



## A COMPARATIVE STUDY ON FAMILY HEALTH CENTERS IN KERALA

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**“Healthy citizens are the greatest asset any country can have.” – Winston Churchill**

**Purpose:** The role that public health care systems play in global health is very important. Health care has changed so much over time to meet the needs of the population in the current setting. People all over the world are being impacted by every incentive offered by public health care. It addresses a wide range of issues that affect individuals' health and well-being. In order to generalize the effectiveness of family health centers in Kerala, primary and secondary data were used to compare the efficiency of Family Health Centres in Thiruvananthapuram.

**Theoretical framework:** Amartya Sen's capability approach and the introduction of HDI represented a paradigm change in the development discourse that raised the priority given to the role of health in human development. According to this perspective, an individual's capacity to carry out their "doings and beings" or "functionings" depends on their ability to do so (sen,2003). Being free from illness is considered to be one of the primary capabilities, hence health is an essential component of the capability approach.

**Design/methodology/approach:** It is a survey research which is quantitative/empirical in nature. Multi-stage random sampling has been used to collect the data. At the first stage the District of Thiruvananthapuram has been chosen randomly as it's the first district in Kerala where Aardram Mission has been introduced and made a trial. In the second stage Vattiyoorkavu and Chemmaruthy Family health Centres (FHC) are chosen from the district randomly in which one belong to the rural area (Chemmaruthy) and the other belongs to urban area (Vattiyoorkavu).In the third stage beneficiaries are chosen randomly. Ten percent of the total Out Patients who visited the FHC for the previous two days from the date of the survey (12 March 2022) were taken for the study. Chemmaruthy FHC had a visit of 552 patients for two days, so 10 percent, that is, 55 patients were surveyed on the date of survey. Vattiyoorkavu FHC had a visit of 365 patients for two days OP, similarly, 36

patients were brought under the study. Permission from the District Medical Office was obtained to carry out the field survey.

Two well-structured questionnaires were used for data collection. One consists of questions about her FHC performance and the other about patient satisfaction. The former must be collected from the FHC's designated staff and the latter from the facility's beneficiaries. Details were collected through structured questionnaire. Then Descriptive statistics, graphs, percentages, and the econometric technique of principle component analysis are utilized in the study.

**Findings:** This study's findings will shed light on how effectively grassroots health care institutions decentralize providing individual health care services. Family Health Centers are a part of new program launched by the State Government of Kerala called Aardram Mission, with the objective to revamp and revitalize the Primary Health care system in 2017. Five years down the lane how far this program has achieved its objective is a major area of concern. The study will uncover critical areas of Family Health Centres in rendering health Care services to the public.

**Research, Practical & Social Implications:** It is a research study which measures how effective our public health programme is in delivering good quality health care to all. And it also throw lights on the fact that how the government is taking care of its people by implementing new initiatives ,especially in protecting the health of its people will definitely have its own implication in different frontiers.

**Originality/value:** I hereby attest that the research paper I have submitted is the result of my own independent and unique labour. All of the sources from which the thoughts and passages were derived have been properly credited. The work has not been submitted for publication anywhere and is devoid of any instances of plagiarism.

*Keywords: Health, Healthcare, Primary Health Centre, Primary health centers, Aardram Mission*

## INTRODUCTION

Health is an incentive to support an individual's function in a wider society. There are two types of health that are frequently discussed: They are mental and physical well-being. Living a lifestyle that lowers one's risk of disease is what it means to be physically well. Although mental health is just as important as physical health, it's hard to define. In addition to the absence of anxiety, depression, and other mental health conditions, mental health includes the capacity to enjoy life, overcome challenges, and reach one's full potential. There is a link

between mental and physical health. Stress and depression can result from a poor physical condition. These more general aspects of physical, mental, and social health are the focus of primary health care. It guarantees comprehensive health care for treatment, including rehabilitation, promotion, and prevention, as well as palliative care.

"Primary Health Care(PHC) is a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment." World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF). A vision for primary health care in the 21st century: Towards Urban Health Care and the Sustainable Development Goals. The most inclusive, equitable, cost-effective, and efficient method for improving people's social well-being as well as their physical and mental health is primary health care (PHC). Around the world, evidence of the extensive impact of investing in PHC continues to grow, particularly during times of crisis like the COVID-19 pandemic.

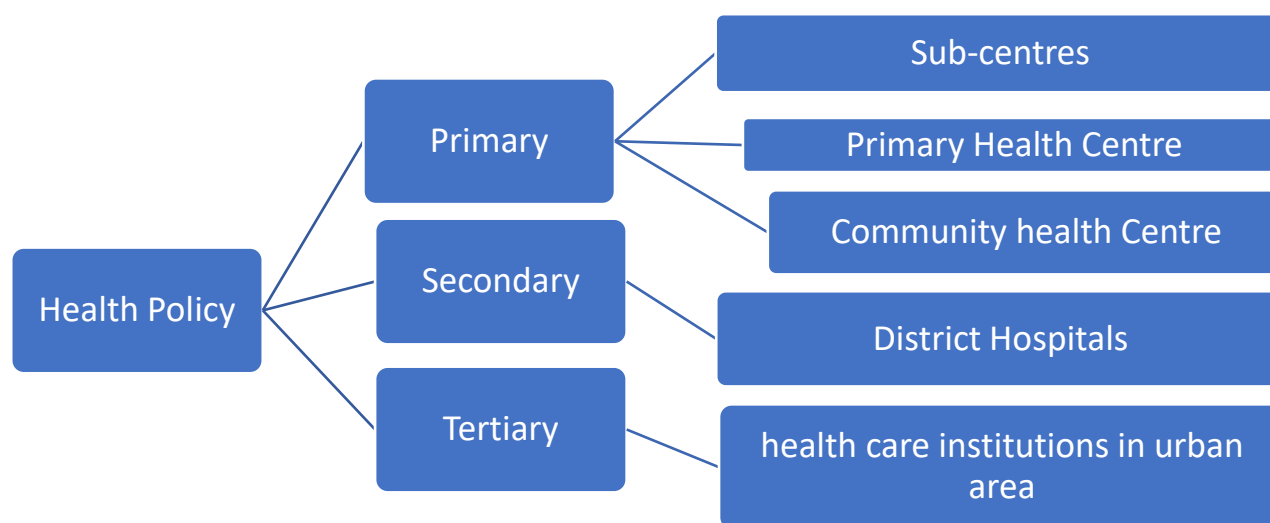
The objectives of PHC fall into three broad categories: primary care, multispectral policy and action, empowering individuals and communities, and essential public health functions. An ideal health care model was established in the 1978 declaration of the international conference on primary health care held in Alma-Ata, Kazakhstan. Barefoot doctors are one of many things that sparked the idea for the Primary Health Care initiative. The following are the WHO's five essential components for achieving its objective: reforms to service delivery, public policy, leadership, and universal coverage, as well as an increase in stakeholder participation.

