
St .Paul Hospital millennium medical college



ASSESSMENT OF THE DURATION OF BIRTH INTERVAL AND ASSOCIATED FACTORS AMONG WOMEN WHO ARE ADMMITTED TO SPHMMC OBGYN WARD.

BY: DR. SELAMAWIT ESHETU (INTERN)

ADVISOR: MR.SAMSON ZEGEYE (MPH)

A STUDENT RESEARCH TO BE SUBMITTED TO THE DEPARTMENT OF PUBLIC HEALTH, SPHMMC, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF MEDICINE

ADDIS ABABA, ETHIOPIA SEPTEMBER, 2017

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Abstract

Background: short birth interval between consecutive births increase the number of children a women can have. This will have a harm full effect on the mother and child health with an increase in population. There fore understanding the practice of birth interval and its determinants is helpful to design helpful intervention based on evidence. The objective of this study is to determine the duration and fators associated to the birth interval among women who are admitted to SPHMMC OBGYN departemnt.

Objectives The objective of this study is to assess the duration of birth interval and associated factors among women who are admitted to St. Paul hospital millennium medical college obstetrics and gynecology ward.

Methods: The study design employed was institutional based cross sectional analytic design among fe-male patients who are parous with at least one delivery and admitted to St. Paul hospital millennium medical college obstetrics and gynecology ward. Interviewer based questioner was used to collect data.

Result: From the total number of respondents 130 (69%) of them have two children and 64 (49.2%) of them have practiced optimum birth interval. 57(43.8%) have practiced below the optimum birth interval and 9(6.9%) of them practice birth interval more than the optimum. The median duration of the actual birth interval was 34 month (SD +/-20.9) and the median duration of the preferred birth interval was 36 month (SD +/-13.2).the duration of birth interval has shown significant variation by residence, breast feeding practice, sex of the previous pregnancy outcome, contraceptive use and monthly income.

Conclusion: low proportion of optimal birth spacing practices with short actual birth interval length and longer preferred birth interval lengths were evident among the study subjects. Hence interventions to enhance contraceptive utilization behaviors among women would be helpful to narrow the gap between optimal and actual birth spacing.

Key word: Birth interval duration

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List of abbreviations

AOD: Adjusted odd ratio

COD: Crude odd ration

DHS: Demographical health statistics

FMOH: Federal ministry of health

OBGYN: Obstetrics and gynecology

SPHMMC: Saint Paul hospital millennium medical college

SPSS: Statistical package for social science

SD: Standard deviation

WHO: World health organization

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1. Introduction

1.1 Background

Birth spacing is the length of time between two successive live births. The adequate birth interval is considered as a positive factor in the health of mothers and their children. Birth spacing has been the main strategy of the health promotion program for mothers and children. The birth spacing has been reported to have a significant effect on the child's future physical and mental capabilities ^[1]. WHO recommended that the interval between pregnancies should be at least 36 months to minimize the risk of adverse maternal, perinatal and infant outcomes ^[2]. Postpartum family planning programs are very important for the optimum birth interval which is beneficial for the health, social, and economic condition of the family ^[3].

Many studies have shown that short birth intervals adversely affect the health of mothers and their children's chances of survival. Short birth intervals (less than 36 months) increase maternal risks such as third trimester bleeding, toxemia, malnutrition, anemia, and maternal mortality. It can lead to several serious outcomes for neonates as well, such as prematurity, low birth weight, stillbirth, neonatal mortality and adverse effect on intellectual ability, physical growth and development ^[4-6]. Longer duration of birth interval (more than 60 months) is also associated with increased risk of maternal death, third trimester bleeding, eclampsia and post-partum hemorrhage ^[7].

Women in developing countries have shorter birth intervals than they would prefer. The main reason for short birth intervals is that many women in developing countries do not use contraception after birth and therefore are likely to become pregnant once fecundity returns ^[13]. Birth spacing is a well-known, underutilized, and admittedly not fully understood health intervention ^[14]. Adequate child spacing is considered as a positive factor on the health of mothers and their children. A variety of demographic and socio economic characteristics influence women's spacing practices ^[7,15]. Thus, understanding practice of birth interval and factors which influence women's birth interval is critical for countries like Ethiopia with a population policy aiming at reducing fertility.

1.2 Statement of the problem

Longer intervals between consecutive births decrease the number of children a woman can have. This results in beneficial effects on population size and on the health status of mothers and children. Our country, Ethiopia as one of the most populous country in Africa with high number of rate of maternal mortality and child mortality will be used from the longer interval between consecutive births women could have. From other research done in southern part of Ethiopia the duration of birth interval in our country is affected by different socioeconomic and cultural factors. and from this research Majority (57%) of women

were practicing short birth interval length with the median birth interval length of 33 months and actual birth interval length is significantly shorter than preferred birth interval length^[19]. Birth interval showed significant variation by contraceptive use, residence, wealth index, breast feeding and occupation of husbands. Addressing this factors will allow us to make better interventions and plans to decrease the prevalence as well as consequence of short duration birth interval. Therefore, understanding the practice of birth interval and its determinants is helpful to design evidence based strategies for interventions.

1.3 Justification of the study

Assessing factors that determine the birth interval among female patients who are admitted to SPHMMC OBGYN ward will serve as a baseline data for future plans made by FMOH to improve birth interval among women of reproductive health by providing the actual data about problem and possible recommendation.

2. Literature review:

2.1 Duration of birth interval

Optimal spacing until the next pregnancy is generally understood as resting period between pregnancies that allows the mother time to recover from pregnancy, labor and lactation ^[10]. Longer time period between births allows the next pregnancy and birth to occur more likely to be at full gestation and growth ^[11,12]. For years, family planning programs have advocated two years intervals between births for infant and child health and survival. The basis of the recommendation is that waiting 2 month before trying to become pregnant after live birth will help avoid the range of birth to pregnancy intervals associated with the highest risk of poor maternal, perinatal, neonatal and infant health outcomes. In addition after a miscarriage or induced abortion the recommended interval to next pregnancy is at least six month in order to reduce the risk of maternal and perinatal outcomes.^[18] In one research done in southern Ethiopia, majority of the study subjects were aware of the optimal length of birth interval between two successive births. Accordingly, 60% of the respondents were knowledgeable about optimum birth interval. More than half (57%) of the women in reproductive age group have been practicing short birth interval below the recommended duration of optimal birth spacing. Regarding the median length of months between two successive births, women on average are 3 months behind what has been recommended as the healthiest birth interval.

