JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

UTILIZATION OF MATERNAL, CHILD HEALTH, AND FAMILY PLANNING SERVICES IN PRIMARY HEALTH CENTRES: A STUDY AMONG WOMEN IN KOLLAM DISTRICT.

Selsa.S
[1]Associate Professor
Department of Home Science
Sree Narayana College for Women, Kollam

Abstract

Health, recognized as a fundamental human right, is central to sustainable development and human resource growth. The foundation of rural healthcare delivery remains primary health care, which was initially established in India by the Bhore Committee (1946) and reinforced by the Alma-Ata Declaration (WHO, 1978). Maternal and child health, family welfare, immunization, and health education are among the preventive, promotional, and curative services offered by PHCs . Maternal and child morbidity continues despite significant improvements, such as India's infant mortality rate dropping to 25 per 1,000 live births and fertility to 1.9.Recent studies highlight uneven utilization of PHC services, influenced by education, socio-economic status, and accessibility (Purbey *et al.*, 2025; Clinical Epidemiology & Global Health, 2024). Women's health directly impacts child survival , while inadequate maternal care continues to contribute to infant mortality .This study investigates the utilization of services provided by Primary Health Centres in maternal, child health, and family planning among women in Kollam district, Kerala. The research employed both theoretical and practical approaches, selecting PHCs at Mundakkal, Polayathode, Eravipuram, and Uliyakovil as study sites. A purposive sample of 100 women was surveyed using an interview schedule. The findings underscore the importance of strengthening PHCs as accessible, equitable, and community-cantered institutions to improve maternal and child health outcomes.

Keywords: child health, family planning, primary health centres, sustainable health, community, child morbidity.

Introduction

Health is universally recognized as a cornerstone of sustainable development at the individual, community, and national levels. It is essential for the development of human resources and directly influences the quality of life, thereby contributing to the social and economic progress of a nation. According to Margetts (2005), public health is the collective effort of society to protect and improve the health of everyone. The World Health Organization (WHO, 1948) further conceptualizes health as "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity," emphasizing its dynamic nature and its role as a fundamental human right. Primary health care (PHC) represents the first level of contact between individuals and the healthcare system. WHO defines it as necessary health care that is based on practical, scientifically sound, and socially acceptable methods, is available to everyone through community participation, and is affordable for both the country and the community.The Bhore Committee's recommendations in 1946 were the first to talk about primary health care in India. Since gaining independence, there has been a lot of progress in building up PHC services and infrastructure. However, there are still problems with reaching the goal of "Health for All" (Pandye, 2013). Primary Health Centres (PHCs)

are state-owned facilities that provide preventive, promotive, and curative services. They are the main way that people in rural areas get health care. A medical officer and paramedics usually work at each PHC, which serves about 100,000 people in about 100 villages (Park, 2009). These centers also serve as referral units for sub-centers and are prepared to offer maternal and child health services, family welfare programs, immunization, nutrition promotion, and health education (Mahapatra *et al*., 2007).Recent studies highlight both progress and persisting gaps in maternal and child health service utilization. For instance, Purbey *et al.* (2025) examined national survey data from 2005 to 2021 and identified substantial enhancements in maternal and child healthcare utilization, although disparities remain among socio-economic groups and regions. Despite these achievements, maternal and child morbidity and mortality remain pressing concerns. Women and children, as the most susceptible demographics in society, necessitate focused interventions. Gupta (2002) emphasizes that child health cannot be viewed in isolation; improvements in women's health directly enhance child survival and well-being. Similarly, Basch (1999) attributes infant mortality largely to inadequate maternal and newborn care.The Government of India has implemented several maternal and child health programs through PHCs and sub-centres, aiming to deliver preventive, promotive, and curative services. The Indian government has set up a number of maternal and child health programs through PHCs and sub-centers. These programs aim to provide preventive, promotional, and curative services. However, utilization of these services is influenced by multiple factors, including education, socio-economic status, cultural attitudes, and accessibility. This underscores the need to assess the extent of utilization of PHC services in maternal, child health, and family planning, particularly in districts such as Kollam, where rural populations depend heavily on these facilities.

Methodology

The methodology of the study combined theoretical and practical approaches to examine the utilization of services provided by Primary Health Centres (PHCs) in maternal, child health, and family planning among women in Kollam district. The research area included PHCs at Mundakkal, Polayathode, Eravipuram, and Uliyakovil, with 100 purposively selected samples. A structured questionnaire was used for collecting data. The study was undertaken with the objectives such as**; t**o examine the role of Primary Health Centres in delivering maternal and child health care services, **t**o assess the extent of utilization **of** maternal, child health, and family planning services among women, **to** explore community perceptions by identifying the aspects of PHC services that are appreciated and those that are viewed unfavourably.

Result and Discussion.