The Alma Ata declaration lays out a number of principles that must be followed in order to establish and maintain PHC as part of comprehensive health systems. The multi-sectional approach, equitable distribution of health care, community participation, utilization of appropriate technology for human health resources, and to put it succinctly, PHC aims to address socioeconomic factors that influence poor health. Even though Alma Ata came up with strategic goals, many people around the world criticized and responded to them because the goals were too broad and unclear. Because of this, approaches to primary health care (PHC) have developed in different contexts to take into account resource disparities and local health issues of importance. The Selective Primary Health Care approach (SPHC) is another name for this.

Kerala has organized health care even before the arrival of the European medicine system. Thiruvananthapuram and Cochin principalities had accessible medical facilities prior to the state's formation.

Primary and secondary health centers, two malaria control units, and 138 maternal child welfare units were established during the first five-year plan period. The improvement of healthcare facilities for the prevention of communicable diseases was the primary focus of the second five-year plan. 39 new dispensaries and 80 maternal and child centers were included in the third five-year plan, and the fifth plan focused on school-level disease prevention. Since 1996, the Gram Panchayath has been responsible for PHC management and control, and they have the authority to allocate funds for PHC. However, the establishment of the National Rural Health Mission marked a ground-breaking step in the revitalization of the rural health system. Through health centers, the NRHM 2005 aimed to improve rural populations' health. CHC later received palliative care services during the 12th plan period at the institutional level.

**Figure 1:** Health policy system in Kerala.



In order to broaden people's access to healthcare, our health policy envisions a three-tier structure that includes primary, secondary, and tertiary healthcare levels. A Sub-Centre (SC) for 3000 to 5000 people, a Primary Health Centre (PHC) for 20000 to 30000 people, and a Community Health Centre (CHC) as a referral center for every four PHCs for 80,000 to 1.2 lakh people make up the primary tier of healthcare facilities. The district hospitals were to provide primary care to the urban population and serve as the second level of care for rural patients. It was planned that urban healthcare facilities with sophisticated diagnostic and investigative facilities would provide tertiary healthcare (Figure 1).

“Kerala's growth rate from the first plan to the 12th plan is 54.5%, while CHC's growth rate from the first plan to the 12th plan is 6.90%. PHC has a growth rate of 1.77 percent in India and 3.28 percent in Kerala. In India, sub-centers expand by 17.05%, with Kerala experiencing negative growth of 1.015 percent. The standardization of healthcare facilities was the cause of this. During the sixth five-year plan, which ran from 1981 to 1985, there were 4 Community Health Centers in Kerala and 761 in India. Later on, there were 5,396 institutions in India and 222 in Kerala. In terms of primary health centers, India had 9,115 and Kerala had 199, respectively. It was increased to 25,875 in India and 944 in Kerala following the 12th five-year plan. In the case of sub-centers, the situation was different because, in 2009, the standardization of health institutions led to a decrease in the number of sub-centers and PHCs” (Rural Health Statistics 2015).

The state of Kerala made the decision to prepare with a ground-breaking program called Aardram Mission rather than resorting to previous entices. The mission began operations in November 2016. Sub-centers, PHCs, CHCs, Medical College Hospitals (MCH), and Regional Cancer Centers (RCCs) are among the state's excellent network of hospitals. However, due to their inability to manage a large number of patients, MCs are unable to effectively provide their services. The quality of these institutions' delivery services will be impacted by this. This is mostly because there isn't a good system for keeping people out. For ailments that could have been treated at lower-level hospitals, many people go to Medical College hospitals. This is mostly because lower-level hospitals don't provide the right care or treatment, beneficiaries don't feel confident approaching them, and the number of casualty cases has gone up. People are forced to directly approach higher-level institutions like medical Colleges of all of these factors.

With MCHs and specialist hospitals serving only as referral hospitals, the only solution to this issue is to strengthen the lower-level hospitals so that they can effectively address the majority of health issues. The Kerala government has launched the Aardram Mission to transform public healthcare facilities. Aardram Mission aims to expand specialty and super specialty services to district and taluk hospitals as well as to government hospitals by providing people-friendly health care. Its objective is to transform Primary Health Centers into Family Health Centers, a distinct initiative designed to meet the healthcare requirements of each family member. It has objectives like a web-based appointment system, registration, patient reception, e-display boards, writing rooms, improved sanitation, drinking water, signboards, and other things. Web-based referrals to higher-level hospitals will be made possible by this. The mission addresses the local community's preventive, promotion, and rehabilitation interventions as well as the family's health care requirements.

In addition to the usual Out Patients (OP), primary prevention of communicable and non-communicable diseases will be the primary focus of FHCs. The FHCs will be in charge of providing services for mothers and

children, controlling lifestyle diseases, and preventing infectious diseases. Teens, couples, the elderly, and addicts will all have access to counseling services at FHCs. FHCS's outpatient facilities will be open Monday through Saturday from 9 a.m. to 6 p.m., and from 9 a.m. to 1.30 p.m. on Sundays, also from 8 a.m. to 4 p.m., laboratory facilities will be available.

At its organizational levels, the Mission places a high value on PHCs, taluks, and district hospitals. The Local Self Government plays a crucial role in ensuring that the mission runs smoothly. This mission relies heavily on the Health Services Department, medical education committee, hospital management committee, and others. Additionally, it is anticipated that these institutions will appropriately address and combat health hazards. However, it's interesting to note that the majority of Aardram Mission's goals align with those of the 2018 Astana Conference. By the year 2020, all of the state's primary health centers will be transformed into Family Health Centers. During the first phase (2017-2018), 170 institutions participated in the mission. 504 institutions were chosen in the second phase (2018-2019). In the first phase, sixteen PHCs from the Thiruvananthapuram district were successfully transformed into FHCs. Twenty of the approved 42 PHCs had been converted to FHC during the second phase. In total, the Trivandrum district has 36 FHCs. The study focuses on 16 completed FHCs from phase 1 in the Thiruvananthapuram district as it can be considered as a testimonial.

The study intends to throw lights on the following objectives:

1. To assess the performance of the Family Health Centers of Thiruvananthapuram district.
2. To determine how satisfied beneficiaries are with FHCs.

## **LITERATURE REVIEW**

In 2010, Leiyu Shi et al. attempted to investigate the impact of the Health Care, Growth Initiative on the number and types of patients who visited health centers as well as health center characteristics that were significantly associated with service expansions. Conducted a time trend on a standard data system and attempted to observe the connection between the types of funding received and the variation in the number of patients and encounters in the study. The study found that the center's growth among patients has been rapid. When compared to the other centers, the total number of patients and encounters increased by 60% and 58%, respectively. The study highlighted the significance of public spending in expanding health center services.

