

Beyond Reproductive Life: Trends and Burden of Premature Menopause, Female Sterilization and Hysterectomy in India

2022 - 23

Population Research Centre

(Established by Ministry of Health and Family Welfare)

Gokhale Institute of Politics and Economics

(Deemed to be University u/s 3 of the UGC Act. 1956)

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Research Study Submission

**Beyond reproductive life: Trends and burden of premature menopause,
female sterilization and hysterectomy in India**

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February 26, 2023

[Report prepared and Submitted Ministry of Health and Family Welfare, Government of
India, New Delhi- 110011]

Contents

Abstract	2
1. Background	3
2. Need for the study	6
3. Objectives	6
4. Data source and methods	6
4.1 Data.....	6
4.2 Operational definition of outcome variables.....	7
4.3 Predictor variables	8
4.4 Methods of data analysis.....	8
5. Results	9
5.1 Sterilization among Indian female	9
5.2 Premature Menopause among Indian Women	11
Moreover, the risk of menopause decreases as education level increases during all the survey periods, though the effect is attenuated with time. Tobacco and alcohol consumption have shown any significant effect on menopause among women aged 30-40 in all the study rounds. As expected BMI status of women is significantly associated with menopause. The risk of menopause was 25 per cent (OR: 0.755; p<0.001) and 16 per cent (OR: 0.844; p<0.05) less likely among women with Normal BMI compared with Thin women in 2005-06 and 2019-21, respectively. On the other hand, the risk of menopause was higher among women engaged in Agriculture labour work compared to not working women, though results are not significant for 2019-21.	12
5.3 Hysterectomies among Indian female.....	12
6. Summary and discussion	14
7. Conclusion	18
8. References	19

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Abstract

Recently many health indicators shown positive outcomes such as reduction in maternal mortality, infant and child mortality. At the same time some of the critical issues are persistent for long time and some issues are emerging with positive achievements. Female Sterilization, Premature Menopause and Hysterectomy are the emerging reproductive health issue in India. To access the trends and determinants of premature menopause, female sterilization and hysterectomy three rounds of NFHS data (NFHS-I, NFHS-II and NFHS-III) have been used. Result suggests that there has been an increased in the female sterilization, and Hysterectomy among female over the years. In case of premature menopause, it increased from 4.7 in 1992-93 to 7.0% in 2005-06 then declined to 5.9%. Logistic regression result suggests women's age, wealth status of the household, religion, caste, education and BMI of women significantly affect the female sterilization, premature menopause and hysterectomy. Owing to the limitations of the secondary data, there is a greater need to undertake further research on female sterilization, premature menopause and the rapid increase in the prevalence of hysterectomies in India using the empirical data. It has very negative consequences for women's health in the longer run.

Key words: Sterilization, hysterectomy, premature menopause, NFHS, India

1. Background

India have achieved some of important milestones in reducing maternal mortality, infant mortality and child mortality (SRS, 2016). The life expectancy of women has been increased considerably and overtaken men recently (Canudas-Romo et al., 2016). India fertility declined in last decade particularly southern states was seen sharp decline (Census of India, 2011; Susuman, Lougue, & Battala, 2016). However, this has been accompanied with ignored health issues of women such as higher prevalence of premature menopause, increased rates of hysterectomies and rampant female sterilization. These increasing trends of this three issues related post reproductive health of women are received little attention in the reproductive health programmes and among the public health researchers in India. Premature menopause is also known as the premature ovarian failure (POF). It is a sickness characterised by the end of the menstruation cycle before the age of 40 years. Throughout the last decades' interest in the timing of natural menopause has rapidly increased since menopausal age has significant health implications. It was observed that about 1.5 per cent of women below the age of 40 years were in menopause; consistent with the 1-2 per cent range reported internationally (Shuster et al., 2010).

There are health concerns associated with the premature menopause. Research suggests that women with premature menopause have anovulation and hypoestrogenism, with primary or secondary amenorrhea, infertility, sex steroid deficiency, and elevated gonadotrophin levels (Goswami & Conway, 2005; Kalantaridou, Davis, & Nelson, 1998). Premature menopause has been linked to numerous studies that identify an array of risks including, but not limited to, a reduction in sexual desire in women (Nappi & Lachowsky, 2009) and may subsequently lead to husbands' extramarital sexual relationships, resulting in family disharmony (Mahadevan, et al., 1982). In some cases, research has even asserted that premature menopause leads to higher risk of cardiovascular diseases, early mortality, morbidity, and ischemic stroke (Cooper & Sandler, 1998; de Kleijn et al., 2002; Lisabeth et al., 2009). Evidence also suggest that age at menopause is associated with the risk of several chronic diseases such as cardiovascular diseases, breast and endometrial cancers, and osteoporosis. Moreover, health problems related to premature menopause are not well known in India because the determinants and prevalence of premature menopause are not well documented. Scarce information about premature menopause and its health and social consequences is another concern in India.

Policies and programs focus generally on the child-bearing age, particularly on maternal and child health care services. Premature menopause may have profound implications on morbidity and mortality, especially in regard to cardiovascular diseases. Furthermore, a high percentage of premature menopause cases are caused by of high morbidity among women, and thus a serious problem to be addressed by the health care system. The social consequences of premature menopause could lead to a disturbance in married life, because in some cases, women lose interest in sex.

The another emerging women's issue in India is Hysterectomy which is the removal of the uterus. Hysterectomy is primarily done to save women from uterus-related life-threatening problems and for a better and healthy life. However, hysterectomy is a principal cause for non-obstetric surgery in many parts of the world (Byles et al., 2000; Hammer et al., 2015; Whiteman, 2008; Stankiewicz et al., 2014). Though, it is also found to have adverse health effects on women's physical, mental and social health, predominantly on pre-menopausal, young women (Carlson, 1997; Kjerulff et al., 2000; UZUN et al., 2009). Additionally, hysterectomy is associated with many health complications such as early onset of menopause, higher risk of cardiovascular disease, higher risk of stroke, urinary incontinence, loss of sexual desire and other health problems (Desai, et al., 2011; Desai et al., 2017). Studies asserted that fibroids, prolapse, menorrhagia, endometrial hyperplasia cervical dysplasia, dysfunctional uterine bleeding, ovarian mass, chronic pelvic inflammatory disease, and cervical intraepithelial neoplasia are reported as common indications for the hysterectomy (Radha, et al., 2015; Verma and Verma, 2016; Pandey et al., 2014). The prevalence of hysterectomy varies broadly across different geographic settings owing to the variations in uterine pathology, providers and patient factors and socio-cultural reasons (UZUN et al., 2009; Stankiewicz et al., 2014). Studies have also highlighted that primary caesarean deliveries, repeat caesarean deliveries, vaginal birth after caesarean, and multiple births were independently associated with an increased risk for peripartum hysterectomy (Whiteman, et al., 2006).

In India, in recent years there seems to be an outpouring in hysterectomy cases involving young women. That has led to doubt on the misuse of the procedure. Nevertheless, there are no population-based studies that provide insights into hysterectomy prevalence and its determinants at the national level; consequently, research on this domain of women health is scanty in India. The fourth round of National Family Health Survey has the first time collected the information of hysterectomy in India.

