



University of Kerbala
Collage of Medicine

Department of Family and Community Medicine

**Characteristics of the Females Presented with
Secondary Infertility Attending Infertility Clinic at
Gynecology and Obstetrics Teaching Hospital in Holy
Kerbala Governorate – 2022**

A Thesis

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as Partial Fulfillment of the Requirements for the Degree of Higher
Diploma in Family Medicine

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(اللَّهُ مَلِكُ السَّمَاوَاتِ وَالْأَرْضِ يَخْلُقُ مَا يَشَاءُ يَهَبُ لِمَنْ يَشَاءُ إِنَاءً وَيَهَبُ لِمَنْ يَشَاءُ الذُّكُورَ (49) أَوْ يُزَوِّجُهُمْ ذُكْرَانًا وَإِنَاءً وَيَجْعَلُ مَنْ يَشَاءُ عَقِيمًا إِنَّهُ عَلِيمٌ قَدِيرٌ (50))

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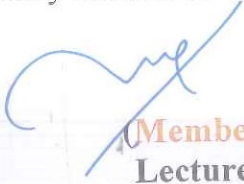
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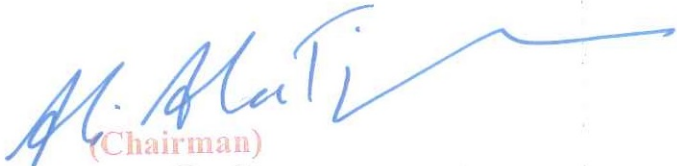
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Dedication

To:

My father, my mother, my husband

my family

my supervisors

And to all looking after success

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List of abbreviations:

Abbreviations	Meaning
BMI	Body Mass Index
CS	Cesarean Section
D.M	Diabetic Mellitus
DHEAS	Dehydroepiandrosterone Sulfate
FSH	Follicle-Stimulating Hormone
GnRH	Gonadotropin-Releasing Hormone
HTN	Hypertension
Kg	Kilo Gram
LH	Luteinizing Hormone
M ²	Meter Square
NSAIDS	Non-Steroidal Anti-Inflammatory Drugs
PCOS	Poly Cystic Ovary Syndrome
PID	Pelvic Inflammatory Disease
P value	Probability Value
RTA	Road Traffic Accident
SPSS	Statistical Package of The Social Sciences
STI	Sexually Transmitted Infections
SLE	Systemic Lupus Erythematosus
WHO	World Health Organization

Abstract

Background: Infertility is a worldwide public health issue, defined as the inability to conceive within one year despite regular unprotected intercourse. Primary infertility is the inability to conceive after a year of unprotected sexual intercourse without any previous conception, whereas secondary infertility refers to couples who are unable to conceive after a year of unprotected sexual intercourse after a previous pregnancy. About one-third or more of all cases of infertility are caused by female reasons, another third by male causes, and the remaining cases are brought on by mixed or unexplained factors.

Objectives: This study aimed to determine the characteristics of the females presented with secondary infertility attending infertility clinic at gynaecology and obstetrics teaching hospital in holy Kerbala governorate.

Patients and Methods: A cross-sectional study was conducted involving the women who attended the infertility clinic at gynaecology and obstetrics teaching hospital in holy Kerbala to evaluation and treatment. Among 400 women aged 18-48 years, the study was conducted from March 2022 to July 2022 using a self-administrated structured questionnaire in Kerbala governorate which is located in centre of Iraq.

Result: Regarding the characteristics of secondary infertility about 48% of the participants reported using contraception, 24.7% of the participants used oral contraceptive pills and about 12.3% of them used injectable type for more than one year, other characteristics of secondary infertility about 44.3% had irregularity of menstrual cycle, 43% had abnormal vaginal discharge, 24% had dysmenorrhea, 22% had polycystic ovarian syndrome, 15.5% had tubal blockage, 15.5% had pelvic

inflammatory disease,3% had uterine fibroid,5% had diabetic mellitus and 5% had hypertension.

Conclusions: the findings of the study showed that significant association between body mass index of patients, ectopic pregnancy, diabetes mellitus, hypertension, family history of secondary infertility and age groups.

Chapter One

Introduction and literature Review

1. INTRODUCTION

Infertility is an important public health issue around the world, which is defined as the inability to conceive within a year despite regular unprotected sexual activity (Cena, Chiovato and Nappi, 2020).

Primary infertility is the inability to conceive after a year of unprotected sexual activity without any prior conception, whereas secondary infertility refers to couples who are unable to conceive after a year of unprotected sexual activity following a prior pregnancy. About one-third or more of all cases of infertility are brought on by female reasons, another third by male reasons, and the remaining cases are brought on by mixed or unexplained circumstances. Every year, 60–80 million new couples experience infertility (Mallikarjuna and Rajeshwari, 2015). According to the World Health Organization (WHO), 20% of couples in developed countries and 25% of couples in developing countries have suffered secondary infertility during their lifetime (Li *et al.*, 2020), (Wiweko *et al.*, 2017). The percentages are substantially higher in other regions, such as the Middle East and North Africa (MENA) region, and can reach up to 30% in some communities.

Infertility is a cause of instability in the lives of couples, especially women, increasing the likelihood of divorce, lowering the likelihood of getting married, putting her at risk of domestic violence, and raising the possibility that her husband will take another wife in religions where polygyny is acceptable, like the Islamic Arab world (Musa and Osman, 2020).

According to research done in Iraq show that the maternal fertility in Iraq has been dropping since 2003, and the war-related situations have accelerated this decline (Mubark, 2021). Iraqi women have an average fertility rate of roughly 4.5 children per woman (Mubark, 2021).

Male, female, combined, or unexplained variables can all be involved as causes of secondary infertility. In further detail, the male factor might manifest as defective

low sperm count (oligospermia), poor sperm motility (asthenospermia), abnormal sperm morphology (teratozoospermia), and other conditions (Zhaira *et al.*, 2019).