Mohamad Alameddine et.al (2012) conducted a study on “The Retention of Human Resources in Primary Health Care Centers in Lebanon; a national survey” to investigate the characteristics of PHC human resources,

the likelihood of staff leaving, factors affecting staff retention, and burnout levels in Lebanon's PHCs. A survey of all employees was conducted in a cross-sectional study from 81 selected PHCs. Socio-demographic factors, organizational characteristics, the likelihood of quitting, and the degree of professional burnout were the variables studied. Bivariate analysis and multinomial logistic regression were the analysis tools used. Two out of five respondents indicated that they would like to quit their jobs. Poor pay, better job opportunities, and a lack of professional development were the main reasons people quit. As a result, the Lebanese healthcare system cannot support an extended role for PHCs with a workforce that is unstable. In their study titled "Patient satisfaction with primary healthcare in Kashmir," Saba Amin and Devesh Kumar (2018) attempted to portray patients' perceptions of PHC services. The goal of the paper was to provide government officials with insight into the poorly functioning PHCs so that they could immediately take corrective action. Indeed, the work was extremely beneficial because it helped administrators comprehend their administration-related issues and prospects.

Joel Freilich et al. conducted a questionnaire study of patients' and healthcare professionals' perspectives on patient ideas, concerns, and satisfaction in primary care (2019). The study's participants in planned consultations at five primary health centers and two PHCs were selected for a cross-sectional questionnaire study. During the consultation, approximately 75% of the patient's thoughts and explanations for their symptoms emerged. The majority of patients expressed their thoughts, while a small number expressed concerns and some anticipated explanations for their illness.

Anitha C.V. and Dr. Navitha Thimmaiah (2013) presented a case study that examined the extent to which primary health care (PHC) is utilized in rural areas and the factors that influence the accessibility of PHC services. Kodakola PHC in the Mysore district has been selected for the study. The study utilized a 50-response random sample. The chi-square test and methods like dummy regression and correlation have been used in the research. Only 82% of people have access to PHC, it was found. Income, educational level, and distance are the barriers to access. Distance is the most important of these factors.

Jishnu Das et. al conducted a study on "Quality and Accountability in Health Care Delivery" was conducted in 2016; The majority of private providers lacked even basic medical qualifications, according to audit study evidence from primary care India, but they frequently recommend the right treatment equally and frequently. All quality metrics were higher in private clinics among doctors with public and private practices. Inconvenient procedures and increased treatment costs in private clinics were disadvantages. Hospitals in the public sector failed to provide high-quality care. The study came to the conclusion that public sector clinics put in less effort than they could.

Anubhav Agarwal, Carlyn Mann, and others conducted a study in 2020 on the subject of "Recurrent cost in primary health care in Ethiopia; Facility and disease-specific unit costs, as well as their components in primary government hospitals and health centers, necessitate domestic investment if Ethiopia is to attain universal health coverage and long-term health. The study looked at each health center and hospital's "unit cost," or cost per unit of service output. The data used were qualitative as well as quantitative. The survey was sent out to 47 health centers and 25 primary hospitals. The unit cost and a fee-free mixed disease-specific unit cost were estimated using a top-down costing method. It was discovered that underutilization of service delivery is reflected in high unit costs charged for services

As we can see from the aforementioned reviews, it is essential to examine the accessibility, satisfaction, and performance of the existing health system as a whole in order to evaluate the impact of any health plan. The following step is to assess the novel scheme's efficiency and effectiveness.

## **MATERIAL AND METHODOLOGY**

The study used both primary and secondary data. The primary data for the empirical analysis were gathered from the FHCs of Chemmaruthy and Vattiyoorkavu in the Thiruvananthapuram District. Out of the total number of patients who went to both FHCs, 10% were used as samples. The total sample size of 90 is taken into account when determining which variables influence patient satisfaction. Chemmaruthy FHC will serve as a benchmark for the comparison of Vattiyoorkavu FHC in this study. The study makes use of diagrams, percentages, and tables for the analysis.

For the purpose of the study, Vattiyoorkavu FHC is chosen at random from a total of 16 FHCs in the Thiruvananthapuram district. It is three kilometers from the Vattiyoorkavu junction in Kulashekharan. In 2018, as part of the second phase of the Aardram mission, the facility was transformed into a Family Health Center. The center covers a population of 57000 people. This is in a semi-rural location. Chemmaruthy Health Center is located at Varkala Taluk in Thiruvananthapuram District, 1 km from Chemmaruthy Junction. This is the first family health center to open in the state on August 17, 2018. The health center has a population of 40,000. It has the National Credit Accreditation certification in Kerala with 88%. The center meets all the standards required for national quality certification by the National Health Mission of the Ministry of Health and Family Welfare. The health center belongs to a semi-rural area. Centers received an National Quality Assurance Standards(NQAS) based on their performance under various criteria, including outpatient units, national health mission implementation, laboratory facilities, personnel, control units, information control, and basic infrastructure. The center operates a palliative care unit recognized as the best palliative care unit in the



district. The FHC differs from its other FHCs in that it maintains small farming practices. Proceeds from these activities will be distributed to Aganwadi students. The center has a gym and its own fitness trainer. Chemmaruthy FHC is therefore used as a benchmark FHC for the Thiruvananthapuram district and compared with his randomly selected FHC from the same district.

Regarding sampling and sample size, the details required about the FHC were collected from the health inspector of the respective FHCs. Ten percent of the total Out Patients who visited the FHC for the previous two days from the date of the survey (12 March 2022) were taken for the study. Chemmaruthy FHC had a visit of 552 patients for two days, so 10 percent, that is, 55 patients were surveyed on the date survey. Vattiyoorkavu FHC had a visit of 365 patients for two days OP, similarly, 36 patients were brought under the study. Permission from the District Medical Office was obtained to carry out the field survey. Two well-structured questionnaires were used for data collection. One consists of questions about her FHC performance and the other about patient satisfaction. The former must be collected from the FHC's designated staff and the latter from the facility's beneficiaries. Details were collected through structured questionnaire.

The variables considered for the study of the first objective are both qualitative and quantitative. These are the availability and quantity of human resources, training facilities for doctors and staff, and the outpatient status of the FHCs (before and after the Aardram mission).

The variables considered for understanding patient satisfaction that is the second objective are as follows; socio-economic variables like gender(G), age (children, teens, adults, elderly(AGE), education(EDU) ( illiterate, primary, secondary, and above) Employment status (EMP) ( student, unemployed, government employees, private employ), monthly income(Y) (below Rs5000, Rs50000- 10000, Rs10000-20000, above Rs20000). The independent variables considered for understanding satisfaction are; Accessibility; this dimension measured the Easily Accessible (EA), Satisfactory Working hours (SWH), Availability of Low-Cost Health services (LCH), Availability of Medicines (LCM), and Inconvenience in Waiting for long Queues (ILQ). Continuity; this measures the possibility of seeking advice from the same doctor in every visit (SD), reference to higher-level hospitals (REF), Doctors' ease of accessing medical records (DAMR), Regular Follow-Ups (RFU) made by the institution, and Availability of Vaccination. (AV). People friendliness; is measured through understanding the satisfaction of the patients with the behavior and treatment of doctors (BD), nurses (BN), Laboratory staff (BLS), and officials (BOF). Comprehensiveness; indicates the proper Maintenance of Medical records for each patient, and the basic Pre-Check done by the Head Nurse (PCH). Communication; measures the proper time devoted by the doctor for each patient is Satisfactory (PS), the response of the doctor to the queries of patients, and the friendliness of the doctor-patient relationship (PF).