Along with premature menopause and hysterectomy, the tilt of the family planning programmes towards females is also a cause of concern. India is the first country in the world to adopt an official family planning programme in 1952 to reduce population growth. In the initial phase of the programme focused were given to the ‘traditional methods’ recommended by the government. Following the failure of this method due to inaccurate use, the government recommended other family planning methods such as condoms, diaphragms and jelly (Srinivasan, 1988). In the 1960s, the government accentuated the need to motivate couples to accept family planning by an ‘extension approach’ and many new methods were introduced. The sterilisation was introduced in 1966 with targets to be achieved by health workers (Gwatkin, 1979). In 1967 the government introduced cash incentives to attract sterilization acceptors to accelerate the pace of fertility decline. During 1975 to 1977 aggressive sterilisation camps were held all over India and about 8.25 million sterilizations were carried out. However, these camps mainly offered male sterilisation (Gwatkin, 1979). Over the years, due to advancement in the public health and technology new method have come in the practice, unfortunately most the family planning methods are leant towards female. In the recent year, in July 2012, the international family planning was held in London, where unprecedented levels of financial and political commitments were made to achieve the goal of 120 million users of family planning by 2020 (Askew, et al., 2013). India also in 2012, committed to spend \$3 billion by 2020 for family planning (FP) program, to drive access, choice and quality of FP services and to increase the modern contraceptive usage from 53.1% to 54.3% and to ensure 74% of the demand for modern contraceptives is satisfied by 2020 (GOI, 2017). It was ensured that both modern spacing and permanent methods would be promoted, but the share of the spacing method is quite low compared to permanent method.

There is ample evidence that female sterilization has increased globally and in India, and at the same time, there is a reduction in male sterilization which is a cause of concern. The evidence further shows that with the increase in female sterilization, there is an increase in sterilization regret among females (Bansal & Dwivedi, 2020) which indicates the overemphasis on female sterilization than spacing methods of family planning. Many women regretted about the child loss post sterilization (Kim et al., 1997; Ramanathan and Mishra, 2000), quality of care and type of health provider (Koenig et al., 2000; Ramanathan and Mishra, 2000).

2. Need for the study

The burden of female sterilization and early female sterilization on the health and quality of women is evident. Moreover, unlike developed countries where women enter into menopause during their fifth decade of life, Indian women experience menopause from the 40s, thereby having longer exposure of post-menopausal time and its associated consequences. At the same time, many women continue to have children even in their 40s. Hence, a major challenge for India is to tackle the dual problem of catering to the needs of both maternity and menopausal women simultaneously. With this context, the current study shed the light on these three important public health issues in India. For this the following objectives have been framed.

3. Objectives

The specific objectives of the current study are:

- i. To study the level, trends and determinants of female sterilization in India
- ii. To study the level, trends and determinants of premature menopause among female in India.
- iii. To study the level, trends and determinants of hysterectomies among female in India.

4. Data source and methods

4.1 Data

First, third and fifth round of National Family Health Survey (NFHS) data, conducted during 1992-93, 2005-06 and 2019-21 were used for present study. The National Family Health Survey is a nationally representative, large-scale, multi-round cross-sectional survey conducted in a representative sample of households covering more than 99 per cent of the population throughout India and has collected detailed information related to population, health, nutrition of children and women, domestic violence, communicable and non-communicable diseases etc. In NFHS-I, information of 89,777 ever married women in the age group of 13-49 years, residing in the 88,562 households in India, were captured from the 24 states with the response rate of 99%. Multistage systematic random sampling was used to capture the respective samples under NFHS-I. The survey adopted a two-stage sample design in rural areas and a three-stage sample design in urban areas.

In the NFHS-III, information of 124,385 ever-married women in the age group of 15–49 years, residing in 109,041 households in India, were captured in two phases from 29 states of India. Multistage systematic random sampling was used to capture the respective samples under NFHS. The survey adopted a two-stage sample design in rural areas and a three-stage sample design in urban areas.

NFHS-V provides information for 707 districts, 28 states, and 8 union territories. In NFHS-V, information of 724115 ever-married women in the age group of 15–49 years, residing in 636,699 households in India were collected. Two-stage stratified cluster sampling method was applied in the NFHS-V. In the first stage of the sampling, a fixed number of primary sampling units (areas) were selected, with probability proportional to their size. In the second stage, 22 households were selected within each primary sampling unit by using systematic random sampling technique. Details of the survey design and data collection procedure for both the surveys have been published elsewhere (<http://rchiips.org/nfhs/index.shtml>).

As unit of analysis is women therefore, the individual data files of all three rounds of NFHS survey have been used for analysis purpose.

4.2 Operational definition of outcome variables

i. Female sterilization

In the NFHS, there are two direct questions on the respondents' current use of family planning methods. The first question asked was: “Are you currently doing something or using any method to delay or avoid getting pregnant?” If the answer was yes, women were asked further questions regarding the type of methods they currently use. Those who replied ‘female sterilization’ as a family planning method were recorded ‘Yes’ for female sterilization and ‘No’ for otherwise with the code ‘1’ and ‘0’, respectively.

ii. Premature menopause

Premature menopause, considered as a dependent variable, is defined as the absence of menstruation for six months preceding the survey among married women in the reproductive age group of 30 to 49 years. Pregnant women and women in the postpartum amenorrhea period were not considered for the study. It was recorded dichotomous form, ‘Yes’ for passing through menopause period and ‘No’ for otherwise with the code ‘1’ and ‘0’ respectively.

iii. Hysterectomy

Hysterectomy is surgery that involves partial or complete removal of the uterus of a woman. As NFHS 4 had first time collected the information on hysterectomy, hence for this, only NFHS rounds 4 and 5 will be utilised. The NFHS asked women various questions related to hysterectomy. The first question asked was: “When did your last menstrual period start?” Among the several answers to this question, one of the options was “Has had hysterectomy”. The direct question on hysterectomy canvassed was “Some women undergo an operation to remove the uterus. Have you undergone such an operation?” If the answer was yes, women were asked further questions regarding the timing and place of and the reason for the hysterectomy. for the analysis purpose, it was recorded in dichotomous form, ‘Yes’ for having hysterectomy and ‘No’ for otherwise with the code ‘1’ and ‘0’ respectively.

4.3 Predictor variables

All the possible socio-economic and demographic variables have been in the analysis to see their effect and contribution in early neonatal mortality in India. The independent variables included in the study were women’s current age (15-24, 25-34, 35-49 years); place of residence (urban and rural); wealth quintiles (Poorest, Poor, Middle, Richer and Richest); religion (Hindu, Muslim and others); caste (Scheduled caste, scheduled tribes, other backward classes and none of them); media exposure (no exposure and any exposure); women’s BMI (Thin, Normal, and overweight/obese); working status (not working, professional/managerial work, agriculture work and manual worker/other).

