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Statistics

A STUDY ON ASSOCIATION OF MATERNAL AND CHILD HEALTH VARIABLES WITH BIRTH SPACING IN INDIA

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ABSTRACT **Introduction-** Birth spacing is an important element of the population growth of any country and has a strong relationship with maternal and child health. It is defined as the time interval between two consecutive live births of children. **Methodology-** The present study used secondary data from NFHS-4 that was conducted in 2015-2016. We restricted our sample to those reproductive women age 15-49 years who had reported at least two pregnancies in the reproductive calendar, with the most recent of those births having occurred in five years preceding the survey. If women had more than two children then birth spacing of last two was taken for analysis. This study included, a total of 104907 women in the final analysis sample. **Results-** Majority 82027 (78.2%) women were residing in rural areas of India while 228880 (21.8%) were residence of urban area. 44376 (42.3%) of the women had age group of 25-29 years. Approximately three fourth 76591(73.0%) mothers have given birth to 2-3 children. Male child preponderance was seen in this analysis. Caesarean section was done in 11198 (10.7%) mothers. **Conclusion-** The authors suggest that authorities from union and state governments, health officials, other stakeholders and policymakers should contribute towards improving birth spacing practices through various educational campaigns, family planning activities and benefits to the couples having 2 children at the prescribed birth interval promoting good health of mothers as well as child.

KEYWORDS : Birth Spacing, Maternal and child health, Policymakers.

Introduction

The study of birth spacing is important for maternal and child health[1] as it is an important element of the population growth of any country and has a strong relationship with maternal and child health. It is defined as the time interval between two consecutive live births.[2]

According to World Health Organization (WHO) the recommended birth spacing between two children should be at least 2–3 years in order to reduce the risk of adverse maternal and child health outcomes.[3-4] Maternal health constitutes the ante natal care, during pregnancy care and post pregnancy care.

Evidence from systematic reviews and meta-analyses indicates that short and long intervals between pregnancies are independently associated with increased risk of adverse maternal, perinatal, infant, and child outcomes.[5-7]

Numerous WHO collaborative studies reported that babies had the best chance to survive infancy when they were born after a three-to-four years gap with the previous child. There is a potential need for substantial increase in birth spacing and postponing of births to later ages, and hence, reducing adverse maternal and child health and nutritional outcomes.

Previous studies have shown that short birth intervals have negative effects on pregnancy outcomes and are associated with increased health risks for both mothers and newborns. Thus, using a nationally representative cross-sectional sample of National Family Health Survey (NFHS-4), we investigated the association between birth spacing, maternal health and child health.

Materials and Methods

The present study used secondary data from NFHS-4 that was conducted in 2015-2016, It covered a sample of 601,509 households, 699,686 women aged 15–49 years from 29 states and 7 Union Territories (UTs) of India. The women file of NFHS consists of data from 699686 women that were selected through a multistage stratified sample survey (NFHS-4). It provides information on basic demographic and socioeconomic characteristics of respondents, housing characteristics, fertility, family planning, maternal and child health, infant and child mortality. Data of only selected mothers has been used for analysis purpose of this study.

In terms of data extraction, we restricted our sample to those reproductive women age 15-49 years who had reported at least two pregnancies in the reproductive calendar, with the most recent of those births having occurred in five years preceding the survey. If women had more than two children then birth spacing of last two was taken for analysis. We included, a total of 104907 women in the final analysis sample according to inclusion and exclusion criteria.

Dependent Variable

We term the time between last two consecutive child births as Birth Spacing (BS). If women had more than two children then birth spacing of last two was taken for analysis. The birth spacing (BS) was divided into three groups i.e. Short BS (6-24 months), Medium BS (25-36 months) and Long BS (37-60 months).

Independent Variables

According to prior literature on births in India and abroad and availability of data in NFHS-4, factors associated with child and mothers were used in this study. Type of place of Residence and religion were taken as key household characteristics. Maternal variables included mother's age in years, educational status, previous pregnancy outcome, postpartum contraceptive use after previous pregnancy. Factors related to children included gender of the child, birth order, total children ever born and delivery by caesarean section.

Results

Descriptive statistics of dependent and independent variables was presented as frequencies and percentages to summarize study variables. Further, we analysed bivariate distribution to examine the association of demographic, maternal and child health variables with birth spacing. Association of variables was tested by using chi-square test. Total women analysed in this study are 104907. Majority 36823 (35.1%) mothers have interval of 25-36 months between their last and second last pregnancy. Almost similar no. of women 34366 (32.8%) and 33718 (32.1%) have 37-60 months and 6-24 months birth spacing in their last pregnancy respectively.

Majority 82027 (78.2%) women were residing in rural areas of India while 228880 (21.8%) were residence of urban area. Hinduism is followed by 75034 (71.5%) mothers whereas 17111 (16.3%) were Muslim. Very few 8944 (8.5%) were Christians and 3818 (3.6%) were following some other religion.