Overall satisfaction; includes the measure of basic hygiene(H), like whether the center is clean and tidy, availability of safe drinking water (DW), good toilet facilities, and efficiency of medical equipment (INC). Given these twenty-eight independent variables EDU, Y, EMP, EA, SWH, LCH, LCM, ILQ, REF, DAMR, SD, EREF, AV, BD, BN, BLS, BOFS, RCP, PRCK, DTW, AAQ, CFHC, TOI, INC, SATIS the study aims to find those independent variables which have most and least influence on the dependent variable Satisfaction(S).

## RESULTS AND DISCUSSION

Data relating to the FHCs collected are analyzed and presented below:

Kerala is one of the few states in the country that can boast a relatively well-implemented Human Resource model and a dedicated human resource management department. One key area for immediate reform is getting real-time data showing doctor counts, hiring status, deployment, and more. Competent personnel is key to achieving health goals.

*Table 1: Human resource availability*

Posts	Vattiyoorkavu FHC	Chemmaruthy FHC
MO	3	4
Grade 2	3	2
HI	1	1
JHI	7	8
PHN	1	-
JPHN	6	5
Office Staff	2	3
Staff Nurse	4	4
Pharmacist	2	2
Nursing Staff	1	1

Hospital Attendant	2	2
Part-time sweeper	1	1
Lab technician	2	3
Receptionist	1	1
Data entry operator	1	1
Total	37	38

Source: Primary Data

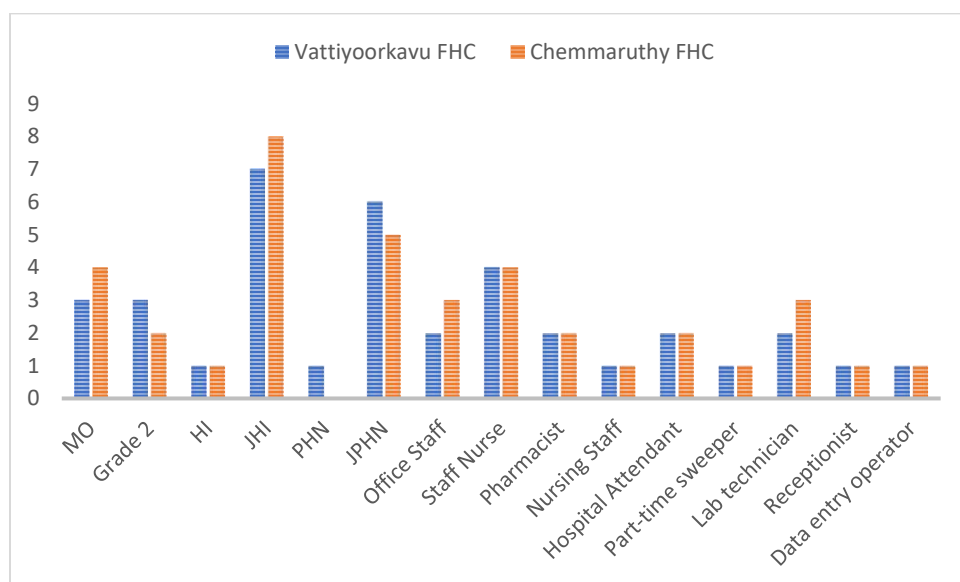


Figure 2: Human Resource

Source: Primary data

The table above shows the 16 positions and their assigned numbers. Chemmaruthy has a total licensed workforce of 38 and Vattiyoorkavu has 37 when calculating health workers per population, health workers considered were Medical Officers, Health Inspectors, Junior Health inspectors, Junior public health Nurses, Public Health Nurses, Staff Nurses, grade 2, pharmacists, and nursing staff. The FHC has a worker per 2036 people. In the case of Chemmaruthy the health worker per population is one health worker for 1423 people. The health worker per population ratio is comparatively higher for Vattiyoorkavu than Chemmaruthy.

Chemmaruthy health center has four medical officers while Vattiyoorkavu has only 3. The doctor-to-patient ratio of the former is 1:1900, and the latter is 1:9250. There is a huge difference in doctor-patient ratios. Health

inspectors are available in the same number for both centers. In the case of Junior Health Inspector, Chemmaruthy health center is eight and Vattiyoorkavu is 7. Vattiyoorkavu lags behind in a single number.

In the case of Primary Health Nurses, there is one post each for the two FHCs. The post in Chemmaruthy health center was found to be temporarily vacant during the survey period. Office staff, staff nurses, pharmacists, Health inspectors, Hospital attendants, receptionists, and data entry operators are the same for both institutions. Grade 2 workers are 3 in the case of Vattiyoorkavu and 2 for Chemmaruthy. Nursing Staff is also higher for Vattiyoorkavu than Chemmaruthy. In the case of a lab technician, it is higher by a single number for Chemmaruthy.

Even though the total human resource available is higher for Vattiyoorkavu, it is not found to be visibly beneficial for the working efficiency of the hospital. The increased population that the hospital is supposed to be covered eliminates the added advantage of having more human resources than that of Chemmaruthy Health Center. The qualification of medical officers is two MBBS and pulmonologist for Vattiyoorkavu FHC, but the availability of a physiotherapist gives an added advantage for the working of the physiotherapy unit of the Chemmaruthy Health center. One doctor of the Chemmaruthy health center is hired by Local Self Government. In addition to the available staff, there is a gym trainer for the hospital. The salary for the LSG-hired staff and gym trainer is paid from the Local Government fund. There is also additional staff like a palliative care nurse and an ambulance driver they are funded from a project fund allotted by the government. The local government intervention in Chemmaruthy FHC is found to be far better than Vattiyoorkavu.

The service of Asha workers or midwives also helps a lot in the field base activities of the health centers. Both Vattiyoorkavu and Chemmaruthy have 33 Asha workers each. This is a low number for Vattiyoorkavu because of the huge population. The overall intervention of Asha workers is comparatively low in Family Health Centers. This is a serious issue to be addressed.

Medical equipment and drugs have a vital role in the quality of health care. A proper guideline should direct the appropriate usage of limited medical resources. Even though the government had provided information about essential drugs, less information is available about medical equipment. The study has incorporated the availability of ten essential pieces of equipment and their count.