4.4 Methods of data analysis

Univariate, bivariate and multivariate analysis have been used for the study. In univariate analysis, simple frequency distribution has been shown. In the bivariate analysis, cross tabulation between predictors and outcome variables have been done. In Multivariate analysis, logistic regression technique has been applied to see the significant effect of predictor variables on outcome variables. Logistic regression technique has been because outcome variables are in dichotomous form.

5. Results

5.1 Sterilization among Indian female

Trends in different type of contraceptive method use in India, 1991-2021

The comparison of the use of different contraceptive methods in India from NFHS-1, NFHS-3, and NFHS-5 are shown in Table 1. Over the past 27 years there has been a steady increase in the Contraceptive prevalence rate (CPR) from 40.6 percent in 1992-93 to 56 per cent in 2005-06 and further to 66.7 per cent in 2019-21. Since 1992-93, the use of each modern and traditional method except male sterilization has increased. The share of female sterilization in the CPR increased from 27.3 per cent in 1992-93 to 37.9 percent in 2019-21, total 38.8 per cent increased has observed in female sterilization between 1992-2019-21. At the same time, 91.3 per cent declined observed in male sterilization.

In the same period, the share of the three officially sponsored spacing methods- i.e. Pills, IUD and condom increased 1.2 per cent to 5.1 percent, 1.9 per cent to 2.1 per cent and 2.4 per cent to 9.5 per cent, respectively between 1992-93 to 2019-21.

Trends in age at sterilization in India, 1992-2021

Table 2 shows that a large proportion of women are getting sterilized at a very young age, and this proportion has increased over the years. Among the sterilized women, 36.2% in 1992-93 and 45.2 % in 2005-06 and 42.5% in 2019-21 underwent sterilization when they were less than 25 years old. 19.5% in 1992-93, 35% in 2005-06 and 36.4% in 2019-21 women underwent sterilization when they were aged 25-29. In other words, about 80 per cent of sterilized women got sterilized before age 30. The median age at sterilization rages between 27 years to 25.6 over the years. Over the past 27 years, the distribution of sterilized women by age at sterilization and the median age at sterilization have remained practically constant.

Trends in parity at sterilization in India, 1992-2021

Table 3 depicts the trends in the parity of women at sterilization since 1992-93 to 2019-21. The trends show that sterilization among women shifting to lower parity women. For illustration, the proportion of sterilised women with 1 parity (one child) has increased from 1.2% in 1992-93 to 3.25 in 2019-21. Similarly, there has been a drastic shift in the women with two children, among the sterilised women 16.7% of women were second parity women in 1992-93 which as

increased to 46.1% in 2019-21. The proportion of sterilised women has shown the declined trends among higher parity women (4 or more parity) over the years.

Prevalence of sterilization among currently married women by their background characteristics in India, 1992-2021

Table 4 presents the result of the prevalence of female sterilization by their backgrounds characteristic. The female stylization users increased to 38.8% points from NFHS-1 to NFHS-5. The result indicated that the prevalence of sterilization has increased across almost all the sub-groups of the population. The percentage of sterilised women decreased in the age categories 15-24 years and 25-34 years between 1992-93 and 2019-21. Besides, it has also decreased among Muslim women from 30.3% in 1992-93 to 21.9 in 2019-21 (27.9 % decline has been observed).

From the table, we can also see that the rate of increase in female sterilisation was highest among older women (37.6%), among the residents of rural areas (47.2%), women belonging to poor households (60%), the follower of Hindu religion (181.7%), women belong to Schedule tribes (73.6%), among illiterate women (91.1%) and in agriculture worker's women during 1992-93 to 2019-21.

Determinant of female sterilization

Table 5 gives the results of logistic regression to show the determinants of female sterilization in India, 1992-93 to 2019-21. From the table, we can see that older women are more likely to undergo sterilization compared to those who belong to the 15-24 years' age group across all the survey periods, and the age effect has become stronger over the years. The odds of being sterilized were highest among women aged 35-49 years (OR: 9.72; $p < 0.001$ in 1992-93; OR: 21.92; $p < 0.001$ in 2005-06, and OR: 38.7, $p < 0.001$ in 2019-21). During 1992-93 and 2005-06, rural women were 7% (OR: 0.93 and 5% (OR: 0.95) less likely to go for sterilisation compared to urban women, whereas, in 2019-21, rural women were 16 times (OR: 1.16, $p < 0.001$) more likely to go for sterilization than urban women. Wealth quintiles have shown a constant positive significant effect on female sterilization across all the survey rounds. In 1992-93, the odds of being sterilised were significantly higher for Muslim (OR: 1.44, $p < 0.001$) and other (OR: 2.26, $p < 0.001$) religions women than Hindu women, but there has been a drastic shift as the odds ratio of being sterilised for Muslim (OR: 0.40; $p < 0.001$) and other religion (OR: 0.41; $p < 0.001$) has reciprocated in 2019-21. Media exposure was positively associated with female sterilization for all the survey rounds. Historically, educated women are less likely to opt for

female sterilization than illiterate women. The odds for female sterilization decrease with the increase in the education level in all the survey periods. The likelihood of obtaining female sterilization has been higher among Agriculture workers than not working females. For example, the odds for female sterilization was 48 times (OR: 1.48; $p < 0.001$), 50 times (OR: 1.50; $p < 0.001$) and 87 (OR: 1.87; $p < 0.001$) more likely for Agriculture worker compared to not working female during 1992-93, 2005-06 and 2019-21, respectively.

5.2 Premature Menopause among Indian Women

The risk of childbearing in a population declines with increasing age. Menopause is the culmination of a gradual decline in fecundity with increasing age. After attaining age 30, women's susceptibility to pregnancy declines with age as an increasing proportion of women become infecund. The term infecundity denotes a process rather than a well-defined event. Although the onset of infecundity is difficult to determine for an individual woman, there are ways of estimating it for a group of women. In NFHS-3, menopause is defined as the absence of menstruation for six or more months preceding the survey. Women who report that they are menopausal or that they have had a hysterectomy are also included in this category. Women who are pregnant or postpartum amenorrhoeic are assumed not to be menopausal.

Prevalence of premature menopause among women 30-40 years, India, 1992-2021

Table 6 provides the prevalence of premature menopause among women 30-40 years by their background characteristics, 1992-2021. In India, 4.8 per cent of women aged 30-40 years had menopausal in 1992-93, and it increased to 7 per cent in 2005-06 and declined after that to 5.9 per cent in 2019-21. With respect to age groups, as age increases, the prevalence of premature menopause also increases. The prevalence of premature was higher among women residing in rural areas than urban areas in all the survey periods. The poor women were more prone to premature menopause than those in affluent households across the survey periods. Similarly, the prevalence of premature menopause was higher among Hindus than among others religions. For illustration, 5.3 per cent of women aged 30-40 had premature menopause in 1992-93, which increased to 7.0 per cent in 2005-06, which further increased to 6.0 per cent in 2019-21. Similarly, scheduled castes and tribes are more prone to premature menopause across the survey periods. The effect of education is clearly visible in premature menopause as the percentage of women aged 30-40 years having menopause was higher among illiterate women

(5.4% in 1992-93, 9.1% in 2005-06 and 9.6% in 2019-21). The prevalence of menopause was higher among women who consumed tobacco and alcohol and among thin (BMI<18.5) women in 2005-06 and 2019-21. Additionally, the prevalence of premature menopause was higher among all the categories of women in all the survey rounds. For illustration, 5.6 per cent of women in 1992-93, 8.8 in 2005-06 and 7.6 in 2019-21 had menopause.