Depending on the sexual history, socioeconomic status, lifestyle, and cultural background of those it affects, the secondary infertility has a variety of causes and effects. There is limited evidence about socioeconomic and demographic factors related to infertility. The secondary infertility is caused by situations that may be avoided, including sexually transmitted infections, tubal damage, polycystic ovary syndrome (PCOS), and pelvic inflammatory diseases, menstrual irregularity, endometriosis, submucosal fibroids, lifestyle choices, advancing maternal age, age at marriage, delaying childbirth, socioeconomic status, occupational risks, anovulation, and ovarian failure and it's also brought on by other, frequently unavoidable factors, such as chronic disease or disease management (such as chemotherapy) and Prothrombin G20210A mutation has once more been identified as an unknown factor in women's recurrent miscarriages (Pradhan, Patel and Patel, 2021) (Bayu *et al.*, 2020) (Deshpande and Gupta, 2019) (Kardi *et al.*, 2018).

In addition to these pathological and biological causes of infertility, there may also be certain social and psychological causes that are connected to specific behaviors that impact couples attempting to have children. (Soleimani, 2020)

According to published research, psychological variables like depression and emotional distress may increase the probability of infertility. A delay in having children for new couples in religious and conservative communities such as in the middle east can be a stressful experience, especially for women various psychological responses appear in couples who are facing infertility problems, including low self-esteem, anger, sadness, jealousy toward other couples who already have children, anxiety, and depression (Jabeen, Khadija and Daud, 2022).

Failure of ovulation is the single most common cause of infertility in females. The normal ovarian cycle is so complex that even small deviations may disrupt the cycle and prevent ovulation. Ovulatory disorders are most often caused by an abnormality in one of the controlling hormones. However, problems can also arise if the ovaries themselves are resistant or non-responsive to normal levels of hormones. In addition, absent, damaged, or diseased ovaries will prevent ovulation. Amenorrhea, oligomenorrhoea, irregular menstrual cycles, and infertility are the main symptoms of ovulatory disorders (Navarro, 2019).

Polycystic ovarian syndrome is a condition in women that can cause an imbalance of reproductive hormones. This imbalance can cause a plethora of different health issues, such as: infertility, irregular menstrual cycles, cysts on the ovaries, fluctuated weight gain and loss, acne and unwanted hair growth, mental health issues and increased levels of testosterone and other androgens (Mascarenhas *et al.*, 2012).

There are four main types of PCOS that women can be diagnosed with, each with a different subset of symptoms and treatments (Umer and Sadeq, 2020).

- ❖ Insulin –resistant PCOS is the most common type of PCOS occurs when the body stop responding well to insulin and increases blood sugar in the body, this causes increases the production of androgens and interferes with ovulation (Umer and Sadeq, 2020).
- ❖ Post –pill PCOS occurs after taking oral contraceptives, this occurs due to the surge of androgens produced when one stops taking pills, the effects are usually temporary and symptoms typically go away (Mascarenhas *et al.*, 2012).

- ❖ Inflammatory PCOS occurs when chronic inflammation drives the production of androgens, this can interfere with ovulation and the menstrual cycle, targeting the source of inflammation can help mitigate symptoms (Umer and Sadeq, 2020).
- ❖ Adrenal PCOS caused by elevated levels of Dehydroepiandrosterone Sulfate (DHEA) produced by the adrenal glands, and is typically a response to stress, maintaining and reducing the stress in one's day can help manage this type of PCOS (Mascarenhas *et al.*, 2012).

Obesity is a serious health issue that affects people all around the world, particularly women who are fertile. It affects natural reproduction, having a body mass index (BMI) over 30 kg/m² indicates obesity, which is a serious and developing health problem(Kalliala *et al.*, 2017). Obesity has a considerable negative influence on the quality of life and is linked to metabolic, cardiovascular, and oncological complications. Obesity is also linked to a higher likelihood of spontaneous miscarriage in reproductive-age women and higher dangers of problems during pregnancy and childbirth(Kalliala *et al.*, 2017)(Chan *et al.*, 2014). Natural fertility in women who are obese is also impaired, with a higher chance of ovulation abnormalities, due to the hypoestrogenic status and elevated leptin levels inhibiting the gonadotropic axis (Broughton and Moley, 2017),(Prost *et al.*, 2020).

Tubal obstruction is one of the causes of secondary female infertility, which accounts for 14% to 45% of all female factor infertilities. Tubal blockage affects either the proximal, middle, or distal end. 10% to 25% of women with tubal illness have infertility owing to proximal fallopian tube occlusion. The proximal fallopian tube is extremely prone to muscle spasm, deposition of viscous secretion, mucosal agglutination, and intrinsic luminal filling abnormalities due to its characteristic

changeable morphology, which can be straight, slightly curved, or convoluted. Infertility and blockage result from this (Ombelet *et al.*, 2008),(Shen *et al.*, 2020).

Tubal obstruction most likely the result of:

1. An infection brought on by both bacteria and viruses that are typically spread through intercourse and results in damage to the fallopian tubes. Chlamydia trachomatis and Neisseria gonorrhoea, which cause cervicitis in females and can climb to the upper reproductive tract in 10–20% of cases, are the main causes of sexually transmitted infections, resulting in pelvic inflammatory disease. PID may damage fallopian tubes and cause inflammation, leading to tubal factor infertility (Anbesu, Aychiluhm and Alemayehu, 2022),(Bae and Lee, 2022). Chlamydia trachomatis infection is associated with a 3.4-folds increase in tubal factor infertility (Mbah *et al.*, 2022), (Wang *et al.*, 2020).
2. The most prevalent gastrointestinal conditions are appendicitis and colitis, which cause abdominal inflammation that may affect the fallopian tubes and cause scarring and obstruction (Wang *et al.*, 2020).
3. Previous operations such as surgery on the pelvis or abdomen can result in adhesions in the canal, preventing the passage of ova through it, this is one of the most significant causes of disorders that affect the fallopian tubes(Wang *et al.*, 2020).
4. An ectopic pregnancy develops within the canal itself, presents a danger to the woman's health, and might even be fatal(Zhang *et al.*, 2021), (Wang *et al.*, 2020).
5. Congenital defects rarely, women may be born with fallopian tube anomalies that are occasionally connected to the uterus (Wang *et al.*, 2020).

