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Research

Determinants of Duration of the First Birth Interval Using the Semi-parametric Survival Model in Uttar Pradesh, India: Evidence from NFHS – 5 (2019-2021)

Udisha Singh, Jai Kishun, Anup Kumar, Uttam Singh, Sachin Kumar, Vishwas Kapoor, Prabhakar Mishra

Department of Biostatistics & Health Informatics,
Sanjay Gandhi Postgraduate Institute of Medical Sciences, India

ABSTRACT

Background: First birth is an important phenomenon in women life. It not only affects the duration of the rest of birth intervals but also affects the reproductive pattern of women. The study aims to explore the determinants of the duration of the first birth interval.
Subjects dan Method: The cross-sectional study data of 33,275 women married between the years 2005-2021 aged (15-49) years from Uttar Pradesh, were selected from NFHS-5 data. The NFHS-5 sample is a stratified two-stage sample. Socio-demographic, socio-economic and cultural factors were taken as independent variables. The dependent variable was the first birth interval variable. Data analysis was performed on SPSS version 23 software and R Programming language for graphical representation. Cox proportional hazard models were applied for analysis.
Results: The mean age of women at first marriage was 19.4; SD=3.26 years and the mean age of women at first birth was 21.39; SD=3.24 years. The median duration of the first birth interval was22 months with an IQR of 14 until 32 months. Cox hazard proportional analysis revealed that religion, residence, (ever) fetal loss, age at first birth, heard family planning, and women or husband education were found to be statistically significant factors associated with the duration of the first birth interval ($p<0.001$).
Conclusion: There is a need to change the mindset of people towards the concept of the use of family planning methods to increase the length of the birth interval, regardless of various factors. This would help to increase the duration of the birth interval, improve the health of women and children, as well as help reduce population growth.

Keywords: Uttar Pradesh, birth interval, semi-parametric, cox model, hazard plot.

Correspondence:
Jai Kishun, Department of Biostatistics and Health Informatics, Sanjay Gandhi Postgraduate Institute of Medical Sciences. Lucknow – 226014, India; email: jaikishan.stat@gmail.com. Mobile:

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BACKGROUND

Among the joys and challenges people face in life, none is more amazing than having a first child. The first birth marks a woman's transition into motherhood (Logubayom et al., 2013). The duration of First Birth Interval (FBI) is defined as the time interval between the marriage and the occurrence of the first birth (MacInnes, 2003). FBI is important for understanding present as well as future fertility patterns. It is directly or indirectly associated with family size, maternal

health, child health, maternal and child mortality (Dehesh et al., 2022). The duration of the first birth interval not only affects the length of the rest of the birth intervals but also affects the reproductive pattern in women (Millman and Hendershot, 1980; Trussell and Menken, 1978; Yamaguchi, 1995). Data on the duration of the first birth interval is considered an important event for most couples and so is unaffected by recall lapse and not affected by the erratic fluctuations of the postpartum period (Singh et al., 2006). The duration of the first birth interval after marriage could determine the happiness and survival of her marriage. While delayed births could lead to contention, suspicions, and even breakups of marriages. Very early births, especially the unexpected and unwanted ones, could do the same or even worse. In most Indian settings, a marriage is considered incomplete without children (Logubayomet al.,2013; Polo et al., 2000). Fertility patterns in the world have changed drastically over the last two decades and producing very diverse childbearing patterns (Chernet et al., 2019).

Now, India has achieved the replacement level of fertility as per the NFHS-5 (2021) that report in 2019-2021, the current Total Fertility Rate (TFR) is 2.0 as compared to the NFHS-3 (2007) that report in 2005-2006 (TFR was 2.7). Though, among all the states of India, Uttar Pradesh is the third largest state in terms of higher TFR (i.e. 2.4) which remain to achieve a replacement level of fertility (NFHS, 2007; NFHS, 2017). Some studies have demonstrated that the duration of FBI influences social and cultural factors and the childbearing pattern of a family (Trussell and Menken, 1978; Nath et al., 1999). Fertility pattern also depends on the age at first marriage of women and men (Rasekh and Momtaz, 2021). Getting married at an older age is also more likely to shorten the duration of first birth. If couples marry at a very young age, decisions on the number of children, use of contraceptives and the like may be formed at a less mature age, consequently affecting the birth interval (Bumpass et al., 1978).

Short birth intervals (<24 months) are associated with increased health risk for both mothers and newborns. Early childbearing can interrupt a young women's education and other activities which women need to accomplish (Chernet et al., 2019). Other major social, economic and cultural, and personal values may influence fertility and the duration of first birth (Löfstedt et al., 2005; Bongaarts, 2008). Women's education has a greater influence on the duration of FBI of women than the education of their husbands (Khan and Raeside, 1998). Several studies have also shown the considerable effect of education on women during the first birth interval (Bumpass et al., 1978; Hoem, 2000; Kohler et al., 2002; Martin, 2000; Morgan et al., 1999).