Determinants of premature menopauses among women aged 30-40 years, India, 1992-2021

Table 7 depicts the result of logistic regression for premature menopause in India. Three independent logistic regression models have been applied for three periods. Results confirm the effect of age on premature menopause, as shown in the bivariate analysis. Age is positively associated with menopause as odds show the increasing trend as age increases, though the age effect is attenuated over the period. Interestingly, wealth status has shown a peculiar result against bi-variate analysis; compared to the poorest, women from affluent families are significantly at greater risk of premature menopause. Further, women belonging to other backward classes are significantly 22 times more likely to have menopause (OR: 1.22; p<0.001) than scheduled castes women in 2019-21.

Moreover, the risk of menopause decreases as education level increases during all the survey periods, though the effect is attenuated with time. Tobacco and alcohol consumption have shown any significant effect on menopause among women aged 30-40 in all the study rounds. As expected BMI status of women is significantly associated with menopause. The risk of menopause was 25 per cent (OR: 0.755; p<0.001) and 16 per cent (OR: 0.844; p<0.05) less likely among women with Normal BMI compared with Thin women in 2005-06 and 2019-21, respectively. On the other hand, the risk of menopause was higher among women engaged in Agriculture labour work compared to not working women, though results are not significant for 2019-21.

5.3 Hysterectomies among Indian female

Prevalence of hysterectomies among women of reproductive ages by their background characteristics

Table 8 presents the prevalence of hysterectomies among women of reproductive age by their background characteristics in India, 2015-16 and 2019-21. At the India level, the prevalence of hysterectomies was 3.2 % in 2015-16, which increased to 3.3% in 2019-21. The prevalence of

hysterectomies varies substantially by the socio-economic characteristics of the respondent in both survey periods.

Women aged 35-49 years had a high prevalence of hysterectomy (7.5% in 2015-16 and 7.8% in 2019-21) than women in age groups 25-34 years (1.7% in 2015-16 and 1.3% in 2019-21) and 15-24 years (0.1% in 2015-16 and 2019-21). Further, Rural women are more prone to hysterectomies than urban residents in both survey periods, with a prevalence rate of 3.4-3.6. Nearly 4% of women from the middle wealth index (the highest among all) had a hysterectomy than women from the rest of the wealth categories for both periods. With the increase in education, the prevalence of hysterectomies decreased. 5.7% and 7.2% of women with no education had hysterectomies than 1% and 0.7% of women with higher education in 2015-16 and 2019-21, respectively. The prevalence of hysterectomy varied according to caste and religious groups. A higher proportion of Hindu women (3.4% for both periods) underwent hysterectomy than women from the Muslim religion (2.2-2.3%). Prevalence of hysterectomy was more prone among OBCs in both survey periods, with a percentage of 3.6. In addition, 3.1-3.3% of women from other castes and 2.9-3.1% from Scheduled castes and 2.3-2.2 from scheduled tribes underwent a hysterectomy in 2015-16 and 2019-21. Women who were engaged in any wage-related work had a higher prevalence of hysterectomy than women who were not working (2.8% in both periods).

Determinants of hysterectomy

Table 9 shows the odds ratio (OR) from the multivariate logistic regression, which examined the likelihood of a woman undergoing a hysterectomy belonging to given demographic and socio-economic characteristics. A woman's age was found to be statistically associated with an increase in the risk for a hysterectomy. For example, women aged 35-49 were 85.5 times (OR: 85.5; $p < 0.001$) and 133.8 times (OR: 133.8; $p < 0.001$) as likely as women aged 15-24 to have undergone a hysterectomy in 2015-16 and 2019-21 respectively. Women who lived in rural areas had about 16 times (OR: 1.163; $p < 0.001$) and 22 times (OR: 1.221; $p < 0.001$) greater likelihood of having had a hysterectomy as compared with women living in urban areas in 2015-16 and 2019-21 respectively. Woman's schooling was significantly negatively associated with hysterectomies. Women with more years of schooling were less likely to have undergone a hysterectomy than women without schooling. For illustration, women with higher education were about 0.24 times (OR: 0.247; $p < 0.001$) and 0.19 times (OR: 0.194; $p < 0.001$) less likely to have had a hysterectomy compared with women with no schooling in 2016-17 and 2019-21 respectively. Women with a "secondary complete" level of education were about 43% and 54%

less likely to have had a hysterectomy compared with women with no schooling in 2015-16 and 2019-21, respectively. Women from the higher wealth quintile households were at a significantly higher risk for hysterectomy than women from the poorest wealth quintile households. For example, women from the richer quintile were 2.6 times (OR: 2.6; $p < 0.001$) and 2.3 times (OR: 2.3; $p < 0.001$) more likely than women from the poorest quintile to have undergone a hysterectomy in 2015-16 and 2019-21. Similarly, poor, middle and rich women had a significantly higher risk of hysterectomy than women from the poorest quintile.

Muslim [(OR: 0.728, $p < 0.001$ in 2015-16) (OR: 0.787; $p < 0.001$ in 2019-21)] and other religion [(OR: 0.723, $p < 0.001$ in 2015-16) (OR: 0.759, $p < 0.001$ in 2019-21) women were less likely to have had a hysterectomy compared with Hindu women. Caste was also found to be associated with hysterectomy. Compared with women from scheduled castes, women from scheduled tribes were less likely to have had a hysterectomy. However, women from other backward classes and other castes were more likely to have undergone the operation than their scheduled caste counterparts.

In our analysis, the type of occupation also came out as a significant predictor of hysterectomy, though only for 2015-16. The study found that women working as agriculture labourers 1.17 times (OR; 1.172, $p < 0.001$) were more likely to have undergone a hysterectomy compared with not working women in 2015-16. For 2019-21, there were no significant difference exists; even odds show the attenuated effect. Similarly, there is no significant difference the in the media exposure variable for both periods.

6. Summary and discussion

India is the first country in the world which has launch the official family planning program in 1952 with the aim to reduce the population growth. Significant financial investments were made to expand service delivery points so that contraception can be easily assessable to couples. To curb the population growth and popularizing the family planning, the government made available different contraceptive methods to couples like condoms, Intrauterine contraceptive device (IUD), diaphragm, and sterilization (Srinivasan, 1998). The family planning methods were made available at small-small birth control clinics, health centres and hospitals (Ledbetter, 1984).

