

The Effect of Birth Spacing on Maternal and Child Health in Al-Kalakla, Al-Gouba, Khartoum State 2022-2023

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Abstract

Background: Birth spacing also called inter-pregnancy interval is defined as the time period between the ends of one pregnancy to the start of the next pregnancy. Having inter-pregnancy interval less than two years is associated with many maternal and child health complications.

Methodology: This is a community-based cross sectional observational analytical study conducted in Al-Kalakla, Al-Gouba in Khartoum Sudan. Women of child bearing age who have two children or more, in Al-Kalakla, Al-Gouba were included in the study. The data was collected by an interviewed questionnaire.

Results: A total of 161 women were evaluated, from different age and different educational levels, the prevalence of short birth spacing less than two years was found to be (15%) and interval of more than two years was found to be (85%) of the study. Maternal complications were found to be (4.3%) have miscarriage, (1.2%) have endometritis, (1.2%) have hypertension, (0.26%) third trimester bleeding, and no women been found to have anemia and premature rupture of membrane. Child health complications in women with short birth spacing were found, (4.3%) malnutrition, (4.3%) preterm delivery, (4.9%) low birth weight.

Conclusion: We found that the prevalence of women with short inter-pregnancy interval in the area of study is less than women with spacing more than two years. There are no correlation between short inter-pregnancy interval and poor health outcome. The maternal and child health complications were found more in women with adequate inter-pregnancy interval. We recommend further research in this area.

Keywords: Birth Spacing; Maternal Health; Child Health-Malnutrition-Miscarriage; Low Birth Weight

Abbreviations

SSA: Sub-Saharan Africa; UNICEF: United Nations International Children's Emergency Fund; PROM: Premature Rupture of Membrane; LBW: Low Birth Weight; WHO: World Health Organization

Introduction

Background information

Al-kalakla Administrative Unit is one of Gabal Awlia locality in Khartoum State; it is located in the east bank of White Nile bordered by Khartoum locality from north, White Nile from west, Alnil Alabid Administrative Unit from south and Al Nasar Administrative Unit from east. Its total area is about 155 km² [1].

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Child spacing is where the parents have a period between births of their children. Optimal child spacing means: having children 2 - 3 years apart. Birth spacing are influenced by a complex range of factors, some of which are rooted in social and cultural norms, others in the maternal health histories and behaviors of individual women, utilization of reproductive health services and other background factors. Birth spacing is also directly influenced by contraceptive use and induced abortion. Other socio-economic factors such as the mother's place of residence, education and work have also been correlated with birth spacing although the mechanisms by which these background variables influence birth spacing is less clear [2].

Reports indicated that an estimated 303,000 maternal deaths occurred worldwide and among this, 99% of deaths were from developing countries [3]. The scenario is worst in SSA in which 546 deaths per 100,000 live births were documented as compared to 216 maternal deaths per 100,000 live births worldwide [4,5]. The mothers recognize the importance to space children for the health of the child and mother. In Bara-Sudan however, women have on average a birth interval of 18 - 24 months, according to a UNICEF study conducted in January 1990. The Sudan Demographic and Health Survey, conducted in 1989, measured the total fertility rate for women at 5.0 and reported that 58.4% of currently married women would like to limit or space births of their children [6]. Much of the literature on IPI comes from low-to middle-income countries, where women's baseline nutritional status, health, and health care differs substantially from women in the United States (US) [7].

Problem statement

According to statistical data from AL-Turki hospital in AL-kalakla, among the total women of 419 there are (60.6%) reported to have birth interval between the two last successive births to be below 36 months. Women with short birth spacing are at high risk of developing hypertensive disorders of pregnancy, anemia, third-trimester bleeding, PROM, and puerperal endometritis [8-11]. Beyond the maternal and child health implications, closely spaced birth increases population growth, decelerates one's country economic development, decreases women's productivity, and increases the demand for natural resources [8]. Short interval between conceptions has been related to adverse outcomes such as miscarriage, preterm labor, LBW [12], congenital malformations, intrauterine growth restriction, preeclampsia, cerebral palsy and perinatal or infant death [13,14]. Our study can help identify if there is a relation between short birth spacing and maternal and child health outcome, and to estimate the prevalence of short birth spacing in Al-Kalakla, Al-Gouba.