In the present study shows that among the 100 families surveyed, the largest proportion (30%) has attained graduation, making it the most common educational level. This is followed by 28% who have studied only up to +2, indicating that a significant section of families possess basic schooling but have not pursued higher education. Professionals account for 21%, reflecting a considerable presence of specialized, career-oriented qualifications such as medicine, engineering, or law. Postgraduates form 13%, suggesting moderate advancement beyond graduation, while undergraduates represent the smallest group at 8%, showing limited continuation without completion of a degree

Table.1.The level of female education is directly associated with the utilization of maternal and child health services.

Educational level	Utilization of maternal and child health service	
	Yes	No
Up to SSLC	25	3
Graduates	28	2
Post graduates	12	1
Professionals	18	3

P value = 0.9176, P › 0.05

Chi square test reveals that calculated value 0.9176 is greater than the table value 0.05. The data clearly shows the extent of female education is directly correlated with the utilization of maternal and child health services. Women with an SSLC education have a high utilization rate (25 out of 28), but this rate goes up even more for graduates (28 out of 30) and postgraduates (12 out of 13). This shows that higher education makes people more aware of and able to make decisions about health care. Interestingly, professionals have a slightly lower usage rate (18 out of 21), which could be because of work-related issues or because they use other private

health services. In general, the results are in line with what has already been said in the literature about how important education is for using maternal health services. Caldwell (1979) posited that female education markedly enhances health-seeking behavior, whereas Babalola and Fatusi (2009) discovered that educated women are more inclined to utilize antenatal and delivery care.

Table.2. Income of family per month.

Sl. No.	Income level	Percentage of families N=100
1.	Below 30,000	29
2.	30,001 to 40,000	30
3.	40,001 to 50,000	19
4.	Above 50,000	22

The above table shows that most of the respondents are in the lower to middle-income range. For example, 29% of them earn less than ₹30,000 and 30% earn between ₹30,001 and ₹40,000 a month. This accounts for almost 60% of the sample, which shows that most of them have low incomes. A smaller percentage (19%) make between ₹40,001 and ₹50,000, while 22% of families say they make more than ₹50,000, which is the higher-income group with more financial security. This pattern indicates income disparity within the sample, with the majority of households clustered in lower income brackets while a minority experience elevated earnings.

Table.3.Chi square test is used to find the relation between the age of the family member and the decision making to limit the size of the family.

Age	Size of the family		
	Up to 3	4 to 6	Above 6
15 – 34	32	27	2
35 - 54	6	27	2

P value = 0.0068m , P ‹ 0.05

The chi-square test examining the relationship between age and family size decision-making shows a statistically significant association, as the p-value (0.0068) is less than 0.05. Younger respondents aged 15–34 years are more likely to belong to smaller families, with 32 reporting up to three members compared to only six in the 35–54 age group. In families of 4–6 members, both age groups are represented equally (27 each), while in families above six members, both groups show minimal representation (two each). This indicates that younger individuals demonstrate a stronger preference for limiting family size, reflecting changing attitudes influenced by education, awareness of health services, and socio-economic considerations, whereas older respondents are more commonly associated with medium-sized families, suggesting adherence to traditional norms. Overall, the significant chi-square result confirms that age plays an important role in shaping decisions about family size.

Table.4. Utilization of maternal and child health services

Sl. No.	Utilization of maternal and child health services	Percentage of families N=100
1.	Fully	90
2.	Partially	10

The data on how many families used maternal and child health services shows that 90% of them did, while only 10% did not. The high level of use shows that the sample is well-informed about and has easy access to maternal and child health programs. This shows that public health efforts to improve the health of mothers and children are working. The limited number of non-users may be due to obstacles like cultural beliefs, lack of knowledge, or logistical difficulties. These findings align with national data from the national family health survey (Nfhs-5, 2019), which indicated substantial enhancements in the utilization of maternal and child health services throughout India, encompassing antenatal care, institutional deliveries, and child immunization.

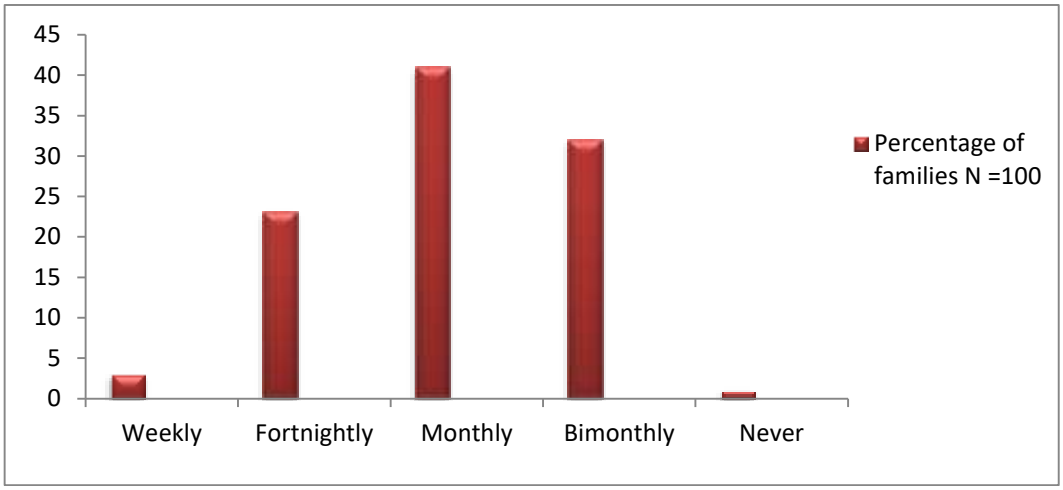

Figure.1. Visit of health workers to families.