Endometriosis is a benign estrogen-dependent inflammatory condition caused by ectopic endometrial implants. Endometriosis affects between 10% and 15% of women of reproductive age. The most typical endometriosis symptom is pelvic discomfort. Women may also experience the following symptoms: dysmenorrhea, lower back pain that can be experienced at any time during the menstrual cycle, lower pelvic pain before and during menstruation, cramps a week or two prior to menstruation, heavy menstrual bleeding or bleeding in between periods, infertility, pain following sexual activity, discomfort with bowel movements, and lower abdominal pain that can occur before and during periods. Numerous sources have discussed the link between endometriosis and infertility. A cause-and-effect connection is still debatable. Through mechanical adhesion, such as pelvic adhesion, the pelvic anatomy is altered, which lowers fertility. These adhesions affect myometrium contraction, impair sperm motility, and damage ovule release or selection. Endometriosis-related etiologic causes of infertility include anti-genetic growth factors, inflammatory cytokines, and normal genes (Waseem *et al.*, 2021).

Infertility can be caused by a variety of hormonal disorders. Hormonal abnormalities can be caused by endocrine glands such as thyroid, pituitary, and hypothalamic gland problems. These preliminary glands are in charge of producing sex hormones. Birth control drugs, stress, and certain disorders, such as hypothyroidism, all affect these glands. If any of these glands experiences a malfunction, the entire process of ovulation is disrupted, making pregnancy difficult. Furthermore, certain therapies might result in hormonal imbalances, chemotherapy can result in anatomical and hormonal alterations that impair a breast cancer patient's sexual potential (Osuka *et al.*, 2018), (Waseem *et al.*, 2021).

Infertility can be caused by hyperprolactinemia, which suppresses the hypothalamic-pituitary-gonadal axis. When prolactin levels are too high, the anterior pituitary gland stops secreting the luteinizing hormone and follicle-stimulating hormone. This decrease in gonadotropins causes menstrual cycle irregularity and a decrease in ovarian estrogen production, resulting in anovulation and infertility (Edinoff *et al.*, 2021).

Some medical diseases are implicated in causing female infertility, systemic lupus erythematosus is multiple automatic systems that affects fertility in women. The genital tract in women may be affected by cytotoxic treatment due to the disease activity (cc, 2021).

In particular, both type 1 and type 2 D.M has been associated with undesirable effects on the women's reproductive axis. Individuals with DM and primary and secondary amenorrhea exhibit low levels of estradiol (Gokalani *et al.*, 2019), LH, and FSH, which have mostly been associated with a lack of residual insulin secretion (Al Awlaqi, Alkhayat and Hammadeh, 2016), and poor metabolic control (Ibáñez *et al.*, 2017). Furthermore, the effects of chronic hyperglycemia on the neurons of the hypothalamus is that causes a decreased LH response to GnRH stimuli (Palimeri, Palioura and Diamanti-Kandarakis, 2015).

Hyperglycemia also affects ovarian function in women. Elevated blood glucose levels trigger peripheral insulin resistance. In addition, hyperglycemia can also affect ovarian function via the accumulation of advanced glycation products (Palimeri, Palioura and Diamanti-Kandarakis, 2015). Collectively, nutrients, especially glucose availability, are crucial metabolic regulators of reproductive function (Fontana and Della Torre, 2016), (Cena, Chiovato and Nappi, 2020).

The immune system is essential in sexual disorders such as habitual abortion. This demonstrates that the maternal immune response to the developing semi-

allogeneic fetus is critical to a healthy pregnancy. Local and systemic immune responses, including immunoglobulins, cytokines, hormonal, and endometrial variables, have an impact on embryo implantation. These elements are crucial to the success of implantation and pregnancy. For the female sexual function to occur, natural killer cells are crucial. These cells are associated with gene expression, infertility, or abortion caused by natural killer cell cytotoxicity, and inductive failures(Waseem *et al.*, 2021).

According to the study done in Tikrit Iraqi, PCOS where the main ovulatory causes of female infertility constituted about 41% followed by other risk factors as tubal, uterine, and cervical factors (Al-Mahmood and Al-Ajeely, 2020).

According to the WHO, tubal factor about 36% of secondary infertility in women around the world, ovulatory factor for 33%, endometriosis for 6%, and no evident reason in 40% of cases. A similar distribution was seen in Asia, Latin America, and the Middle East, in Africa, most infertile women experienced tubal infertility, which is especially prevalent in Sub-Saharan Africa, ranging from 20% to 60% (Vander Borgh and Wyns, 2018).

According to study in Taiwan, 42–50% of women who gave birth through cesarean sections (CS) did not have any further children after five years, compared to 29% of women who gave birth naturally vaginally. Within the group under study, infertility was 25% prevalent. Among the individuals in the study, the prevalence of primary and secondary infertility was 9 and 16 %, respectively (Hsu *et al.*, 2022).

This study aimed to identify characteristics of the females presented with secondary infertility attending infertility clinic at gynecology and obstetrics teaching hospital in holy Kerbala governorate.

Chapter Two

Patients and Methods

2. Patients and Methods

2.1 Study design, setting, and time

A cross-sectional descriptive study including analytical elements were conducted involving the women who attended the infertility unit in the Gynecology and Obstetrics teaching hospital in holy Kerbala Governorate for infertility evaluation and treatment. Among 400 women aged 18-45 years. The study was conducted from March 2022 to July 2022 using structured questionnaire in Kerbala governorate which is located in center of Iraq. The area of the governorate is about 52,856 square km, its population is about 1,283484 people according to 2020 estimates, the gynecology and obstetrics teaching hospital is located in Kerbala and is considered a major hospital when its clinical capacity reaches 125 beds and includes 6 words, a delivery room, operating room, an emergency unit and advisory units, including a 2 obstetrics and gynecology clinics, in addition to an infertility clinic.

2.2 Sample and Sampling Technique

A convenient sample was used to select patients from the infertility consultant unit, which was the sole governmental infertility clinic in Kerbala. Data collection was conducted on Wednesday where most women attend. The infertility clinic provides health services for infertile women; it has two rooms, one for infertility examinations and management and another room with an ultrasound machine for infertile women's gynecological examinations.