Justification

Mothers and children are the building blocks of society, therefore we want to highlight a common health problem which is short birth spacing, this issue is also suggested by a report on birth spacing by a WHO -technical consultation [15], the consultation made the following suggestions for further research in the area of birth spacing, coherent theoretical frameworks needs to be developed that can explain and analyse the possible causal relationships between birth-to-pregnancy intervals and maternal, perinatal and infant outcomes, particularly child mortality. To our best knowledge, there is no known published paper or research addressing this issue in Alkalakla, AlGouba in Khartoum-state and that was the motivation to conduct this study.

Methodology

Study design

This is an observational analytical, cross-sectional community-based study.

Study area

This study was conducted in station 6 in Al Gouba district in Jabal Awlia locality in Khartoum-Sudan.

Study population

The population included in the study was those living in station 6 in Al Gouba district in Jabal Awlia locality with 322 household.

Inclusion criteria

All women of child bearing age who are married and have at least two children who live in Al Gouba district.

Exclusion criteria

All women who are not of child bearing age who are not married and have less than two children and who does not live in Al Gouba district.

Sampling technique

This sample was selected by probability systemic random method. The approximate number of houses was 322, divided by the sample size 161; the first house was selected randomly, and then we used systemic random technique to collect from one house and skip the next house.

Study variables

Independent variables:

1. Age
2. Social status
3. Educational status
4. Number of pregnancies.

Dependent variables:

1. Hypertension
2. Anemia
3. Malnutrition
4. Preterm birth.

Sample size

$$sample\ size = \frac{n}{(1 + n \times e^2)}$$

n: Total population

The total number of population of Al-Gouba, station 6 = 760

e: Margin of error at 7% (standard value of 0.07)

$$n = 760 / (1 + 760 \times 0.07^2) = 161.$$

Study tools

The study tool was questionnaire.

Data collection method:

Data was collected by direct interview method.

The questionnaire contained the following sections:

- Section A: General information such as age, social status, educational status, pregnancy status, total number of pregnancies.
- Section B: Contains the assessment of impact of birth spacing on maternal health, presence of hypertension, duration of it, presence of anemia in pregnancy, abnormal bleeding in third trimester of pregnancy, PROM, puerperal endometritis.
- Section C: Contains the assessment of impact of birth spacing on child health, contains number of children living now, presence of child death, whether the child is living with the mother or not, presence of twins, age of each child, weight at birth, term or preterm, presence of medical condition, presence of malnutrition.

Analysis

Analysis was by statistical package for social science version 27 (SPSS).

Ethical consideration

Ethical consideration was given by University of Bahri College of medicine, deanship office, referred to the head of Jabal Awlia locality. All entries were taken after full explanation of the questionnaire and approval of the participants.

Results

Age	15 - 25	7.5%
	26 - 35	40.4%
	> 35	52.2%
Social status	Married	88.8%
	Widow	6.2%
	Divorced	5.0%
Educational level	Uneducated	5.7%
	Secondary school	39.9%
	University	54.4%

Table 1: Socio-demographic data of women of child bearing age in Al-kalaka, Al gouba 2023.

Number of child death	
Yes	60
No	101
Women pregnant during the study	
Yes	20
No	141

Table 2: Obstetric background of women of child bearing age in Al-kalaka, Al gouba 2023.