Birth interval is the length of time between two successive live births ^[1]. Beginning with a live birth, the birth interval can be divided into the period of postpartum amenorrhea, the menstruating interval, and the following period of gestation ^[2]. Ethiopia is the second most populous country in Africa next to Nigeria, with population size of 73,918,505 million and total fertility rate of 5.4 ^[1,3]. Like many other African countries, Ethiopia has so far shown little change in fertility.

Fertility is an important component of population dynamics which plays a major role in changing the size and structure of a given population ^[7]. Factors affecting fertility are broadly classified into proximate (direct) and distal (indirect) factors. The proximal factors are bio-behavioral factors, like being sexually active, use of contraceptive, duration of postpartum infecundability, abortion and sterility which affect fertility directly, whereas, distal determinants, are socio-cultural factors which affect fertility indirectly through affecting the bio behavioral factors ^[4,8,9]. Optimal spacing until the next pregnancy is generally understood to refer to resting period between pregnancies that allows the mother time to recover from pregnancy, labor and lactation ^[10].

For years, family planning programs have advocated two years intervals between births for infant and child health and survival ^[11,12]. Recent research found that birth intervals of 3 to 5 years are safer for mothers and babies compared to birth intervals of two years or less ^[7,8,12]. Some researchers also opined that birth intervals longer than five years are less healthy suggesting that such mothers may lose the protective benefit of previous child bearing and hence have complications as seen in primigravida ^[12]. Few people including women themselves understand the risks involved in bearing children ^[7]. Women in developing countries have shorter birth intervals than they would prefer. The main reason for short birth intervals is that many women in developing countries do not use contraception after birth and therefore are likely to become pregnant once fecundity returns ^[13]. Birth spacing is a well-known, underutilized, and admittedly not fully understood health intervention ^[14]. Adequate child spacing is considered as a positive factor on the health of mothers and their children. A variety of demographic and socio economic characteristics influence women's spacing practices ^[7,15]. Thus, understanding practice of birth interval and factors which influence women's birth interval is critical for countries like Ethiopia with a population policy aiming at reducing fertility. Hence, this study was conducted to determine duration and determinants of birth interval among women admitted to SPHMMC OBGYN department.

In many parts of the world's developing countries, women were practicing low birth interval i.e. birth interval of less than 36 months. Longitudinal studies conducted over eleven years in Tanzania among 15,373 married women using data extracted from demographic surveillance survey indicated that about 48.4% of births were happened below the recommended minimum length of 36 months between two live births. But, Studies from developed country showed that the median birth interval is higher compared to developing countries. For instance, in Iran more than 70% of child bearing age women were practicing birth interval of greater than 2 years. Institutional based cross sectional study done among 415 women in Iraqi in 2009 also showed that about (31.8%) women had a birth interval of less than 12 months and (26.7%) had a birth interval of between 19-24 months. Studies in different parts of Ethiopia also showed similar results. For instance, in community based cross sectional study conducted in 2008 among 645 married women in Jimma, 27% of births were happened within less than 24 months from previous birth, while only 33% of births happened between 33 and 35 months after a previous birth, and in retrospective study done in 2012 among 617 women in Gondar, Northern Ethiopia, the median birth interval was 32.6 months (95% CI: 31.2-34.1) which is less than the minimum inter birth interval recommended by world health organization. In addition, with the minimum duration of birth interval of less than 18 months and maximum of greater than 60 months in Somali region and Addis Ababa respectively, the median duration of birth interval in Ethiopia was 34 months (EDHS, 2012). Studies had confirmed that this short inter birth intervals contributes a lot for adverse outcome for infant, neonatal and mother's health.

The hypothetical causal mechanisms which explains the association between short inter birth intervals and adverse outcomes were: maternal nutritional depletion, folate depletion, cervical insufficiency, vertical transmission of 8 infections, suboptimal lactation related to breastfeeding–pregnancy overlap, sibling competition, transmission of infectious diseases among siblings, incomplete healing of uterine scar from previous cesarean delivery, and abnormal remodeling of endometrial blood vessels. If a new pregnancy starts before complete folate restoration after delivery, the woman was at higher risk of maternal folate deficiency and subsequent adverse perinatal outcomes such as low birth weight, preterm birth, and small for gestational age. Community based cross sectional study conducted in 2013 on consequence and determinants of short birth intervals in Bangladesh revealed that birth intervals of less than 21 months were associated with a greater than two-fold increased risk of adverse pregnancy outcome, stillbirth and neonatal mortality⁽²⁰⁾. A meta-analysis done using 52 demographic and health survey data from developing countries; Latin America, Asia, Africa and Middle East countries indicated that compared with a preceding birth-to-pregnancy interval of greater than 36 months, children conceived with interval durations of less than 24 months have significantly higher risks of mortality. In a case control study done in 2014 in south East of Ethiopia on risk factors for low birth weight, mothers who gave birth with in birth interval of 2 years and below were 3.2 times more likely to give low birth weight baby than mothers who gave birth greater than 2 years apart (AOR = 3.2; (95 % CI =1.58–6. Short intervals between pregnancy is also an indicator for that the women didn't breast fed her previous child, as proper breastfeeding delays the mother's early regaining of fecundity. Short inter pregnancy interval prompt the preceding child to start weaning before the appropriate age. This will contributes for malnutrition, infection, and poor school performance^(19,20). According to the 2011 EDHS data, Short birth intervals substantially reduce children's chances of survival, especially intervals of less than two years. For example, children born less than two years after the preceding birth were 2.5 times more likely to die within the first year of life and within the first five years of life as children born three years after the preceding birth. So, by promoting the length of birth interval to at least two years we can reduce under-one mortality by 50%. Researchers also claimed that pregnancies which happen sooner after a previous birth are more likely to be unintended.