The sample size was measured by using the Raosoft website. The sample size was determined following the convenience sampling technique since it is one of the most prevalent non-probability sampling techniques. The sample size

estimation was based on the presumption that the probability of having an adequate relationship between characteristics and subfertility in females was 50.0%, with a 95% confidence interval and a 5% margin of error. Based on the above estimation method, the minimum required sample size was 384 participants. However, as the study ended, a total of 400 samples was collected, which exceeded the minimum sample needed for this study

2.3 Inclusion Criteria

The inclusion criteria were as follows:

- (1) After a year of frequent, unprotected sex, women who had tried unsuccessfully to get pregnant, without using any type of contraceptive, and had previously conceived.
- (2) Age range, women of reproductive age (18-48 years).
- (3) Iraqi nationality.
- (4) Permanent residence in Karbala.

2.4 Exclusion Criteria

The exclusion criteria were the following:

- (1) Women who had not conceived previously after one year of regular unprotected sexual intercourse without using any type of contraceptive.
- (2) Temporary residence in Karbala.
- (3) Breastfeeding.
- (4) Those who have a clinical diagnosis of male-factor infertility.

2.5 Ethical consideration

The study was carried out with ethical permission from the research ethics committee at the college of medicine - university of Karbala and the Karbala health directorate, dated (2 February 2022). The ethics committee of the faculty of medicine evaluated and approved the study protocol. The agreement of participants was obtained when collecting data for the study. Verbal consent was obtained, which was written at the beginning of the questionnaire. Informed consent included information about the study's aim and purpose. The participants were also told that their identities would be kept anonymous, and the secrecy of their data was guaranteed.

2.6 Data Collection

After obtaining informed permission, 400 women with secondary infertility completed a questionnaire designed for this study. Due to the corona epidemic, the interview was conducted in an open space with social distance. Due to incomplete survey questionnaires, the remaining respondents ($n = 15$) were omitted from the final analysis. The questionnaire was compiled from several papers and research studies. The supervisor checked the data to ensure that it was captured and saved correctly.

A systematic questionnaire with 12 questions separated into 5 sections was created. A multi-item questionnaire was developed after analyzing previous studies on infertility risk factors and doing a thorough literature study. The first part (Part I) consisted of questions about personal socio-demographic information. The second section (Part II) included lifestyle questions, while the third part (Part III) included reproductive and marital histories. The fourth section (Part IV) included gynecological, sexual, and family history. The fifth section (Part V) focused on the medical, medication, and surgical histories.

Part I: Sociodemographic Data: comprised women's ages, educational status (illiterate, read and write, primary, secondary, college or higher), employment (housewife, employer, student), etc. monthly average income (poor, average, good) and present residence (rural, urban).

Part II: Lifestyle: Participants' height and weight were assessed to determine their Body Mass Index. BMI was calculated as weight in kilograms divided by the square of the height in meters (kg/m^2), the underweight as less than $18.5 \text{ kg}/\text{m}^2$; normal weight as $18.5\text{--}24.9 \text{ kg}/\text{m}^2$; overweight as $25.0\text{--}29.9 \text{ kg}/\text{m}^2$; and obese as greater than $30 \text{ kg}/\text{m}^2$ (Cong *et al.*, 2016).

Part III: Reproductive and Marital History; (age at first marriage; consanguinity; recurrent marriage; marriage duration), menstrual profile (age at menarche, menstrual cycle interval, duration of menstruation, menstrual regularity); menstrual abnormalities (heavy menstrual bleeding, dysmenorrhea, secondary amenorrhea, intermenstrual bleeding); obstetric history (gravidity; parity; miscarriage; ectopic pregnancy; molar pregnancy; post-partum bleeding or infection); and family planning: history of used contraception for more than 1 year (intrauterine devices, oral contraceptive pills, ; contraceptive injection; contraceptive patch; natural; barrier methods; contraceptive implant; contraceptive ring).

Part IV: gynecological; Sexual and family history: It includes (chronic pelvic discomfort more than 6 months, abnormal vaginal discharge, dysuria, tubal obstruction which diagnosed by hystosalpingography, PCOS, endometriosis, and postictal bleeding), (female infertility; menstrual cycle irregularity; PCOS; uterine fibroid; DM; thyroid disease; premature ovarian failure which diagnosed by ant mullerian hormone).

Part V: Medical; medication and surgical history: DM, thyroid disease, hyperprolactinemia, hypertension, cancer, rheumatic diseases, mental illnesses, antihypertensive drugs; prolonged use of steroid hormone therapy; prolonged use of high dose of nonsteroidal anti-inflammatory drugs (NSAID) , chemotherapy, losing weight treatment, antidepressants, antipsychotics, caesarean sections, dilatation and curettage appendectomy, and the use of herbs; road traffic accident; myomectomy; laparoscopy; hysteroscopy; laparotomy; cystectomy.

2.7 Pilot study

In March 2022, a piloted sample of 25 participants was used to examine both the participant's response speed and the reliability of the questions (test-retest). This was done to assess the feasibility of the questionnaire and to overcome any difficult issues that may arise during data collection method. The questionnaire takes about 10-15 minutes to complete on average. The pilot research responses were not included in the final analysis.

2.8 Statistical analysis:

All participant responses to the questionnaire were put into a data sheet and given a serial identity number. To prevent errors, several entries were used. The statistical package for the social sciences programmer, version 28.0 (IBM, SPSS, Chicago, Illinois, USA), and the real statistics resource pack software for Mac (Release 7.2) of the resource pack for Excel 2016, were used to create the data analysis for this project. copyright (2013 – 2020).

Descriptive Data analysis

Descriptive statistics were performed on the participants' data of each group. Values were N (%) for categorical variables. The distribution of the data was checked for normality.

Inferential data analysis

Chi-square was used to measure the association between categorical variables. Fisher's exact test was used as an alternative when the chi-square was inapplicable. A P value of less than 0.05 was regarded as statistically significant.

Chapter Three

Results

3. Results

The clinical demographic characteristics of patients group were summarized in the Figure (3.1), which illustrates the mean age of participants which mean age of females (30.3 ± 6.9) and the age group of (18-48) years old. The patients group were divided into subgroups based on age. Overall, results indicated that most of the study samples were within the age group of (28-38) years old. The frequencies of the education level among the patient's group were shown in Figures (3.2). Most of the participants to have a bachelor degree. Also, about 68% of the participants pointed to have an average monthly income and about two third were reported to be an employee, as presented in Figures (3.3 & 3.4).

