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**A study on Profile of patients attending
infertility clinic**

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Contents

Sl.No.		Page No
	Foreword	i
	Tables	ii
	Executive Summary	iii
1	Introduction	1
2	Objectives	10
3	Data and methodology	10
4	Characteristics of patients attending Infertility Clinic, W&C Hospital, Thycaud	11
5	Characteristics of patients attending Infertility Clinic, W&C Hospital, Thycaud through an exit interview of 224 women	19
6	Profile of women who became pregnant through the treatment sought from the infertility clinic, Thycaud	25
7	Summary and Conclusion	28
	References	32

Foreword

Infertility is not merely a health problem but has wide ranging social and psychological impact on the couples. Infertility prevalence ever experienced by currently married women within the age group (20-49) years with two or more years of marital duration in Kerala was 11.1 percent. Most of the studies draw inference from sample population to understand the determinants of infertility. But here the authors attempt to understand the profile of women attending an infertility clinic in Thiruvananthapuram district. Such women's background, previous disease history, medications, treatment and co-morbidity would be of utmost importance in understanding what causes infertility. The authors are thankful to the Department of Health, Government of Kerala for according sanction in collecting information from the hospital in the State. The authors sincerely thank Dr. Sam John Varghese for his unending help in capturing information from the respondents. Population Research Centre Kerala has been working in coordination with the State Health Department and this study was chosen in consultation with the State Health Department.

I appreciate the authors of the study Dr. Shylaja.L, Research Officer and Dr. Anitha Kumari K R, Field Investigator of PRC Kerala in successfully completing the study. The findings will definitely be of great use to Planners and Policy makers in understanding the gender differentials in health care needs in the State.

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List of Tables

Sl No		Page No.
1	Number of women registered and pregnant during 2005-2017 in infertility clinic, W&C Thycaud	10
2	Characteristics of Patients who seek infertility treatment	13
3	Percent distribution of disease history of women	14
4	Details of ultra sound scan of the Uterus	14
5	Disease history of men (Percent	15
6	Details of Semen Analysis	15
7	Details of type of sperm	17
8	Profile of sample women	20
9	Health profile of sample women and their husbands	21
10	Negative health behaviour of Husbands	24
11	Sample women by IUI done and the current pregnancy status	24
12	Profile of pregnant women and their husbands	26
13	Distribution of pregnant women by Health problems	27

Executive Summary

Out of the infertility clinics functioning in Government hospitals in Kerala, infertility clinic that functions in W&C hospital, Thycaud is selected for the study. It is the best performing clinic in the State and the yearly success rate is 30 to 35 percent. Clinic is functioning since 2005. Data set consists of 7470 women and available details are analysed. We interviewed 224 women who attended the clinic in December 2017 and collected information. Details of women who became recently pregnant (that is from October to December 2017) are filtered from the main data base and also analysed.

There are large numbers of clients coming for treatment from all over Kerala as the clinic is famous for infertility treatment. Patients have an OP book in which all history of husband, wife and family are entered. All tests like blood, USG scan and semen analysis are being done here. Medical treatments and IUI and IUD provide good results in the centre. Characteristics of the patients show that majority are from Thiruvananthapuram district and Kollam and Kanyakumari district of Tamil Nadu which is adjacent to this district. Age of men and women shows young clients are coming for treatment and those who married within two years are mostly seeking treatment. Men who sought treatment belong to skilled worker category and majority of the women are house wives. One quarter of the men consume alcohol. Out of the 384 patients whose disease histories were entered, 47 percent has asthma, 16 percent has abortion history and five percent were diabetic. Whereas among the 128 men whose history was entered, 41 percent has asthma and 17 percent had undergone appendicectomy. USG scan details of 1351 women are entered which shows that 42 percent has normal uterus and ovaries and 44 percent has polycystic ovary disease. Semen analysis of men reveals that 73 percent of the semen takes more time to liquefy and 87 percent has normal total count, 65 percent of the men have normal sperm motility, 74 percent has normal volume of semen, 84 percent has normal viscosity and only 35 percent of the men's sperm has normal morphology. Out of the 182 men, 60 percent have azoospermia and 31 percent have OAT condition.

Findings of the exit interview of patients attending the clinic shows that a higher proportion of women who seek treatment for infertility are young and the average age of women is 27 years and the average age of their husbands is 32.5 years. The average marital duration of couple is 40 months. About 22 percent of women have their marital duration above 60 years. Average duration of couple staying together is 32 months. Out of the 224 women taken for exit interviews, 16.5 percent of them are obese (BMI ≥ 30) or risky mothers. About 37 percent of the women are overweight (BMI between 25 and 29.9) and they also have a tendency to become risk. About 15 percent of the sample women have thyroid dysfunction and 13.4 percent are affected by PCOD.

Study shows that among the male partners (husbands) of the selected sample women, about two percent of the husbands received treatment for varicocele and about 8 percent were affected by mumps. Profile of 172 women who became pregnant through the treatment sought from the infertility clinic, Thycaud, shows that the mean age of pregnant women is 27.8 years. The average age of their husbands is 32 years. Considering the occupation of pregnant women who sought treatment from the clinic, majority (78 percent) are house wives. About 19.2 percent of their husbands are working outside and living away from spouse (which include men working in gulf and other countries, states other than native place, those who are working in the armed force and related service etc). The average duration of marriage among the above women is 46 months. Majority of the women have primary sterility. About 13 percent of women reported that they have hirsutism. About 5 percent of pregnant women reported that they had experienced dyspareunia or painful intercourse and 22 percent of pregnant women reported that they had experienced dysmenorrhea before pregnancy. About 3 percent of pregnant women reported that their husbands have the habit of smoking and 28 percent of women reported that their husbands have the negative health behaviour of consuming alcohol.

The study findings point to higher proportion of the young couples seeking treatment for infertility with average marital duration of 40 months. Over weight, obesity thyroid dysfunction and PCOD are apparently the major problems among women who have sought infertility treatment. Negative behaviors like consuming alcohol and smoking are also seen among men who have sought infertility treatment. Since the study is not a clinical one, inquiry into the probable causes of infertility is not attempted although the tests carried out for ascertaining infertility are described based on information available from the data set. Limitations in deriving conclusions is a major problem owing to incomplete data capture. Every couple who approach the clinic has not transmitted the end result of their treatment by way of whether they have conceived or not. Steps could be taken to complete this gap in knowledge for further research so that infertility treatment can be made more effective. To achieve this documentation of information need to be stressed. Valuable information on probable causes of infertility could be tapped if data capture is effectively made by a Medical person/Demographer/Statistician with sufficient knowledge on the aspect. It would definitely prove to be a strong data base for further research on infertility.

Profile of patients attending infertility clinic

1. Introduction

Infertility as defined by the World Health Organization is the failure of a couple to procreate despite seriously attempting to do so for at least 12 months. Couples are considered infertile if they do not conceive over a 12-month period of unprotected intercourse, but experience shows that many of these supposedly “infertile” couples will eventually conceive, even without treatment. For example, 38 percent of couples attending an infertility clinic in India conceived before any treatment began, and another 27 percent conceived before their treatment was completed (Singh, 1996). Similarly, a Chilean study found that only 4 percent of women were infertile after their first eight years of marriage, although 26 percent had experienced a delay in conception that lasted longer than 12 months (Fuentes and Devoto, 1994). Infertility affects both men and women. Yet women, particularly in developing countries, may bear the sole blame for barren marriages; in many areas infertility is a socially acceptable basis for divorce by the husband (Singh, 1996; Leke et al., 1993; Yeboah et al., 1992). The World Health Organization (WHO, 2004) estimated that 60 to 80 million couples worldwide suffer from infertility. The most comprehensive study of infertility—WHO study of 5,800 infertile couples seeking help at 33 medical centers in 22 developed and developing countries—found that men were either the sole cause or a contributing factor to infertility in more than half of couples. Overall, the studies found that female causes accounted for between 25 to 37 percent of infertility worldwide (with larger proportions in sub-Saharan Africa and Southeast Asia), male causes accounted for between 8 to 22 percent, and both male and female causes accounted for between 21 to 38 percent.

Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide (Sciarr, 1994; Population Council, 2004). Global infertility prevalence rates are difficult to determine, due to the presence of both male and female factors which complicate any estimate which may only address the woman and an outcome of a

pregnancy diagnosis or live birth (WHO, 2004). One in every four couples in developing countries had been found to be affected by infertility, when an evaluation of responses from women in Demographic and Health Surveys from 1990 was completed in collaboration with WHO in 2004. The burden remains high. Another WHO study, published at the end of 2012, has shown that the overall burden of infertility in women from 190 countries has remained similar in estimated levels and trends from 1990 to 2010. Global rates of infertility have remained relatively stable between 1990 and 2010, according to a study that compiled data from 277 national surveys in 190 countries. WHO estimated that in 2010, 48.5 million couples worldwide were unable to have a child. Also found that 1.9 percent of women aged 20-44 who wanted a child were unable to have their first live birth and 10.5 percent of women who had previously given birth were unable to have another baby after five years of trying. This represented a 0.1 percent and 0.4 percent decrease from 1990, respectively (Warren-Gas, 2013).

Infertility affects a relatively large number of couples at some point in their reproductive life. Infertility can result from either women or man's problem or due to the problem of both. The reasons for infertility are not only diseases but also the lifestyle and social circumstances of the individual or couple. Infertility is more of a social concern than a family issue. Infertility is complex. It has multiple causes and consequences depending on the gender, sexual history, life style, society and cultural background of people it affects.

Dr Jeremy Thompson, Associate Professor in Paediatrics and reproductive health at the University of Adelaide, pressed surprise that infertility rates had remained stable despite a dramatic rise in levels of obesity and type 2 diabetes over the last few decades. According to him, all the metabolic diseases do have an effect on fertility. Nonetheless the study found no evidence to support concerns that higher numbers of older women wanting children and environmental factors affecting sperm quality may have contributed to declining fertility in higher income countries. The results were published in the open access journal PLOS Medicine.

In most of the developing countries and South-East-Asian countries in particular, infertility has been relatively neglected as a health problem and as a subject of social science research (Jeejeebhoy, 1998). The major focus of the programme in these countries is still on the implications of high fertility and its control rather than understanding the various dynamics of infertility. However, data from various countries show that infertility affects a large number of couples (WHO, 1994; Jeejeebhoy, 1998). Further, it is also presumed that the consequences of infertility will be greater in countries with pro-natal culture where motherhood is viewed as synonymous with womanhood (Inhorn, 2003). Traditionally, motherhood for women is seen as natural and in many societies, feminine identity was synonymous with motherhood. Therefore, at least in most of the developing countries, the desire for children is universal. However, not all couples who desire a child are successful in becoming parents. For many couples, the inability to bear children is a tragedy.

The expectations of society, family, religion and culture nurture a sense of failure, loss and exclusion in infertile couples. Therefore, infertility is generally considered as a difficult condition for individuals and couples. Infertility has till now been a private matter to be resolved individually. However, the World Health Organisation has recognised it as a public health issue worldwide.

Generally, one out of 10 people experience primary and secondary infertility. Majority of those who suffer infertility live in developing countries. On an average, infertility varies from 1 per cent to 12 per cent across countries (Vayena et al., 2002; WHO, 1991; Fiddler and Bernstein, 1991; Balen and Inhorn, 2002). The incidence of primary infertility varies from 1 to 8 per cent and secondary infertility is as high as 35 per cent. The world's highest infertility rates are reported from the South and Central Africa. In some other countries, infertility is widespread and it can have an enormous impact on healthcare resources. According to Census of India, 1981, infertility in India is around 4-6 per cent and NFHS 1 reports that the childlessness among the currently married above the age of 40 years is 2.4 per cent (Jeejeebhoy, 1998). A community based study shows that among eligible couples prevalence of primary infertility was 6.1 percent, while secondary

infertility was 5.7 percent. Both types of infertility were most prevalent in middle income group (primary 42.8 percent, secondary 44.3 percent). A woman reaches her maximum fertility potential at the age of 30 years. So both types of infertility was common if woman marries late (>30). Primary infertility was observed frequently in first 5 yrs of marital life while secondary infertility was prevalent in couples married for 10-14 years duration. Although in secondary infertility group it was observed that 94 (36.86 percent) were having difficulty in conceiving for < 5 years period (Manna et al, 2014).

The causes of infertility are varied including biological and social factors. It has been generally agreed that around 3 to 5 per cent of the couples are infertile in any populations due to anatomical, genetic and immunological reasons. Infertility higher than this proportion is because of the preventable conditions such as sexually transmitted diseases, infections, healthcare practices and policies and also due to various environmental conditions.

The causes of infertility generally derive from 3 major sources: physiological dysfunctions, preventable factors and unexplained issues (Emily, 2004). Physiological causes of female infertility include tubal blockage, abnormal ovulation, congenital malformation and endometriosis (Daar, 2002). Male infertility factors include issues with sperm counts, motility and quality and ejaculatory dysfunctions. The most common preventable causes of infertility are sexually transmitted infections, especially chlamydia and gonorrhoea (Fidler and Bernestein, 1999; Butler, 2003; Datta and Okopnofua, 2002). Undiagnosed or inadequately treated chlamydia and gonorrhoea in women can lead to pelvic inflammatory diseases (PID), which can lead to infertility. It is estimated that 40 percent of women in developed countries with inadequately treated chlamydia develop PID with 20 per cent of those becoming infertile due to tubal scarring. These rates could be higher in developing countries. Chlamydia and gonorrhoea are the most easily transmitted infections.

The other preventable causes of infertility can broadly be classified into physical, behavioural and socio-economic, biological and environmental and life-style related factors. Studies have shown that the physical environment in which a couple live, like

frequent exposure to heat, noise etc., can affect the reproductive outcomes and increase the prevalence of infertility (Rachooitn and Oslen, 1983; Lipscom et al., 1991). Occupational exposure to certain chemicals like, mercury, chloroform, organic solvents and certain metals like lead, steel etc., too can increase the prevalence of infertility among males and females (Dahl et al, 1999; Lindohm et al, 1990; Valanis et al, 1999). Continuous exposure to pesticides has been reported to be a reason for the higher prevalence of infertility even among farmers and agricultural workers.

Life-style related factors such as diet and obesity too seem to have an adverse effect on the reproductive outcomes in general and infertility in particular (Pasquali et al. 2003). The general consensus is that there is a considerable reduction in fecundity among women with a body mass index that exceeds 25 kg/m² (Hassan and Killick, 2004). The behavioural factors such as excessive intake of caffeine, smoking and consumption of alcohol too are associated with reduced reproductive outcomes (Fenster et al, 1997; Tolstrup et al, 2003; Ness et al, 1999, Juhl et al, 2003; Eggert et al, 2004). Further, excessive atmospheric pollution, water contamination and the chemicals used for water purification too contribute to the increased prevalence of infertility. Apart from this, various other biological and socio-economic factors also contribute to elevate the risk of infertility in human beings.

Another common cause of infertility in today's world is the advancing maternal age. As women delay childbearing to pursue education and employment opportunities, they face potentially increased difficulty in becoming pregnant due to diminishing egg quality and ovulatory function with increase in maternal age.