The family planning programme in India started with a very cautious approach with clinic approach of the planned parenthood organization. This approach was based on the assumption

that those who need family planning would visit such clinic without any hesitation. After the failure of this approach, extension approach was used to popularised the family planning programme, in which family planning services merged with the MCH services. The rationale for this programme was that when women go to hospitals for maternity care, they are in a positive frame of mind to receive family planning education, the need for family planning is uppermost in their minds at that time. Despite the concerted efforts, the population growth remained more or less the same and progress in the family planning programme was not satisfactory. Hence, government changed its policy of persuasion, and moved towards mass sterilization under the camp approach. During April 1976 to March 1977, a national target of 4.3 million sterilizations was set in (Ledbetter, 1984). In the beginning, the family planning programme was lean towards male as millions of vasectomies happened under the camp approach. However, this increasing vasectomies caused a massive political disturbance, and when a new government came in the power, they rename family planning programme to family welfare programme, in which emphasis was given to “basket of choices” (Pachauri, 2014). In basket of choices approach, couples can decide on which contraception to use to control their fertility, which included female, male sterilization, IUD, oral contraceptives, and condoms. But over the period of time female sterilization emerged as the only method adopted among the married female in India and male methods lost their momentum (Tripathy et al., 1994; IIPS & ICF, 2021).

Globally, around 219 million women use female sterilization followed by male condom (189 million) (UN, 2019). In most of the region, the prevalence of female sterilization has declined but in central and southern Asia, it increased (UN, 2019) and 36% of the worlds’ female sterilizations are happing in India (UNDESAPD, 2013).

In India, birth control remains largely a woman's responsibility and burden for several reasons, including- Gender roles and cultural norms, Lack of awareness, limited access to healthcare, stigma around contraception and limited resources. Traditional gender roles and cultural norms in India often place the responsibility for family planning and contraception on women. Women are expected to be the primary caregivers for children, and the burden of preventing unplanned pregnancies often falls on them. Many women in India are not aware of the various forms of birth control that are available to them, or they may not have access to information about how to use them effectively. Further, Women may have limited access to healthcare, particularly in rural areas. This can make it difficult for them to obtain birth control

and other reproductive healthcare services. Additionally, women in India may not have the financial resources to access contraception or may not have the time to use it properly due to their other responsibilities.

These factors all contribute to the continued burden of birth control falling on women in India. To address these issues, it is important to increase awareness and education about contraception, promote gender equality, and ensure that women have access to affordable and effective birth control methods. This can be achieved through government programs, community-based education and outreach, and collaborations with healthcare providers and other organizations. By working to reduce the burden of birth control on women, India can help improve women's health and increase gender equity.

Premature menopause

Premature menopause, which is defined as menopause occurring before the age of 40, is affected by various socio-economic determinants. Menopause typically receives less attention in women's health research than other reproductive issues, especially among Indian women. The early onset of menopause, i.e., before the global median age of 50 years, should become a policy concern, because of its connection to higher morbidity and mortality in older years. The study found that prevalence of premature menopauses increases with increase in the age of the women in all the survey round. The risk of premature menopauses was significantly higher among the women belongs to poor or middle households, though the results were not significant in 1992-93. Women with lower income and those who work in certain occupations, such as manual labour or shift work, may be more likely to experience premature menopause. This is likely due to the increased physical and psychological stress associated with these types of work, which can have an impact on the reproductive system.

Women with lower levels of education were more likely to experience premature menopause. This may be due to a lack of knowledge about reproductive health and the factors that can impact menopause. Results further shows that risk of premature menopause was less among Muslim and other religion community, though result were significant for other religion only. This might be because of food practice. Lifestyle factors such as smoking, alcohol consumption have not shown any significant relationship with the premature menopause, however, these factors can have a negative impact on the reproductive system and may

contribute to early menopause. Analysis further asserted the women normal BMI was significantly lower the risk of premature menopause.

It is important to note that premature menopause can also be caused by certain medical conditions or genetic factors. However, socio-economic determinants can play a role in the risk of premature menopause and may be addressed through interventions such as improved access to healthcare, education, and workplace policies that support women's reproductive health.

Hysterectomy

The results show that prevalence of hysterectomy, which is the surgical removal of the uterus, has been increasing over the period of time in India and the prevalence is significantly varies across the socio-economic characteristics of the population. We found that older women were significantly more likely to undergo hysterectomy. This is because they may be more likely to have gynaecological problems that require surgery. Further, Women themselves choosing hysterectomy after achieving the desired number of children. Study has also found the rural women were significantly more likely to undergo hysterectomy than urban women. The prevalence of hysterectomy is somewhat linked with the low age at first birth and high number of births and untreated reproductive morbidities. These are typical features of reproduction among rural women and women with no schooling in India. Women with lower levels of education were more likely to undergo hysterectomy in both the survey round. This may be due to a lack of knowledge about reproductive health and the factors that can impact the uterus. Awareness about health check-ups and health-seeking behaviour are also low among illiterate/less educated women and those from poor socioeconomic backgrounds. These factors can potentially delay, or cause the women to avoid, seeking treatment at the initial stages of a reproductive health problem.

The results further asserted that there was positive relationship between economic status and hysterectomy. The chance of hysterectomy significantly increases as economic status increase This may be due to the access to quality healthcare and greater knowledge about health care and greater purchasing power. Muslim and other religion women were less likely to undergo hysterectomy. It might be because of culture and gender norms. In some communities in India, there is a cultural belief that women should undergo hysterectomy after they have completed their childbearing. This may lead to unnecessary or premature hysterectomies. It has also found that agriculture worker and manual worker women were more likely to undergo

hysterectomy. Women workers may experience pressure to remove the uterus, either to treat gynaecological ailments permanently or to preserve labour productivity, as suggested by other research and recent news reports (Desai, 2016; Sardeshpande, 2014; Jadhav, 2019). Additionally, women and healthcare providers may not be aware of alternative treatments that can address gynecological problems without requiring hysterectomy. This lack of awareness can lead to unnecessary hysterectomies.

It is important to note that some hysterectomies may be medically necessary, but unnecessary hysterectomies can have negative health consequences for women, including increased risk of heart disease, osteoporosis, and sexual dysfunction. Addressing the social determinants of hysterectomy in India, such as improving access to quality healthcare and raising awareness of alternative treatments, can help reduce the number of unnecessary hysterectomies and improve women's reproductive health.

7. Conclusion

India experiencing rapid changes in its diseases patterns leading to epidemiological transition. India also experienced rapid reduction in population growth in recent decade. Recently, many health indicators shown positive outcomes such as reduction in maternal mortality, infant and child mortality. At the same time some of the critical issues are persistent for long time and some issues are emerging with positive achievements. In seven decades of government family planning programmes failed to include men as a responsible person for family planning. The female sterilization has been single large method achieved targets of limiting population growth while bearing abundant problems. The persistent dominance of female sterilization in the India is largely determined by socioeconomic conditions. Reproductive health programmes should address the socioeconomic barriers and consider multiple cost-effective strategies such as mass media to promote awareness of modern temporary methods. Increased levels of premature menopause among Indian women pose serious health consequences for women. Women with premature menopause will have more health related problems which leads reduced quality of life. There is greater need to undertake further research on premature menopause and rapid increase in prevalence of hysterectomy in India. It has very negative consequences for women health in longer run.