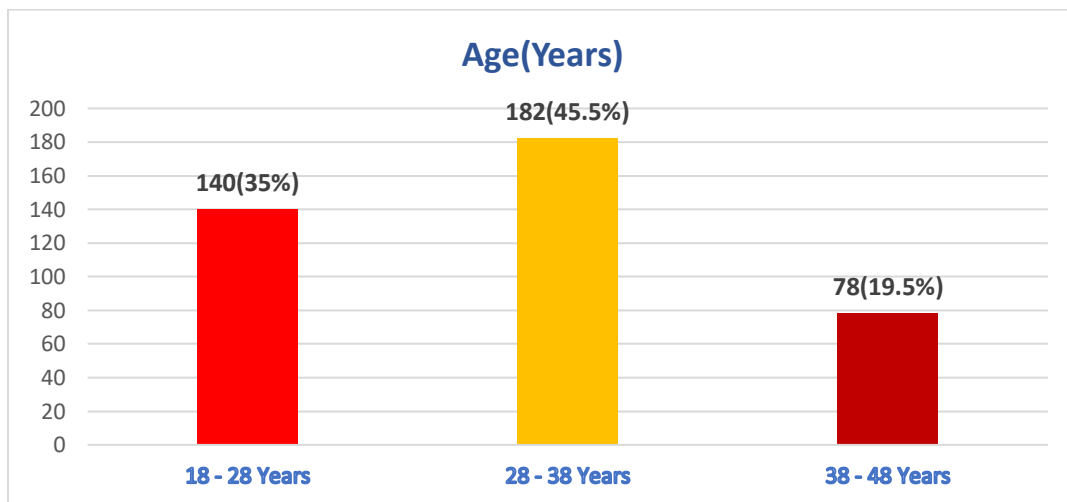


Figure 3.1: Distribution of age groups among patients with secondary infertility

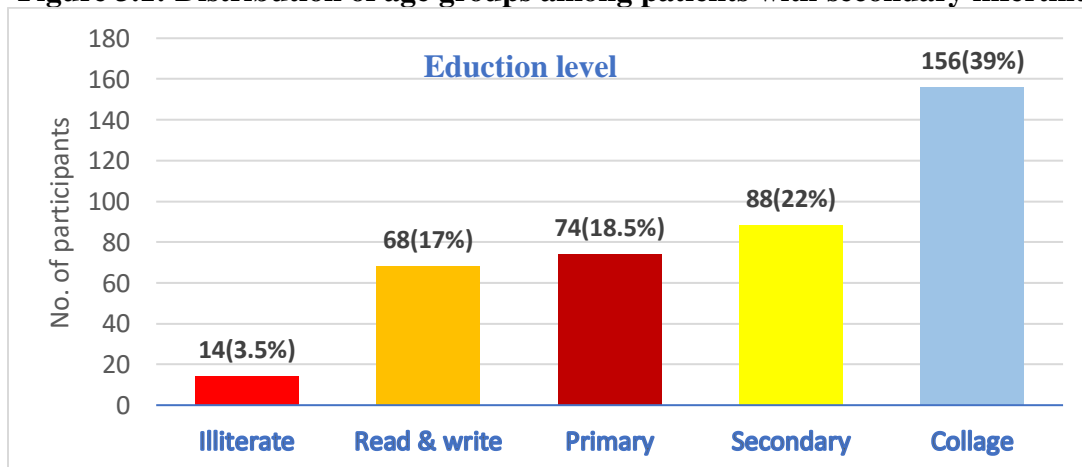


Figure 3.2: Distribution of education level among patients with secondary infertility

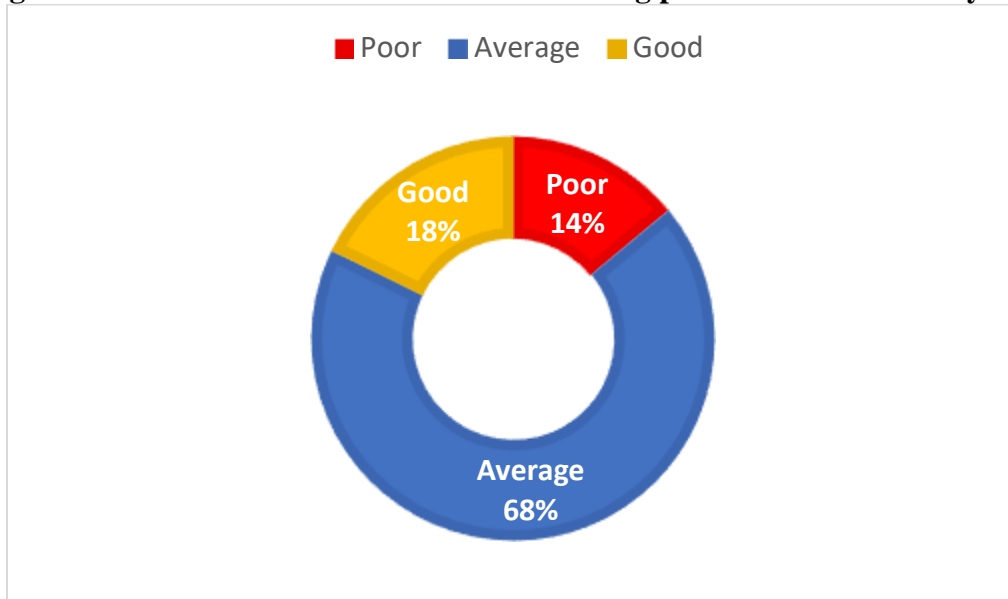


Figure 3.3: Distribution of Socio-demographic variables regarding the monthly income among patients with secondary infertility