There has been significant economic development throughout the world, particularly in India, in recent decades that has resulted in changes in biological, cultural and environmental aspects, which in turn have an impact on fertility outcomes. Several clinical studies have pointed out that, over time, the prevalence of infertility in the world has increased, especially in the developing countries. Many factors such as lifestyle changes, environmental changes and the changing occupational patterns have contributed

to increased prevalence of infertility in the developing countries. Moreover, the prevalence of infertility is reported to be higher in developing countries than in developed countries mainly because of the fact that the medical technologies in these countries are not adequate to address this issue.

In view of the epidemiological and nutritional transition that is taking place in the developing countries and the associated changes in dietary trends and physical activity levels, the proportion of increasing over-weight adults in these countries is a clear indication of the life-style changes that are taking place within a society. Further, with the social and economic development, several changes have been reported in these countries like, increased environmental pollution, changes in occupational structure, changes in dietary intake and the physical activity levels. All of this adversely affects the health of the individual in general and their reproductive outcomes in particular.

Sexually transmitted infections (STIs) are generally considered the leading preventable cause of infertility worldwide, especially in developing countries (WHO, 2004; Ombelet et al, 2008). STIs cause approximately 70 per cent of all pelvic inflammatory disease (PID) cases, which often result in tubal damage (WHO, 2004; Ericksen and Brunette, 1996). A large study conducted by the WHO in 25 countries, with over 5800 couples, found that over 85 per cent of the infertility among African women was attributable to infection, compared to only 33 per cent in women worldwide (Ombelet et al, 2008).

Among Indian women reporting primary infertility and PID, STI prevalence was high (Population Council; 2004). The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent (WHO, 2004). Estimates of infertility vary widely among Indian states from 3.7 per cent in Uttar Pradesh, Himachal Pradesh and Maharashtra, to 5 per cent in Andhra Pradesh (Unisa,1999), and 15 per cent in Kashmir. Moreover, the prevalence of primary infertility has also been shown to vary across tribes and castes within the same region in India. However, it should be noted that many of these estimates use different definitions of infertility and consider different time periods, which makes direct comparisons difficult between any studies.

An epidemiological study of infertility among urban population of Ambala, Haryana showed that there were total of 4456 eligible couples and 534 were found to be having primary or secondary infertility. The study showed that among eligible couples prevalence of primary infertility was 6.1 percent, while secondary infertility was 5.7 percent. Among couples with primary infertility male factors were responsible in 49 (17.9 percent), female factors in 86 (31.5 percent) and both partners were accountable in 66 (22.3 percent) while 77 (28.2 percent) couple cause of infertility was unexplained. In women with primary infertility ovulatory factor was commonest cause while in secondary infertility tubal blockage and pelvic inflammatory disease (PID) were equally responsible. Study shows that majority of cases with infertility had normal menstrual cycles while women with secondary infertility had oligomenorrhea as commonest menstrual pattern. It was concluded that this study has provided significant information concerning the prevalence of infertility in the study area and has informed about different demographical and etiological factors associated with infertility (Mittal et al., 2015).

Infertility is not merely a health problem, it is also a matter of social injustice and inequality (Kumar, 2007). Infertility can have a serious impact on both the psychological well-being and the social status of women in the developing world. As a result of their infertile status, they suffer physical and mental abuse, neglect, abandonment, economic deprivation and social ostracism as well as exclusion from certain social activities and traditional ceremonies (Jumayev, 2012)

In the study (Manna et al. 2014) it was found that 191(2.2 percent) couple were infertile, out of them (0.1 percent) had been suffering from secondary infertility and 182 (2.0 percent) were primarily infertile. Maximum number of infertile women is in the age group of 25-34 years whereas no infertile woman belongs to ≥ 45 years. Maximum number of infertile male belonged to the same age group and only 5.8 percent belonged to ≥ 45 years. Statistically significant relationship was found between medical problem and presence of family history, obesity and addiction. About 21.5 percent women had different kinds of menstrual abnormality, out of which a large proportion had oligomenorrhoea and hypomenorrhoea or both (14 percent). Maximum (64 percent) number of women suffered from PID followed by PCOD (19 percent). About 61 percent

women have done USG followed by hormonal assay (26 percent) and HSG (11.8 percent). Out of 191 infertile couples 111 (58.1 percent) were evaluated for infertility. Among them, 89(46.6 percent) couples showed abnormality. About 43 percent had PCOD, 29 percent had endocrinal abnormalities, 11 percent had tubal block, and 6 percent had tubo-ovarian mass. Maximum women (57 percent) received ovulation induction therapy and 24 percent received hormonal treatment for PCOD, it is also noticeable that 2 percent women have gone through IVF. About 71.7 percent of infertile men received treatment. Among them 60 percent infertile men received general treatment and 31 percent men had treated for hypogonadism. It is noted that none had gone for ART. About 71.7 percent infertile male have gone through semen analysis and out of those 40.9 percent have shown some kind of abnormalities. About 32.85 percent having abnormal count, 10.9 percent having abnormal volume, 5.1 percent abnormal morphology, 6.6 percent having abnormal motility and 1.5 percent having low fructose content. About 27.2 percent infertile women had followed up their treatment reasonably whereas only 18.3 percent men follow up the treatment.

Treatment and prevention for infertility are integral components of the programme of action of the International Conference for Population and Development (ICPD). India's Reproductive and Child Health Programme, however, fails to focus on infertility. Studies around the world have shown that infertility is a growing problem that needs immediate attention. This issue becomes more important in view of the fact that the medical facilities available in many developing countries are inadequate to address the issue. Although a few recent studies have attempted to address this issue, the data on levels, trends and consequences of infertility are however very limited, especially in the Indian context as well as in Kerala.

Anupama (2011) from a hospital based study in Kerala reported that trends in infertility are difficult to determine or to interpret for several reasons. She ascertained that infertility was high among working women and was rising as women today are more goal oriented. She found that endometriosis was the cause of infertility in around 20 to 40 percent of women; polycystic ovary syndrome (PCOS) was the reason for 5 to 10 percent

of women. Reduced sperm counts can be caused by genetic factors, infections (e.g. mumps), anatomic abnormalities, heat, or exposure to toxic chemicals during fetal development or adulthood. Toxic chemical exposure can directly damage developing sperm. Obesity and stress at home or work place produces a definite reduction in sperm count and motility as well as causes sexual dysfunction in males. Reduced sperm counts can be caused by genetic factors, infections (e.g. mumps), anatomic abnormalities, heat, or exposure to toxic chemicals during fetal development or adulthood. Toxic chemical exposure can directly damage developing sperm. Obesity and stress at home or work place produces a definite reduction in sperm count and motility as well as causes sexual dysfunction in males.

According to DLHS 3 the prevalence of infertility problem ever experienced by currently married women within the age group (20-49) years with two or more years of marital duration in Kerala was 11.1 percent, of which 9.1 percent women had ever experienced primary infertility, 2.0 percent women had experienced secondary infertility. The prevalence of currently infertile women was 4.4 percent in the state. Dr Peter Robert Brinsden, group medical director of Bourn Hall Clinic, the world's first IVF or In Vitro Fertilization clinic reported that the infertility is increasing at an alarming rate in Kerala . According to Brinsden, the reasons for this could be as varied as women marrying late, and the high alcoholic consumption among men. The alcohol consumption in Kerala is highest in India and this contributes to nearly 50% of the total number of infertility cases. The infertility situation has led to the popularity of infertility treatment in the state with more couples going in for IUI (intrauterine insemination) and IVF procedures (The Times of India, 2012). Jaya Lal Mohan, Ernakulam District RCH Officer, at a media workshop on RCH, reported that the male infertility was higher in Kerala. Food, occupation and even dressing habits were factors responsible for infertility. Studies have found that use of napkins was affecting the growth stages of infants (The Hindu daily, 2004). The Times of India daily reported that the IVF clinics in Kerala have doubled over the past 5 years. A quick count shows that from 20 IVF clinics in 2012, the numbers have jumped to 41 in 2017. Fertility specialists reported that the reason for this phenomenon was not the increased infertility among couples but many were increasingly moving

towards infertility situations due to late marriages and delay in pregnancy. Studies of infertility are rare in Kerala. NFHS and DLHS cover infertility aspects. But these data sets are not exclusively for the infertility studies. Limited data exclusively for the subject is available. Keeping this background in mind the present study is undertaken. Hence we approach the infertility clinic in Thiruvananthapuram which is functioning since 2005 with the Women and Child Hospital, Thycaud.