8. References

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Tables Sterilization

Table 1: Trends in different types of contraceptive methods use in India, 1992 to 2021

Family Planning methods used	Percentage			Percentage Change		
	1992-93	2005-06	2019-21	1992-06	2005-21	1992-2021
Not using	59.4	43.7	33.3	-26.5	-23.8	-44.0
Pill	1.2	3.1	5.1	156.7	64.6	322.5
IUD	1.9	1.7	2.1	-8.0	22.0	12.2
Injections	0.0	0.1	0.6	150.0	460.0	1300.0
Condom	2.4	5.2	9.5	115.6	80.5	289.3
Female sterilization	27.3	37.3	37.9	36.6	1.6	38.8
Male sterilization	3.4	1.0	0.3	-70.1	-70.9	-91.3
Periodic abstinence	2.6	4.9	6.2	87.8	26.3	137.3
Withdrawal	1.4	2.5	4.0	77.5	59.5	183.1
Other	0.2	0.4	1.0	72.7	168.4	363.6
Total	100	100	100			

Table 2: Trends in age at sterilization in India, 1992-2021

Age at sterilization	1992-93		2005-06		2019-21	
	N	%	N	%	N	%
<25	9,429.26	36.2	16,142.59	45.2	84,756.02	42.5
25-29	9,483.38	36.4	12,506.20	35.0	72,614.53	36.4
30-34	5,089.39	19.5	5,376.90	15.1	31,418.89	15.8
35-39	1,674.06	6.4	1,427.11	4.0	8,518.22	4.3
40-44	339.730947	1.3	223.6427	0.6	1,680.34	0.8
45-49	35.4261731	0.1	10.76268	0.0	259.869104	0.1
Total	26,051.24	100.0	35,687.21	100	1,99,247.86	100

Table 3: Trends in age at sterilization in India, 1992-2021

Parity at sterilization	1992-93		2005-06		2019-21	
	N	%	N	%	N	%
0	58.9781661	0.2	33.21447	0.1	189.587721	0.1
1	319.108125	1.2	452.9079	1.3	6,458.53	3.2
2	4,350.38	16.7	10,629.63	29.8	91,812.88	46.1
3	7,248.29	27.8	10,916.50	30.6	57,741.29	29.0
4	5,808.14	22.3	6,748.84	18.9	25,662.93	12.9
5+	8,266.35	31.7	6,906.12	19.4	17,382.63	8.7
Total	26,051.24	100	35,687.21	100	1,99,247.86	100

Table 4: Prevalence of sterilization among currently married women in India, 1992-2021

Background variables	2019-21		2005-06		1992-93	
	%	N	%	N	%	N
Women's current age						
15-24	6.6	86,991	9.9	23,508	7.3	26,738
25-34	31.8	1,96,203	39.9	35,000	33.9	30,709
35-49	54.4	2,38,158	53.3	34,581	39.6	27,231
Place of residence						
Urban	36.3	1,63,395	37.8	28,604	30.4	22,077
Rural	38.7	3,57,957	37.1	64,485	26.3	62,601
Wealth status						
Poorest	34.5	97,962	29.3	17,425	22.7	16,899
Poor	38.4	1,04,135	37.0	18,495	23.9	16,676
Middle	42.3	1,06,488	41.9	18,671	27.1	16,867
Rich	40.5	1,08,247	43.0	18,985	31.8	17,001
Richer	33.5	1,04,520	34.9	19,513	30.9	17,235
Religion						
Hindu	40.6	4,27,114	39.9	75,799	14.4	10,070
Muslim	21.9	68,631	21.3	12,288	30.3	1,962
Others	36.3	25,607	37.7	5,002	29.0	72,646
Caste						
Schedule caste	39.8	1,12,610	38.3	17,498	25.7	10,253
Schedule tribes	40.3	47,852	35.5	7,590	23.2	7,409
OBCs	40.4	2,24,682	39.5	37,528	NA	NA
None of them	33.0	1,06,418	35.2	27,746	28.0	67,017
Media exposure						
No	35.0	1,24,598	33.1	35,729	22.7	39,785
Any exposure	38.8	3,96,754	39.9	57,360	31.4	44,893
Education status						
No Education	48.5	1,42,885	39.6	44,061	25.4	51,768
Primary	46.1	72,119	43.7	14,181	36.1	13,672
Secondary	34.3	2,39,274	35.8	24,656	28.4	16,067
Higher	19.3	67,074	22.0	10,186	14.9	2,953
BMI						
Thin	33.9	67,815	36.8	28,760	NA	NA
Normal	37.1	2,90,308	36.2	47,900	NA	NA
Overweight/Obese	42.2	1,43,316	45.5	12,869	NA	NA
Working status						
Not working	31.9	52,905	31.3	53,310	24.2	58,002
Professional/managerial	42.1	6,641	44.5	6,618	34.7	3,428
Agricultural	58.7	12,185	46.2	25,288	34.9	16,920
Manual worker/others	46.9	5,931	43.6	7,838	31.5	6,174
Total	37.9	5,21,352	37.3	93,089	27.3	84,525

Note: Cases may not be equal due to missing values. All the figures are weighted.

Table 5: Determinants of sterilization among currently married women in India, 1991-2021

Background variables	2019-21		2005-06		1992-93	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Women's current age						
15-24®						
25-34	16.90***	[15.55,18.37]	12.46***	[11.77,13.18]	7.313***	[6.903,7.747]
35-49	38.70***	[35.58,42.10]	21.92***	[20.69,23.21]	9.727***	[9.176,10.31]
Place of residence						
Urban®						
Rural	1.160***	[1.110,1.212]	0.955*	[0.919,0.992]	0.939**	[0.898,0.981]
Wealth status						
Poorest®						
Poor	1.243***	[1.179,1.310]	1.324***	[1.247,1.405]	1.103**	[1.038,1.172]
Middle	1.565***	[1.479,1.656]	1.518***	[1.430,1.612]	1.219***	[1.149,1.294]
Rich	1.682***	[1.581,1.790]	1.681***	[1.576,1.793]	1.337***	[1.257,1.422]
Richer	1.510***	[1.406,1.623]	1.506***	[1.400,1.620]	1.151***	[1.069,1.239]
Religion						
Hindu®						
Muslim	0.409***	[0.384,0.436]	0.457***	[0.433,0.483]	1.445***	[1.311,1.594]
Others	0.416***	[0.391,0.441]	0.548***	[0.519,0.578]	2.265***	[2.125,2.416]
Caste						
Schedule caste®						
Schedule tribes	0.720***	[0.681,0.762]	0.638***	[0.600,0.678]	0.765***	[0.710,0.823]
OBCs	1.080***	[1.033,1.129]	1.04	[0.998,1.091]	NA	NA
None of them	0.793***	[0.751,0.838]	0.800***	[0.764,0.838]	1.049	[0.995,1.106]
Media exposure						
No®						
Any exposure	1.341***	[1.283,1.402]	1.350***	[1.297,1.406]	1.420***	[1.363,1.479]
Education status						
No Education®						
Primary	0.944*	[0.896,0.994]	1.096***	[1.047,1.148]	1.486***	[1.418,1.557]
Secondary	0.606***	[0.580,0.633]	0.710***	[0.680,0.742]	0.933**	[0.885,0.982]
Higher	0.219***	[0.203,0.236]	0.251***	[0.236,0.267]	0.285***	[0.256,0.318]
BMI						
Thin®						
Normal	0.97	[0.921,1.019]	0.938***	[0.904,0.973]	NA	NA
Overweight/Obese	1.01	[0.952,1.068]	1.148***	[1.091,1.207]	NA	NA
Occupation types						
Not working®						[1,1]
Professional/managerial	1.154***	[1.087,1.225]	1.079**	[1.027,1.134]	1.114**	[1.033,1.200]
Agricultural	1.874***	[1.794,1.957]	1.501***	[1.438,1.568]	1.482***	[1.418,1.548]
Manual worker/others	1.270***	[1.196,1.347]	1.161***	[1.101,1.224]	1.340***	[1.259,1.427]
Observations	99525		113214		84165	

