

**An empirical study on use of birth control measures in married females with special emphasis on millennials of Ahmedabad.**

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**ABSTRACT**

Birth control, also known as contraception, encompasses a range of methods used to prevent pregnancy and manage reproductive health. This research studies various forms of birth control, including hormonal methods (e.g., birth control pills, patches, and injections), barrier methods (e.g., condoms and diaphragms), long-acting reversible contraceptives (LARCs, such as IUDs and implants), and permanent solutions (e.g., sterilization). Each method has its own set of benefits and challenges which directly influence its adoption rates among different demographic groups. This study examines the efficacy, advantages, and possible drawbacks of each approach while taking accessibility, socioeconomic, and individual preferences into account. The acceptability of various birth control methods and their application are also covered in the paper. Current trends, advancements, and future directions in contraceptive technology and policy are discussed, highlighting the need for continued research and improved access to reproductive health services in the region of study.

**Keywords:** Birth, Condom, Copper T, Contraception, Prevention

**Introduction**

India's population has been growing rapidly since the mid-20th century, reaching over 1.3 billion people in 2021 officially making it the second most populous country in the world after China. India's population is projected to continue growing with an annual growth rate of around 1.0% in 2020 is expected to surpass China as the world's most populous country by 2027. But according to the projections made by United Nations, India had a population of 1,425,775,850 in 2023, surpassing China already.<sup>1</sup> The country's large population presents both challenges and opportunities, including strain on resources and infrastructure, as well as a vast labor force and potential for economic growth. Recently the population growth rate has slowed down due to improved healthcare facilities, increased education, and access to family planning methods. We also saw mass sterilization campaigns in some states of India where coercive measures in some locations were adopted. Many other factors contributed to falling birth rates in China and India, but the relative contributions of each remain a matter of debate.<sup>2</sup> Contraceptive methods play a pivotal role in family planning and reproductive health, significantly impacting population dynamics, socio-economic development, and individual well-being. In India, a country with a population exceeding 1.4 billion, the introduction and adoption of contraceptive methods have been crucial in managing population growth and improving quality of life. The history of contraception in India dates back to ancient times, with various traditional methods being practiced. However, modern contraceptive measures began to gain prominence with the government's family planning initiatives in the mid-20th century.

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The Indian government has implemented various policies and programs to control population growth and its adverse impact on society, including promoting family planning and improving access to education and healthcare. The Indian government launched its first family planning program in 1952, which marked the beginning of a sustained effort to integrate contraceptive services into public health policy. India also enacted policies to discourage the formation of large families and to slow population growth, including through its national family welfare programme beginning in the

1950s.<sup>3</sup> We have seen that in states where governments were able to set their own policy priorities and, emphasized on overall socio-economic development supported with women's empowerment, fertility decreased at a more speedy pace than the country. On the contrast states that invested less in development for girls and women, experienced slower reductions in fertility.<sup>4</sup> Despite these efforts, the uptake of modern contraceptive methods in India has faced several challenges, including socio-cultural resistance, misinformation, and limited access in rural areas. The government and various non-governmental organizations (NGOs) have implemented numerous programs to address these barriers, including educational campaigns, subsidized contraceptive supplies, and improved healthcare infrastructure. Today, India offers a diverse range of contraceptive options, including hormonal methods (e.g., oral contraceptive pills, injectable), barrier methods (e.g., condoms), intrauterine devices (IUDs), and permanent methods (e.g., sterilization). The introduction and expansion of contraceptive methods in India continue to evolve, driven by advancements in medical technology, changing societal attitudes, and ongoing policy reforms. Understanding the historical context, current landscape, and future directions of contraceptive use in India is essential for addressing the reproductive health needs of its diverse population and ensuring equitable access to family planning services.