Table 2: Essential medical equipment

Basic Equipment	Chemmaruthy FHC	Vattiyoorkavu FHC
BP Apparatus	10	5
Oxygen Cylinder	1	2
Nebulizer	2	3
Stethoscope	10	2
Thermometer	20	2
Glucometer	4	2
Fridge	4	3
Hub Cutter	4	1
ECG Machine	1	1
Display board	3	2

Source: Primary Data

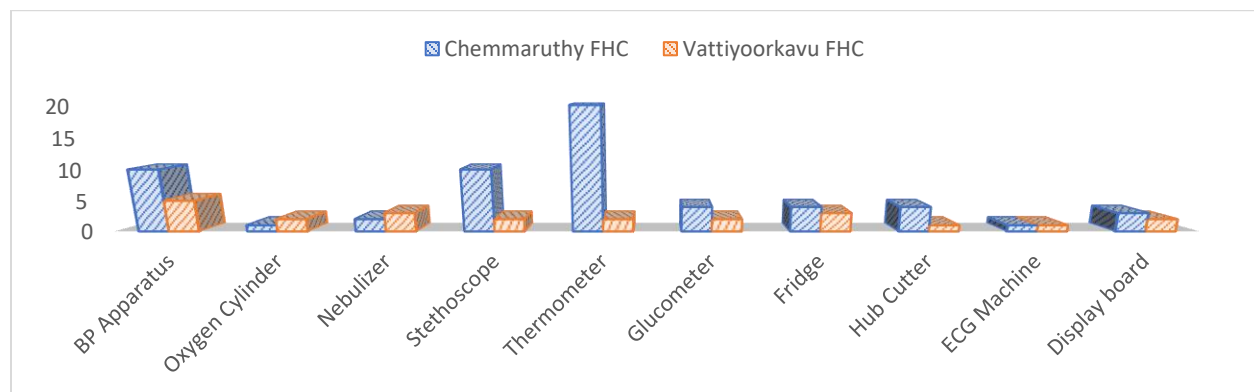


Figure 3: Essential medical equipment

Source: Primary data

The total count of the given medical equipment is clearly higher for the Chemmaruthy health center than for Vattiyoorkavu. Except for the number of oxygen cylinders and nebulizers, all other equipment is higher in number for Chemmaruthy FHC. A notable difference can be seen in the number of BP apparatus, Stethoscope, and oxygen cylinders. Hub cutter and ECG machine only in a single number. There are no backups for this equipment in case of malfunctions. All other equipment is in quite a well-functioning state. All essential drugs are most often available from the pharmacy in both hospitals. Rarely do people have to buy it from outside.

One problem stated by the officials of the Chemmaruthy health center is the lack of storage space for stocking the medicines in a pharmacy. Due to a large number of OP visits, there is a need to stock a larger quantity of drugs.

Outpatient status is an implicit tool to dissect the performance of an institution. After Primary Health Centers are replaced by Family Health Centers, outpatient status is an applicable index to assess the acceptance of its metamorphosis from the side of the devisee.

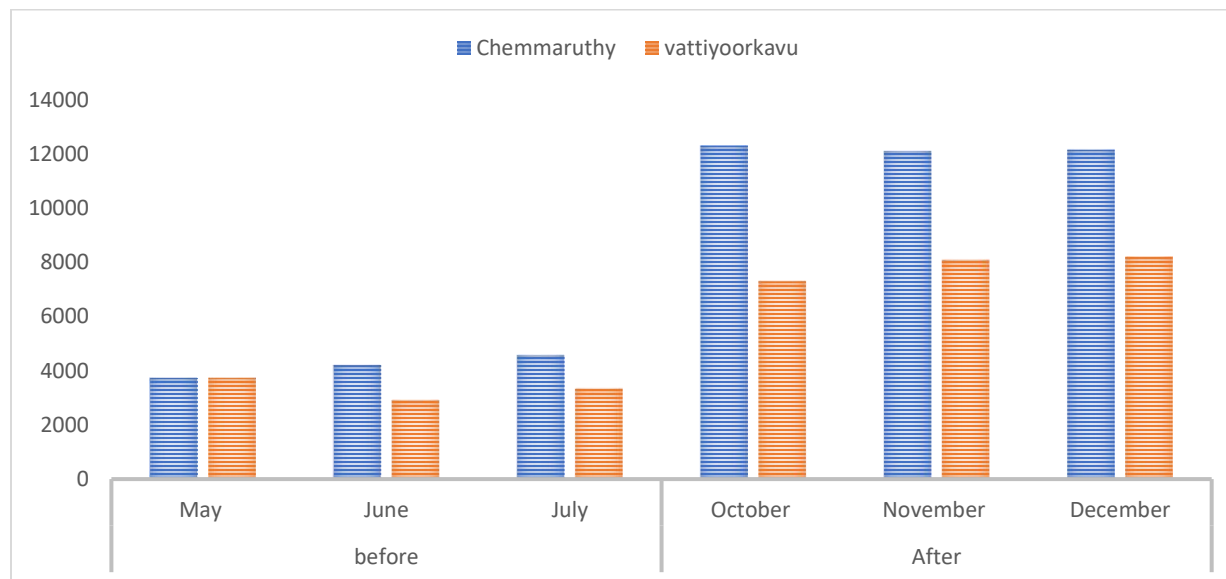


Figure 4: Out-patient status

Source: Primary data

The first section of the graph represents the last three months' OP status of both institutions before the month of implementation of the Aardram mission. Vattiyoorkavu FHC represented a population of 57000 and Chemmaruthy represented a population of 37000. The graph shows that the overall OP status of Vattiyoorkavu was lower than Chemmaruthy health center even before the implementation of the Aardram mission. However, the average of both centers rounded around 3000-5000.

Analyzing OP's position following Aardram's mission could provide insight into the extent to which the populace was willing to accept this modification. In the case of Vattiyoorkavu OP, there may be evidence of a twofold increase. In the case of Chemmaruthy, it is a threefold increase once more, demonstrating the Chemmaruthy Family Health Centre's operational effectiveness. Given these variables that indicate the Family Health Center's performance, understanding how patients feel about these medical facilities and how satisfied they are with the services they receive is essential.