Note: * p<0.05, ** p<0.01, *** p<0.001; ®: reference category; AOR: adjusted odds ratio.

Premature Menopause

Table 6: Prevalence of premature menopause among women 30-40 years, India, 1992-2021

Background variables	2019-21		2005-06		1992-93	
	%	N	%	N	%	N
Age						
30-32	2.7	66574	2.9	11,427	1.8	9,464
33-34	3.7	33810	3.9	6,229	3.0	5,205
35-36	5.5	46212	6.7	7,656	4.2	5,814
37-38	7.4	36681	8.4	5,798	6.1	4,597
39-40	12.3	39627	16.1	6,387	11.8	4,858
Place of residence						
Urban	4.0	76,619	5.8	12,510	4.7	8,819
Rural	6.9	1,46,286	7.6	24,987	4.8	21,119
Wealth status						
Poorest	7.0	41,330	6.4	6,952	4.8	5,942
Poor	7.6	42,631	7.8	7,167	5.4	5,599
Middle	6.7	44,836	9.0	7,445	4.3	5,541
Rich	5.3	46,783	7.4	7,589	4.8	5,874
Richer	3.2	47,325	4.5	8,343	4.5	6,982
Religion						
Hindu	6.0	1,82,104	7.0	30,357	5.3	3,473
Muslim	5.5	28,584	6.9	4,770	4.5	854
Others	4.7	12,217	6.9	2,370	4.7	25,611
caste						
Schedule caste	6.1	47,505	6.9	6,923	4.7	3,407
Schedule tribes	5.2	20,474	7.4	3,049	5.8	2,481
OBCs	6.5	95,826	7.8	14,890	NA	NA
None of them	5.0	46,826	5.9	11,539	4.7	24,049
Media exposure						
No	8.2	51,924	7.8	14,319	4.9	13,958
Any exposure	5.2	1,70,981	6.5	23,178	4.6	15,980
Education status						
No Education	9.6	65,849	9.1	19,260	5.4	18,148
Primary	6.4	33,537	6.9	5,431	4.2	4,987
Secondary	4.4	94,677	4.8	8,563	3.8	5,429
Higher	1.7	28,841	1.7	4,240	1.7	1,297
Tobacco consumption						
No	5.8	2,11,146	6.8	31,795	NA	NA
Yes	7.2	11,758	8.1	5,701	NA	NA
Alcohol consumption						
No	5.9	2,20,833	6.8	36,393	NA	NA
Yes	7.9	2,071	11.1	1,096	NA	NA
BMI						
Thin	6.7	23,876	8.3	11,065	NA	NA
Normal	5.7	1,20,897	6.3	18,650	NA	NA
Overweight/Obese	6.0	68,975	6.7	6,343	NA	NA
Occupation types						
Not working	5.2	20,408.12	5.9	18,320	4.6	18,826
Professional/managerial	3.9	3,774.83	5.9	3,939	4.1	1,899

Agricultural	7.6	5,835.74	8.8	11,276	5.6	6,499
Manual worker/others	5.8	3,259.36	7.4	3,940	4.5	2,657
Total	5.9	222904	7.0	37,497	4.8	29,937

Note: Cases may not be equal due to missing value. All the figures are weighted.

Table 7: Determinants of premature menopauses among women aged 30-40 years, India, 1992-2021

Background variables	2019-21		2005-06		1992-93	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Age						
30-32®						
33-34	1.308*	[1.064,1.607]	1.340**	[1.094,1.641]	1.596***	[1.265,2.013]
35-36	1.788***	[1.502,2.128]	2.368***	[2.004,2.798]	2.310***	[1.880,2.837]
37-38	2.367***	[1.991,2.816]	3.221***	[2.724,3.808]	3.706***	[3.039,4.520]
39-40	4.042***	[3.449,4.737]	6.446***	[5.537,7.505]	6.886***	[5.747,8.251]
Place of residence						
Urban®						
Rural	1.1	[0.951,1.268]	0.898	[0.797,1.012]	0.998	[0.857,1.162]
Wealth status						
Poorest®						
Poor	1.423***	[1.216,1.664]	1.155	[0.972,1.373]	1.124	[0.928,1.361]
Middle	1.528***	[1.288,1.812]	1.345***	[1.134,1.596]	0.943	[0.774,1.149]
Rich	1.426***	[1.174,1.734]	1.389***	[1.149,1.679]	1.085	[0.884,1.332]
Richer	1.09	[0.855,1.390]	1.299*	[1.038,1.626]	1.19	[0.932,1.520]
Religion						
Hindu®						
Muslim	0.839	[0.700,1.004]	1.054	[0.906,1.228]	0.872	[0.639,1.191]
Others	0.790*	[0.646,0.966]	0.835*	[0.703,0.991]	1.004	[0.832,1.211]
Caste						
Schedule caste®						
Schedule tribes	0.765**	[0.635,0.921]	0.846	[0.697,1.026]	1.184	[0.926,1.512]
OBCs	1.228**	[1.070,1.410]	1.108	[0.969,1.266]	NA	NA
None of them	0.951	[0.794,1.140]	1.01	[0.873,1.168]	1.15	[0.955,1.386]
Media exposure						
No®						
Any exposure	0.805***	[0.710,0.914]	0.93	[0.826,1.041]	1.088	[0.948,1.249]
Education status						
No Education®						
Primary	0.688***	[0.592,0.801]	0.705***	[0.614,0.810]	0.722***	[0.606,0.860]
Secondary	0.550***	[0.482,0.628]	0.515***	[0.447,0.592]	0.626***	[0.520,0.754]
Higher	0.230***	[0.167,0.316]	0.216***	[0.169,0.277]	0.384***	[0.282,0.522]
Tobacco consumption						
No®						
Yes	0.9	[0.742,1.091]	0.96	[0.842,1.083]	NA	NA
Alcohol consumption						
No®						
Yes	0.922	[0.660,1.288]	1.22	[0.960,1.551]	NA	NA
BMI						
Thin®						
Normal	0.844*	[0.723,0.986]	0.755***	[0.676,0.844]	NA	NA
Overweight/Obese	0.902	[0.758,1.074]	0.90	[0.772,1.041]	NA	NA
Occupation types						
Not working®						
Professional/manage	1.068	[0.881,1.293]	1.05	[0.898,1.228]	0.939	[0.740,1.192]
Agricultural	1.059	[0.932,1.203]	1.165*	[1.026,1.323]	1.062	[0.918,1.230]
Manual worker/others	0.966	[0.805,1.159]	1.08	[0.924,1.263]	0.909	[0.738,1.120]
Observations	30793		34704		30925	

Note: * p<0.05, ** p<0.01, *** p<0.001; ®: reference category; AOR: adjusted odds ratio

Hysterectomies

Tables 8: Prevalence of hysterectomies in India by background characteristics of respondents, 2015 to 2021, India.