The data show that health workers visit families most often once a month (41%), then twice a month (32%), then every two weeks (24%), every week (3%) and finally never visited (1%). This distribution shows that families do get regular visits, but most of them are spaced out over longer periods of time. The literature points out that the frequency of health worker visits is directly correlated with enhanced health outcomes and service utilization. For instance, Scott *et al (*2021), say that regular visits from community health workers improve household health behaviors, build trust, and make it easier to get primary care services .

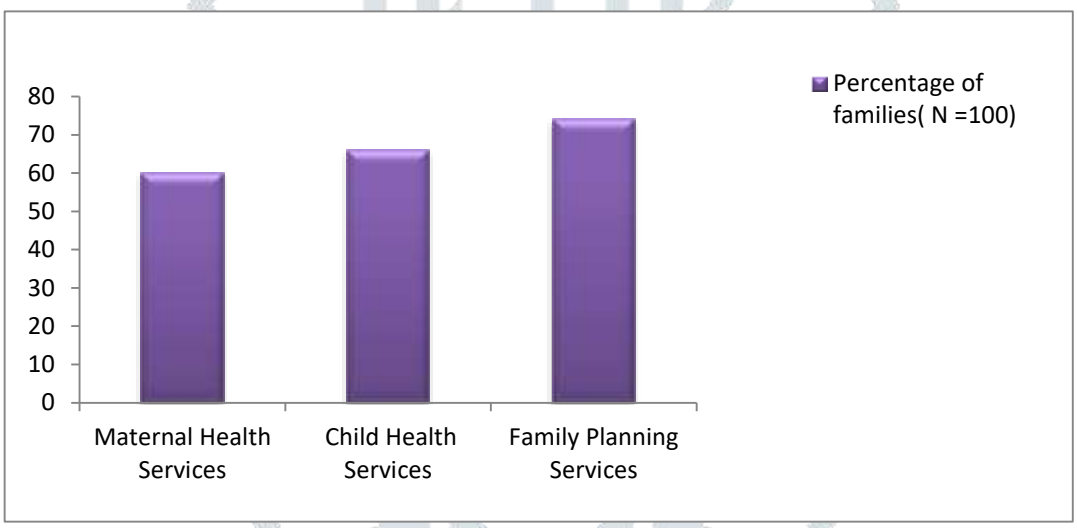

Figure.2. Services availed by family.

The data shows the kinds of health services that families availed from primary health centre. The 100 households that were surveyed used family planning services the most (74%), followed closely by child health services (66%). Maternal health services were used by 60% of the households. This distribution indicates that families emphasize preventive and forward-looking health strategies, especially those that safeguard child welfare and manage fertility.Ahmed *et al.(*2012), also stress that maternal and child health services, along with family planning, greatly lower the number of mothers who die and make health systems as a whole stronger The findings indicate that households perceive health services in a comprehensive manner, with family planning acting as a conduit to enhanced maternal and child health outcomes.