2. Objective

The main objective is to study the profile of patients attending infertility clinic

3. Data and Methodology

Out of the infertility clinics function in Govt. hospitals in Kerala, infertility clinic functions in W&C hospital, Thycaud is selected for the study. It is the best performing clinic in the State at Govt. sector and the yearly success rate is 30 to 35 percent. Clinic is functioning since 2005. The following table shows that patients attending the clinic and become pregnant are increasing alarmingly. Since 2014 one data entry operator is appointed and data are entered in to the computer. Since data are not properly entering, we could not use all data for all variables. Data set consists of 7470 women and available details of them are analysed. We interviewed 224 women who attended the clinic in December 2017 and collect information. Details of women who become recently pregnant (that is from October to December 2017) are filtered from the main data base and also analysed.

Table 1: Number of women registered and pregnant during 2005-2017 in infertility clinic, W&C Thycaud

Year	Total Registered	Pregnant
2005	237	20
2006	426	62
2007	563	91
2008	871	124
2009	1377	331
2010	1814	429
2011	2528	533
2012	2847	733

2013	3151	857
2014	3163	894
2015	3079	884
2016	2808	1101
2017	3842	1317

4. Characteristics of patients attending Infertility Clinic, W&C Hospital, Thycaud

The American Society of Reproductive Medicine defines infertility as a condition that can be diagnosed when a couple fails to conceive within 12 months of unprotected intercourse. Infertility may result from male factors (estimates range from 20-50% of cases), female factors (about 30% of cases), and the rest are attributable to couple-dependent factors or are unexplained. Giving birth to a child can be one of life's most rewarding experiences – but also a fairly complicated one. Infertility is a major gynecological disorder affecting almost 10 percent of couples. Lifestyle changes have been contributing to the increase in infertility rate in Kerala. This high prevalence shows the depth of this problem in our society. Unfortunately government hospitals providing infertility care are very rare. Treatment for infertility includes repeated ultrasound scanning, medications, Lab procedures and laparoscopic surgeries which are quite expensive.

W&C Hospital Thycaud was established in the year 1814 by Her Highness Sethu Parvathy Bai from the Royal Travancore family. It started as a dispensary but later it was changed in to health centre on 1839. Dr. Ponnen Lukose, who was the Kerala's first women doctor was appointed in this Hospital. The hospital was upgraded on 1996 as the 'First Referral Unit' and later as District Hospital. It is a spacious hospital with large corridors and tree for giving shade, multi storied building and modern equipments blended with traditional outlook is the only solace for mother and newborn babies. The hospital is having an average of 650 delivery cases attended per month. Infertility clinic at W&C Hospital, Thycaud is functioning from the year 2005 at a two storied building with a total area of 4300 sq. ft. The clinic is providing the following facilities such as Registration, History, Investigations, Semen analysis, Ultrasound scanning, Diagnosis, Decision making regarding treatment, Treatment with drugs and follicular study, Intra

Uterine Insemination (IUI) & Diagnostic Laparoscopy. Dr. Sam John Varghese, who heads the Intra Uterine Insemination (IUI) facility at the Women and Child Hospital, Thycaud, is a messiah for childless couples. This infertility specialist, who works close to 12 hours a day, does his job with only a handful of staff and the most basic of facilities. His success rate of 70 to 90 per cent a month has raised the stock of the laparoscopic centre and infertility clinic attached to the hospital. Nearly 3000 childless couples register at the clinic every year.

Presently the hospital is unable to provide adequate care for patients with complicated diseases needing laparoscopic surgeries and IVF/ICSI. These treatments are quite expensive for low economic background people and so the Government has proposed to upgrade the existing infertility clinic with advanced facilities. Hence the government has decided to upgrade the existing infertility clinic at W&C Hospital Thycaud as an IVF/ICSI centre.

There are 7470 patients whose ID number and details are entered in to the computer from 2014 to January 2018. Patients are from neighbouring districts and from Tamil Nadu. About 83 percent of patients are from Thiruvananthapuram followed by Kollam (8.2 percent) and Tamil Nadu (5 percent).

Most of the men who come for treatment belong to the age group 31-35 where as women belongs to 26-30 age group. More than one fourth of the men are in the age group 26-30 and one fifth of the 36-40 age group men sought treatment in the clinic. About 34 percent of the women in the age group 21-25 also sought treatment. Marital duration shows that most of those (about 41 percent) who sought treatment are in the newly married group or within 2 years of marriage followed by those married more than 110 months of marriage. Occupational analysis of patients attending clinic reveals that men are mostly engaged in skilled work (38 percent), men who are working away from their family like Gulf, Army, and Ship (14 percent). Govt servants constitute 13 percent of the patients and another 13 percent working in private institutions. About 78 percent of the women are house wives and 10.5 percent have Govt. Jobs.

Table 2: Characteristics of Patients who seek infertility treatment

<i>Characteristics</i>	<i>Percent</i>	<i>Number</i>	<i>Characteristics</i>	<i>Percent</i>	<i>Number</i>
<i>District</i>			<i>Marital Duration</i>		
Alappuzha	1.3	96	<24	41.2	3076
Ernakulam	0.2	14	25-36	8.1	602
Idukki	0.1	6	37-48	5.2	390
Kannur	0.1	7	49-72	6.1	458
Kasaragod	0.0	1	73-109	5.0	376
Kollam	8.2	616	>110	34.4	2568
Kottayam	0.4	29	<i>Occupation of Husband</i>		
Kozhikode	0.1	9	Business	9.2	687
Malappuram	0.1	5	Govt. Servant	13.0	969
Palakkad	0.2	12	Gulf, Army, Ship etc	14.3	1066
Pathanamthitta	1.3	90	IT Field	0.1	9
Thiruvananthapuram	82.7	6181	Paramedical Staff	0.7	51
Thrissur	0.3	23	Private	13.1	981
Wayanad	0.0	2	Professional category	1.7	124
Mahi	0.0	1	Skilled worker	38.1	2845
Bangalore	0.0	1	Unskilled worker	9.9	738
Jharkhand	0.0	1	<i>Occupation of Wife</i>		
Tamil Nadu	5.0	375	Business	0.5	37
<i>Age of Husband</i>			Govt. Servant	10.5	781
<25	2.7	201	HW	78.1	5835
26-30	25.5	1906	IT Field	0.1	8
31-35	40.3	3012	Paramedical Staff	1.2	88
36-40	22.1	1652	Private	5.9	438
41-45	7.6	565	Professional category	1.2	89
>46	1.8	134	Skilled worker	1.7	124
<i>Age of Wife</i>			Unskilled worker	0.9	70
<20	3.9	288	<i>Smoking of husband</i>		
21-25	34.2	2558	Yes	98.4	7349
26-30	37.5	2802	No	1.5	121
31-35	18.8	1405	<i>Alcohol Consumption of Husband</i>		
36-40	5.5	408	Yes	27.1	2022
>41	0.1	9	No	72.9	5488
			Total	100.0	7470

Only 1.5 percent is reported to have smoking behaviour but 27.1 have a habit of consuming alcohol. Smoking is strongly linked to male infertility although the reasons are not entirely clear. Some studies show that smoking can reduce the sperm count by 23 percent and sperm motility by 13 percent (<https://www.fertilitysa.com/blog/2016/03/23/kick-the-habit-for-your-168365> assessed on 31-3-2018). Alcohol consumption as much as five drinks per week can significantly

lower a man's testosterone and the quality of his sperm. Many recreational drugs have the same effect (Sansone et al, 2018).