Place of residence in rural or urban, and wealth index, are key factors that influence first birth and overall fertility (Logubayom et al., 2013). A study entitled "The effect of status of women on the first birth interval in Indian Urban society" has shown that economic condition of the family can also influence the duration of FBI and fertility levels. its because the families belonging to the upper class with high per capita income prefer a smaller number of children which in turn reduces infant and maternal mortality and results in better reproductive health for a mother. Among various socio-cultural factors influencing fertility in Indian societies (religion and caste system) may be influential. The caste system that prevails among Hindus comprises a system of beliefs, attitudes, and practices that individuals share, also presumed to affect fertility behaviour (Nath et al., 1999).

Birth to women in wealthier households occurred after longer birth intervals in India (Dommaraju, 2009). For a developing country like India, socio-economic, demographic, health and cultural background are the influencing factors for the duration of the first birth interval. According to the NFHS-4 report, urban women marry later than rural women (NFHS, 2017). Women having 12 or more years of schooling marry much later than other women. Early marriage has been declining over time.

To formulate effective policies to motivate people to give birth later, it is necessary to study influence of various social, demographic, and cultural factors. Most Indian studies focused on birth spacing rather than the factors affecting the duration of the first birth interval in Uttar Pradesh, India (Singh et al., 2012a, 2012b). In addition, very few were also using a Semi-parametric model for the analysis of time to event study on surveied data. As the fertility pattern and their preferences are changing according to time, this study aims to see the background forces or characteristics that pushed couples to shorter or longer first birth intervals after marriage in Uttar Pradesh.

SUBJECTS AND METHOD

1. Study Design

Individual women record data from National Family Health Survey (NFHS-5) was used, which was collected during the year 2019-21 in 707 districts of 28 states and 8 union territories (UT) of India. The NFHS-5 survey employed a cross-sectional design and quantitative methods for data collection. The NFHS-5 sample is a stratified two-stage sample. The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted on a representative sample of households throughout India. NFHS provides many important indicators such as levels of fertility, maternal and child health, etc. by background characteristics at the national and state levels.

2. Population and Sample

Of the total 97,661 women surveyed from Uttar Pradesh, 33,275 women who had been married between 2005 and 2021 were selected for this study. 27,572 women who gave birth to their first child and the rest 5703 were censored. All those women, whose duration of FBI was less than 7 months, were removed from this study. Women who did not become mothers were regarded as censored. For the censored women duration was considered from marriage date to survey date. Of the selected data, the majority of women (98.3%) were married, few were widowed (0.8%) divorced (0.4%) separated (0.5%) and only (0.3%) were married but their Gauna (Conjugal relations which generally preceded by a second ceremony among Hindus) was not performed and they were also excluded from the study (TPB).

3. Study Variables

In this study, socio-demographic, socio-economic, and cultural factors were taken as independent variables and the first birth interval was considered a Dependent variable.

4. Operational Definition of Variables

Duration of first birth intervals: was calculated from the date of marriage until the first birth (considered as an event or response variable for this study). It is defined as the time interval between the marriage and the occurrence of the first birth.

Religion: India's religious landscape is characterized by a wide range of religious practices and beliefs, such as Hinduism, Budhis, Jainism, and Sikhism are four major religions. Approx. 80% population belongs to Hindus and all others remaining is considered as non-Hindu.

Caste: cheduled Castes (SCs) and Scheduled Tribes (STs) are the most disadvantaged socio-economic groups in India. Other Backward Class refers to sections of society

that were found to be educationally and socially backward. People belonging to none of the above-stated categories are none of them.

Place of residence: means the physical place of residence of a person. It is classified into rural and urban. Rural is a geographical area located outside towns and cities while towns, cities, and suburbs are classified as urban areas.

Wealth index: is a composite measure of a household's cumulative living standard. It is calculated using household assets, such as televisions; bicycles; materials used for housing construction; types of water access and sanitation facilities, etc. In this study wealth index are categoryzed by poor (poorest and poorer), middle, rich (richest and richest).

Fetal loss and contraceptive use: (also called a stillbirth) is the death of a fetus that is at least 20 weeks gestation but dies before it is born. Whereas contraception is the intentional avoidance of conception through the use of various tools, sexual behaviors, substances, medications, or surgical techniques.

Education: of women and their husbands (illiterate, primary, secondary, and higher). An illiterate person is unable to read and write. The term "primary education" refers to schooling grades 1 through 5. Secondary education includes grades six through twelve. Further study, often known as graduation or post-graduation, is what is meant by higher education.

Heard family planning: is percentages of all women aged 15-49 who heard or saw about family planning methods on the radio, on television, in a newspaper or magazine, on a mobile phone, or by any health worker.

A conceptual framework of this study is shown in figure 1. This is based on the various prior studies that considered variables that influenced the duration of the first birth interval.