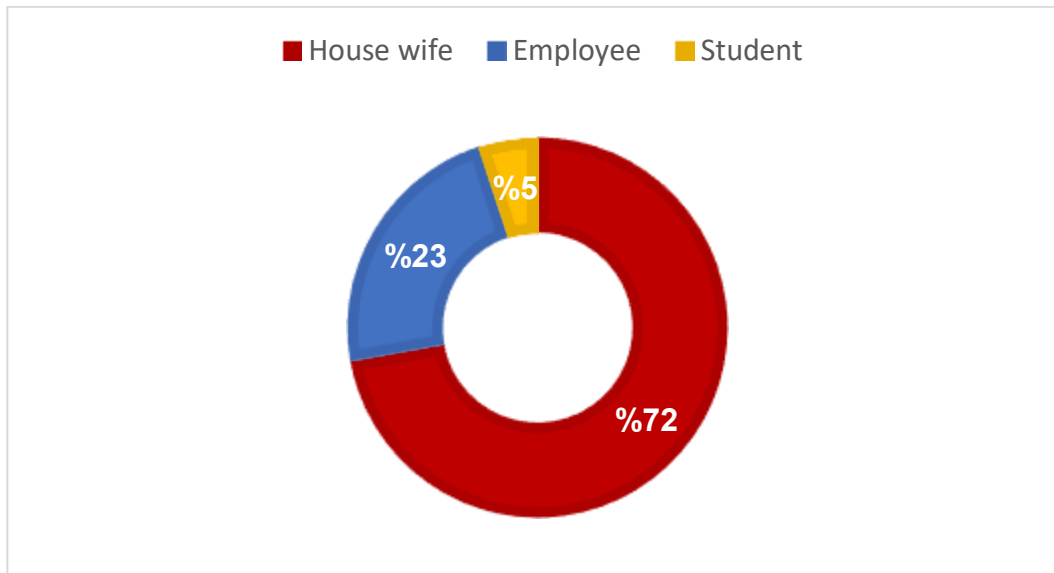


Figure 3.4: Distribution of Socio-demographic variables regarding occupation among patients with secondary infertility

On the other hand, mean age of marriage \pm SD (20.77 \pm 5.39) years & mean duration of marriage (9.28 \pm 5.42) years, results also illustrated that 30.5% of

consanguinity marriages were more prevalent among the women who experienced secondary infertility, as presented in figures (3.5 & 3.6 & 3.7).

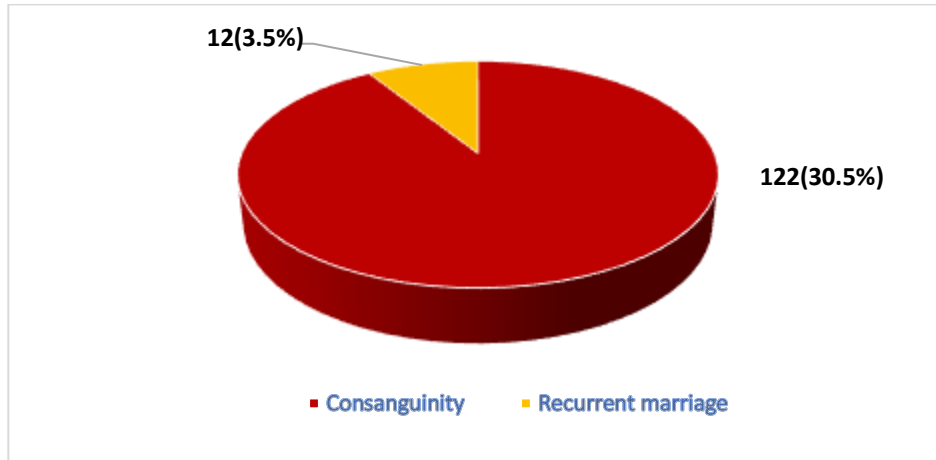


Figure 3.5: Distribution of marital history among patients with secondary infertility

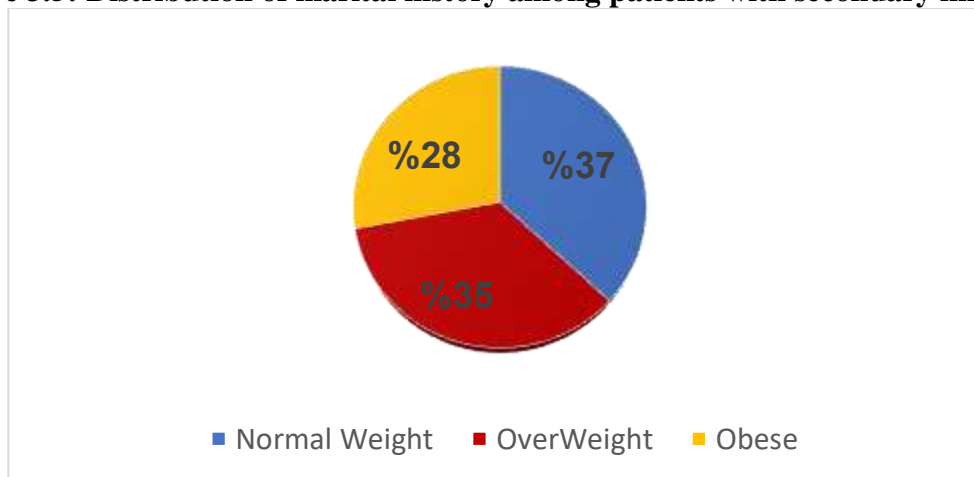


Figure 3.6: Distribution of (BMI groups) among patients with secondary infertility

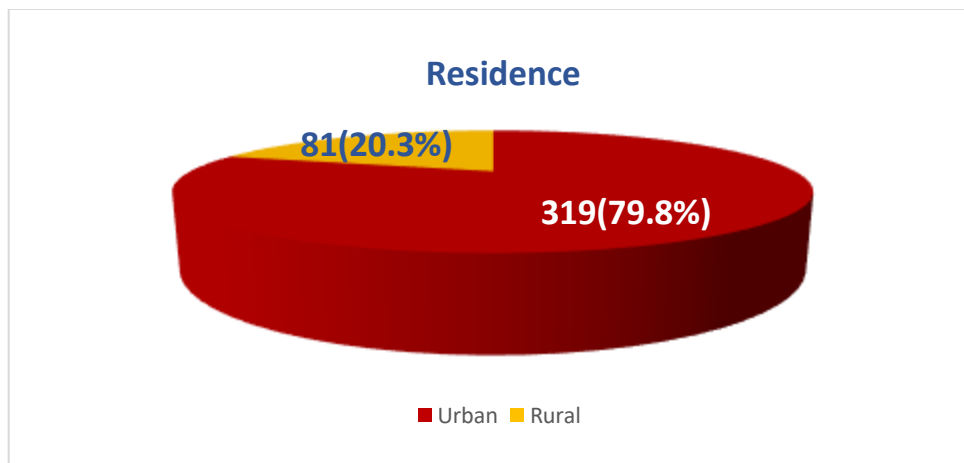


Figure 3.7: Distribution of socio-demographic variables regarding residence among patients with secondary infertility

Among the cases, regarding the menstrual cycle history among patients with secondary infertility mean age at menarche (13 ± 0.82) years, mean and duration of menstrual cycle (24.46 ± 2.35) days and mean day numbers of menstrual cycle (5.14 ± 1.14) days, 44.3 % of women had regularity of menstrual cycle, and 25% have dysmenorrhea. Furthermore, majority of the participants didn't report any of other menstrual cycle disorders such as heavy menstrual bleeding, intermenstrual bleeding or secondary amenorrhea, as shown in Table (3.1).