Table 3: Percent distribution of disease history of women

Disease history of women	Percent	Frequency
Abortions	15.6	60
Ectopic Pregnancy	2.1	8
Fibroadenoma	2.6	10
Laparoscopy	5.5	21
Asthma	47.4	182
Laprotomy	1.6	6
Haemorrhoidectomy	0.3	1
Psychosis	0.8	3
LSCS	3.1	12
Have child	0.5	2
Allergy+Rhinitis	0.8	3
Diabetic	4.7	18
Blighted Ovaries	0.8	3
Conceived	2.1	8
Others	12.2	47
Total	100	384

Disease history of only 384 women are available in the data set provided. Out of them 47 percent has Asthma and five percent has diabetic. About 16 percent has an abortion history and 5.5 percent has done laparoscopy for corrections of the uterus or for adnexa. More than 12 percent has problems like myoma, increase of weight, psoriasis, TB, and UTI.

Table 4: Details of ultra sound scan of the Uterus

Ultra sound scan of the Uterus	Percent	Number
Cyst	6.0	81
Fibroids	3.0	40
Follicles	3.2	43
PCOD	44.3	598
Myometrium Lesion	0.3	4
Polyp	0.2	3
PVO	0.2	3
Other problems	1.3	18
Normal	41.5	561
Total	100.0	1351

USG scan of the uterus of 1351 women reveals that 44 percent has Poly Cystic Ovary Diseases (PCOD) problems and 6 percent has cyst and each three percent has fibroids and follicles found in their USG scan.

Table 5 Disease history of men (Percent)

Disease history of men	Percent	Frequency
Allergy+Rhinitis	6.3	8
Diabetic	3.9	5
Appendicectomy	17.2	22
Asthma	41.4	53
Thyroid	10.9	14
UTI	2.3	3
Hypertension	2.3	3
Others	15.6	20
Total	100.0	128

Out of the 128 men whose details of treatment history are available more than 41 percent has Asthma and using inhalers and 11 percent has thyroid. A considerable percent (17 percent) had an appendicectomy in their life time.

Table 6: Details of Semen Analysis

Details of Semen Analysis	Percent	Frequency	Details of Semen Analysis	Percent	Frequency
Liquefaction time			Volume		
<30	27.5	325	<1.5 ml	25.2	347
High time required to liquefy	72.5	855	1.5-6.8 ml	74.3	1023
Total	100	1180	>6.8ml	0.4	6
Total count			Total	100.0	1376
count <15million	12.8	189	Morphology		
Normal count	87.2	1283	<4 percent	5.7	13
Total	100.0	1472	4-44 percent	35.4	81
Motility			>44 percent	59.0	135
<40 percent	15.3	228	Total	100.0	229
40-78 percent	65.1	969	Viscosity		
>79 percent	19.6	291	Normal	83.7	747
Total	100.0	1488	Abnormal	16.3	146
			Total	100.0	893

Semen analysis consists liquefaction time, total count of the semen, motility of the sperm, volume of the semen, morphology of the sperm. There are details of liquefaction time of only 1180 patients, total count details of 1472 patients, motility details of 1488 patients, volume of 1376 patients, Viscosity of 893 and morphology of 228 patients in the computer.

Liquefaction

Semen is normally produced as a coagulum. The specimen will usually liquefy within 30 minutes. The failure to liquefy within half an hour is abnormal. Delayed liquefaction may indicate a problem with the prostate, the seminal vesicles, or the bulb urethral glands, which are also known as the male accessory glands. Table shows that majority (72.5 percent) of the patients' semen takes more time to liquefy.

Total count

Sperm concentration or count is determined by how many sperm are present within each millilitre of semen. Majority of the patients (87 percent) have total count in the normal range. That is in the range of 15 million to 213 million.

Motility

Although low sperm count is the most common reason for poor fertility, low sperm motility (asthenospermia) can also be a problem. Often these two characteristics occur together, making conception extra challenging. A man is considered fertile by the World Health Organization (WHO) guidelines if he has a minimum "progressive motility", i.e. grade a+b. of 32%, equivalent to 4.8 million/ml of semen (minimum WHO requirement sperm count of 15 million per ml x 32%). Vitality must be a minimum of 60% live spermatozoa.

Factors that can affect sperm motility include structural problems associated with the tail, sperm death (necrospermia) and autoimmunity against sperm. Majority of the men in the centre has motility in the range of 40-78 percent for those data are available.

Volume

Normal sperm volume (amount) is 1.5 to 5 ml, or about a teaspoon. Volume of semen produced is measured to determine if there is a blockage of the seminal vesicles. Volumes less than 1.5 millilitres may indicate an obstruction preventing sufficient sperm concentration within semen and reducing fertility. Out of the 1376 men, 4 percent has a volume of 1.5 to 6.8.

Morphology

Normal sperm morphology means that more than about 44% of sperm should be normally shaped. A normal sperm measures 50-70µm in length. It has a large oval head, which measures about 3 – 6 x 2 – 3µm, a short middle piece and a long tail. Normal semen may contain up to 20% abnormal forms. Out of the 229 semen analysis only 35 percent has a normal morphology

Viscosity

Viscosity is measured after complete liquefaction has occurred. Viscosity is considered "normal" if the liquefied specimen can be poured from a graduated beaker drop by drop with no attaching agglutinum between drops. This is important because it is the ability of sperm to travel from the site of deposition into the cervix or uterus. Out of the 893 men whose semen viscosity is measured, 84 percent has normal viscosity.

Table 7: Details of type of sperm

<i>Type of Sperm</i>	<i>Percent</i>	<i>Frequency</i>
Azoospermia	61.0	111
Oligoasthenozoospermia	0.5	1
Asthenozoospermia	1.5	3
Necrozoospermia	0.5	1
OAT	31.3	57
Teratozoospermia	0.5	1
Varicocele	4.4	8
Total	100	182

Type of sperm

Azoospermia

A concentration in excess of 15 million sperm per millilitre is considered as a healthy sperm count in this clinic. Any figure below this is classified as a low sperm count (oligozoospermia). If no sperm is found in the analysis it's possible that there is an obstruction preventing sperm flow or an absence of sperm production. Termed azoospermia, this medical condition affects approximately 2% of the male population. But here 60 percent of the 182 men have this condition.

Asthenozoospermia

Decreased sperm motility (Sperm motility < 40%) is called Asthenozoospermia. Frequent causes are abnormal spermatogenesis (sperm manufacture), epididymal sperm maturation problems, transport abnormalities, varicocele. These conditions should all be looked for if sperm motility is repeatedly "low". Here 1.5 percent of those tested is in this condition.

Necrozoospermia.

A total absence of moving sperm is called necrozoospermia. It is vital to see if the sperm seen are alive or viable. Here one man is found to be in the stage.

OAT or Oligoasthenoteratozoospermia

Oligoasthenoteratozoospermia (OAT) is the term we used to describe this condition. By definition, OAT is characterized by semen with the following qualities:

- an abnormally low number of sperm (oligozoospermia)
- an abnormally low number sperm with good motility (asthenozoospermia)
- an abnormally low level of sperm of a healthy shape (teratozoospermia)

The term oligoasthenoteratozoospermia is used when all three factors are present.