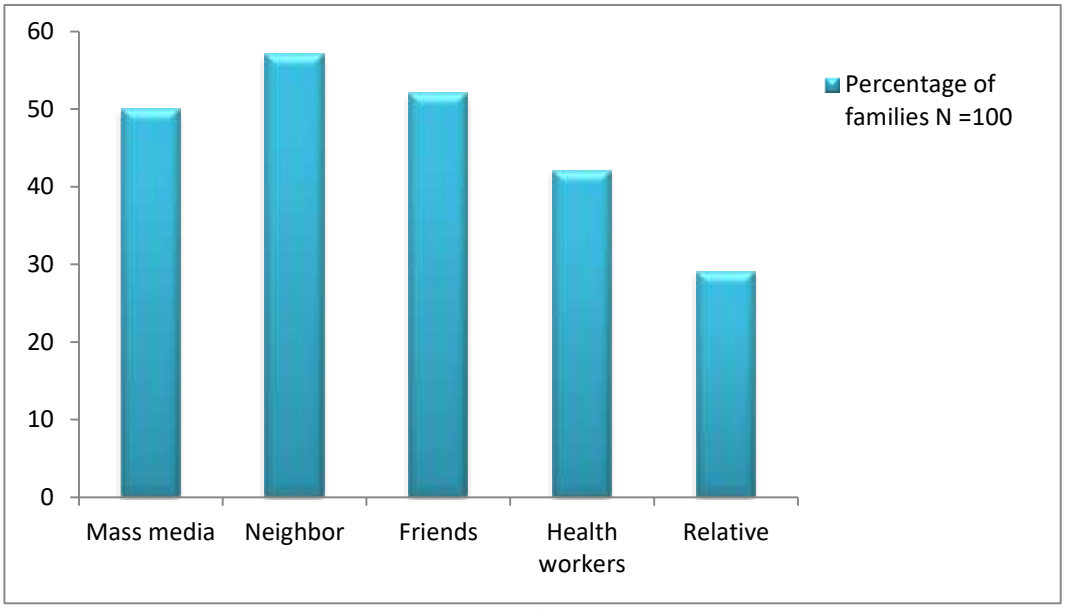

Figure.3. Sources of information about maternal and childcare services provided by primary health centre.

The data shows that the majority of families get their information about maternal and childcare services from informal social networks, such as neighbors (57%) and friends (52%). Mass media (50%) is a close second. Conversely, direct communication from healthcare personnel (42%) and relatives (29%) is comparatively less significant. This pattern shows how important community-based and peer-to-peer communication is for raising health awareness. This is in line with research that shows that interpersonal networks are often trusted and easy-to-access sources of health information in low- and middle-income countries (Rimal and Lapinski ,2009). Mass media also becomes a major source, showing how it plays a big part in spreading public health campaigns and messages about maternal health (Wakefield *et al.*2010).

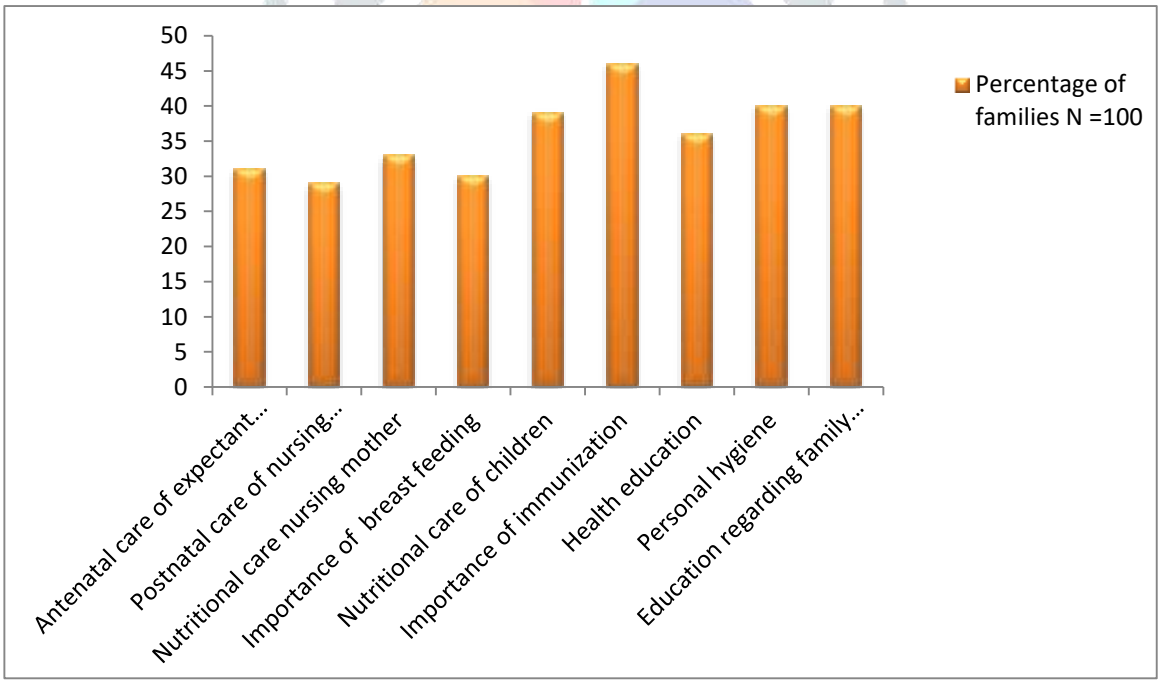

Figure.4. Information provided by the primary health centre staff

The data show that the most common information given by PHC staff is about the importance of immunization (46%), personal hygiene (40%), and family planning education (40%). Other areas include taking care of children's nutrition (39%), teaching them about health (36%), taking care of nursing mothers' nutrition (33%), breastfeeding (30%), prenatal care (31%), and postnatal care (29%). This distribution indicates that although preventive and promotive health messages are being disseminated, there is a disparity in emphasis, with immunization and hygiene receiving more focus than maternal health education. This kind of prioritization shows what the country's health priorities are, but it also shows that there aren't enough comprehensive counseling services for mothers and children. Research shows that health education given by

PHC staff can help improve the health of the whole community. Nair *et al*.(2016)assert that proficient communication by frontline health workers regarding immunization, nutrition, and hygiene markedly improves awareness and the adoption of healthy practices within families, thus fortifying primary healthcare delivery.