Table 3.1: Distribution of study sample according to menstrual cycle history among patients with secondary infertility

Variable	Group	Frequency	percentage
Regularity of menstrual cycle (M.C)	Yes	223	55.8
	No	177	44.3
Heavy menstrual bleeding	Yes	10	2.5
	No	390	97.5
Intermenstrual bleeding	Yes	7	1.8
	No	393	98.3
Dysmenorrhea	Yes	99	24.8
	No	301	75.3
Secondary amenorrhea	Yes	22	5.5
	No	378	94.5

(Descriptive statistics Frequency & percentage)

The mean period of secondary infertility (4.50 ± 3.44) years, about 17.7% indicated to have post-partum hemorrhage and infection, only 7% were reported to the occurrence of either induced miscarriage or spontaneous abortions independently as present in Figure (3.8).

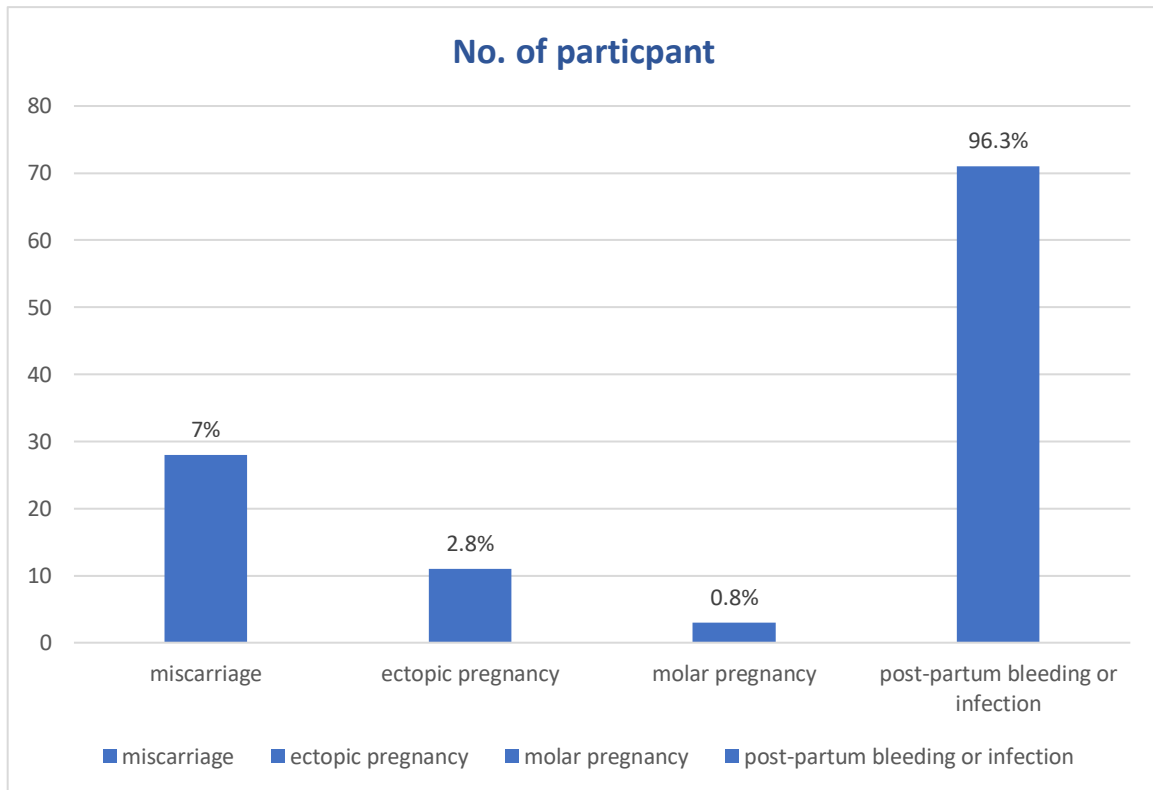


Figure 3.8: Distribution of obstetric history among patients with secondary infertility

The current study also examined the gynecologic history among patients with secondary infertility, results demonstrated that 10.7% of the females have chronic pelvic pain, 43% have abnormal vaginal discharge, 2.7% have dysuria, 15.5% of females have pelvic inflammatory disease, only 15.5% have tubal blockage, and 3% of females have uterine fibroid, also about 22% of the participants have polycystic ovary syndrome, results were shown in Table (3.2).

Table 3.2: Distribution of study sample according to gynecologic history among patients with secondary infertility

Variable	Group	Frequency	percentage
Chronic Pelvic Pain	Yes	43	10.8
	No	357	89.3
Abnormal Vaginal Discharge	Yes	172	43.0
	No	228	57.0
Painful Urination	Yes	11	2.8
	No	389	97.3
PID	Yes	62	15.5
	No	338	84.5
Tubal Blockage	Yes	62	15.5
	No	338	84.5
Uterine fibroid	Yes	12	3
	No	388	97
PCOS	Yes	88	22.0
	No	312	78.0

(Descriptive statistics Frequency & percentage)

Medical and medication history of the participants were also examined, few participants reported having chronic disease, 5% or less of the females indicated to have one of the most common diseases such as diabetes mellitus, hypertension and thyroid disorders as presented in Table (3.3).