MATERNAL LEVEL VARIABLES					
Birth Spacing	6-24 Months n(%)	25-36 Months n(%)	37-60 Months n(%)	Total n (%)	P VALUE

Mother's Age					
<18 years	32 (0.1)	17 (0.1)	4 (0.1)	53 (0.1)	<0.001
18-24 years	10643 (31.6)	8349 (22.6)	4218 (12.3)	23210 (22.1)	
25-29 years	14060 (41.7)	16308 (44.3)	14008 (40.6)	44376 (42.3)	
≥30 years	8983 (26.6)	12149 (33.0)	16136 (47.0)	37268 (35.5)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Educational Status					
No education	12284 (36.4)	13903 (37.8)	12334 (35.9)	38521 (36.7)	<0.001
Primary	5484 (16.3)	6102 (16.6)	5185 (15.1)	16771 (16.0)	
Secondary	14134 (41.9)	14924 (40.5)	14228 (41.4)	43286 (41.3)	
Higher	1816 (5.4)	1894 (5.1)	2619 (7.6)	6329 (6.0)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Previous pregnancy outcome					
Miscarriage	1811 (5.4)	2056 (5.6)	2139 (6.2)	6006 (5.7)	<0.001
Abortion	867 (2.6)	1010 (2.7)	1054 (3.1)	2931 (2.8)	
Stillbirth	255 (0.8)	267 (0.7)	325 (0.9)	847 (0.8)	
Live Birth	30785 (91.3)	33490 (90.9)	30848 (89.8)	95123 (90.7)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Postpartum Contraceptives Used					
No	18164 (53.9)	19796 (53.8)	18413 (53.6)	56373 (53.7)	0.743
Yes	15554 (46.1)	17027 (46.2)	15953 (46.4)	48534 (46.3)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	

Majority 44376 (42.3%) of the women had age group of 25-29 years. Among the mothers having short BS, maximum 14060(41.7%) were belong to the age group of 25-29 years, among medium BS, maximum had the age group of 25-29 years while among long BI women, 16136 (47.0%) had age 30 years or more.

No education was seen in 38521 (36.7%) women, in comparison 43286 (41.3%) mothers were educated till secondary level while 6329 (6%) women completed their higher education. Majority 95123 (90.7%) women given live births while some women had miscarriage 6006 (5.7%) abortion 2931 (2.8%) and stillbirth 847 (0.8%). Postpartum contraceptive usage was seen in 48534 (46.3%) mothers.

CHILD VARIABLES					
Birth Spacing	6-24 Months n(%)	25-36 Months n(%)	37-60 Months n(%)	Total n (%)	P VALUE
Children ever born					
2-3	25026 (74.2)	26622 (72.3)	24943 (72.6)	76591 (73.0)	<0.001
4-5	6309 (18.7)	7539 (20.5)	6955 (20.2)	20803 (19.8)	
6+	2383 (7.1)	2662 (7.2)	2468 (7.2)	7513 (7.2)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Birth order					
2	16648 (49.4)	17047 (46.3)	16242 (47.3)	49937 (47.6)	<0.001
≥3	17070 (50.6)	19776 (53.7)	18124 (52.7)	54970 (52.4)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Gender of child					
Male	18743 (55.6)	20182 (54.8)	18751 (54.6)	57676 (55.0)	<0.05
Female	14975 (44.4)	16641 (45.2)	15615 (45.4)	47231 (45.0)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	
Delivery by caesarean section					
No	30448 (90.3)	33168 (90.1)	30093 (87.6)	93709 (89.3)	<0.001
Yes	3270 (9.7)	3655 (9.9)	4273 (12.4)	11198 (10.7)	
Total	33718 (100)	36823 (100)	34366 (100)	104907 (100)	

Approximately three fourth 76591(73.0%) mothers have given birth to 2-3 children whereas 7513 (7.25%) has more than six children. Among the births in the five years preceding the survey, majority 54970 (52.4%) were third order births or higher. Male child preponderance was seen in this analysis as 57676 (55.0%) mothers had given birth to a baby boy whereas 47231 (45.0%) mothers had delivered a girl child. Approximately 93709 (90.0%) deliver the baby through normal process while 11198 (10.7%) have to go through caesarean section to give birth to their baby.

DISCUSSION

Health of the women is an important component for whole society throughout the cause of life. Couples having birth spacing 3 to 5 years has health benefits for children and help mothers recover physically and psychologically before she can conceive again, and could faces the demands of another pregnancy, birth, child care as well as breast feeding. It also decrease abortions among women, improves children's health, nutrition and development, increases equity among community members and helps to preserve the environment.[7] In India, the unmet contraceptive method is directly found to be a reason for short birth spacing.

In the present study, there was a statistically significant association found between age group, educational status, previous pregnancy outcome of mothers , number of children ever born, birth order, gender of child, delivery by caesarean section and categories of birth spacing (pvalue<0.001) whereas no significant association among postpartum contraceptives used and birth spacing (pvalue>0.05).

In a study by Limabenla et. al., occupation and education had shown statistically significant association with knowledge level regarding birth spacing methods among primigravida mothers (p<0.001) and pregnancy in months (p<0.05), and no association with other demographic characteristics such as age, religion, type of family, previous information regarding birth spacing and source of information.[8]

Conclusion

The authors suggest that authorities from union and state governments, health officials, other stakeholders and policymakers should contribute towards improving birth spacing practices through various educational campaigns, family planning activities and benefits to the couples having two children at the prescribed birth interval promoting good health of mothers as well as child.

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