Idiopathic oligoasthenoteratozoospermia is used when the cause of the condition is unclear. Up to 30 percent of male infertility cases are said to have idiopathic OAT. Here out of the 182 persons 31 percent has this condition

Teratozoospermia

If more than 40% of sperm seen are of abnormal form it is called teratozoospermia and here one person is found to be have abnormal sperm form.

Oligoasthenozoospermia

If motile density is less than 8 million sperm/ml, it is called Oligoasthenozoospermia and one is reported to have this condition in the clinic.

Varicocele

It is a term used to describe abnormally dilated veins (called the “pampiniform plexus” of veins) in the scrotum. Varicoceles can cause three main problems: Impaired fertility, decreased testosterone production by the testis, or scrotal discomfort. For this reason, they are not usually treated unless there is reason for concern about one of these problems. In some cases, varicocele can cause azoospermia, or the complete lack of sperm in the ejaculate

5. Characteristics of patients attending Infertility Clinic, W&C Hospital, Thycaud through an exit interview of 224 women

Primary data were collected from 224 women who attended the infertility clinic for treatment at W&C Hospital Thycaud, Thiruvananthapuram through an exit interview using a semi structured schedule during the month of December 2017. Table 8 gives the profile of women and her partner who seek treatment for infertility from the clinic. Considering the age of husbands, about one third of them belong to the age group of below 30 years and about 9 percent of them belong to the age group of above 40 years. About half of them belong to the age group (30 – 34) years. Two out of ten men are in the age group (35 – 39) years and the average age of husbands is 32.5 years. Regarding the age of women, it is seen that a higher proportion of women seek treatment for infertility are young and the average age of women is 27 years. About 44 percent of them belong to the age group of below 25 years and 37 percent of women are in the age group (25-29) years. Only four percent of the women belong to the age group of 35 years and above.

The average marital duration of couple is 40 months. About 22 percent of women have their marital duration above 60 years. Average duration of couple staying together is 32 months. About 9 percent of the women have a duration staying together with their

husband as less than ten months. About 24 percent of women are staying with their husband for 10 to 15 months, 14 percent for 16-20 months, 18 percent for 21-29 months, 13 percent for 30-39 months, 9 percent for 40-49 months and about 16 percent of women are staying with their husband for more than 50 months.

Table 8: Profile of sample women

Characteristics	Number	Percent	Characteristics	Number	Percent
Age of Husband			Duration of Stay		
≤29	57	25.4	≤9 months	20	8.9
30-34	106	47.3	10-15	53	23.7
35-39	42	18.8	16-20	32	14.3
≥40	19	8.5	21-29	34	15.2
Age of Wife			30-39	30	13.4
≤24	98	43.8	40-49	20	8.9
25-29	82	36.6	≥50	35	15.6
30-34	36	16.1	BMI of Wife		
≥35	8	3.6	≤18.4	12	5.4
Marital Duration			18.5-24.9	93	41.5
≤14	29	12.9	25-29.9	82	36.6
15-19	31	13.8	≥30	37	16.5
20-29	40	17.9	Abortion if any		
30-39	44	19.6	No	198	88.4
40-59	30	13.4	1	18	8.0
60+	50	22.3	2	5	2.2
			3	2	0.9
			4	1	0.4

Obesity, stress and lifestyle changes are wreaking havoc with the reproductive health of women. Women seem to be paying a higher price for lifestyle changes than men. Gynaecologists reported that women with metabolic and reproductive problems have one common factor, a high percentage of body fat. Obesity has far more consequences for women than men because apart from metabolic disorders and cardiovascular risks, it also affects their reproductive health adversely. Dr. Sheila Balakrishnan, Associate Professor of Gynaecology at SAT hospital, Thiruvananthapuram who is also in charge of the infertility clinic opined that the first step in infertility treatment for many women now is

weight reduction. According to her about 30-40 per cent of women who go for infertility treatment are obese and she added that the ability to conceive spontaneously is reduced by obesity. Obesity also affects pregnancy outcome as related conditions like hypertension or gestational diabetes present increased risk for the mother as well as the baby (The Hindu daily, 2016). Table 8 also shows that 16.5 percent of the women taken for the study are obese (BMI ≥ 30) or risky mothers. About 37 percent of the women are overweight (BMI between 25 and 29.9) and they have more risk of becoming infertile.

Considering the health profile of couple who seek treatment from infertility clinic at Thycaud, only a negligible proportion of women (one percent) are hypertensive and diabetic. Thyroid dysfunction, which is quite prevalent in the population affects many organs including the male and female gonads, interferes with human reproductive physiology, reduces the likelihood of pregnancy and adversely affects pregnancy outcome, thus becoming relevant in the algorithm of reproductive dysfunction. Thyroid autoimmunity increases the miscarriage rate (Trokoude et al., 2006). For over two decades now, endocrinologists have noticed a strong link between hypo- and hyperthyroidism and infertility as well as adverse pregnancy and neonatal outcomes (Singer, 2015).

Table 9: Health profile of sample women and their husbands

Disease History of women	Frequency	Percent	Disease History of men	Frequency	Percent
Hypertension			UTI/STD		
No	222	99.1	No	222	99.1
Yes	2	0.9	Yes	2	0.9
Thyroid dysfunction			Varicocele treated		
No	191	85.3	No	220	98.2
Yes	33	14.7	Yes	4	1.8
Diabetes			Mumps		
No	222	99.1	No	207	92.4
Yes	2	0.9	Yes	17	7.6
Uterus Status			Sexual function		
Normal	192	85.7	Normal	224	100.0
Abnormal	2	0.9	Testicular Maldescent		
PCOD	30	13.4	No	224	100.0
			Total	224	100.0

Hypothyroidism (underactive thyroid) affects about 0.5 percent of women of reproductive age. In children and teens, the condition is associated with a delay in reaching sexual maturity (Jefferys, 2015). The researchers also noted that thyroid disease is associated with an increased risk of problems during pregnancy, including miscarriage, preeclampsia, poor fetal growth, premature birth and stillbirth. With hypothyroidism, the thyroid gland doesn't produce enough of certain important hormones. Low levels of thyroid hormone can interfere with the release of an egg from ovary (ovulation), which impairs fertility.

For women, treating hypothyroidism is an important part of any effort to correct infertility. If infertility remains after hypothyroidism has been corrected, other interventions to treat infertility may be needed. The Obstetrician & Gynaecologist, found that 2.3 percent of women with fertility problems had an overactive thyroid (hyperthyroidism), compared with 1.5 percent of those in the general population and the condition is also linked with menstrual irregularity (Health Day News, 2015). One previous study reported that about 21.46% women had different kinds of menstrual abnormality, out of which a large proportion had oligomenorrhoea and hypomenorrhoea or both (14%)(Manna et al., 2014)

From the Table 9, it can be seen that about 15 percent of the sample women have thyroid dysfunction. Awareness of the thyroid status in the infertile couple is crucial, because of its significant, frequent and often reversible or preventable effect on infertility. Recent clinical reports show that many of the women in the reproductive age group have the burden of PCOD. This may be a major reason for occurrence of miss carriages and infertility among women. PCOD (Polycystic Ovary Disorder) is an endocrine disorder that causes various hormone levels to become irregular, along with inflammation. Frank (1995) found that women with PCOS were concomitant with increased risk of infertility. A community based study in West Bengal shows that maximum (64 percent) number of women suffered from PID followed by PCOD (19 percent). About 61 percent women have done USG followed by hormonal assay (26 percent) and HSG (11.80 percent). Out of 191 infertile couples 111 (58.12 percent) were evaluated for infertility. Among them,

89(46.60 percent) couples showed abnormality. 43 percent had PCOD, 29 percent had endocrinal abnormalities, 11 percent had tubal block, and 6 percent had tubo-ovarian mass. Maximum women (57 percent) received ovulation induction therapy and 24 percent received hormonal treatment for PCOD, it is also noticeable that 2 percent women have gone through IVF (Manna, 2014).