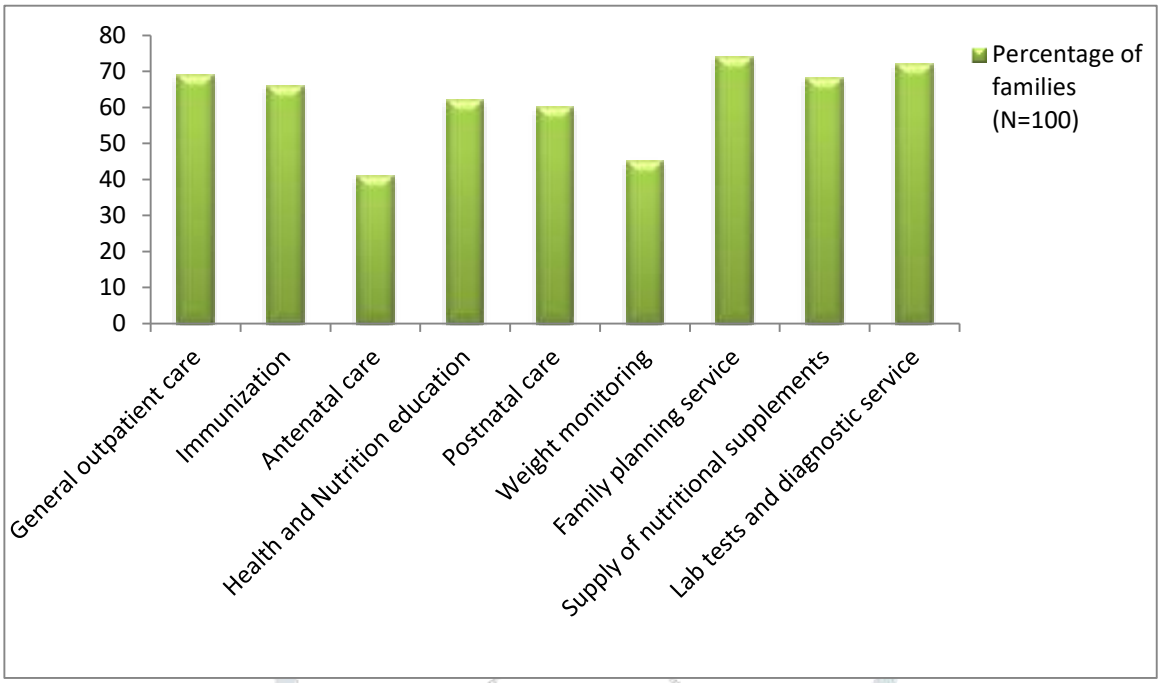

Figure. 5. Services received from health centres.

The data show that the most common services people use at health centers are general outpatient care (69%) and the supply of nutritional supplements (68%). After that, people use postnatal care (58%), immunization (66%), weight monitoring (45%), antenatal care (41%), Lab test and diagnostic service (72%), family planning services (74%), and health and nutrition education (22%). This pattern shows that people are more likely to use curative services and nutritional support than preventive and promotive services like health education and family planning. These differences show that there are bigger problems with primary healthcare delivery, where short-term medical needs often take precedence over long-term preventive strategies. Supporting literature underscores this disparity: Reddy *et.al,*. contend that although India's PHCs have broadened access to essential curative and maternal-child health services, preventive care and health education remain insufficiently prioritized, hindering the prospects for enduring enhancements in community health outcomes.

Table.5.Frequency of home visit by the health personnel during post natal period.

Sl. No.	Frequency of visit during post-natal period	Percentage of families N =60
1	Weekly	10 (16)
2	Monthly	42 (70)
3	Fortnightly	35(58.3)
4	Rarely	9(15)
5	Not visited	4(6.7)

The data indicate that most families (70%) reported monthly visits from health personnel during the postnatal period, followed by fortnightly visits (58.3%), weekly visits (16%), infrequent visits (15%), and no visits at all (6.7%). This distribution shows that most families do get some kind of postnatal follow-up, but not very often. Only a small number of families have contact with their doctor every week. Regular postnatal visits are very important for keeping an eye on the mother's recovery, the baby's health, and giving advice on breastfeeding, nutrition, and family planning. Literature underscores that insufficient frequency of postnatal visits can jeopardize maternal and child health outcomes. Titaley *et. al.*,2010, say that regular postnatal care visits are strongly linked to lower rates of illness in mothers and newborns because they give doctors a chance to find problems early and encourage healthy.