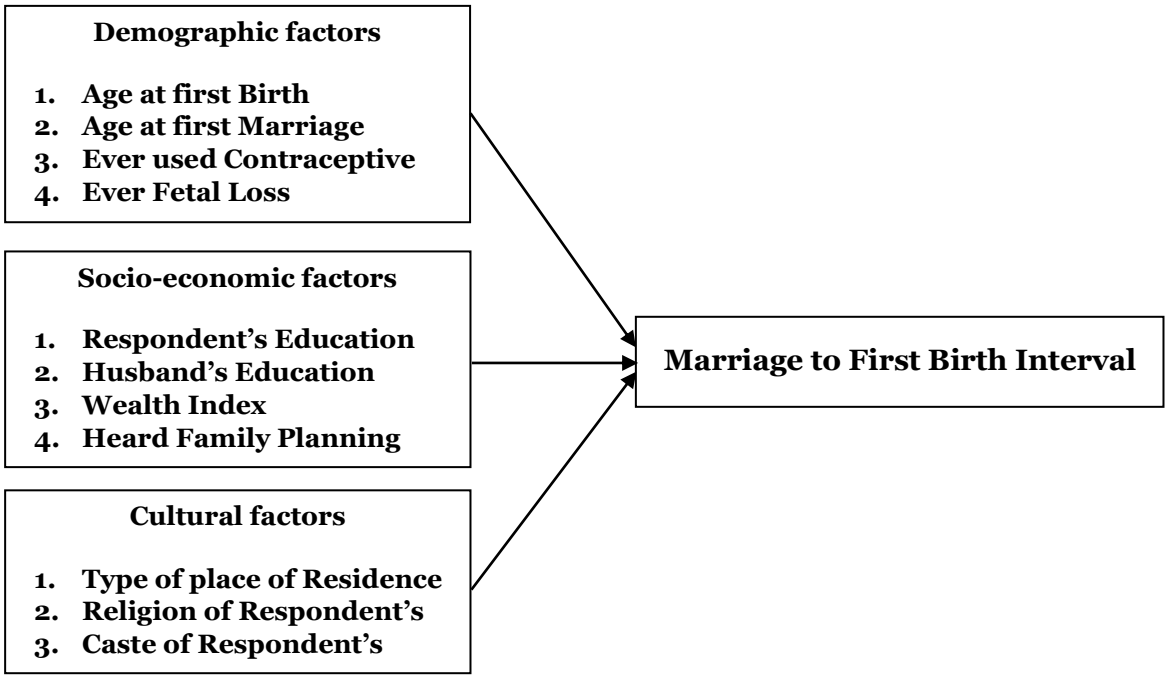


Figure 1. The Conceptual framework of this study

5. Study Instruments

NFHS-% includes four survey schedules or questionnaires—Household, Woman, Man, and Biomarker—were canvassed in 18 local languages using Computer Assisted Personal Interviewing (CAPI). The Woman's Questionnaire collected information from all eligible women age 15-49, who were asked questions on a large variety of topics, including Background characteristics: age, literacy, schooling, religion, caste/tribe, media exposure and Reproduction: children ever born, birth history, current pregnancy, pregnancy terminations.

6. Data Analysis

Descriptive analysis was performed using percentage and frequency for all the variables used in this study. The Cox regression model is used to investigate the effect of all independent variables such as socio-economic, demographic, and cultural factors on the duration of the first birth interval. Due to the simplicity of this model, it is applied in any demographic and medical studies including marriage age and birth interval. In this method, the effect of independent variables on time could be determined with the hazard ratio (Trussell et al., 1985; Cox, 1972).

The description of the model is given in the following subsection.

Hazard Function: It is the probability of failure during a short interval provided that the individual has survived at the beginning of the interval.

Cox Proportional Regression Model:

To determine effective factors, the Cox PH model was applied for multivariable analysis. This model contains two components including baseline hazard (ho(t)) and predictor statement. The Cox Proportional Hazard model assumes that the ratio of the Hazard Function is constant (proportional) for two subjects. Before fitting of model, the proportional hazard (PH) assumptions were checked and verified. For model building, first, we fitted Cox regression between each predictor and outcome, and all the predictors having ($p<0.050$) were selected for further multiple Cox analysis with ($p<0.050$) in the model. The adjusted hazard ratios (AHR) and 95% CIs were reported by the final graphical representation. Data analysis was performed using SPSS version 23 software, and R Programming language for graphical representation

7. Research Ethics

The present study is based on NFHS-5 data which is the freely available in public domain. So, no ethical approval is required.

RESULTS

1. Sample Characteristics

Of the 33,275 ever married women in Uttar Pradesh, 27,572 (82.9%) had their first child during their reproductive age of 15-49 years. The mean age of women at first marriage was 19.4; SD = 3.26 years, and the mean age of women at first birth was 21.39; SD = 3.24 years. The median duration of the first birth interval was estimated at 22 months with an IQR of 14 to 32 months.