The infertility rate with polycystic ovaries is very high. These women usually will have difficulty in getting pregnant and require treatment to improve chances for pregnancy. Some women with polycystic ovary syndrome will ovulate (release a mature egg) occasionally, others do not ever ovulate. PCOD is one among the cause for infertility women in our study. About 14.3 percent of the selected women have some kind of uterus problems, out of which 13.4 percent of the sample women have PCOD.

Mumps is a viral infection that principally affects the parotid glands. However, it can also affect the testicles, giving rise to a condition called orchitis, which means inflammation of the testicle. If orchitis occurs before puberty fertility is usually unaffected. In the case of post-pubertal males it is estimated that 30 percent of males who develop mumps also develop orchitis during the course of the illness. In a third of these cases both testicles are affected. Orchitis can result in atrophy of the testicles, which in turn can impair sperm production. However complete sterility is rare in post-pubertal males that develop orchitis. It is important to emphasise that both testicles have to be affected by orchitis and mumps without orchitis carries no threat to fertility. In summary the chances of a man being sterile as a result of childhood mumps is low.

Considering the health situations among the male partners (husbands) of the selected sample women, it is seen that about two percent of the husbands received treatment for varicocele and about 8 percent is affected by mumps. Only two persons reported that their husbands are affected by UTI/STD. All the male partners of the women under study have normal sexual functions and no testicular maldescent.

Table 10: Negative health behaviour of Husbands

Negative health behaviour	Number	Percent
Alcohol consumption		
No	191	85.3
Yes	33	14.7
Smoking		
No	188	83.9
Yes	36	16.1
Total	224	100.0

It can be seen from the Table 10 that about 15 percent of the partners of women under study have the habit of consuming alcohol and 16 percent of men are smokers.

Table 11: Sample women by IUI done and the current pregnancy status

Characteristics	Number	Percent
IUI Done		
No	174	77.7
1	19	8.5
2	17	7.6
3	11	4.9
5	2	0.9
7	1	0.4
Current status of pregnancy		
Not Pregnant	218	97.3
Pregnant	4	1.7
Sp. Pregnant	1	0.4
Failed	1	0.4
Total	224	100.0

Intrauterine insemination (IUI) is a fertility treatment that involves placing sperm inside a woman's uterus to facilitate fertilization. The goal of IUI is to increase the number of sperm that reach the fallopian tubes and subsequently increase the chance of fertilization.

The Infertility clinic functioning with W&C Hospital, Thycaud, Thiruvananthapuram provides the IUI treatment for women having infertility problems. Table.10 provides the proportion of sample women who have undergone IUI and their current pregnancy status. Out of the total 224 women selected for exit interview, 22 percent of women have undergone IUI. About 8.5 percent women have undergone IUI once, and 7.6 percent of

women have undergone twice, about 5 percent women have undergone IUI thrice, two women have undergone five times and one of them has undergone IUI seven times. About 78 percent of sample women and their husbands are under various kinds of diagnosis and treatment other than IUI. Out of the total women who underwent IUI 10 percent have become pregnant but one case is failed. One woman became spontaneously pregnant during the treatment.

6. Profile of women who became pregnant through the treatment sought from the infertility clinic, Thycaud.

This section deals with profile of women who attended the infertility clinic for treatment at Thycaud, Thiruvananthapuram, and were reported to be pregnant during October to December 2017. About 172 women who reported that they became pregnant during the above period of treatment from the clinic were selected for the study. Table .11 provides the details of the above pregnant women. It can be seen that about half of the pregnant women belong to the age less than 25 years. About 38 percent of the pregnant women are in the age group of 26-29 years and only two percent of pregnant women have the age of more than 35 years. The mean age of pregnant women is 27.8 years. The average age of their husbands is 32 years. About 48 percent of their husbands are in the age group of 30-34 years and about 26 percent of their husbands have the age of 35 years and above. Only 7.6 percent of their husbands are in the age of less than or equal to 25 years.

Occupational categorization of husbands of the selected pregnant women shows that the highest proportion of them are skilled workers (24 percent) followed by husbands working outside and living away from the spouse (19.2 percent which include men working in gulf and other countries , states other than native place, those who are working in the armed force and related service etc.) and unskilled workers (19.2 percent), private employee (14 percent), Govt. servants (13 percent) and the least proportion of professional staff (1.2 percent). In the study on risk factors affecting female infertility in South Indian Districts of Tamil Nadu and Kerala by Shamila and Sasikala(2011) , a positive correlation of infertility ($P < 0.01$) was recorded where the husband lived abroad

due to occupation. Considering the occupation of pregnant women, majority (78 percent) are house wives. About 7.6 percent are working as Govt. servants; five percent are paramedical staff, another five percent working as professional employees and four percent working as private employees.

Table12: Profile of pregnant women and their husbands

Characteristics	Number	Percent	Characteristics	Number	Percent
Age of Wife			Occupation of Wife		
≤25	84	48.8	Govt. Servant	13	7.6
26-29	58	33.7	House Wife	134	77.9
30-34	27	15.7	Paramedical Staff	8	4.7
≥35	3	1.7	Private Employee	7	4.1
Age of Husband			Professional	8	4.7
≤25	13	7.6	Skilled	1	0.6
26-29	33	19.2	Student	1	0.6
30-34	82	47.7	Duration of Marriage		
≥35	44	25.6	<15	33	19.2
Occupation of Husband			15-29	18	10.5
Business	13	7.6	30-59	14	8.1
Govt. Servant	22	12.8	60-114	18	10.5
Husband working away	33	19.2	≥115	89	51.7
Paramedical Staff	4	2.3	District		
Private Employee	24	14.0	Alappuzha	1	0.6
Professional	2	1.2	Kollam	5	2.9
Skilled	41	23.8	Pathanamthitta	1	0.6
Unskilled	33	19.2	Tamil Nadu	6	3.5
			Thiruvananthapuram	159	92.4
			Total	172	100.0

Regarding the duration of marriage of couple, it can be seen that about 52 percent has duration greater than or equal to 115 months, about 19 percent has duration of less than 15 months. About 10.5 percent of the pregnant women have their duration of marriage between 60 months and 114 months. The average duration of marriage among the above women is 46 months. The district wise variation of women attending for treatment in the infertility clinic shows that about 92 percent of them belong to Thiruvananthapuram district, 3.5 percent from Tamil Nadu, three percent from Kollam district, one woman each from Alappuzha and Pathanamthitta districts.

Table 12 gives the health problems and other issues among the selected woman who became pregnant by the treatment received from the infertility clinic during October to December 2017. Majority of the women have primary sterility. Out of the total 172 pregnant women, two of them reported that they had experienced previous abortions but no one had experienced MTP. About 13 percent of women reported that they have hirsutism. About 5 percent of women reported to have acne and two women reported that they have experienced galactorrhoeas.

Table13: Distribution of pregnant women by Health problems

Characteristics	Number	Percent	Characteristics	Number	Percent
Abortion if any			Previous Infertility		
No	170	98.8	No	157	91.3
Yes	2	1.2	Yes	15	8.7
No MTP	172	100.0	Kochs		
Hirsutism			No	171	99.4
No	150	87.2	Yes	1	0.6
Yes	22	12.8	Thyroid Dysfunction		
Acne			No	159	92.4
No	163	94.8	Yes	13	7.6
Yes	9	5.2	Diabetes		
Galactorrhoes			No	153	89.0
No	170	98.8	Yes	19	11.0
Yes	2	1.2	Husband Treated for Varicocele		
Pelvic pain			No	171	99.4
No	171	99.4	Yes	1	0.6
Yes	1	0.6	Husband Mumps		
Previous Pelvic Infection			No	165	95.9
No	164.0	95.3	Yes	7	4.1
Yes	8.0	4.7	Husband Urethral Structures		
Previous Pelvic Surgery			No	171	99.4
No	171	99.4	Yes	1	0.6
Yes	1	0.6	Husband Smoking		
Dyspareunia			No	167	97.1
No	164	95.3	Yes	5	2.9
Yes	8	4.7	Husband consuming Alcohol		
Dysmenorrhoea			No	124	72.1
0	135	78.5	Yes	48	27.9
1	26	15.1	Total	172	100.0
2	10	5.8			
3	1	0.6			

About eight percent of the pregnant women reported that they had experienced previous pelvic infection and only one woman had previous pelvic surgery. About 5 percent of pregnant women reported that they had experienced dyspareunia or painful intercourse.