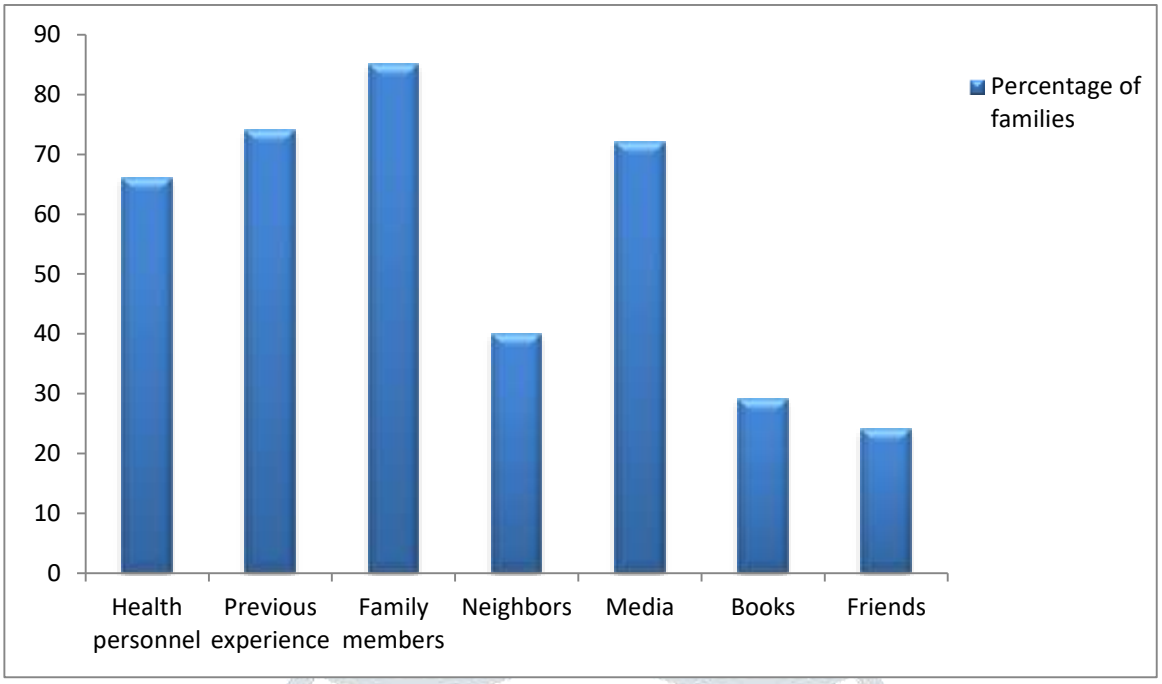

Figure.6. the source of motivation for child immunization.

Table.6. Frequency of Home visit by the health personnel after child immunization.

Sl. No.	When they visit	Percentage of families (N = 66)
1	Next day	14(21.2)
2	After one week	35 (53)
3	After one month	14 (21.2)
4	Not at all	3 (4.5)

The data show that health workers most often visit families one week after their child gets vaccinated (53%). Visits happen less often the next day (21.2%) or after one month (21.2%), and only a very small number (4.5%) say they don't get any follow-up at all. The results show both strengths (high overall follow-up coverage) and weaknesses (limited early visits). This shows that there needs to be more consistent contact with parent's right after immunization to boost their confidence and safety surveillance.

Table.7.Reasons for accepting contraception among households.

Sl. No.	Reason for accepting contraception	Percentage of families (N=74)
1.	Health problems	15 (20.3)
2.	Work load	7(9.5)
3.	To limit family size	10 (13.5)
4.	For effective child rearing	38 (15.3)
5.	For welfare of the family	30(40.5)

Table.7.shows that there are many different reasons why households accept contraception. The primary reason, identified by 40.5% of families, is the welfare of the family, highlighting how reproductive decisions are frequently contextualized within larger issues of economic stability, social well-being, and public health. A substantial percentage (20.3%) cited health issues as a motivating factor, indicating the recognized correlation between maternal health risks and contraceptive use. Limiting family size (13.5%) and effective child rearing (15.3%) also come up as important factors. This suggests that families see contraception as a way to balance their care giving duties with the resources they have. Interestingly, workload (9.5%) was also noted, pointing to the intersection of reproductive decisions with women's labour burden. These results align with previous research that underscores contraception as not only a biomedical intervention but also a socio-economic strategy. For example, Cleland *et.al*., (2012) say that family planning helps reduce poverty and improve child survival by helping parents use their resources better.

Table.8. Family planning methods availed by the family from primary health centre.

Sl. No.	Methods	Percentage of families (N=74)
1	Oral contraceptives	29
2	Condoms	6
3	IUCD	30
4	Sterilization	9

The data indicate that among families accessing services at the Primary Health Centre, the most commonly availed methods are IUCD (30%) and oral contraceptives (29%)**,** while fewer families rely on sterilization (9%) or condoms (6%)**.** This pattern suggests a preference for long-term and semi-permanent methods (IUCD) as well as accessible, reversible options (oral contraceptives), reflecting both the influence of health system availability and family planning priorities. Overall, the findings emphasize that families tend to choose methods that balance effectiveness with flexibility, aligning with broader public health goals of promoting safe, acceptable, and sustainable contraceptive practices. Bongaarts and Bruce, 1995 argue that contraceptive choice is shaped by both service delivery and social context, with reversible methods often preferred due to their adaptability to family needs and changing circumstances.