### Literature review

With increase in world's population, contraception has been crucial in population control strategies. Majority of contraceptives sold today are targeted at females and many of women experience side effects which lead to the discontinuation of these contraceptives after some time of use. Uses of male condoms and vasectomies have been subject to scrutiny, it has been important to create development and awareness of male birth control. To achieve this, hormonal and non-hormonal contraception need to be focused. Hormonal contraceptions are such that prevents production of sperm in the testes but it has to be effective while also causing behavioural changes in men. Focus of Non-hormonal male contraception is on rendering the sperm immotile to prevent fertilization post-copulation. To summaries, by developing non-hormonal male contraceptives, men can have more control over their reproductive health. Before making such contraceptives widely available, it is important to ensure the safety and effectiveness of such methods.

Their study pointed out the relationship between Knowledge, attitude, and practices related to modern family planning methods. They pointed out that majority of the female population in their study were aware about contraceptive use (88.3%) and majority were also favoring its usage (67.7%). But this study was only limited to rural areas. This study was in contrast to B Pegu, who pointed out that despite having high degree of knowledge the practice of contraception usage in married women was less due to demographic, religious, cultural or political barrier.<sup>5, 6, 7</sup> tried to establish the effect of higher levels of education in Kerala having a positive impact on knowledge of birth control methods in young married women. But in their study they saw 58% preferred that they use of reversible methods was preferred over irreversible methods due to fear of side effects. T.K. Rasheeja<sup>8</sup> did a study to establish the positive effect of higher education on women empowerment which provides a base for this study conducted a survey in India where he identified that less options are available as compared to foreign countries.<sup>9</sup> Also, the contraceptive methods aren't women friendly and they need to be more accessible to females along with providing privacy. Hajira Saba et al, found that awareness of all the different types of contraceptives was present in their urban population but the knowledge of its advantages and importance was limited to it limiting birth only. Also low preference was seen for male sterilization because of side effects of weakness in males.<sup>10</sup>

A survey of 600 students from the age group of 15 to 24 years, 98.6% of respondents were unmarried and 77.6% had sexual intercourse. 67.8% had unwanted pregnancy wherein 63.5% had induced abortion. All respondents were having awareness of contraceptives, but only 25.4% have ever used it. Friends/relatives with 73.7% were the most common source of information about contraception. Approximately 1.5 million unplanned pregnancies are witnessed in Nigeria every year and around half of these choose to abort. One third of Nigerian women from child-bearing age had unwanted pregnancy and 1 in 10 had an induced abortion. As abortion is legal in Nigeria with an intention to save woman's life, it's often performed under unsafe conditions with around a quarter resulting in severe complications. Such complications account for around 20 to 40% of 60,000 maternal deaths which occur annually in Nigeria.

Several studies have shown relationship between breast cancer and use of contraceptive pills. It was reported that using pills at times increased risk of breast cancer and that was limited to those who used pills for long time. It was also examined that there is relationship between use of contraceptive pills and emergence of breast cancer and it was found that use of contraceptive pills and term of using pills were significantly related to the development of breast cancer in African American women, 14 women from age group 35 to 64 years were studied and found no significant relationship between both. Where in another research found a significant relationship between both. Meta analysis study showed that OR of breast cancer has increased by 1.19 times in women using contraceptive pills. The result also indicated that use of contraceptive pills for more than 4 years increases the chances of breast cancer by 1.52 times. One of a large cohort study of 17,032 women found that these pills along with adverse effects also have positive impact. Women not using contraception were less likely to utilize maternal and child health services and reside in urban settings. They are more likely to have fear of method side effects.<sup>11</sup>

**Birth control measures:** The paper talks about various birth control measures naming condoms, contraceptive pills, copper T, hormonal injections, female operation/Male Vasectomy, pull out method and I pills

**Current trends and advancements:** Research is ongoing to develop new hormonal contraceptives with fewer side effects and improved efficacy. This includes the development of new progestins and combinations of hormones.