Table 1. shows the descriptive characteristics of all the variables by frequency and percentage. Among 27,572 (82.9%) women who gave birth to their first child, 83.9% belonged to the Hindu community, 54.5% to the OBC community, 81% were from rural areas, and 47% were from the poor class. There were 19.8% of women who had ever experienced fetal loss, while the most women who had ever used contraception were 85.8%. Before turning 20 years old, 70.9% of women were married, and nearly half of them had their first child 35.8 percent. Women 44.2% and their spouses 53% had the majority of their schooling up to the secondary level. Contrarily, 74.8% of women reported having heard about family planning from any source they could have access to.

Table 1. Distribution of women's socio-demographic and cultural Characteristics

Characteristics	Category	First Birth/Event (n1=27,572)		No Birth/Censored (n2=5,703)	
		Frequency	Percentage	Frequency	Percentage
Religion	Non-Hindu	4,432	16.1	998	17.5
	Hindu	23,140	83.9	4,705	82.5
Caste	SC/ST	7,201	26.2	1,531	26.9
	OBC	14,988	54.5	3,076	54.1
	None of them	5,298	19.3	1,083	19
Residence	Urban	5,252	19	1,012	17.7
	Rural	22,320	81	4,691	82.3
Wealth Index	Poor	12,965	47	2,490	43.7
	Middle	5,305	19.2	1,141	20
	Rich	9,302	33.7	2,072	36.3
Fetal loss	No	22,107	80.2	4,943	86.7
	Yes	5,465	19.8	760	13.3
Contraceptive Use	No	3,915	14.2	2,875	50.4
	Yes	23,657	85.8	2,828	49.6
Age at First Marriage	<20 years	19,535	70.9	3,220	56.5
	21-25 years	6,994	25.4	2,038	35.7
	>26 years	1,043	3.8	445	7.8
Age at First Birth	<20 years	11,910	35.8	---	---
	21-24 years	11,537	34.7	---	---
	25-30 years	3,766	11.3	---	---
	>30 years	359	1.1	---	---
Women's Education	Illiterate	6,530	23.7	847	14.9
	Primary	3,505	12.7	601	10.5
	Secondary	12,183	44.2	2,854	50
	Higher	5,354	19.4	1,401	24.6
Husband's education	Illiterate	569	13.8	91	11.1
	Primary	447	10.9	73	8.9
	Secondary	2,179	53	432	52.6
	Higher	914	22.2	226	27.5
Heard Family planning	No	5,061	25.2	838	19.8
	Yes	14,994	74.8	3,403	80.2

SC/ST= Scheduled Caste/Scheduled Tribe
OBC= Other Backward Class

2. Bivariate Analysis

Table 2. summarises the findings of the univariate Cox regression analysis. These findings are shown as exp(β), which stands for unadjusted hazard ratio (HR), coupled with a 95% confidence interval. The result indicates that non-Hindu (HR= 1.14 95%CI= 1.11 to 1.18; p<0.001) women had their first child earlier than Hindu women. Women who belonged into the categories of SC/ST (HR= 0.87; 95%CI= 0.84 to 0.90; p<0.001) and OBC (HR= 0.90; 95% CI=0.87 to 0.93; p<0.001) had their first child later than those who did not. Based on the place of residence, we found that women living in urban areas (HR= 1.14; 95% CI= 1.11 to 1.18; p<0.001) have an early incidence of first live birth after marriage as compared to women living in rural areas. Women from the rich class (HR= 1.13; 95% CI= 1.10 to 1.17; p<0.001) gave birth to their first child earlier after marriage followed by women from the middle class (HR= 1.25; 95% CI= 1.21 to 1.28; p<0.001) as compared to women with

poor class. Women who had (ever) lost a fetus had later first live births (HR= 0.85; 95% CI= 0.83 to 0.88; p<0.001).