A cross sectional study conducted in 2009 in Jimma on fertility planning behavior of married women showed that women whose previous birth interval was less than two years were more likely to report their previous Pregnancy as unintended as compared to women with a previous birth interval of three or more years. This may contribute for termination of pregnancy in unsafe and complicated way such as unsafe abortion. Studies verify that there is strong relationship between under nutrition and birth interval. For example, study conducted in 2014 among 500 under five children in Madhya Pradesh, India indicated that, majority, 57% of the undernourished (underweight, wasted and stunted) children were those born with birth interval of less than 24 months. This could be because of short birth intervals leads to maternal depletion syndrome, milk diminution and competition between siblings close in age for food and other resources. Similarly, study done in 2012 in India showed that out of malnourished children, 93% of them were those born with birth interval of between two pregnancies was ≤ 24 months. Short inter pregnancy interval is also known risk factor for preterm birth, and inadequate birth spacing is associated with shorter overall pregnancy.

2.2 Factors associated with duration of birth intervals

Utilization of any of the modern contraceptive methods was strong predictors of birth interval. In retrospective follow up study done in 2012 in Gondar, north east Ethiopia among 617 women who gave at least one live birth, Women who were non users of contraceptive were about 4 times more likely to have subsequent birth in shorter period after the index child compared to contraceptive users (AHR = 4.29, 95 CI%: 3.00, 6.13). Studies showed that women's education is negatively related with duration of birth interval. The issue of sex preference is common among different society⁽³⁾. This also contributes a lot for duration of birth interval. For instance, community based cross sectional study among 1225 women who gave at least one live birth in Manipur indicated that the risk of having subsequent birth within shorter period was 15% more likely if the preceding birth was female compared to the preceding birth of male child. Breastfeeding improves infant survival and lengthens the interval between pregnancies due to lactational amenorrhea. In cross sectional study conducted in 2009 in Iraq, about thirty four percent of women who breast fed their babies had longer birth interval (>24 months) , compared to 39.1% of mothers who bottle fed their infants who had lower birth interval (8-12 months). Another variable associated with birth interval length is the survival status of the index child. A cross sectional study done among 1225 women in Manipur, India in 2009 is revealed that women with the survival of previous child were 44% times less likely to have short birth interval as compared with the women having the death of the previous child. Death of the index child in infancy or early childhood has been found to be associated with short subsequent intervals because of parents consciously plan a new pregnancy to replace a lost child or the death of a child results short nursing durations which results in earlier resumption of menses and ovulation (Rao S. et al., 2006). Longitudinal study conducted from 1999 to 2010 in Tanzania among 8,989 women ever gave live births, on adherence of women's towards world health organization recommendation for length of birth interval, revealed that if the index child born elsewhere other than health facilities, the subsequent birth is nearly 2 times more likely to be shorter interval compared to those index child born in health facilities (AOR=1.85, 95% CI 1.71-2.00). Age at first birth is an important determinant of duration of fertility and birth intervals. As indicated in Ethiopian demographic and health survey of 2011, as the mothers age increase, the median duration between births also increases i.e. 28.5 months for births to women 15-19 years and 38.7 months for births to women 40-49 years. Studies revealed that those mothers having first birth before reaching 20 years of age, have high number of parity in their reproductive life span; while mothers having first birth at higher age usually having higher birth interval. The likelihood of a short birth interval decreased by 5% for every year that a woman's first pregnancy was delayed (AOR 0.95, CI= 0.92-0.98). In contrast to the above result, studies from Iran in 2012 and Manipur India in 2010 claimed that as the age of marriage increased, with

increasing maternal age concern of infertility and the occurrence of congenital diseases, the couples decide to have their children soon after marriage and the birth interval become short. Knowledge about the optimal duration of birth spacing is also factors which affects women's to practice optimal birth intervals. For instance in study done in Myanmar in 2012 among 415 pregnant women, in which knowledge of the women was assessed using ten questions regarding to the meaning and advantage of birth spacing, the duration of birth interval was higher (≥ 24 months) among women with high level of knowledge compared to low knowledge ($p < 0.001$).

In the research done in Lemo district Women who were rural resident, being student and daily worker in husbands' occupation, breast feeding for 7 to 12, 13 to 23 and 24 and above months, nonuse of modern contraceptives and highest wealth quartile were found to be significant predictors of short birth interval length. Women in the study area have been practicing on average 7 months shorter birth interval length than they would prefer otherwise and the preferred length of birth interval among the study subjects is significantly greater than actual birth interval length.⁽¹¹⁾

The study also revealed that more than 70% of the respondents in this study used the contraceptive methods before this pregnancy, and about 45% of respondents exclusively breastfeed the last child for more than 6 months. It indicated that the use of contraceptive for birth spacing, and exclusive breastfeeding were famously used in rural area. A study done in Egypt found significant association between birth spacing and exclusive breastfeeding, and a study in Bangladesh^[17] also found that using contraceptives leads to a large and significant increase in the space between births—it increases the interval by about 60%. Actual birth intervals of women in most developing countries are shorter than the intervals they would prefer. Many women not only are unable to achieve their own reproductive goals but also are falling far short of the 3 to 5 years intervals that new evidence suggests are healthiest.

In many sub-Saharan African countries, women are the furthest from achieving their preferred birth interval^[16]. In the demographic and health survey analytical study conducted in 20 sub-Saharan countries, the median length of actual birth intervals was 33.7 months on average compared with preferred birth interval of almost 39.9 months^[17]. Women in this study practiced birth intervals in average 7 months shorter than they would prefer.

This wide gap showed a transition from high to low fertility; reproductive goals are changing but contraceptive behavior has yet to follow. from the research done in Bangladesh, Pregnancies that follow less than 15 months are more than four times more likely to end in a non-live birth than those following an interval of three-to-seven years, and babies born after an interval of less than 15 months have an increased risk of mortality 3.6 times that of the lowest-risk group (three-to-seven-year inter-birth intervals). By contrast, mothers who are less than 16 years old have an increased risk of first-week mortality of 2.3 relative to the lowest-risk age category (22-30 year old women).