- (a) **Non-hormonal contraceptives:** There is a growing interest in developing non-hormonal contraceptives, particularly for men, which would avoid the side effects associated with hormonal methods. This includes research on novel targets for contraception, such as the sperm's ability to fertilize an egg.
- (b) **Telemedicine and self-administration:** The COVID-19 pandemic has accelerated the trend towards telemedicine and self-administration of contraceptives, allowing individuals to access contraception without in-person visits to healthcare providers.
- (c) **Digital contraceptive technologies:** We are seeing the development of digital contraceptive technologies, such as smartphone apps and wearable devices. These technologies can help individuals track their fertility, manage their contraceptive use, and potentially even provide new methods of contraception.
- (d) **Policy changes:** There is a trend towards policies that improve access to contraception, such as the removal of barriers like co-payments and the expansion of insurance coverage for contraceptives.
- (e) **Gender-inclusive contraceptive policies:** There is an increasing focus on developing and implementing gender-inclusive contraceptive policies that address the needs and preferences of individuals across the gender spectrum.
- (f) **Integration of contraceptive services:** Integrating contraceptive services with primary care and sexual health clinics, can improve access and uptake of contraception.
- (g) **Community-based interventions:** Community-based interventions, such as peer education and community health workers, can help improve knowledge about contraception and increase access to services, particularly in low-resource settings.
- (h) **Global collaboration:** International collaboration and partnerships are essential for advancing contraceptive research, development, and access, particularly in low- and middle-income countries where unmet need for contraception is high.

**Future Directions in Contraceptive Technology and Personalized Contraception:** Advances in genomics and precision medicine may lead to the development of personalized contraceptive methods that are tailored to an individual's unique biology, minimizing side effects and maximizing efficacy.

**Microbicides and vaccines:** Research on microbicides and vaccines for contraception and sexually transmitted infection (STI) prevention is ongoing. These approaches could provide new options for individuals who may not be able or willing to use current methods.

- **Biodegradable implants:** The development of biodegradable implants for long-acting contraception could eliminate the need for surgical removal, making these methods more accessible and acceptable to users.
- **Smart contraceptive devices:** The integration of artificial intelligence (AI) and machine learning into contraceptive technologies could lead to the development of "smart" devices that can adapt to an individual's unique reproductive patterns and provide personalized contraceptive guidance.
- **Non-invasive contraception:** The development of non-invasive contraceptive methods, such as transdermal patches or nasal sprays, could improve user acceptability and convenience.
- **Combination contraceptives:** The development of combination contraceptives that offer multiple benefits, such as contraception, STI prevention, and treatment for other reproductive health conditions, could improve overall reproductive health outcomes.
- **Sustainable contraceptive technologies:** There is a growing interest in developing sustainable and environmentally friendly contraceptive technologies that can minimize waste and reduce the environmental impact of contraception.
- **Integration with other health technologies:** The integration of contraceptive technologies with other health technologies, such as wearable devices and telemedicine platforms, could improve contraceptive access, adherence, and overall reproductive health outcomes.
- **Addressing unmet need in low-resource settings:** Continued research and development of affordable, accessible, and culturally appropriate contraceptive methods for low-resource settings is essential to addressing the unmet need for contraception globally.

#### **Policies by Indian Government to curb population growth:**

- **National Population Policy (2000):** India's National Population Policy aims to address the country's population growth and promote reproductive health and rights. It emphasizes informed choice and voluntary use of contraception, as well as improved access to quality reproductive health services.
- **Reproductive and Child Health Programme (RCH) (1997):** The RCH program is a government initiative that focuses on improving reproductive and child health in India. It includes family planning services, maternal and child health care.
- **Family Planning Programme (FPP) (1952):** India's Family Planning Programme is one of the oldest and largest in the world. It aims to provide accessible and affordable contraceptive services, promote responsible parenthood, and reduce fertility rates.
- **Medical Termination of Pregnancy Act (1971):** This act legalized abortion in when the pregnancy poses a risk to the mother's life or health like cases of rape, incest, or fetal abnormalities.
- **Pre-Conception and Pre-Natal Diagnostic Techniques Act (1994):** This act bans the use of diagnostic techniques to know the sex of a fetus before delivery and subsequent sex-selective abortions.
- **National Health Mission (NHM) (2013):** The NHM is a initiative by the Indian government which is aimed at improving the health status of underserved and vulnerable populations in India. It includes family planning services as a key component of reproductive and child health.
- **Janani Suraksha Yojana (JSY) (2005):** The JSY is a scheme started by the government that provides financial incentives to pregnant women from low-income households to encourage institutional deliveries and improve maternal and child health outcomes.
- **Rashtriya Kishor Swasthya Karyakram (RKSK) (2014):** The RKSK is a government program focused on improving the health and well-being of adolescents in India. It includes components related to reproductive health, such as contraception and sexually transmitted infection (STI) prevention.