Table 3: Socio-demographic characteristics of the participants

		Vattiyoorkavu FHC		Chemmaruthy FHC	
Demographic variables		Number	Percentage	Number	Percentage
GENDER	Male	14	37.83	18	37.72
	Female	23	62.16	37	67.27
AGE GROUP	0-12	0	0	0	0
	12-18	0	0	2	3.6
	18-30	25	67.56	33	60
	30-50	8	21.62	17	31
	Above50	4	10.81	3	5.4
MARITAL STATUS	single	20	54.05	28	50.9
	Married	16	43.24	27	49
	Widow	1	2.7	0	0
	Divorced	0	0	0	0
INCOME	5000-10000	19	51.35	25	45.4
	10000-25000	8	21.62	13	23.6
	25000-50000	10	27.02	14	25.4
	Above 50000	0	0	3	5.45
EDUCATION	Illiterate	1	2.7	2	3.6
	Primary	2	5.4	3	5.45
	Secondary and Higher	34	91.89	50	90.9
EMPLOYMENT	Student	15	40.54	23	41.8
	Govt. job	3	8.1	3	5.44
	Pvt. job	5	13.51	4	19
	Others	14	37.83	25	45.5

Source: primary data

The table above represents the socio-demographic status of Chemmaruthy and Vattiyoorkavu FHC. In Chemmaruthy FHC, the majority of the respondents were female, comprising 67.27%,

and the males 37.72%. The least represented age group was 12-18, and the highest belongs to the 18-30 category. As per the marital status, single as well as married people were 50%. Only 5.45% of people were government employees, and the majority were workers like fruit vendors, daily laborers, carpenters, etc. and followed by students comprising 41.8%. Regarding education, 90% of the people had secondary and higher education, and there was the very least percentage of illiterate people (3.6%). The majority of the respondents fall in the income category of Rs5000-Rs10000 (45.5%), followed by the category Rs10000-Rs25000 (25.4%). Only 5.45% of people had an income above Rs50000. Female respondents outnumbered male respondents in both FHCs. FHC had a higher percentage of Chemmaruthy, with 67.27 percent. In the Vattiyoorkavu FHC, the 18- to 30-year-old age group had the highest response rate, at 67.56 percent. Vattiyoorkavu had members who belonged to one of three marital statuses: widow, married, or single. Chemmaruthy, on the other hand, only had single and married respondents. Vattiyoorkavu had the highest percentage of single respondents (54.05 percent) out of the two FHCs. In terms of income, Vattiyoorkavu had 51.35 percent of the people in both FHCs who fell into the 5000-10000 income range. Two of them had a literacy rate of 90%, with the majority completing secondary or higher education. In terms of employment status, the majority of respondents to the Vattiyoorkavu FHC survey were students (40.45%), whereas the majority of respondents to the Chemmaruthy FHC survey were daily laborers, fruit and vegetable vendors, and so forth.

Table 4: Accessibility

<b>Vattiyoorkavu FHC</b>						
ACCESSIBILITY	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
Convenient distance between FHC and home	37	100	0	0	0	0
Satisfactory working hours	31	83.7	1	2.7	5	13.5
Inconvenience in longer waiting hours	16	43.2	4	10.8	17	45.9
Health care is available at a low cost	34	91.9	0	0	3	8.1
Reference to higher-level hospitals If needed	34	91.9	1	2.7	2	5.4
Most of the medicines are received from FHC	18	48.6	9	24.3	10	27



<b>Chemmaruthy FHC</b>						
Items	NO	%	NO	%	NO	%
Convenient distance between FHC and home	50	90.9	1	0.018	4	7.27
Satisfactory working hours	50	90.9	0	0	5	9.09
Inconvenience in longer waiting hours	22	40	4	7.27	29	52.72
Health care is available at a low cost	54	98.18	0	0	1	0.018
Reference to higher-level hospitals If needed	45	81.81	2	3.63	8	14.54
Most of the medicines are received from FHC	28	50.9	9	16.36	18	32.72

Source: Primary Survey

7.27 percent of respondents did not find the distance to be convenient. 90.90% of respondents reported being satisfied with their work hours, while 9.090% reported being dissatisfied. 52.72 percent of respondents reported being inconvenient. 98.18% of respondents agreed that low treatment costs were available. 81.81% of respondents agreed with the functioning of a good reference system, 14.54% disagreed, and 3.63 percent remained neutral. 32.72 percent of respondents were against the availability of FHC medicines, with 50 percent being in favor.

Only 90% of Vattiyoorkavu respondents find the distance to the Chemmaruthy FHC convenient, despite their satisfaction with the distance from their homes. Chemmaruthy Family Health Center also sees patients from the next village for consultations. As a result, this inconvenience caused by distance for 7.27 percent of individuals is quite understandable. Concerning the working hours, 90% of FHC employees were satisfied. On the other hand, only 83.7% were content during work hours. The lack of other hospitals in the area is the reason given by respondents to Vattiyoorkavu. Their concern is that if FHC could extend its work overnight, it would be extremely beneficial to them. In these FHCs, the inconvenience of waiting in long lines is distributed roughly equally, with equal agreements and disagreements. According to the guidelines, elderly people should receive priority, but this is not done correctly. For quick consultation, only causality cases are accepted. Nearly all respondents to the Chemmaruthy FHC survey agreed that healthcare services are inexpensive, while the Vattiyoorkavu FHC survey found it to be low. When compared to Chemmaruthy, Vattiyoorkavu has a referral system that has been around for a long time.

Vattiyoorkavu has a lower availability of medicines prescribed by FHC doctors than Vattiyoorkavu does. Most of the time, patients are told to buy their medicines elsewhere. Chemmaruthy health center has a higher percentage for four of the six variables that are considered for accessibility: satisfactory working hours, no inconvenience in waiting in long lines, low cost of health care, and availability of medicines. Overall, patients' perceptions of FHC's accessibility to patients are positive.

Table 5: Continuity

Vattiyoorkavu						
	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
The doctor can access my medical records	26	70.2	9	24.3	2	5.4
I see the same doctor every visit	18	48.6	5	13.5	14	37.8
Reference to higher-level hospitals is easier	35	94.6	1	2.7	1	2.7
I am regularly followed up with the institution	25	67.6	5	13.5	7	18.9
Chemmaruthy						
Items	NO	%	NO	%	NO	%
Doctors can access my medical	27	49.09	6	10.9	22	40
I see the same doctor at every visit are easier	27	49.09	6	10.9	22	40
I am regularly followed up by the institution	44	80	5	9.09	6	10.96
Provides all necessary vaccines	46	83.63	4	7.27	5	9.09

Source: Primary data

The continuity factor for Vattiyoorkavu and Chemmaruthy FHC is shown in the table above. 70% of patients are aware that doctors can access their patient's medical records in the event that they forget. 48% of respondents agree that they are receiving the same doctor's consultation, while 37% disagree. They were all in agreement that FHC provides an easy link to higher-level hospitals. Only 67.6% of respondents were in

favor of regular follow-up from the FHC, while 19% were against it. 70% of respondents supported the basic availability of vaccines, 16% disagreed, and 13.5 percent remained neutral in their opinions.

In Chemmaruthy, 49% of patients agree with doctors about having access to medical records, while 40% disagree. 49% of people say they can see the same doctor every time; However, forty percent disagree. The straightforward reference to higher-level hospitals receives unanimous support from 92% of patients. Eighty percent of respondents were in favor of regular follow-up, while only ten percent of patients were opposed. Eighty percent of respondents were in favor of the availability of all necessary vaccines.

Access to patients' medical records by doctors, regular follow-up, a simple referral system, and the availability of necessary vaccines are all components of continuity. Regarding the first variable, easy access to Vattiyoorkavu medical records, is 70%, whereas Chemmaruthy has much lower numbers. Both FHCs have the same continuity factor when it comes to seeing the same doctor for each visit. Regarding follow-up, Chemmaruthy FHC performs better than Vattiyoorkavu. Chemmaruthy FHC has a higher vaccination availability rate than Vattiyoorkavu. Two of the five variables, regular follow-up by the FHC and availability of vaccines, perform well in chemotherapy. Two variables for Vattiyoorkavu are whether or not doctors can access medical records and whether or not consultations with the same doctor are the same for both FHCs.