2.3 Conceptual frame work

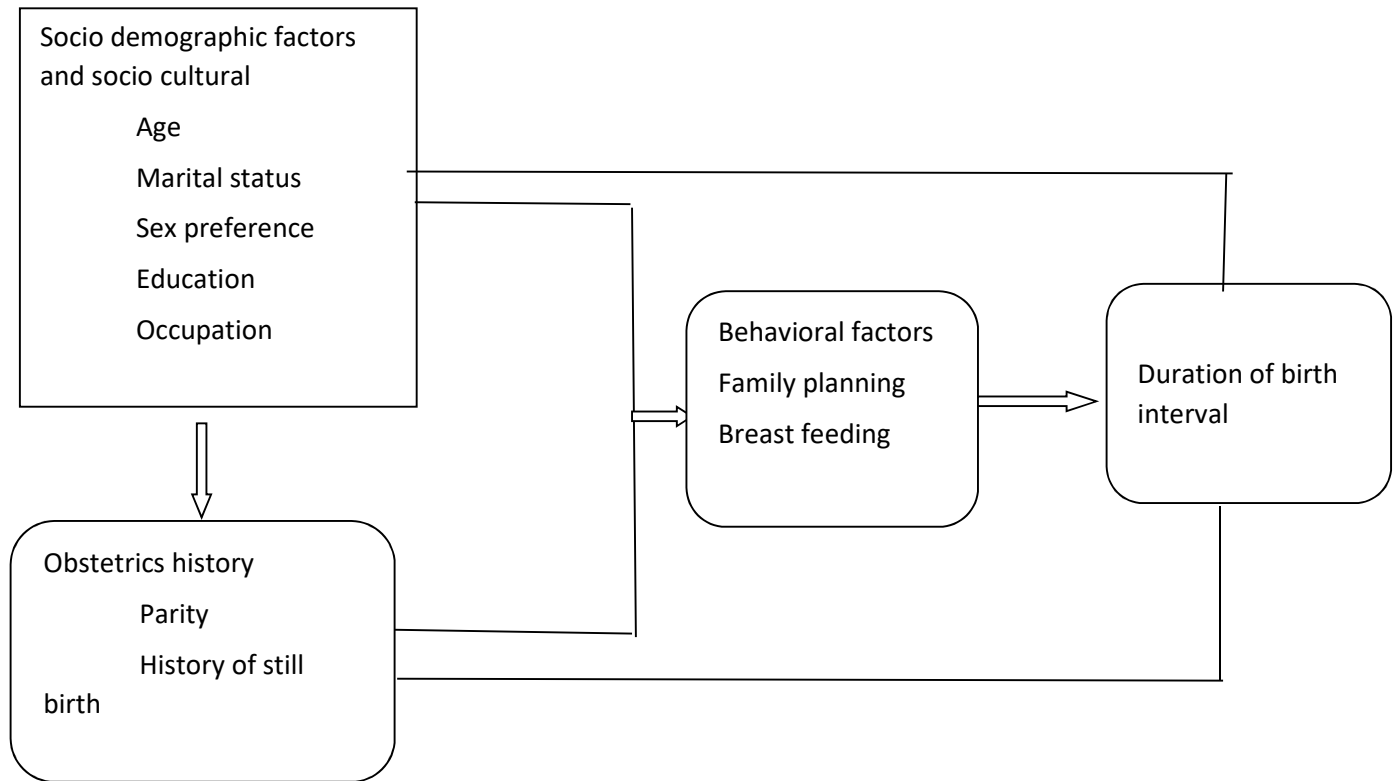


Figure 1: Conceptual frame work of assessment of duration of birth interval among women admitted to SPHMMC OBGYYN (adopted from the research: duration of birth interval and associated factors among married women in Dodota woreda, Arsi zone, Ethiopia)

3. Objectives of the study

3.1 General objectives:

- Assess the duration of the birth intervals and associated factors among women that are admitted SPHMMC OBGYN ward.

3.2 Specific objectives:

- To assess the average birth interval of women that are admitted SPHMMC OBGYN ward
- To assess the associated factors that determine the duration of birth interval.

4. Method

4.1 study design

The study design employed in this study was institutional cross-sectional analytic method among female patients that are admitted to St. Paul hospital millennium medical college OBGYN department. Patients who are parous with one or more deliveries were interviewed using a questionnaire.

4.2 Study setting area

The study was conducted in Addis Ababa (Amharic word for 'new flower') is the capital and largest city of Ethiopia. It has a population of 3,384,569 according to the 2007 population census, with annual growth rate of 3.8%. The city is populated by people from different regions of Ethiopia.

The study was conducted in one of the largest hospitals of the city, St. Paul's Hospital Millennium Medical College which is one of the country's centers of excellence. It was established in 1969, by Emperor Haileselassie in collaboration with the German Evangelical Church, as a source of medical care for underserved populations, and was named St Paul General Hospital until 2008. It currently has 392 beds, with an annual average of 200,000 patients and a catchment population of more than 5 million.

4.3 Study population

Women who were admitted to SPHMMC OBGYN ward in one month duration.

4.4 Sample size and sample procedure

Sample size of the study was determined based on the assumption that

$$n = \frac{Z^2 p (1-p)}{d^2}$$

$Z=1.96$ corresponding to 95% confidence interval sample size

α =degree of accuracy

n =sample size

p =proportion taken as 50% that is 0.5

In other study done in southern Ethiopia lemo district the proportion value taken was 50%

d = degree of precision within (+ or -) 5% of the true value

$$n = \frac{(1.96)^2(0.5 \times 0.5)}{(0.05)^2} \approx 385 \text{ from undefined population}$$

So if 385 is the sample size population for undefined population above 10,000, then n_0 is calculated as:

So if 385 is the sample size population for undefined population above 10,000, then n_o is calculated as:

$$n_o = n / 1 + (n/N)$$

$n = 385 / 1 + (385/300) \approx 169$ subjects (where 300 being the total number of patients admitted to SPHMMC OBGYN ward within one month)

where n =sample size and

N =source population

169 with 10% non-response rate sample size will be 186 subjects.