Table.9.Pre-acceptance education on contraception among households.

Sl. No.	Pre acceptance education	Percentage of families N=74
1.	Received	21 (28.4)
2.	Not received	53 (71.6)

The data show that only 28.4% of families got education on birth control before they got pregnant. The other 71.6% did not. This shows that there is a big gap in counselling and awareness efforts at home. To improve acceptance and long-term use of family planning methods, it would be important to make counselling services stronger at the community and primary health care levels. Cleland *et.al.*,2006, stress that counselling and education must be part of effective family planning programs to make sure that people can make informed choices, lower unmet needs, and raise continuation rates.

Table.10.Sources of pre-acceptance education on contraception among families.

Sl. No.	Person who gave pre acceptance education	Percentage of families N=74
1.	Health personnel	45 (60.8)
2.	Satisfied adopters	20(27)
3	Not received	9

The data indicate that within households, 60.8% received pre-acceptance education on contraception from health professionals, 27% learned from satisfied adopters, and 9 families did not receive any education whatsoever. This shows that trained health workers are still the main source of contraceptive counseling, which makes sure that the information is correct and trustworthy. The small number of families without any education shows that there is a gap in outreach that could make it harder for people to make informed decisions and keep using the service. .Cleland *et.al.*,2006, contend that successful family planning initiatives necessitate the integration of health worker counseling with community-level information dissemination, as peer experiences frequently bolster trust and acceptance, while professional guidance guarantees informed decision-making.

Table.11.Availability of follow-up services after family planning adoption among households.

Sl. No.	The follow up services received after family planning adoption	Percentage of families N=74
1.	Received	63(85.1)
2.	Not received	11(14.86)

The data show that 85.1% of households that used family planning methods got follow-up services, while only 14.86% did not. This shows that post-adoption support is usually good, so most families get counseling, monitoring, and management of side effects, which are all important for continued use of birth control.Cleland *et.al.*,2006, contend that follow-up services are integral to family planning programs, as they mitigate

complications, offer reassurance, and enhance continuation rates, thereby guaranteeing that adoption results in effective and enduring utilization.

Table.12.Satisfaction with the service provided by primary health centre.

Sl. No.	Satisfaction with the service provided by primary health centre	Percentage of families N=100
1.	Yes	88
2.	No	12

The data show that 88% of households were happy with the services provided by the Primary Health Centre, while only 12% were unhappy. This shows that the Primary Health Centre is mostly meeting families' needs by providing health services that are easy to get to and use, which builds trust and encourages people to use them.Rao *et al.*2006, assert that patient satisfaction serves as a principal metric for assessing the quality of primary health care, as it signifies both the efficacy of service provision and the extent to which health systems address community needs.

Table.13.Factors contributing to satisfaction with primary health centre services among households.

Sl. No.	Reasons	Percentage of families N=88
1.	Nearness	28 (31.8)
2.	Availability of free medicine	57(64.8)
3.	Good service	39 (44.3)
4.	Good and clean environment	21(23.9)

* Multiple responses

The information shows that a number of important things affect how happy people are with the services at the Primary Health Centre. The most common reason was that the medicine was free (64.8%), followed by good service (44.3%), the centre being close (31.8%), and a clean and pleasant place to be (23.9%). These results indicate that both accessibility and quality of care significantly impact satisfaction, with material support (free medicines) being the most critical factor. The significance of service quality and cleanliness underscores that families prioritize not only medical care but also the comprehensive experience of care. These factors show that satisfaction is made up of more than one thing. Study by Rao et.al.,2006, stress that patient satisfaction in primary health care is influenced by accessibility, the availability of medications, provider conduct, and the physical environment of health facilities, all of which directly impact utilization and trust in the health system.

Table.14.Factors contributing to dissatisfaction with primary health centre services among households

Sl.No.	Reasons	Percentage of families (N=12)
1.	Distance	8(66.7)
2.	Absence of doctors	2 (16.7)
3.	Bad treatment by the staff	6 (50)
4.	Lack of availability of medicine	3 (25)
5	Long waiting time	9(75)

The data show that most households are unhappy with Primary Health Centre services because of distance (66.7%) and long wait times (75%). Other reasons include bad treatment by staff (50%), not having enough medicine (25%), and not having enough doctors (16.7%). These results indicate that problems with accessibility and service delivery are the biggest problems, with distance and wait times being especially important in making people think negatively. Poor staff behaviour and a lack of resources make people even more unhappy, showing that there are systemic problems that hurt trust and use of primary health care. Overall, the results show that making services more accessible, cutting down on wait times, making sure medicine is available, and building stronger relationships between providers and patients are all important for improving satisfaction and service quality. Rao *et.al.*,2006, discovered that patient dissatisfaction in primary

health care frequently correlates with prolonged waiting periods, insufficient medication availability, and adverse staff attitudes, highlighting the necessity for responsive and patient-centred service delivery.