Table 6: People-Friendliness

Items	Vattiyoorkavu FHC					
	AGREE		NEUTRAL		DISAGREE	
	NO	%	NO	%	NO	%
Satisfied with the behavior of reception staff	27	73	0	0	10	27
Satisfied with doctors' treatment	37	100	0	0	0	0
Nurses and laboratory staff	33	89.1	1	2.7	3	8.1
Officials listen to complaints from patients	30	81	3	8.1	4	10.4
Provides necessary services in case of emergency	30	81	3	8.1	4	10.4
Items	Chemmaruthy FHC					
	AGREE		NEUTRAL		DISAGREE	
	NO	%	NO	%	NO	%

Satisfied with the behavior of reception staff	49	89.09	1	0.018	5	9.09
Doctors' treatment and approach	54	98.18	1	0.018	0	0
Nurses and laboratory staff	49	89.09	2	3.63	4	7.27
Officials listen to complaints from the patients	48	87.27	4	7.27	3	5.45
Provides necessary services in case of emergency	48	87.27	4	7.27	3	5.45

Source: Primary data

Regarding people's friendliness in Vattiyoorkavu FHC, 73% of respondents were satisfied with the behavior of the reception staff. All the respondents were satisfied with the doctor's treatment. As regards the behavior of nurses and reception staff, 89% of people were satisfied, and 8% were not. 81% of people agreed that officials listen to the complaints of the patients, whereas 10% disagreed. As regards the service provided at the time of emergency, 81% of respondents were satisfied.

The table above also shows that 89% of people were satisfied with the behavior of the reception staff. As regards the treatment and approach of the doctor, 98.18% of people were marked as satisfied and the rest were neutral. Regarding the behavior of nurses and laboratory staff 89% were satisfied 7% were dissatisfied. 87% of people agreed that officials listen to the complaints of patients, 5% were not, and 7% were neutral in their stand. As regards the satisfaction of necessary services in case of necessary services, 87% of the respondents were satisfied. Regarding people friendliness, 73% of respondents were satisfied with the behavior of the reception staff. All the respondents were satisfied with the doctor's treatment. As regards the behavior of nurses and reception staff, 89% of people were satisfied, and 8% were not. 81% of people agreed that officials listen to the complaints of the patients, whereas 10% disagreed. As regards the service provided at the time of emergency, 81% of respondents were satisfied. It also reveals that 89% of people were satisfied with the behavior of the reception staff. As regards the treatment and approach of the doctor, 98.18% of people were marked as satisfied and the rest were neutral. Regarding the behavior of nurses and laboratory staff 89% were satisfied 7% were dissatisfied. 87% of people agreed that officials listen to the complaints of patients, 5% were not, and 7% were neutral in their stand. As regards the satisfaction of necessary services in case of necessary services, 87% of the respondents were satisfied.

Table 7: Comprehensiveness

	Vattiyoorkavu FHC					
	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
All members have medical files and undergoing routine checkups	26	70.2	4	10.8	7	18.9
Each visit weight, BP, and pressure are checked	24	64.9	5	13.5	8	21.6
	Chemmaruthy FHC					
COMPREHENSIVENESS	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
All members have medical records and undergo routine- checkups	49	89.09	1	0.018	5	9.09
On each visit, they measure weight, BP, and temperature	32	58.18	11	20	12	21.81

Source: Primary data

Seventy percent of those who access the Vattiyoorkavu FHC concur that they have their own individual medical files there, while 18 percent do not and ten percent are neutral. Concerning the pre-check, 64% of respondents concur that the nurse conducts a pre-check prior to consulting a physician, 21% disagree, and 13% remain neutral.

Knowledge of the Chemmaruthy FHC's management of medical records: 89 percent of respondents were in agreement, while 9 percent were not. Only 58% of people are in agreement that nurses do a pre-check on patients before they see a doctor. 21% of people are against this, and 20% are neutral. Under comprehensiveness of all patients' medical records and pre-check before consulting a doctor, only two factors were taken into account. Regarding medical records, 70% of Vattiyoorkavu patients and 89% of Chemmaruthy FHC patients both have them. In both FHCs, the pre-check is not carried out correctly. 64% of respondents in Vattiyoorkavu and 58% in Chemmaruthy concur that they go through a pre-check before meeting with a doctor.

Table 8: Communication

	Vattiyoorkavu FHC					
	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
The doctor treats me well by taking sufficient time	32	86.4	3	8.1	2	5.4
Doctors' answers to all my queries	31	83.8	2	5.4	4	10.8
	Chemmaruthy FHC					
	AGREE		NEUTRAL		NEUTRAL	
Items	NO	%	NO	%	NO	%
The doctor treats well by taking sufficient time	48	87.27	1	0.018	6	10.9
Doctors answer all my queries	52	94.54	11	20	12	21.81

Source: Primary Data

87% of people are pleased with how doctors treat them, and only 10% are dissatisfied. 94% of patients are satisfied with how doctors respond to their questions, while 21% are dissatisfied. Regarding the doctor's treatment at Chemmaruthy, it has performed better than Vattiyoorkavu FHC. Similarly, Chemmaruthy performs well when responding to questions from a doctor. As a result, Chemmaruthy FHC manages the communication variable well, as found by the researchers.

Table 9: Hygiene

	Vattiyoorkavu FHC					
	AGREE		NEUTRAL		DISAGREE	
Items	NO	%	NO	%	NO	%
The center is tidy	30	81	4	10.81	3	8.1
Availability of safe drinking water	28	75.7	4	10.81	5	13.5
Good toilet facilities	20	54	11	29.7	6	16.2
Equipment and instruments are correctly working	21	56.7	11	29.7	5	13.5
	Chemmaruthy FHC					

Items	AGREE		NEUTRAL		DISAGREE	
	NO	%	NO	%	NO	%
The center is tidy	51	92.72	1	0.018	3	5.45
Availability of safe drinking water	52	94.54	0	0	3	5.45
Good toilet facilities	47	85.45	4	7.27	4	7.27
Equipment and instruments are correctly working	40	72.72	11	20	4	7.27

Source: Primary data

One of the most important factors that could be the underlying variable that enables one to seek treatment at a government hospital is hygiene, as shown in the table above. 81 percent of respondents agreed that the center is clean in terms of cleanliness. 76 percent say that safe drinking water is available. At Vattiyoorkavu FHC, 54% of respondents agree that there are adequate restrooms and 57% agree that the instruments function appropriately.