4.5 Sampling procedure

Random sampling technique (lottery) method was applied to choose patients that was participated in the study.

4.6 Inclusion and exclusion criteria

Inclusion criteria

- Patients who were admitted to SPHMMC OBGYN ward.
- Patients who were to participate on the study and give informed consent
- Patients who at least have gave birth to one child

Exclusion criteria

- Patients who were nulliparous
- Patients who were not on reproductive age group.

4.7 Variables

Dependent variables

- Duration of Birth interval

Independent variables

- Age
- Ethnicity
- Residence
- Marital status
- Educational status
- Occupation of the patient
- Educational status of the husband and his influence

- Contraceptive use
- Monthly income
- Breast feeding practice
- Previous pregnancy outcome
- Knowledge about the optimum birth interval

4.8 Operational definitions

- Birth interval: is the length of time between two successive live births(WHO definition)
- Short birth interval: Birth interval less than 36 month(WHO definition,2007)
- Long birth interval: Birth interval greater than 60 month(WHO definition,2007)
- Practice on Birth spacing: those who have heard about the optimum birth interval and also have optimum birth interval (based on the research done in southern part of Ethiopia: Duration and determinants of birth interval among women of child bearing age in Southern Ethiopia)
- Reproductive age: from 15-49(WHO definition,2007)
- Knowledgeable : respondents who have heard about optimum birth interval and know it benefit for the health of the mother and the child (based on the research done in southern part of Ethiopia: Duration and determinants of birth interval among women of child bearing age in Southern Ethiopia)

4.9 Instrument

A questioner was adopted from different literature and used to explore different objectives of the study. The questioner was adjusted in English and translated in Amharic while asking by the data collectors. It consist sociodemographic characteristics and possible factors that determine the duration of birth interval.

4.10 Data quality assurance

The data was collected by data collectors who were trained on the structured questioners until they become conversant with the instrument. Every day the collected data was reviewed for completeness and relevance by the principal investigator and continuous supervision was arranged to control data collection procedure and all the data was checked for completeness, clarity and consistency by the principal investigator. Data will be intensively cleaned before analysis.

4.11 Ethical consideration

Ethical clearance was obtained from the Institutional Review Board of the St. Paul Hospital Millennium Medical College. The study subjects were informed about the research and were asked to participate with their good will and from which they agreed with written consent. The participants were also allowed to leave the research whenever they felt like quit. The data that got collected was absolutely used for this research purpose only and the confidentiality is kept in all ways of the study.

5. Result

5.1 Socio-demographic characteristics of the respondent

With the response rate of 100%, the respondents age range from 15 -25 were 71 (38.25%), 67 (36%) Of the respondents were in between 25- 35 with the median age of 30 (SD of 14). regarding educational level, of all respondents 10 (5.4%) were illiterates, 90 (48.4%) has completed secondary school and 14 (7%) of respondents were degree holders. Regarding marital status 160 (86%) of them were married. The mean of monthly income was 4699.46 Eth birr with SD of 3366.51 ETH birr.

Table 1: Socio –demographic characteristics of the respondents

NO	Variables	Categories	frequency	percent
1	Age	15- 25	71	38.2
		25-35	67	36
		35-45	48	25.8
3	Marital status	Married	160	86
		Single	24	12.9
		Widowed	2	1.1
4	Residence	Urban	139	74.7
		Rural	47	24.3
5	Education of the mother	Illiterate	10	5.4
		Able to read and write	6	3.2
		Elementary	46	24.7
		Junior	31	16.7
		Secondary	79	42.5
		Tertiary	14	7.5
6	Religion	Orthodox	97	52.2
		Protestant	32	17.2
		Muslim	57	30.6
8	Monthly income	<4699.46 Eth Birr	108	58.1
		>4699.46 Eth Birr	78	41.9

5.2 Knowledge about optimum birth interval

Of the respondents 171 (91.9%) have heard about optimum birth interval and 174 (93.5%) agreed on the health advantage of the birth spacing for the mother and the child. From all the respondents 126 (67.7%) thinks the optimum birth interval is between 2 and five years, 43 (23.1%) of them thinks the optimum birth interval is below two years and 2 of the respondents think above five years is the optimum birth interval.

Table 2: Knowledge about birth interval among women admitted to SPHMMC OBGYN ward.

NO	Variables	Categories	frequency	percent
1	Heard about birth interval	Yes	171	91.1
		No	15	8.1
2	Health advantage for mother and child	Yes	174	93.5
		No	12	6.5
3	Optimum birth interval	Below 2 years	43	23.1
		Between 2 and 5	126	67.7
		Above 5	2	1.1

5.3 Previous pregnancy outcome, breast feeding practice and use of family planning

From the respondents, the maximum number of children a mother had was 6 with frequency of 9 (4.8%), the number of mothers who have breast fed their kids were 143 (76.9%), the number of respondents who have used contraceptives were 118 (63.4 %) and from them the total number of contraceptives users, 111 (59.7%) of them used it for birth spacing purpose and 14 (7.5%) of them used it for limiting birth.

Table 3: Independent variables

No	Variable	categories	Frequency	percent
1	Died child	Yes	23	12.4
		NO	163	87.6
2	Sex of last child	Male	102	54.8
		Female	84	45.2
3	Breast feeding practice	Yes	143	76.9
		No	43	23.1
4	Contraceptive use	Yes	118	63.4
		No	61	32.8

5.4 Intention to become pregnant

The desire to have more children before conception of the last child was asked. Accordingly 114 (61.3%) of the respondents had the desire to have the last child. Of those who wanted more children 9 (4.8%) wanted to become pregnant then and 110 (59.1%) desired to postpone the pregnancy for some time later. The average birth interval among respondents who wants to be pregnant then was 48 month with standard deviation of 26.8, the fastest being 12 month and the slowest being 84 month. For those who wants to wait until later the average birth interval was 29 month with standard deviation of 18.1, the fastest being 10 month and the slowest being 102 month.