## Research Methodology

For our study first we tried to find out the research gap using all reliable databases like PubMed, Google Scholar, Google search, Scopus, and Science Direct. For our study we saw all published studies from 2012 until June 2024. Finally, 25 papers were selected out of which majority were population based studies outside India and within. But we saw majority studies being done in states with less fertility. So a research gap was identified and we identified Ahmadabad district as our target population. Primary data was collected with the help of questionnaires. Total 150 women from the millennial age group from Ahmadabad were selected for data collection. Birth control measures being a taboo topic, we could receive only 126 filled questionnaires as the women were reluctant in sharing their personal information. The contact details have not been collected respecting the privacy of respondents.

## Objectives

1. Understand use of various birth control measures used by married females.
2. To understand the awareness of various birth control measures among married females.
3. To understand the comfort level and cost effectiveness in using various birth control measures among married females.
4. To evaluate regularity of menstrual cycle and visit to Gynecologist by married women.

**Table- 1:** Demographic Spread (N=126)

Variable	Categories	No.	%
Age	25-30 years	42	33.3
	30-35 Years	26	20.6
	35-40 Years	33	26.2
	40-45 Years	25	19.8
Number of children	0	15	11.9
	1	66	52.4
	2	36	28.6
	More than 2	7	5.6
	Pregnant as of now	2	1.6
Education	Undergraduate	2	1.6
	Graduate	46	36.5
	Post Graduate	55	43.7
	Professional	23	18.3
Profession	Homemaker	54	42.9
	Business woman	7	5.6
	Freelancer	10	7.9
	Service	55	43.7
Annual family income	Up to Rs.. 2 Lakh	4	3.2
	Rs. 2 to 5 Lakh	18	14.3
	Rs. 5 to 10 Lakh	15	11.9
	More than Rs. 10 lakh	89	70.6
Requirement of perceived Govt. improvement	Yes	122	96.8
	No	4	3.2
Frequency of Gynecologist visit	Once a month	3	2.4
	Once every 6 months	51	40.5
	Once a year	12	9.5
	So as required	60	47.6
	Sexually active	114	90.5
	Not sexually active	12	9.5
Source of awareness	Gynecologist	48	38.1
	Friends/Family	48	38.1
	Self-awareness	30	23.8
Regular menstrual cycle	Yes	122	96.8
	No	4	3.2
Partner's support	Yes	115	91.3
	No	11	8.7
Responsibility of birth control	Husband	90	71.4
	Wife	36	28.6

**Demographic statistics**

Out of total surveyed, 91% respondents are using birth control measures

**Bivariate Analysis****Table- 2:** Cost effectiveness of birth control measures

Birth control measures	Expensive	Moderate	Cheap	Total
Condoms	8	15	92	115
Contraceptive pills	26	30	59	115
Copper T	31	53	31	115
Hormonal injection	47	52	16	115
Female operation	63	23	29	115
Male operation	71	30	14	115
Female condoms	51	50	14	115
Pull out method	27	40	48	115
I pill	28	21	66	115
Vaginal ring	50	45	20	115

**Table- 3:** Awareness of birth control measures

Birth Control measures	Aware but scared of using	Aware but not using	Using	Unaware	Total
Condoms	6	48	61	0	115
Contraceptive pills	20	58	37	0	115
Copper T	34	57	24	0	115
Hormonal injection	30	50	8	0	88
Female operation	67	30	12	6	115
Male operation	60	49	6	0	115
Female condoms	12	42	0	61	115
pUll out method	24	24	30	37	115
I pill	30	30	44	11	115
Vaginal ring	12	36	0	67	115