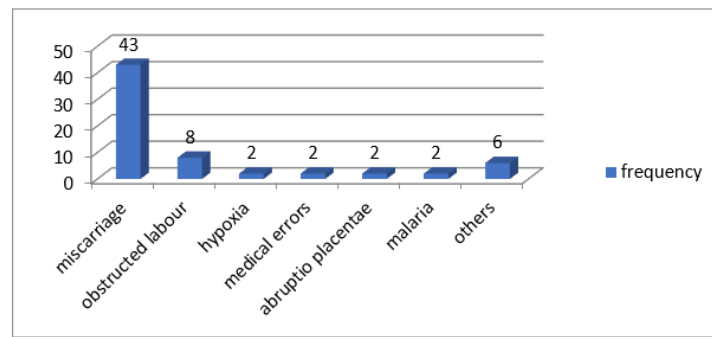


Figure 1: Frequency of causes of child death in Al-kalakla, Al-gouba 2023.

Do you suffer from hypertension?	
Yes	36
No	125
Less or equal to 5 years	
6 - 10 years	17
More than 10 years	10
Did you suffer from anemia during pregnancy?	
Yes	11
No	151
Did you suffer from third trimester bleeding?	
Yes	20
No	141
Did you suffer from PROM?	
Yes	14
No	147
Did you suffer from endometritis?	
Yes	15
No	146

Table 3: Obstetric complications among women of child bearing age in Al-kalaka, Al gouba.

7 mothers had only 1 twins and no one had more twins.

Birth Weight	Frequency
< 2500	24
2500 - 4000	127
> 4000	10

Table 4: Frequency of different birth weight in Al-kalakla, Al-gouba 2023.

Mean birth spacing in relation to total number of samples size 161.

Mean space less than or equal to 2 years	24	15%
Mean space more than 2 years	137	85%

Medical condition	Frequency	Percentage
malnutrition	7	4.3%
Preterm delivery	7	4.3%
LBW	8	4.9%

Table 5: Effect of short birth spacing on child health in Alkalakla Algouba 2023.

Medical condition	Mean space less than or equal to 2 years		Mean space more than 2 years	
Malnutrition	7	4.3%	13	8%
Miscarriage	6	3.7%	37	23%
Hypertension	2	1.2%	31	19.2%
Anemia during pregnancy	0	0%	9	5.6%
Third trimester bleeding	1	0.26%	19	11.8%
PROM	0	0%	13	8.7%
Endometritis	2	1.2%	12	7.4%
Preterm delivery	7	4.3%	10	6.2%
LBW	8	4.9%	16	9.9%

Table 6: Comparison between maternal and child complications in short and long birth spacing in Al-kalakla, Algouba 2023.

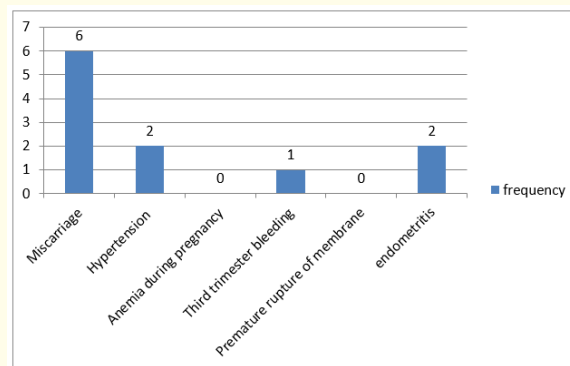


Figure 2: Frequency of maternal complications with mean birth space less than or equal to 2 years among women of child bearing age in Al-kalakla, Al gouba 2023.

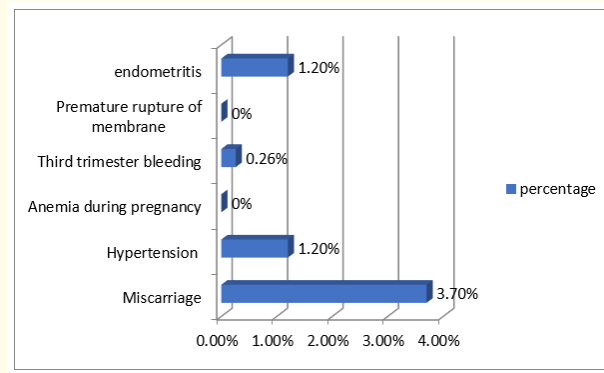


Figure 3: Percentage of maternal complications with mean birth space less than or equal to 2 years among women of child bearing age in Al-kalaka, Al gouba 2023.