5.5 Practice of birth interval and its predictor

From the total number of respondents 130 (69%) of them have two children and 64 (49.2%) of them have practiced optimum birth interval. 57(43.8%) have practiced below the optimum birth interval and 9(6.9%) of them practice birth interval more than the optimum. The median duration of the actual birth interval was 34 month (SD +/-20.9) and the median duration of the preferred birth interval was 36 month (SD +/- 13.2).

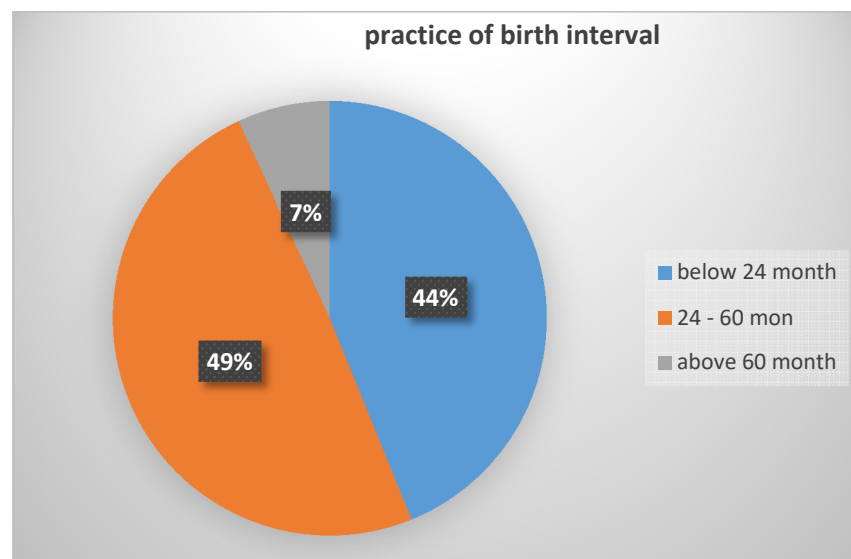


Figure 2: Practice of birth interval among women who are admitted to SPHMMC OBGYN ward.

Residence of the respondents' were found to have significant relation with the birth interval with COR of 0.13 (0.053-0.322), those respondents who live in urban area are more likely to have optimum birth interval than those living in rural areas. Those respondents who have monthly income greater than the mean monthly income (>4699 ETH birr) are more likely to practice optimum birth interval than those with below mean monthly income with COR of 0.446 (0.246-0.811). Respondents who have breast fed their kids have optimum birth interval than those who haven't breast fed with COR of 6.43(2.5-16.1). As one of obstetrics factor those respondents who have male child at the last pregnancy were more likely to practice optimum birth interval with COR of 2.42(0.257-1.175). Those respondents who have used contraceptives are more likely to practice optimum birth interval those who haven't with COR of 2.964(1.49-5.88).

Table 4: Binary logistic regression analysis of practice of birth interval and its predictors of women admitted to SPHMMC OBGYN ward.

variable	categories	Optimum birth interval	Non – optimum birth interval	COR	P value
Residence	Urban	66	73	0.13(0.053-0.332) 1	0.000
	Rural	41	6		
Breast feeding practice	Yes	73	70	6.43(2.5-16.1) 1	0.000
	No	6	37		
Sex of the baby before the last pregnancy	Male	51	28	2.42(0.257-1.175) 1	0.015
	Female	24	32		
Use contraceptives	Yes	58	60	2.964(1.49-5.88) 1	0.002
	No	15	46		
Presence of died child	No	73	90	2.298(0.862-6.127) 1	0.096
	yes	6	17		
Monthly income	<4699.46	37	71	0.446(0.246-0.811) 1	0.008
	>4699.46	42	36		
occupation of mother	Housewife	44	54	1.230(0.688-2.212) 1	0.485
	others	35	53		
Education of mother	< elementary	10	6	2.44(0.847-7.023) 1	0.098
	> elementary	69	101		

After controlling the effect of other variables ,two variables were found singinifantly associated with birth interval including sex of the last pregnancy and monthly income of the respondents with AOR of 4.72(1.9-11.45) and 0.325(0.127-0.808) respectively.those respondents who had a male child at the last pregnancy and those with monthly income above the mean monthly income are more likely to practice optimum birth interval those who havent.

Table 5: Multivariate analysis of predictors that affect practice optimum birth interval among women who are admitted to SPHMMC OBGYN ward

variable	category	Optimum birth interval	Non optimum birth interval	AOR	P value
Sex of the last baby before last pregnancy	Male	51	28	4.72(1.9-11.45) 1	0.001
	Female	24	32		
Monthly income	< 4699.46	37	71	0.325(0.127-0.808) 1	0.016
	> 4699.46	42	36		
Residence	Urban	28	73	0.334(0.107-1.109) 1	0.076
	rural	14	6		
Use of contraceptives	Yes	58	60	0.374(0.612-3.66) 1	0.374
	No	15	46		

6. Discussion

Since the area is the capital of Ethiopia 91.1 % of knowledgeable mothers about birth spacing is acceptable. Population report of 2002 in 55 sub Saharan Africa showed that 57% of women of child bearing age practiced birth interval lengths less than 3 years ^[16]. A finding in this study shows 43.8% have practiced below the optimum birth interval and 9(6.9%) of them practice birth interval more than the optimum and this is not that far away from other sub Saharan countries. On the other hand 49.9% of respondents have practiced optimum birth interval which is far lower relative to the higher proportion of respondents (91.1%) who were considered to be knowledgeable. The fact that there is the difference between the desired birth interval and the actual birth interval can contribute for the wider gap between the practice and the knowledge. The median duration of the actual birth interval was 34 month and the preferred birth interval was 36 month.

Education is considered to be one of the most important socio economic factors having an indirect influence of birth interval through its impact on one more of bio- behavioral variables. For example in 38 of 51 countries with DHS data, women with no education were more likely than women with education to space birth less than 3 years. In this study women with education status more than the elementary were 170 (9.1%) from those only 40% of them practiced optimum birth interval. This is may be because sometimes women with better education compress child bearing in to few years to participate in non- child bearing activities.