**Table- 4:** Comfort in using birth control measures

Using Birth Control measures	Completely Comfortable	Comfortable	Neutral	Not - comfortable	Completely Uncomfortable	Total
Condoms	56	36	13	10	0	115
Contraceptive pills	27	12	32	36	8	115
Copper T	28	8	36	37	6	115
Hormonal injection	18	18	21	34	24	115
Female operation	19	12	10	16	58	115
Male operation	7	0	28	22	58	115
Female condoms	13	8	19	29	46	115
Pull out method	35	19	20	18	23	115
I pill	30	13	13	37	22	115
Vaginal ring	8	13	19	27	48	115

**Table-5:** Preference in using birth control measures

Birth control measures	High preference	Moderate	Not preferring	Total
Condoms	39	37	39	115
Contraceptive pills	43	15	57	115
Copper T	53	18	44	115
Hormonal injection	17	22	76	115
Female operation	27	15	73	115
Male operation	20	9	86	115
Female condoms	12	19	84	115
Pull out method	49	20	46	115
I pill	33	22	60	115
Vaginal ring	18	14	83	115

**Table- 4:**Age and Frequency at which females are visiting their gynecologist

		Frequency of visit to gynecologist				Total
		Once a month	Once every 6 mths	Once a year	So as required	
Age (yrs)	25-30	1	16	4	21	42
	30-35	1	10	3	12	26
	35-40	1	12	3	17	33
	40-45	0	13	2	10	25
Total		3	51	12	60	126

**Table- 5:** Age and whether they have regularity of menstrual cycle

		Regular menstrual cycle		Total
		Yes	No	
Age (yrs)	25-30	41	1	42
	30-35	26	0	26
	35-40	33	0	33
	40-45	22	3	25
Total		122	4	126

**Table- 6:** Age and usage of birth control measures

		Usage		Total
		Yes	No	
Age (yrs)	25-30	38	4	42
	30-35	22	4	26
	35-40	32	1	33
	40-45	23	2	25
Total		115	11	126

**Table- 7:** Number of children and frequency of visit to gynecologist

		Frequency of Gynecologist visit				Total
		Once a month	Once every 6 months	Once a year	So as required	
No of children	0	0	4	5	6	15
	1	2	34	5	25	66
	2	0	12	0	24	36
	More than 2	0	0	2	5	7
	Pregnant	1	1	0	0	2
Total		3	51	12	60	126

**Table- 10:** Number of children and sexually active

		Sexually active		Total
		Yes	No	
No. of Children	0	15	0	15
	1	55	11	66
	2	36	0	36
	<2	6	1	7
	Pregnant	2	0	2
<b>Total</b>		<b>114</b>	<b>12</b>	<b>126</b>

**Table-11:** Number of children and usage of birth control measures

		Usage		Total
		Yes	No	
No. of Children	0	15	0	15
	1	57	9	66
	2	36	0	36
	<2	6	1	7
	Pregnant	1	1	2
<b>Total</b>		<b>115</b>	<b>11</b>	<b>126</b>