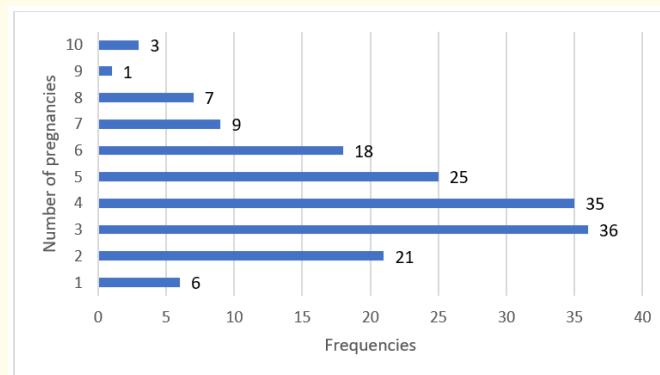


Figure 4: Frequency of number of pregnancies among women of child bearing age in Al-kalaka, Al gouba 2023.

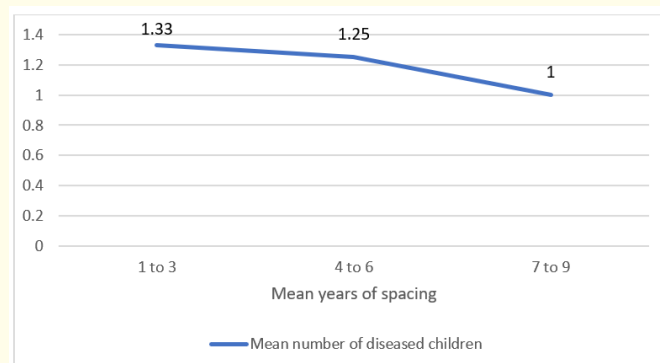


Figure 5: Comparison between different groups of mean years of spacing based on mean number of diseased children in Al-kalaka, Al-gouba 2023.

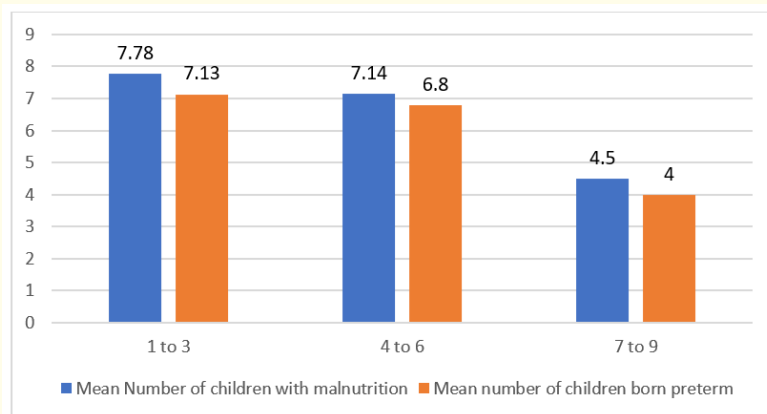


Figure 6: Comparing different means of spacing years based on mean number of children born preterm and mean number of children with malnutrition in Al kalakla Algouba 2023.

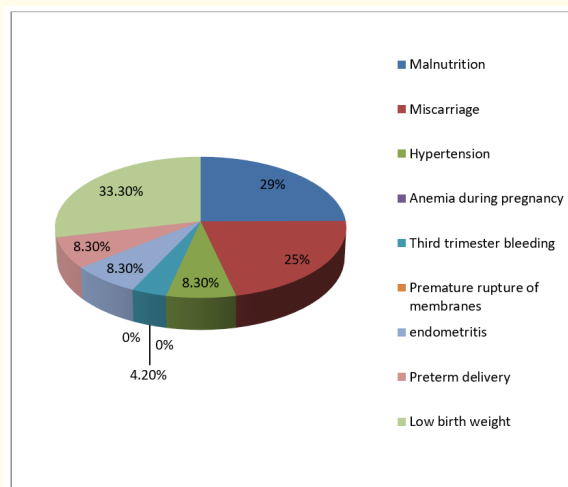


Figure 7: Percentage of maternal and child health complications among women of child bearing age with short birth spacing in Al-Kalakla, Al-Gouba 2023.