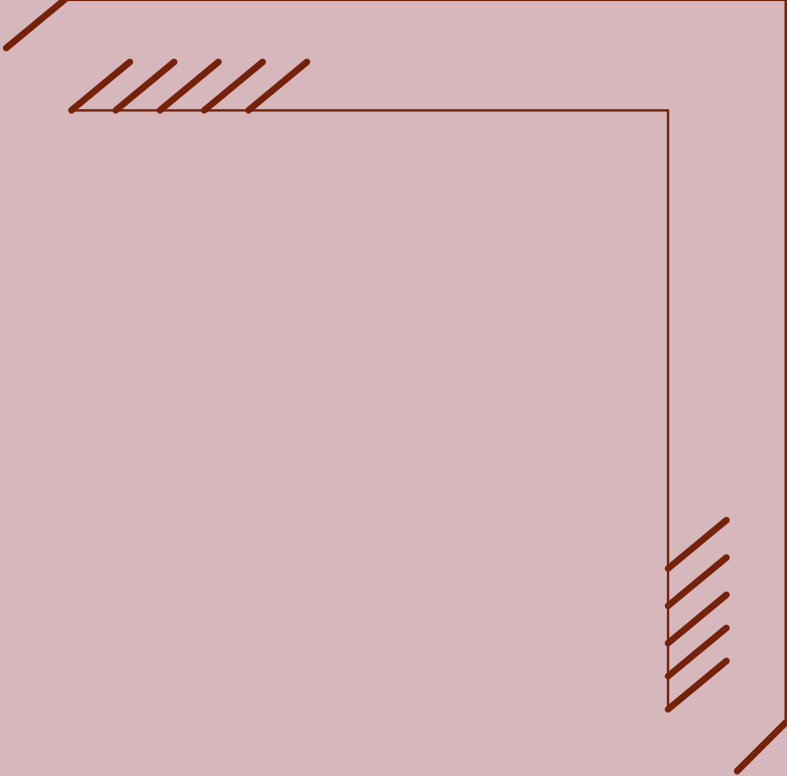

Background Characteristics	2019-21		2015-16	
	%	N	%	N
Current Age				
15-24	0.1	2,41,983	0.1	2,44,518
25-34	1.3	2,17,529	1.7	2,11,812
35-49	7.8	2,64,603	7.5	2,43,357
Place of residence				
Urban	2.6	2,35,279	2.7	2,42,225
Rural	3.6	4,88,836	3.4	4,57,461
Education level				
No Education	7.2	1,62,451	5.7	1,92,135
Primary	4.7	84,922	4.3	87,233
Secondary	2.0	3,63,396	2.0	3,31,037
Higher	0.7	1,13,346	1.0	89,281
Wealth status				
Poorest	2.9	1,33,973	2.4	1,24,054
Poor	3.5	1,44,813	3.1	1,36,900
Middle	3.7	1,48,616	3.6	1,43,814
Rich	3.5	1,50,680	3.5	1,47,978
Richer	2.8	1,46,032	3.1	1,46,939
Religion				
Hindu	3.4	5,89,164	3.4	5,63,739
Muslim	2.3	97,595	2.2	96,461
Others	3.0	37,356	2.7	39,486
Caste				
Schedule caste	3.1	1,58,483	2.9	1,42,619
Schedule tribes	2.2	67,263	2.3	64,144
OBCs	3.6	3,10,783	3.6	3,03,837
None of them	3.3	1,47,918	3.1	1,57,774
Type of occupation				
Not working	2.8	75,120.68	2.8	84,428
Professional/managerial	2.9	9,484.76	4.0	9,921
Agricultural labourers	5.2	15,188.25	5.3	17,717
Manual worker/others	3.8	8,122.04	3.1	7,592
Media exposure				
No	4.2	1,59,253	3.3	1,76,315
Any exposure	3.0	5,64,862	3.1	5,23,371
Total	3.3	7,24,115	3.2	6,99,686

Note: Cases May not be equal due to missing value. All percentage and numbers are weighted.

Tables 9: Determinants of hysterectomies in India, 2015 to 2021, India.

Background Characteristics	2019-21		2015-16	
	AOR	95% CI	AOR	95% CI
Current Age				
15-24®				
25-34	24.91***	[14.30,43.38]	19.73***	[13.07,29.77]
35-49	133.8***	[77.42,231.4]	85.51***	[57.04,128.2]
Place of residence				
Urban®				
Rural	1.221***	[1.105,1.350]	1.163**	[1.060,1.276]
Education level				
No Education®				
Primary	0.697***	[0.626,0.777]	0.804***	[0.722,0.896]
Secondary	0.463***	[0.420,0.510]	0.572***	[0.518,0.631]
Higher	0.194***	[0.155,0.242]	0.247***	[0.200,0.306]
Wealth status				
Poorest®				
Poor	1.495***	[1.317,1.697]	1.548***	[1.347,1.779]
Middle	1.780***	[1.560,2.031]	1.986***	[1.718,2.296]
Rich	2.030***	[1.762,2.339]	2.236***	[1.914,2.612]
Richer	2.315***	[1.971,2.720]	2.607***	[2.198,3.092]
Religion				
Hindu®				
Muslim	0.787***	[0.689,0.898]	0.728***	[0.638,0.830]
Others	0.759***	[0.655,0.879]	0.723***	[0.624,0.839]
Caste				
Schedule caste®				
Schedule tribes	0.675***	[0.584,0.779]	0.670***	[0.577,0.777]
OBCs	1.275***	[1.153,1.410]	1.227***	[1.105,1.362]
None of them	1.08	[0.949,1.219]	1.166*	[1.033,1.317]
Type of occupation				
Not working®				
Professional/managerial etc.	0.99	[0.855,1.136]	1.069	[0.933,1.224]
Agricultural	1.05	[0.952,1.147]	1.172**	[1.064,1.290]
Manual worker/others	0.92	[0.804,1.061]	0.786**	[0.667,0.925]
Media exposure				
No®				
Any exposure	1.01	[0.920,1.112]	1.013	[0.916,1.121]

Note: * p<0.05, ** p<0.01, *** p<0.001; ®: reference category; AOR: adjusted odds ratio



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