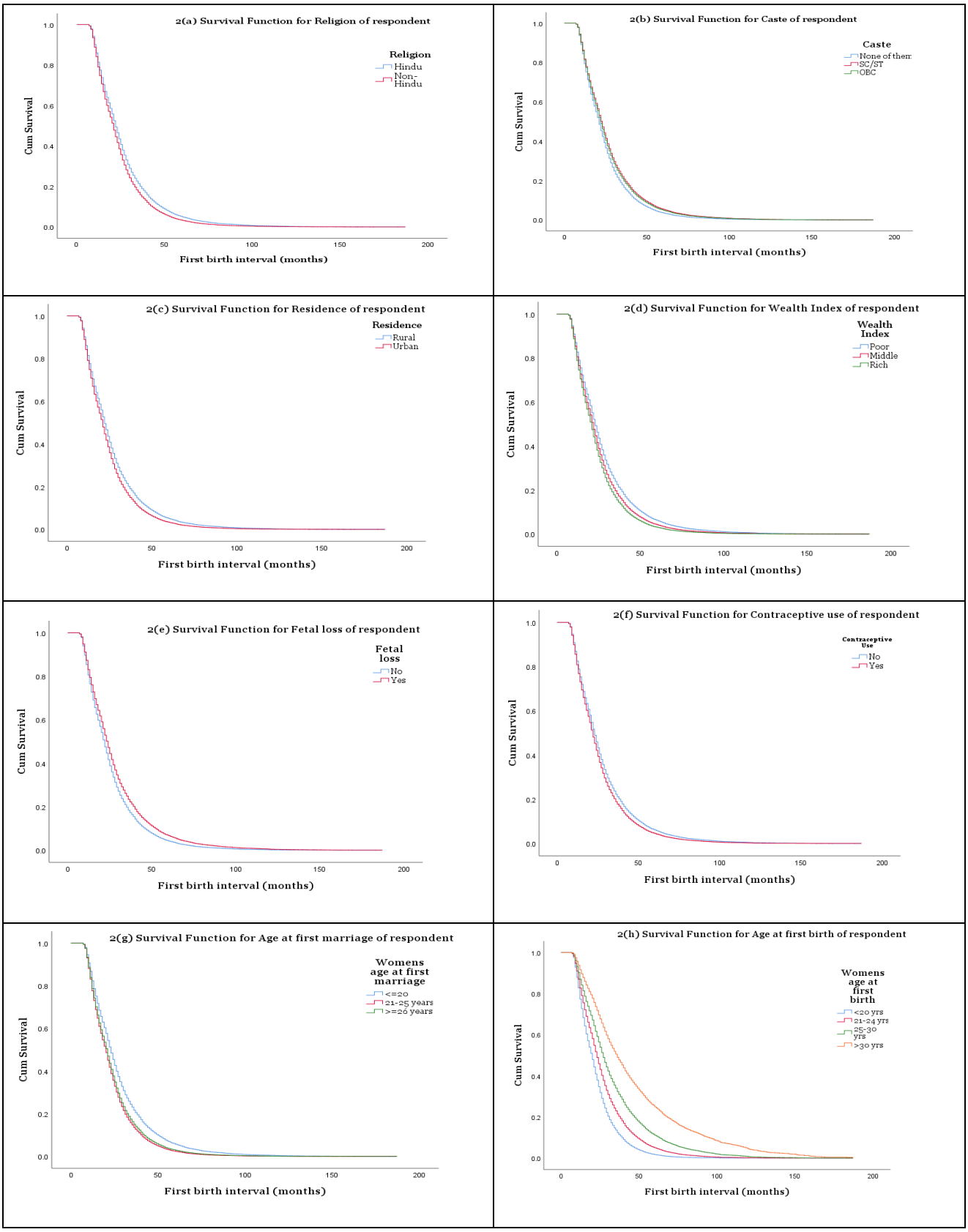
Women's education played an important role as those with higher (HR= 1.22; 95% CI= 1.18 to 1.26; p<0.001) and secondary (HR= 1.18; 95% CI= 1.15 to 1.22; p<0.001) level education had experienced early first live birth as compared to women's with no education. Whereas, women with primary education were found insignificant (HR= 1.01; 95% CI= 0.97 to 1.05; p= 0.494). When compared to husbands without any education, similar results in women were found who had higher (HR= 1.21; 95% CI= 1.09 to 1.34; p<0.001) and secondary education (HR= 1.19; 95% CI= 1.08 to 1.31; p<0.001). Primary level education was found insignificant (HR= 1.05; 95% CI= 0.93 to 1.19; p=0.410). The duration of a woman's first live birth was significantly influenced by her knowledge of family planning (HR= 1.06; 95% CI= 1.02 to 1.09; p<0.001).

Table 2. Result of the univariate Cox proportional hazard analysis to evaluate factors related to the duration of first birth interval

Characteristics	Category	HR	95%CI		p-value
			Lower limit	Upper limit	
Religion	Non-Hindu*	1.14	1.10	1.18	<0.001
Caste	SC/ST*	0.87	0.84	0.90	<0.001
	OBC*	0.90	0.87	0.93	<0.001
Residence	Urban*	1.14	1.11	1.18	<0.001
Wealth Index	Middle*	1.13	1.10	1.17	<0.001
	Rich*	1.25	1.21	1.28	<0.001
Fetal loss	Yes*	0.85	0.83	0.88	<0.001
Contraceptive Use	Yes*	1.10	1.07	1.14	<0.001
Age at First Birth	21-24 years*	0.73	0.71	0.75	<0.001
	25-30 years*	0.54	0.52	0.56	<0.001
	>30 years*	0.34	0.30	0.38	<0.001
Age at First Marriage	21-25 years*	1.30	1.27	1.34	<0.001
	>26 years*	1.23	1.16	1.31	<0.001
Women's Education	Primary	1.01	0.97	1.05	0.494
	Secondary*	1.18	1.15	1.22	<0.001
	Higher*	1.22	1.18	1.26	<0.001
Husband's education	Primary	1.05	0.93	1.19	0.410
	Secondary*	1.19	1.08	1.31	<0.001
	Higher*	1.21	1.09	1.34	<0.001
Heard Family planning	Yes*	1.06	1.02	1.09	<0.001

Reference Category: [a]Hindu, [b] None of them, [c] Rural, [d] Poor, [e] No, [f]No,[g]<20 years, [h] <20 years [i] Illiterate, [j] Illiterate, [k] No,
HR: Hazard Ratio; CI: Confidence Interval,
*:p<0.001

A Covariate Survival Curve of women's socio-demographic, socio-economic and cultural factors for the duration of the first birth interval is shown in figure 2 (a-k). It shows the shorter and longer birth intervals of each covariate.