Mean spacing* Mean malnutrition P value = 0.073.

Mean spacing* Mean preterm P value = 0.186.

- Mean spacing showed no significant correlation with number of children with medical problems (Spearman correlation .007).
- Mean spacing showed no significant correlation with anemia in pregnancy (Spearman correlation -.057).

- Mean spacing showed no significant correlation with third trimester bleeding (Spearman correlation .040).
- Mean spacing showed no correlation with premature rupture of membranes (Spearman correlation .072).
- Mean spacing showed no correlation with endometritis (Spearman correlation .018).

Discussion

This cross sectional observational study that was conducted in Al-Kalakla, Al-Gouba on 2023 on women of child bearing age in this area. The aim of the study is to evaluate the impact of short birth spacing on maternal and child health. There aren't any previous studies conducted on the effect of birth spacing on maternal and child health in Al-Kalakla, AL-Gouba in Khartoum, Sudan. We found the prevalence of short birth spacing less than two years to be 24 (15%) and those with good birth spacing more than two years is 137 (85%) of the total number of sample size included that was 161. In this study, it was found that women with short birth interval have lesser maternal complications, miscarriage (4.3%), hypertension (1.2%), anemia during pregnancy (0%), third trimester bleeding (0.26%), premature rupture of membrane (0%), and endometritis (1.2%), as compared to complications in women with more than two years birth spacing, miscarriage (23%), hypertension (19.2%), anemia during pregnancy (5.6%), third trimester bleeding (11.8%), PROM (8.7%), endometritis (7.4%). This is in contrast to the study conducted in Nigeria that recommended nursing mothers should be made to be aware of the inherent dangers of inadequate birth spacing such as increased risk of premature membrane rupture, utero-placental bleeding disorders, poor health for both the mother and the child, miscarriage or induced abortion and consequently death. The impact of short birth spacing on child health was found to be lesser in women with short inter-pregnancy interval, malnutrition (4.3%), preterm delivery (4.3%) and LBW (4.9%) in contrast to their counterpart, malnutrition (8%),preterm delivery (6.2%) and LBW(9.9%).This is in contrast to a previous study in Sudan that was conducted in labor ward of Khartoum hospital, that found, those women with intervals shorter than 18 months had an increased risk of LBW (OR = 1.9, 95% CI = 1.0 - 3.5, P = 0.04) and preterm labor (OR = 2.3, 95% CI = 1.1 - 4.7, P = 0.01). The percentage of complications in 24 women of child bearing age in Al-Kalakla, Al-Gouba, with short birth spacing less than 2 years was found to be, malnutrition (29%), miscarriage (25%), hypertension (8.3%), anemia during pregnancy (0%), third trimester bleeding (42%), PROM (0%), endometritis (8.3%), preterm delivery (29%), LBW (33.3%). Nevertheless, cultural norms of the locality play an important role in health of mothers and children, due to their high dependence on cattle milk and local fish. Also we found most of the women involved in this study to be well educated, secondary school (39.9%), and university (54.4%), which could play a role in adequate birth spacing that was found in this study. In addition we believe that there are other factors that affect maternal and child health complications and may not be related to birth spacing.

Limitation of the Study

The results of current study is probably not going to be generalized to the global impact of short birth spacing on maternal and child health as it is influenced by many factors. There was recall bias from the participants and this study identified only a small number of women with short birth spacing. The number of houses in the locality is not documented which made data collection method difficult. We also found other difficulties in data collection as some houses did not have people who meet the inclusion criteria, and some houses had more than one candidate for the inclusion criteria.

Conclusion

- The number of women with adequate birth spacing (more than two years) is more than those with short IPI.
- Short birth spacing is not correlated with maternal complications, as these occurred more in women with good birth spacing.
- Malnutrition, preterm delivery and LBW are not complications of short IPI.

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