There are some urban-rural differentials with rural women less likely than the urban women to practice below optimum birth interval. In 51 of 55 countries surveyed by the DHS women who live in rural areas were more likely to have less birth interval than those living in urban areas. In this study 73(52%) of those living in urban areas practice optimum birth interval compared to 6(14%) of those living in rural areas. Better education, health service, job opportunity, social services and access for information could have bought the variation by residence.

Different studies have shown that, women are more likely to have their next child within 3 years if the previous child dies. The longer the previous child survives, the less effect on the subsequent birth interval. In this study, 46% of those women who have died child from the previous pregnancy were found to have birth interval less than 3 years compared to 35% of those who doesn't have died child from the previous pregnancy.

In the study conducted in Mozambique, the sex of the previous child does not seem to have influence on the length of birth interval. But couples who prefer son tend to have their next child soon after the birth of a daughter. In the study conducted in lemo district of southern in Ethiopia, short birth interval less than 3 years follow the birth of a female child, but in this study 48% of women who had the previous child male, have practiced less birth interval than 21 % of those who have had female in the previous pregnancy and sex of the previous pregnancy had significant association with the birth interval. These variation could be due to difference in sex preference among different cultures.

According to DHS 2005 in Ethiopia, the median number of months increased when a wealth quartile is shifted from the lowest to the highest. Similarly in the study conducted in southern Ethiopia

the median length one shift from the lowest quartile to the highest quartile of wealth index. In this study only 37(46%) of women who have monthly income less than the median were practicing optimum birth interval compared to 42(53%) of those with monthly income more above the median. This is probably due to women in better wealth category have better access for education, information and family planning service.

Actual birth intervals of women in developing countries are shorter than then the intervals they would prefer. In many sub Saharan African countries women are the furthest from achieving their preferred birth interval. In demographic and health survey analytic study conducted in 20 sub-Saharan countries, the median length of the actual birth interval was 33.7 month on average compared to the preferred birth interval of almost 39.9 month. Women in the study conducted in southern Ethiopia also have practiced birth interval 7 month shorter than they prefer. Similarly in this study the median duration of birth interval was 34 month and the preferred birth interval was 36 month. This may be due to less contraceptive access, influence of the society and husbands on contraceptive and in appropriate use of contraceptives.

Besides being the most effective nutrition of the child, breast feeding has a contraceptive effect postpartum for those mothers who breast feed exclusively. In the southern Ethiopia study, as the duration of the breast feeding practice increases, it was found that the duration of the birth interval also increases. In research done in Arsi zone, over all breast feeding duration is found to be the strongest predictor of birth interval duration. Breast feeding duration is directly related with duration of birth interval i.e. women who breast fed their index child for less than 24 months were more likely to give birth with in short birth interval duration and vice versa⁽²⁰⁾. This could be due to the effect of breast feeding which results in lactational amenorrhea, extends postpartum infertility by suppressing ovulation and reducing chance of conception through hormonal effect. Results of data from EDHS of 2011, in Ethiopia, also indicated that postpartum amenorrhea and abstinence contributes about 16 months for duration of postpartum insusceptibility (CSA, 2012). But in this study breast feeding practice wasn't associated with the birth interval of the respondents. This may be explained by the fact that even though most respondents have breast fed their kids, it should be exclusive to have a contraceptive effect.

Contraceptive utilization status was another variable associated with duration of birth interval in study done in Arsi. Those women who didn't use any contraceptive method between index child and last pregnancy were 1.6 times more likely to give birth in short interval ⁽²⁰⁾. This result supports community based study done in Lemo, Southern part of Ethiopia, in which contraceptive non 32 users were 1.56 times more likely to practice short birth interval (AOR=1.56 95% CI: (1.1, 2.2)) (Samuel Yohannes et al., 2011). In this study women who have used contraceptive methods were 2.9 times more likely to practice optimum birth interval those who didn't with COR 2.964(1.49-5.88)

7. Conclusion

Majority of the study subjects were aware of optimum birth interval (67.7%). Almost half of the respondents (50.8%) practice birth interval below the recommended duration of optimal birth spacing. Regarding the median length of months between two successive births, women on average are 2 month behind from what has been recommended as the healthiest birth interval. The duration of birth interval was found to be associated with the residence, sex of the previous pregnancy, contraceptive use, breast feeding practice and monthly income. Women who lived in urban area, women who had male child on the last pregnancy, women who used contraceptives and those women who have monthly income more than the median are more likely to practice optimum birth interval. Women in this study have also been practicing on average 2 month behind birth interval than what they actually prefer to have.

8. Recommendations

To SPHMMC: As adequate birth interval is essential for the health of the mother and the child, health education should be provided to reproductive age women clients of our hospital about the benefit of the optimum birth spacing and their reproductive rights in general in every encounter . Family planning service should be provided in effective way so that women can maximize their birth interval. Our hospital has to work on those predictors of the birth spacing, like on effective antenatal care of the pregnant women to improve the outcome of the pregnancy so that it will have good impact on the consequent pregnancies.

To the government and other organization: achieving adequate birth interval among women would have the greatest impact not only on the health of the mother and the child but also maintain the rapidly growing population size of our country. Maintaining this rapidly growing community and achieving the maximum health care service the mother and the child could ever got cannot be the role of some stake holders, Rather FMOH and other governmental and nongovernmental organization who are working in this area should team up together on planning and implementing different strategies that would help women to achieve their reproductive rights and practice optimum birth interval and this different policies and strategies should be implemented on grass root level.