2(a) Survival Function for Religion of respondent
Religion
Hindu
Non-Hindu
Cum Survival
First birth interval (months)
2(b) Survival Function for Caste of respondent
Caste
None of them
SC/ST
OBC
Cum Survival
First birth interval (months)
2(c) Survival Function for Residence of respondent
Residence
Rural
Urban
Cum Survival
First birth interval (months)
2(d) Survival Function for Wealth Index of respondent
Wealth Index
Poor
Middle
Rich
Cum Survival
First birth interval (months)
2(e) Survival Function for Fetal loss of respondent
Fetal loss
No
Yes
Cum Survival
First birth interval (months)
2(f) Survival Function for Contraceptive use of respondent
Contraceptive Use
No
Yes
Cum Survival
First birth interval (months)
2(g) Survival Function for Age at first marriage of respondent
Womens age at first marriage
<=20
21-25 years
>=26 years
Cum Survival
First birth interval (months)
2(h) Survival Function for Age at first birth of respondent
Womens age at first birth
<20 yrs
21-24 yrs
25-30 yrs
>30 yrs
Cum Survival
First birth interval (months)

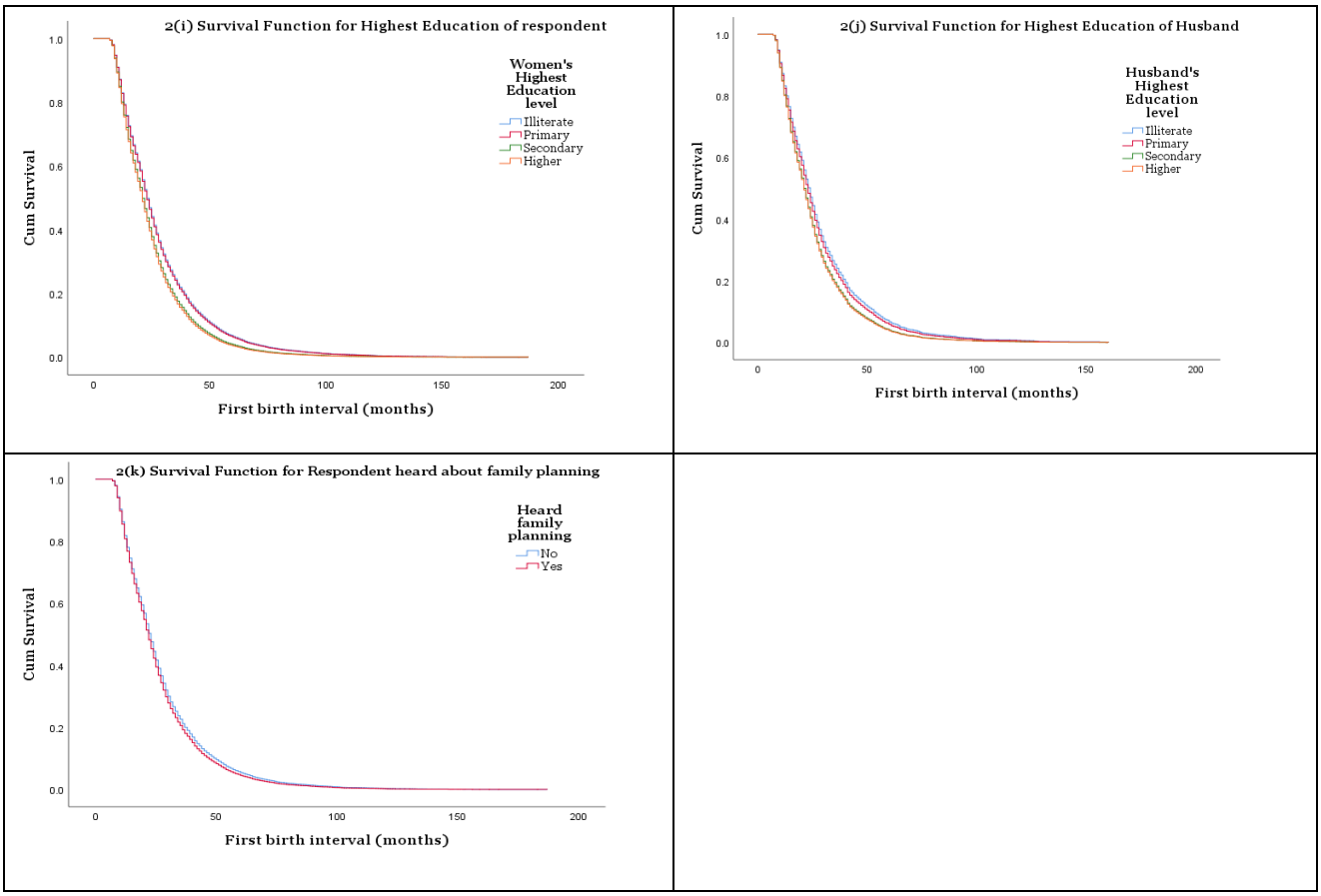


Figure 2. Covariate Survival Curve for women's socio-demographic and cultural Characteristics