Dysmenorrhea is the occurrence of painful cramps during menstruation. Symptoms of dysmenorrhea include an aching pain in the abdomen that may become severe, abdominal pressure, pain in the thighs, hips, and lower back. There are two kinds of dysmenorrhea: primary and secondary. Primary dysmenorrhea occurs when a woman has pain during her period caused by prostaglandins. Prostaglandins are natural chemicals found in the lining of the uterus. Secondary dysmenorrhea occurs when a woman who hasn't had dysmenorrhea before develops it later in life due to problems with her reproductive tract. Examples of problems that can cause secondary dysmenorrhea are uterine fibroids, copper IUDs, endometriosis, sexually transmitted infections, PMS, and emotional factors, such as stress and anxiety. In the present study, about 22 percent of pregnant women reported that they had experienced dysmenorrhea before pregnancy.

About 9 percent of the currently pregnant women reported that they had experienced infertility before previous pregnancy, about 6 percent had thyroid dysfunction and are taking medicines, around 11 percent had diabetes, one pregnant woman's husband had undergone varicocele treatment and seven women said that their husband had previously experienced mumps. Considering the negative health behaviours of husbands, 3 percent of pregnant women reported that their husbands have the habit of smoking and 28 percent said that their husbands had the habit of consuming alcohol.

7. Summary and Conclusion

There are large numbers of clients coming for treatment from all over Kerala as the clinic is famous for infertility treatment. Patients have an OP book in which all history of husband and wife and family are captured. All tests like blood, USG scan and semen analysis are being done here. Medical treatments and IUI and IUD provide good results in the centre. A data entry operator especially for the clinic is appointed to enter the data in the OP book. But she is doing other duties with less time spent on consolidating the

information. Only OP number is correctly entered. So many of the important variables are lacking in the data base. Also as she is not aware of the medical conditions and terminology, data are wrongly entered and the analysis becomes impossible. Also as the workload is more there is no one to supervise the data entry. In majority of the Govt hospital there is data entry operator and there is software to enter the data but to consolidate the data difficulty is encountered as the software is not user friendly. So these software companies have to be paid for taking the data. It is vital to have a statistician or demographer or a medical person for handling such data and supervising data processing because the data captures huge amount of information from patients.

Partial data capture has proved to be serious limitations in drawing vital conclusions. Characteristics of the patients show that majority are from Thiruvananthapuram district and Kollam and Kanyakumari district of Tamil Nadu which is adjacent to this district. Age of men and women shows young clients are coming for treatment and those who married within two years are mostly seeking treatment. Men who sought treatment belong to skilled worker category and majority of the women are house wives. One quarter of the men consume alcohol. Out of the 384 patients whose disease history were available, 47 percent has asthma, 16 percent has abortion history and five percent are diabetic. Whereas among the 128 men whose history was available, 41 percent has asthma and 17 percent had undergone appendicectomy. USG scan details of 1351 women are entered which shows that 42 percent has normal uterus and ovaries and 44 percent has polycystic ovary disease. Semen analysis of men reveals that 73 percent of the semen takes more time to liquefy and 87 percent has normal total count, 65 percent of the men have normal sperm motility, 74 percent has normal volume of semen, 84 percent has normal viscosity and only 35 percent of the men's sperm has normal morphology. Out of the 182 men, 60 percent have azoospermia and 31 percent have OAT condition.

Findings of the exit interview of patients attending the clinic show that a higher proportion of women who seek treatment for infertility are young and the average age of women is 27 years and the average age of their husbands is 32.5 years. The average marital duration of couple is 40 months. About 22 percent of women have their marital

duration above 60 years. Average duration of couple staying together is 32 months. Out of the 224 women taken for exit interviews, 16.5 percent of them are obese (BMI ≥ 30) or risky mothers. About 37 percent of the women are overweight (BMI between 25 and 29.9) and they also have a tendency to become risk. About 15 percent of the sample women have thyroid dysfunction and 13.4 percent are affected by PCOD. Study shows that among the male partners (husbands) of the selected sample women, about two percent of the husbands received treatment for varicocele and about 8 percent were affected by mumps.

Profile of 172 women who became pregnant through the treatment sought from the infertility clinic, Thycaud, shows that the mean age of pregnant women is 27.8 years. The average age of their husbands is 32 years. Considering the occupation of pregnant women who were sought treatment from the clinic, majority (78 percent) are house wives. About 19.2 percent of their husbands are working outside and living away from spouse (which include men working in gulf and other countries, states other than native place, those who are working in the armed force and related service etc). The average duration of marriage among the above women is 46 months. Majority of the women have primary sterility. About 13 percent of women reported that they have hirsutism. About 5 percent of pregnant women reported that they had experienced dyspareunia or painful intercourse and 22 percent of pregnant women reported that they had experienced dysmenorrhea before pregnancy. About 3 percent of pregnant women reported that their husbands have the habit of smoking and 28 percent of women reported that their husbands have the negative health behaviour of consuming alcohol.

A team of doctors are working sincerely for the patients who attend the infertility clinic for treatment. Dr. Sam John Varghese has been working at the infertility clinic since the special wing was started in 2005. With nearly 3000 childless couples registering at the clinic every year, he suggests the need for more permanent doctors, paramedical staff and better infrastructural facilities at the clinic. Beginning his day at dawn in the clinic where childless couples queue up from 3 am to get the tokens distributed from 5:30 am onwards, the doctor and staff render great service making this clinic a place where

women can turn to for infertility treatment with confidence. Now Government has taken up the initiative of constructing a new building for the clinic. According to him, there are a lot of people who cannot afford treatment at multi- specialty hospitals. Fortunately, he has a good team of doctors, nurses and allied staff. The clinic has very limited facilities when assessed based on caseload. OP rooms are very congested and infrastructural facilities are also very limited. There is not even an operation theatre separately for the clinic, all laparoscopic surgeries are being undergone in the general OT at W&C hospital. With all the above limitations the infertility clinic functions very well and is a heaven for thousands of childless couple and those who have secondary sterility.

The study findings point to higher proportion of the young couples seeking treatment for infertility with average marital duration of 40 months. Over weight, obesity thyroid dysfunction and PCOD are apparently the major problems among women who have sought infertility treatment. Negative behaviors like consuming alcohol and smoking are also seen among men who have sought infertility treatment. Since the study is not a clinical one, inquiry into the probable causes of infertility is not attempted although the tests carried out for ascertaining infertility are described based on information available from the data set. Limitations in deriving conclusions is a major problem owing to incomplete data capture. Every couple who approach the clinic has not transmitted the end result of their treatment by way of whether they have conceived or not. Steps could be taken to complete this gap in knowledge for further research so that infertility treatment can be made more effective. To achieve this documentation of information need to be stressed. Valuable information on probable causes of infertility could be tapped if data capture is effectively made by a Medical person/Demographer/Statistician with sufficient knowledge on the aspect. It would definitely prove to be a strong data base for further research on infertility.

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