes	259	54 (20.9)	205 (79.1)	Ref		Ref	
No	66	39 (59.1)	27 (40.9)	0.18(0.102-0.32)	<0.001*	1.19 (0.07-0.55)	0.002**
Postpartum contraceptive use							
Yes	247	86 (34.8)	161 (65.2)	Ref		Ref	
No	78	7 (9)	71 (91)	5.42 (2.39-12.29)	<0.001*	5.70 (1.64-19.81)	0.006**

*P<0.2; **p<0.05; ANC=antenatal care, cOR: crude odds ratio; aOR; adjusted odds ratio

DISCUSSION

The overall prevalence of short birth interval in this study was 29%. Our findings were slightly higher than global prevalence of 25%.[14] Different from the global specifics, sub-Saharan African countries show a divergent picture of near optimal median birth interval. However, individual countries have variations in their birth interval.[5] The variation could be attributed to the socio-economic and education level of women in those countries.

Our prevalence of 29% is higher than 23.3% reported in Ethiopia, 23% reported in Nigeria and 11% reported in Zambia.[15,16] The variations noted between our study and the above studies could be attributed to the fact that all these were community-based studies as opposed to our hospital-based study.

In this study, old maternal age was significantly associated with short birth interval (OR=3.42, CI: 1.15-10.13; p=0.027). The reason could be that old women want to achieve reproductive goals before transitioning into

menopause. Our results contradict findings from Uganda demographic and health survey which indicated that; young women are more likely to have short birth interval.[17]

Our findings indicated that, rural residence was protective factor for short birth interval (OR=0.2, CI: 0.06-0.40; p≤0.001), these women were 0.2 times less likely to have short birth interval. The findings disagree with those of Pimentel et al. where women who live in rural areas were more likely than women who live in urban areas to have birth intervals of less than three years.[5] Our findings were consistent with those noted in Chad, Mozambique, and Pakistan where women residing in urban setting were more likely to have births shorter than three years, owing to better employment opportunities.[5]

The prevalence of short birth interval was high among non-educated women (73.7%) in this study. Our findings are in agreement with the study in Ghana where women with no education were more likely than women with education to have children within three years of each other.[18] The reason could be that educated women have more knowledge regarding the dangers of short birth interval and therefore prefer to space their children for better outcomes.

The results of this study indicated that, women who did not plan for their pregnancy were 3.4 times more likely to have short birth interval compared to those with planned pregnancies. Our findings are in line with the study conducted from Ghana where women who plan their pregnancy have been observed to have longer birth intervals than those who do not want the pregnancy at the time of conception.[19] This is most likely due to the fact that women who plan their pregnancy may adhere to child spacing recommendations.

Women who attended few than four antenatal care visits were at increased risk of getting short birth interval when compared to those who attended more than five times (OR=8.7, 95% CI: 3.19-23.80; p≤0.001). These women could have missed important information regarding recommended birth spacing during ANC.

Findings from this study indicated that; women who breastfed their previous child for less than twelve (12) months were approximately 2 times more likely to have short birth interval in relation to those who breastfed for more than twelve (12) months (OR=1.9, 95% CI: 0.06-0.58; p=0.003). Similar results were found in a study conducted in Ethiopia which concluded that; mothers who breastfed for less than twenty-four months were more likely to have close birth intervals.[20] Another study conducted in India showed that breastfeeding duration was negatively correlated with the risk of having another child. The risk of having a subsequent birth is reduced by 2% for every additional month of breastfeeding.[2] Breastfeeding for more than 12 months may provide a natural method of family planning.

In this study, women who did not use postpartum contraceptives were 6 times more likely to have birth interval less than two years (OR=5.7, 95%CI: 1.64-19.81; p=0.006). Our findings were in line with a study conducted in Ethiopia which found that mothers who did not use contraception between their pregnancies were 6 times more likely than their counterparts who did to have short birth spacing.[21] A study conducted in Manipur, India, found that the use of contraceptive devices was negatively associated with the risk of subsequent birth (p=0.01) and that the risk associated with women who use contraceptive devices is 45 percent lower than the risk associated with women who never use any devices.[5] Postpartum contraceptives provide effective method of preventing unplanned pregnancy and therefore reduces the chance of having short birth interval.

There was no relationship between religion, occupation, monthly income parity, number of living children, previous pregnancy outcome and decision about child birth with short birth interval in regards to this study.

Study strength and limitation

This study was able to assess multiple factors associated with short birth interval. Since the study was conducted at a regional referral hospital, we could not cover all women at the district since others opt to use the lower health centers, hence population-based study is recommended.

CONCLUSION

The prevalence of short birth interval is still high in Uganda compared to the global prevalence. The independent factors associated with short birth interval were maternal age, residence, education level, lack of pregnancy planning, low number of antenatal care visits, breastfeeding for less than 12 months and lack of postpartum contraceptive use. We recommend health workers to educate and sensitize women of reproductive age attending antenatal and postnatal services on child birth spacing, its magnitude and the predictor factors.

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