Conclusion

The study shows that nuclear families are the most common type of family in Kollam. This is in line with larger social and cultural changes toward smaller households. There is a strong link between women's education and the use of maternal and child health services, which shows how important it is for improving health outcomes. Patterns of work and income show that the economy is getting more diverse, but inequality is still a problem, with most families living in lower-income areas. People use a lot of health care, especially for family planning, child health, and immunization services. However, there is still not enough preventive education and maternal health counselling. Service delivery is affected by problems with accessibility, such as long distances to health centres, needing to rely on transportation, and health workers not visiting often enough. Most people are happy with PHC services because they are free and the service is good. However, some people are unhappy because of problems with the system, such as long wait times, staff behaviour, and a lack of resources. In general, the results show that we need to improve education, make healthcare more accessible, improve preventive counselling, and promote patient-centred service delivery. Taking all of these factors into account will strengthen trust in PHCs and lead to long-lasting improvements in the health of mothers and children.

References.

[1]. Ahmed, Saifuddin, *et a*l.2012. Maternal Deaths Averted by Contraceptive Use: An Analysis of 172 Countries. The Lancet, 380(9837):111–125.

[10].Mahapatra, Prasanta, *et al*.2007.Role of Primary Health Centres in Rural Health Care. Indian Journal of Public Health, 51(2):72–76.

[11].Margetts, Barrie.2005.Public Health Nutrition. Oxford: Oxford University Press.

[12].Nair, Manisha, *et al*.2016.Community Health Workers in India: A Review of Their Effectiveness and Challenges. Journal of Health Studies,18(2):110–120.

[13].Pandye, R.2013.Challenges in Primary Health Care in India. Journal of Community Medicine, 8(3):145–150.

[14].Park, K.2009.Park's Textbook of Preventive and Social Medicine. 18th ed., Jabalpur: Banarsidas Bhanot Publishers.

[15].Purbey, Anurag, *et al*.2025.Trends in the Utilisation of Maternal and Child Healthcare Services from the Public and Private Health Sectors in India, 2005–2021: An Analysis of Cross-Sectional Survey Data. BMJ Open, 15(2):082241.

[16].Rao, Krishna Dipankar, David H. Peters, and Karen Bandeen-Roche.2006.Towards Patient-Centered Health Services in India—A Scale to Measure Patient Perceptions of Quality.International Journal for Quality in Health Care, 18(6):414–421.

[17].Reddy, K.S., *et al*.2011.India's Progress in Health Outcomes. Lancet, 377(9764):505–515.

[18].Rimal, Rajiv N., and Maria K. Lapinski.2009.Why Health Communication Is Important in Public Health. Bulletin of the World Health Organization, 87(4): 247–247.

[19].Scott, Kerry, *et al*.2021.What Do We Know About Community Health Workers? A Systematic Review of Existing Reviews."Human Resources for Health Observer Series, no. 19, World Health Organization, 2021.

[2].Babalola, Stella, and Ayodeji Fatusi.2009.Determinants of Use of Maternal Health Services in Nigeria—Looking Beyond Individual and Household Factors.BMC Pregnancy and Childbirth, 9(43):1–13.

[20].Titaley, Christiana R., Cynthia L. Hunter, Peter Heywood, and Michael J. Dibley. "Why Don't Some Women Attend Antenatal and Postnatal Care Services?: A Qualitative Study of Community Members' Perspectives in Garut, Sukabumi and Ciamis Districts of West Java Province, Indonesia. BMC Pregnancy and Childbirth,10(61):1–12.

[21].Wakefield, Melanie A., Barbara Loken, and Robert C. Hornik.2010.Use of Mass Media Campaigns to Change Health Behaviour. The Lancet, 376(9748): 1261–1271.

[22].World Health Organization. 1978.Declaration of Alma-Ata. International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 Sept.

[23].National Family Health Survey (NFHS-4). 2019.India Fact Sheet. Ministry of Health and Family Welfare, Government of India.

[3].Basch, Charles E. 1999.Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. New York: Teachers College, Columbia University.

[4].Bhore Committee Report.1946. Health Survey and Development Committee. Government of India.

[5].Bongaarts, John, and Judith Bruce.1995. The Causes of Unmet Need for Contraception and the Social Content of Services. Studies in Family Planning, 26(2):57–75.
[6].Caldwell, John C.1979.Education as a Factor in Mortality Decline: An Examination of Nigerian Data. Population Studies, 33(3):395–413.
[7].Cleland, John, *et al*.2006.Family Planning: The Unfinished Agenda. The Lancet, 368(9549):1810–1827.
[8].Clinical Epidemiology and Global Health. 2024.Availability of Public Health Facilities and Utilization of Maternal and Child Health Services in Districts of India,18:101–110.
[9].Gupta, M.C. 2002.Child Health in India. New Delhi: Jaypee Brothers Medical Publishers.