**Table- 8:** Hypothesis statistics

Variables	Test used	Statistics	Null Hypothesis Accepted/ Rejected	Findings
Age and Frequency of Gynec visit	Chi square	0.979	Accepted	Age is not having significant impact on frequency of Gynec visit by women
Age & Regular menstrual cycle	Chi square	0.039	Rejected	Age is having significant impact on regular menstrual cycle
Age & use birth control measures or not	Chi square	0.417	Accepted	Age is not having significant impact on whether women are using birth control measures or not
Number of children and gynec visit	Chi square	0.000	Rejected	Number of children is having significant impact on frequency with which women are visiting gynecologist
No of children and sexually active or not	Chi square	0.046	Rejected	Number of children is having significant impact on whether women are active or not
Number of children and use or not	Chi square	0.022	Rejected	Number of children is having significant impact on whether these women use birth control measures or not
Sexually active and awareness	Independent Samples Test	0.012	Rejected	Sexually activeness is having significant impact on awareness about different birth control measures
Sexually active and comfort	Independent Samples Test	0.195	Accepted	Sexually activeness is not having significant impact on comfort level in using different birth control measures
Sexually active cost	Independent Samples Test	0.066	Accepted	Sexually activeness is not having significant impact on perception of female towards pricing of birth control measures
Family income and awareness	ANOVA	0.002	Rejected	Family income is having significant impact on awareness about various birth control measures
Family income and comfort	ANOVA	0.066	Accepted	Family income is not having significant impact on comfort level in using birth control measures
Family income & cost	ANOVA	0.003	Rejected	Family income is having significant impact on perception of female towards pricing of various birth control measures
Profession and awareness	ANOVA	0.000	Rejected	Profession is having significant impact on awareness of birth control measures in women
Profession and comfort	ANOVA	0.23	Accepted	Profession is not having significant impact on comfort in birth control measures in women
Profession and cost	ANOVA	0.10	Accepted	Profession is not having significant impact on cost that women are bearing towards birth control measures in women
Education and awareness	ANOVA	0.835	Accepted	Education is not having significant impact on awareness of birth control measures in women
Education and comfort	ANOVA	0.536	Accepted	Education is not having significant impact on comfort in birth control measures in women
Education and cost	ANOVA	0.117	Accepted	Education is not having significant impact on cost that women are bearing towards birth control measures in women
Awareness	One sample test	0.000	Rejected	There is significant difference in awareness among different birth control measures
Comfort	One sample test	0.000	Rejected	There is significant difference in comfort level in using various birth control measures
Cost	One sample test	0.000	Rejected	There is significant difference in perception of female towards pricing of different birth control measures



## Findings

1. Out of total surveyed, 91% female respondents are using birth control measures
2. With regards to cost effectiveness, 50% females responded; perceive female operation and male operation as an expensive method. Wherein almost 80% female believe condoms to be most cost efficient instrument. Around 45-50% female are moderate about cost effectiveness of Copper T, hormonal injections and female condoms. I pill are considered cheap for 57% respondents, wherein vaginal ring falls under moderate and expensive categories equally.
3. With regards to awareness about various methods, 53% people are using condoms and 42% are aware but not using it because of other reasons. 50% respondents are aware of vaginal ring, hormonal injections and copper but not using it. More than 50% respondents are very much aware of female and male operations but they are very scared of doing it which really need awareness in Indian society. 38% respondents are using I pills and 37% people are aware about female condoms but none of them are using it.
4. 50% respondents are completely comfortable in using male condoms. 31% female respondents are not comfortable in using contraceptive pills. People are either neutral or not comfortable with Copper T. Female and Male operations are receiving negative opinion as 50% respondents are completely uncomfortable with both methods. 45% are completely uncomfortable to use female condoms as well as vaginal ring. Overall, copper T, pullout method, contraceptive pills and condoms are respectively most preferred measures as per female respondents.
5. Female visit Gynecologist once every 6 months or as and when required. More than 90% females are having regular menstrual cycle and 34% out of which are from age group 25 to 30 years.
6. Age is not having significant impact on frequency of Gynecologist visit and use of birth control measures but impacts the menstrual cycle. Number of children is having significant impact on frequency with which women are visiting Gynecologist, sexually active and use of birth control measures.
7. Sexually activeness is having significant impact on awareness but not on comfort level and price effectiveness of different birth control measures. Family income is having significant impact on awareness and pricing perception about various birth control measures not having that impact on comfort level in using it. Profession is having significant impact on awareness but not on comfort and price perception. Education is not having significant impact on awareness, comfort or price perception of birth control measures in women.

## Conclusion

This article aimed to present findings regarding the Usage of Birth control measures assessing it on factors like cost, ease of usage, awareness etc. Here, we point out that the underlying causes of less usage as various methods is less awareness and stigma related to their effectiveness. It was observed from the majority of the findings that the usage of birth control methods is nowhere related to their education or family income. Though the kind of profession they are in and the number of children a female has does have a significant impact on the usage of birth control methods. However, this review has certain limitations, i.e., including only females' point of view; secondly, the number of correspondents was limited due to the taboo nature of the topic. Further study incorporating more balanced demographic population could be helpful in identifying the bottlenecks and pave a way for better healthcare programs implementation. In our opinion, it is essential that traditional methods be preserved along with the need to bring out innovative and safe birth control measures. Further Studies can be done on populations of various cities to generalize the findings to the country.

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