3. Multivariate Analysis

Religion, Caste, Residence, (Ever) Fetal Loss, Age at First Birth, Secondary and higher education of women/husband, Heard Family planning was included in the final Cox model after being determined to be significant in univariate analysis with 95% confidence interval. In the final Cox model religion, residence, (ever) fetal loss, age at first birth, and heard family planning were found significantly affect the duration of the first birth interval. Some variables caste and education of women/husbands were also partially significant in the model. As shown in figure 3. Compared to Hindu women, non-Hindu women give birth to their first child earlier. In the caste variable, only women from the SC/ST category were found significant in the model. While women from the OBC category (AHR= 0.95; 95% CI= 0.84 to 1.06; p=0.340) were insignificant. Women who had lived in urban areas had shorter birth intervals than those who had lived in rural areas. Those women who had suffered a fetal loss had a delay in the birth of their first child. Women with secondary and higher education had shorter first birth intervals; similar findings were seen for the husband's education, while primary education of women (AHR= 0.96; 95% CI= 0.85 to 1.10; p=0.595) and husband (AHR= 1.15; 95% CI =0.99 to 1.34; p=0.071) were found insignificant factor for the duration of the first birth interval. However, a greater gap was seen among women who had learned about family planning before the first birth, regardless of where they had acquired it. A Hazard plot of Multivariable adjusted Cox proportional hazard Model to evaluate factors related to the duration of the first birth interval is constructed.

Table 3: Result of the Multivariable Cox proportional hazard analysis to evaluate factors related to the duration of first birth interval

Characteristics	Category	AHR	95% CI		P-value
			Lower limit	Upper limit	
Religion	Non-hindu*	1.24	1.12	1.38	<0.001
Caste	OBC	0.95	0.84	1.06	0.340
	SC/ST*	0.89	0.81	0.98	0.020
Residence	Urban*	1.14	1.03	1.25	0.010
Ever Fetal loss	Yes*	0.88	0.8	0.97	0.010
Age at first birth	21-24 years*	0.7	0.65	0.76	<0.001
	25-30 years	0.48	0.42	0.54	<0.001
	>30 years	0.22	0.16	0.31	<0.001
Women's Education	Primary	0.96	0.85	1.10	0.600
	Secondary*	1.14	1.02	1.27	0.020
	Higher*	1.5	1.3	1.73	<0.001
Husband's education	Primary	1.15	0.99	1.34	0.070
	Secondary*	1.31	1.16	1.48	<0.001
	Higher*	1.21	1.04	1.4	0.020
Heard Family planning	Yes*	0.91	0.84	1.00	0.040

Reference categories: (a) Hindu, (b) None of them, (c) Rural, (d) No, (e) <20 years, (f) Illiterate, (g) Illiterate, (h) No

CI= Confidence Interval; HR= Hazard Ratio; SC\ST= Scheduled Caste/Scheduled Tribe; OBC= Other Backward Class

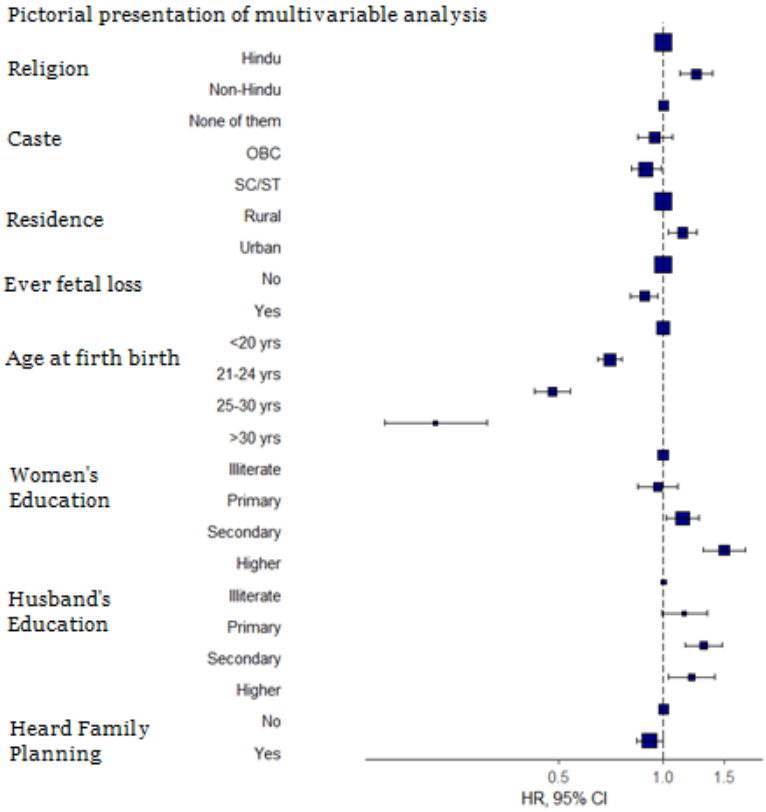


Figure3. Graphical representation of Multivariable Cox proportional hazard Model (adjusted analysis) to evaluate factors related to the duration of the first birth interval among women.