In terms of the cleanliness of Chemmaruthy FHC, 93 percent of respondents agree that the facility is clean, 95 percent agree that safe drinking water is available, 86 percent agree that the facilities for the toilets are adequate, and 72 percent agree that the equipment works as intended

Table 10: Descriptive Statistics

	Chemmaruthy FHC(n=55)		Vattiyoorkavu FHC(n=37)		
	Mean	Standard deviation		Mean	Standard deviation
EDU	2.87	0.433	EDU	2.89	0.39
EMP	3.15	1.899	EMP	3.081	1.83
Y	1.91	0.967	Y	1.756	0.862
EA	1.11	0.369	EA	1.27	0.607
SWH	1.09	0.29	SWH	1.189	0.461
ILQ	1.67	0.61	ILQ	1.679	0.668
LCH	1.02	0.135	LCH	1.135	0.346
REF	1.22	0.498	REF	1.216	0.479
LCM	1.65	0.751	LCM	1.756	0.83
DAR	1.29	0.712	DAR	1.54	0.869

SD	1.62	0.68	SD	1.64	0.715
EREF	1.15	0.524	EREF	1.242	0.641
RFUP	1.29	0.629	RFUP	1.45	0.73
AV	1.24	0.576	AV	1.432	0.728
BRS	1.13	0.388	BRS	1.27	0.45
BD	1.04	0.27	BD	1.27	651
BN	1.15	0.448	BN	1.189	0.461
BLS	1.2	0.558	BLS	1.27	0.607
BOFS	1.42	0.786	BOFS	1.621	0.828
RCP	1.13	0.388	RCP	1.405	0.685
PRCK	1.62	0.805	PRCK	1.486	0.731
DTW	1.15	0.405	DTW	1.27	0.607
AAQ	1.05	0.229	AAQ	1.216	0.534
CFHC	1.09	0.348	CFHC	1.324	0.534
SDW	1.05	0.229	SDW	1.351	0.461
TOI	1.22	0.567	TOI	1.756	0.894
INC	1.47	0.813	INC	1.729	0.902
SATIS	1.09	0.348	SATIS	1.27	0.607

Source: Primary data

The descriptive statistics for 37 samples from Vattiyoorkavu FHC and 55 sample data from Chemmaruthy FHC are presented in the table above. The variable's name can be found in the first column. The mean is represented by the second column. The standard deviation of the two FHCs, which had a sample size of 37 and 55, comes next. When compared to their respective means, the standard deviations are relatively low. Vattiyoorkavu FHC has the highest Employment mean ( $M=3.08$ ) and standard deviation ( $SD=1.83$ ). The Employment (EMP) variable has a high mean. The sample population's mean employment is ( $M=3.15$ ), and the standard deviation is ( $SD=1.899$ ).



Table 11: Correlation

	EDU	Y	EMP	EA	SATIS
EDU	1	-0.2	-0.18	0.089	0.094
Y	-0.205	1	0.027	0.08	0.03
EMP	-0.205	0.03	1	0.056	-0.092
EA	0.089	0.08	0.056	1	0.252
SWH	0.094	0.03	-0.09	0.252	1
ILQ	0.05	0.07	-0.21	0.244	-0.038
LCH	0.04	0.01	-0.16	-0.041	0.43
REF	0.045	-0.1	-0.07	0.372	0.117
LCM	-0.195	0.24	0.127	0.206	0.147
DAMR	-0.118	0.09	0.16	-0.123	-0.13
SD	0.084	0	-0.09	-0.126	-0.102
EREF	-0.08	-0.1	-0.02	-0.084	-0.089
RFuP	-0.134	-0.1	-0.01	-0.06	0.55
AV	-0.249	0.07	0.019	0.051	0-.020
BRS	-0.233	0.03	0.276	0.031	0.06
BD	0.04	-0.1	-0.16	0.332	0.43
BN	0.097	0.07	-0.11	0.575	0.466
BLS	-0.123	-0	0.147	0.072	0.229

BOFS	-0.058	-0.1	0.107	0.031	0.074
PRCK	0.098	-0.1	0.201	0.678	0.225
DTW	0.108	-0.3	-0.15	0.264	0.359
AAQ	0.071	-0.2	0.067	-0.072	0.203
CFHC	0.078	-0.3	0.232	0.066	0.1
SDW	0.71	-0.2	-0.1	0.147	0.203
TOI	-0.036	0	0.004	0.15	0.102
INC	-0.247	-0.1	0.158	-0.052	0.05
SATIS	-0.168	0.14	-0.1	0.066	0.1

Source: Primary data

In Chemmaruthy FHC, the correlation coefficient ought to be greater than.0001. The test variables are highly collinear if the value is very close to zero. If it is zero, there is no solution. It demonstrates how each question is related to the others (correlated). The relationship between each of the 28 items can be seen in the table-correlation matrix. It is essential to keep in mind that some of the correlations are high (such as + or.50 or greater) while others are low (such as close to zero). High associations indicate that these two items are connected and may be grouped together in the factor analysis. Most of the time, items that have low associations won't have high loadings on the same factor. The determinant must be greater than.0001 is one assumption. Because it is.01 in this case, this assumption is true. If the determinant value is zero, no factor analysis solution is available.

The correlation matrix of Vattiyoorkavu FHC (Table 11), which depicts the relationships between each of the 28 items, is presented in Table 11. It is essential to keep in mind that some of the correlations are high (such as + or.40 or greater) while others are low (such as close to zero). If the determinant value is zero, no factor analysis solution is available.

## CONCLUSION

Chemmaruthy FHC and Vattiyoorkavu FHC were the two-Family Health Centers chosen for the study from the Thiruvananthapuram district. The first Kerala FHC to receive a National Accreditation

Quality Certificate is Chemmaruthy FHC. The research set out to compare Vattiyoorkavu FHC to Chemmaruthy FHC as a standard. Have attempted to determine how much the FCHs need to be improved.

The objective of the study was to compare the Family Health Centers in the Thiruvananthapuram district. The two samples taken for the study were the Vattiyoorkavu FHC and the Chemmaruthy FHC, which was the first FHC implemented in Kerala. Chemmaruthy FHC was used as a benchmark to compare Vattiyoorkavu FHC, a randomly selected FHC, due to its superior performance, which was recognized with numerous awards and NAQS certification. It focused on patient satisfaction and the performance of the health centers.

It was discovered that Vattiyoorkavu FHC performs poorly in areas like outpatient status, essential medical equipment and infrastructure, and adequate human resources. It should be noted that although the FHC has progressed significantly since its conversion from a PHC to an FHC, it has not yet reached its full potential. The study attempted to identify improvement areas.

Variables like accessibility, continuity, comprehensiveness, people-friendliness, communication, and hygiene were used to measure patient satisfaction. Except for communication, the people of Vattiyoorkavu lag behind in all of these aspects. The goal of the study was to identify the weak spots at the Chemmaruthy health center. In a nutshell, the Kerala government's Aardram mission initiative has undoubtedly increased public participation in the health care system. Nevertheless, there is room for expansion.

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