9. Strength and limitations

Strength

- ✓ Used primary data
- ✓ Tried to cover the most of the factors associated with birth interval
- ✓ Use of multivariate analysis to show significant relations

Limitation

- ✓ Some important factors of the birth spacing haven't been covered in the study like mode of delivery of the previous pregnancy
- ✓ Small Sample size

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11. Assurance of investigator

Name: Dr. Selamawit Eshetu

Signature:

Advisor: Mr. Samson Zegeye (MPH)

Signature:

12. Annex

Questioners

Dear Respondent: My name is Dr. Selamawit Eshetu, I am medical intern in SPHMMC and I am doing research on assessment of the duration of birth interval and associated factors among women who are admitted to OBGYN department. This questionnaire is prepared to conduct a study on the socio-demographic, socio-economic and biological factors determining inter birth interval among women who are admitted to SPHMMC OBGYN. You are selected and included in the study as part of the sample population to complete the questionnaire designed by the researcher. The information obtained in this study will be used only for research purposes. The data you will provide is very helpful to achieve the intended objectives of the study. Any information obtained will be kept strictly confidential and will not be exposed to any other body. But it may remind you some condition which you may not want to remember at all like death of your family member etc. Involvement in this study is optional and in voluntary basis and you can drop any individual question or the whole questionnaire. But your participation and contribution in the study is very important to come up with important findings which may help local health planners to intervene the problem locally. Yes, continue

No, thank you!

Name of the data collector_____ Sign_____ Date_____

Part I Socio-demographic Characteristics of the respondents

S.N	Questions	Response and Coding	Skip
101	Bed number	_____	
102	Residence	1. Urban 2. Rural	
103	Age of the mother in years	_____	
104	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
105	At what age did you marry?	_____	
106	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Others (specify)_____	
107	Ethnicity	1. Oromo 2. Amhara 3. Guragie 4. Siltie 5. Tigire 6. Others (specify)_____	
108	Education of the mother	1. Illiterate 2. Able to read and write 3. Elementary (1 - 6) 4. Junior (7 - 8) 5. Secondary (9 - 12) 6. Tertiary (12+)	
109	Education of the husband	1. Illiterate 2. Able to read and write 3. Elementary (1 - 6) 4. Junior (7 - 8) 5. Secondary (9 - 12) 6. Tertiary (12+)	Skip to
110	Occupation of the mother	1. Employee (GO/NGO) 2. House wife 3. Merchant 4. Student 5. Farmer 6. Daily worker 7. Others (Specify)_____	
111	Occupation of the husband	1. Employee (GO/NGO) 2. Merchant 3. Student 4. Farmer 5. Daily worker 6. Others (Specify)____	Skip to

112	Monthly income in ETH birr		
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Part II Knowledge on Birth Interval

S.N	Questions	Response and Coding	Skip
201	Have you heard about optimal birth interval between two consecutive births?	1. Yes 2. No	If no go to Q203
202	If yes to question no 201, what is the optimum number of months or years between two successive births?	1. Below three years 2. Three to five years 3. Above five years 4. I don't know	
203	Does adequate/optimum birth spacing have a health advantages?	1. Yes 2. No 3. Don't Know	If no or DK go to Q205
204	If yes to question no 203, whom do you think have health advantages?		
	204.1. The mother?	1. Yes 2. No 3. Don't Know	
	204.2. The child?	1. Yes 2. No 3. Don't Know	
	204.3. Both?	1. Yes 2. No 3. Don't Know	
205	Does short birth interval have a health disadvantages?	1. Yes 2. No 3. Don't Know	If no or DK go to Q301
206	If yes to question no 205, whom do you think have a health disadvantages?		
	206.1. The mother?	1. Yes 2. No 3. Don't Know	
	206. 2. The child?	1. Yes 2. No 3. Don't Know	

	206. 3. Both?	1. Yes 2. No 3. Don't Know	
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Part III Birth History of the respondents (previous pregnancy outcome)

S.N	Questions	Response and Coding	Skip			
301	How many children have you ever born alive?	Males ____ Females____				
302	Have you ever given birth to any child who died later?	1. Yes 2. No →	If no go to Q304			
303	If yes, how many of your children died?	Males ____ Females____				
304	At the time you became pregnant with the last child did you want to have more child?	1. Yes 2. No →	If no go to Q308			
305	If yes to question no 304, was your preference to become pregnant then or wait until later?	1. to become pregnant then 2. to wait until later →	If "1" go to Q308			
306	If your preference is to wait until later, how long did you prefer to wait?	_____				
307	What is the reason to become pregnant then while preferring to wait until later?	_____				
308. Birth Order	1. Sex 1. Male 2. Female	2. In what month and year did (name) born?	3. Is he /she alive? 1. Yes 2. No	4. If died, how old was (name) he/she died 1-----year 2-----Month	5. Current age	309. Birth inter- val in months
308.1.Last child						

308.2. previous to last child						
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Part IV Breast feeding practice

S.N	Questions	Next to Last Child (Response)	Skip
401.	Did you breast fed previous to last child (name)?	1. Yes 2. Never breast fed	→ If “never” go to Q404
402.	If yes to question 401, for how long was (name) breastfed?	_____months	
403.	Reason for stopping breast feeding?	1. The child being old enough 2. New pregnancy 3. The mother was sick 4. Other(specify)_____	
404.	When do you think breast feeding should stop completely?	After _____ months.	

Part V. Knowledge and practice of modern contraceptive use

S.N	Questions	Response and Coding	Skip
501	Do you know any modern method that women and men can use to delay or avoid pregnancy?	1. Yes 2. No →	If no go to Q601
502	If yes for q501, which of the following methods do you know about?		
	502.1. Pills	1. Yes 2. No	
	502. 2. Injectable	1. Yes 2. No	

	502. 3. Condom	1. Yes 2. No	
	502. 4. Implants	1. Yes 2. No	
	502. 5. IUD	1. Yes 2. No	

503	Have you been using any of the modern methods before the conception of your last child?	1. Yes 2. No 	If no go to Q506
504	If yes to question no 503 , what was the purpose?	1. Birth spacing 2. Limiting birth	
505	If yes to question no 503 , which of the following modern methods did you use?	1. Pills 2. Injectables 3. Condom 4. Implants 5. IUCD	
506	Are you using any of the modern methods now?	1. Yes 2. No 	If no go to Q508
507	If yes to question 503 or 506 , from where have you got family planning service?	1. Health post 2. Health center 3. Hospital 4. Private sector	