DISCUSSION

The duration of the first birth interval is known to be an important factor to understand the family size. Some studies have been done on the time interval between marriage age and first birth in India and abroad. Most of these studies were based on hospital data. To analyze the birth intervals, various statistical techniques and models have been developed and implemented. This study aimed to identify the factors that affect the first birth interval from the surveyed data. This study uses the semi-parametric survival model to investigate the determinant of the duration of first birth after marriage among Uttar Pradesh women on the NFHS-5 data set (NFHS, 2021). The major advantage of using the survival model, it uses all ever-married women's data whether they had given their first birth or not till the date of the survey (Suwal, 2001).

Among all the ever-married women of Uttar Pradesh, 82.9% had their first childbirth in this study. From the analysis, it is observed that the mean age at first marriage (19.4 years) and the median age at first birth (21.3 years), which is almost 2 years greater than (NFHS, 2007). This shifting in age at first marriage or child of women is possible because of increment in their education and occupation level. An awareness program may also be the reason for the same. The median duration of the first birth interval was found to be 22 months while some other studies conducted abroad reported the median duration of first birth was 25 and 24 months respectively (Abdel-Fattah et al., 2007; Shayan et al., 2014).

Marriage at an older age is significantly associated with a shorter interval for the first birth. Thus, women who married at an older age have their first birth earlier than those marrying at a younger age. This result is consistent with the study in India and abroad (Dommaraju, 2009; Joshi and Schultz, 2013). The reason may be older women need to give birth soon after marriage to have the desired number of children before the end of their reproductive life. And, a woman who gets early marriage use contraceptive to elongate the duration of first birth until it becomes physically and mentally matured (Simeon et al., 2014). However, some contradictory results were also observed such as in Pakistan, younger women at marriage had shorter first birth intervals (Kamal, 2013).

According to this study, religion was one of the important factors in the duration of the first child's birth. Non-Hindu women were more likely to experience the early birth of their first child after marriage. The likely reason for this fact is that women belonging to non-Hindu communities are less educated, socially and economically backward as well as less aware of health complications due to shorter birth intervals. Also due to some religious beliefs and customs, non-Hindu communities want early first childbirth. Caste variable (sub-divided into SC/ST, OBC, and none of them) was partially included in the final Cox Model and concluded that women belonging to SC/ST category have a higher chance of experiencing delayed first birth. Similar results are found in the study (Singh et al., 2012a).

The birth interval of women living in urban areas was smaller than that of women living in rural areas. The possible reason for this could be the fact that women living in urban areas are married later to complete their education and find employment. They try to have their first child as soon as feasible due to their older age. Women living in urban areas also want to avoid age-related pregnancy complications in the future (Yohanneset al., 2011). Further, it was observed that women with (ever) fetal loss had a significant delay in having their first live birth. This finding was supported by the re-

sult of other studies (Singh et al., 2012a). Women with Secondary and higher education have a significantly shorter first birth interval after marriage as compared to women who were not educated. This may be due to the reason that at the time of entry into marriage life, educated women can be emotionally prepared, biologically matured, and financially secured to have a child (Chernetet al., 2019). A study in India also established that the education of women was significantly associated with the first birth interval only while the husband's education was significantly associated with the first and second birth interval (Singhet al., 2012). Education suppresses the desire for a large family and gets the female more aware, which in turn leads to fewer and well broughtup children (Okezie et al., 2010).

This study emphasizes the importance of increasing couple education, religious studies, the role of mass media exposure, and awareness of contraceptive use. As the first birth interval is one of the prime determinants of fertility. Hence, there is a need to change the mindset of people toward birth spacing irrespective of their socio-demographic factors and to familiarize couples with the concept of the use of family planning methods to increase the length of the first birth interval. Additional demographic surveys are also needed on the direct biological determinants of first birth such as cohabitation frequency, fetal loss, abortion, contraception, etc. to collect reliable data that can help to understand the factors for shorter birth intervals. Therefore, this study has helpful information for family planning policies.

The limitation of this study is that it only analyzed a single state data out of 36 available states of India including the union territory. Data used in the study were surveyed data based on reported by respondents, hence, recall bias of information may possible. This study may also be done at the national level or regional level.

AUTHOR CONTRIBUTION

All the authors have contributed significantly for the analysing data as well as preparing the final manuscript.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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