Table 3.3: Distribution of study sample according to medical history among patients with secondary infertility

Variable	Group	Frequency	percentage
DM	Yes	20	5.0
	No	380	95.0
Thyroid Disease	Yes	13	3.3
	No	387	96.8
Hyperprolactinemia	Yes	8	2.0
	No	392	98.0
Hypertension	Yes	20	5.0
	No	380	95.0
Rheumatological Diseases	Yes	8	2.0
	No	392	98.0
Psychotic Diseases	Yes	1	0.3
	No	399	99.8

(Descriptive statistics Frequency & percentage)

Medication history among patients with secondary infertility were also examined, about 10% or less of the females indicated to have medication for treatment of chronic disease such as antihypertensive drugs, DM and NSAID as presented in Table (3.4)

Table 3.4: Distribution of study sample according to medication history among patients with secondary infertility

Variable	Group	Frequency	percentage
Antihypertensive drugs	Yes	12	3.0
	No	388	97.0
Treatment For DM	Yes	11	2.8
	No	389	97.3

Prolonged Use of Steroids	Yes	8	2.0
	No	392	98.0
Hormonal Therapy	Yes	12	3.0
	No	388	97.0
NSAIDS	Yes	11	2.8
	No	389	97.3
Herbal Use	Yes	34	8.5
	No	366	91.5
Treatment of obesity	Yes	15	3.8
	No	385	96.3
Antidepressant drugs	Yes	0	0
	No	400	100
Antipsychotic drugs	Yes	1	0.3
	No	399	99.8
Chemotherapy Treatment	Yes	1	0.3
	No	399	99.8

(Descriptive statistics Frequency & percentage)

Surgical history among patients with secondary infertility was demonstrated in Table (3.5), results showed that the most frequently surgical history about 38.3% of participants have caesarean section, 15.3% have dilatation and curettage, 3.3% have appendectomy, 2% of females have hysteroscopy, only 6% of females have laparoscopy and laparotomy.

Table 3.5: Distribution of study sample according to surgical history among patients with secondary infertility

Variable	Group	Frequency	percentage
Caesarean Section	Yes	153	38.3
	No	247	61.8
Dilatation & Curettage	Yes	61	15.3
	No	339	84.8
Appendectomy	Yes	13	3.3
	No	387	96.8
Laparoscopy	Yes	24	6.0
	No	376	94.0
Hysteroscopy	Yes	8	2.0

	No	392	98.0
Laparotomy	Yes	24	6.0
	No	376	94.0
Ovarian Cystectomy	Yes	5	1.3
	No	395	98.8

(Descriptive statistics Frequency & percentage)

About half of the participants reported to use a birth control method, the most used type of birth control history among patients with secondary infertility showed the following order; oral contraceptive pills, contraceptive injection, barrier or intrauterine device. The number of the female and birth control method illustrates in Figure (3.9).

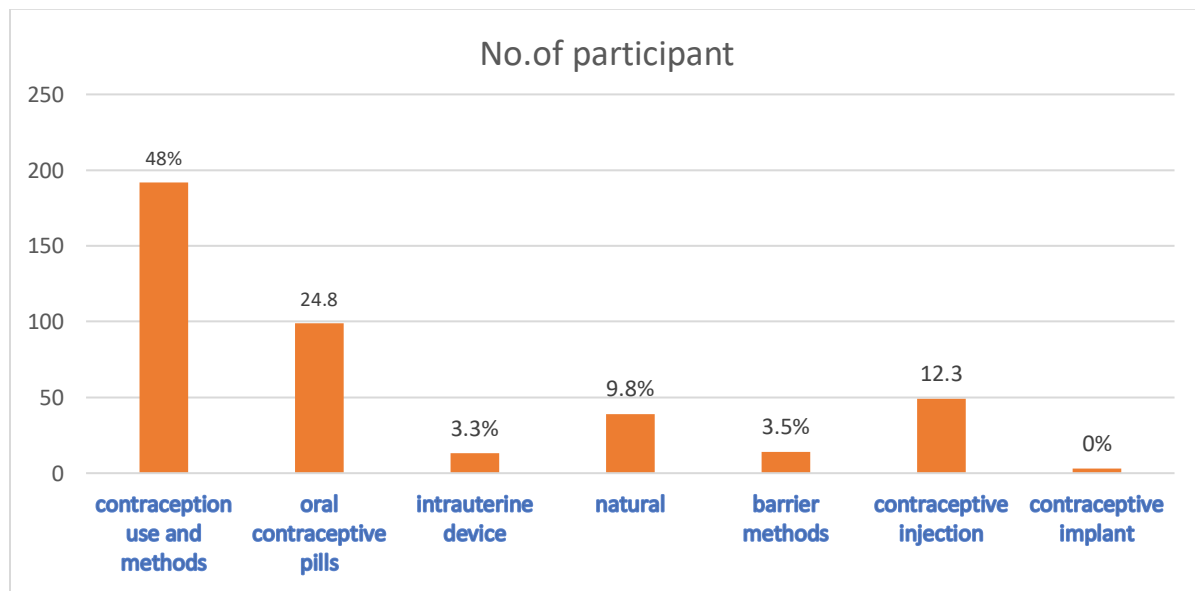


Figure 3.9: Distribution of Birth control history among patients with secondary infertility

Furthermore, the most frequently presented family history associated with the case study was female secondary infertility seen in 14.5 % of the patients. About 6.3 % of the participated women also reported a history of polycystic ovary syndrome, very rare cases reported other history of diseases as presented in Table (3.6).

Table 3.6: Distribution of study sample according to family history among patients with secondary infertility

Variable	Group	Frequency	percentage
Female secondary infertility	Yes	58	14.5
	No	342	85.5
Menstrual Cycle Irregularity	Yes	5	1.3
	No	395	98.8
PCOS	Yes	25	6.3
	No	375	93.8
Uterine Fibroid	Yes	1	0.3
	No	399	99.8
DM	Yes	3	0.8
	No	397	99.3
Thyroid Disease	Yes	5	1.3
	No	395	98.8

(Descriptive statistics Frequency & percentage)

This study examined the sexual history among patients with secondary infertility. The frequency of sexual dysfunction was verified in polycystic ovary syndrome. polycystic ovary syndrome patients with the domains of coital and dyspareunia being the commonly affected in 93.7% and 21.3 % of cases respectively, as presented in Figure (3.10).

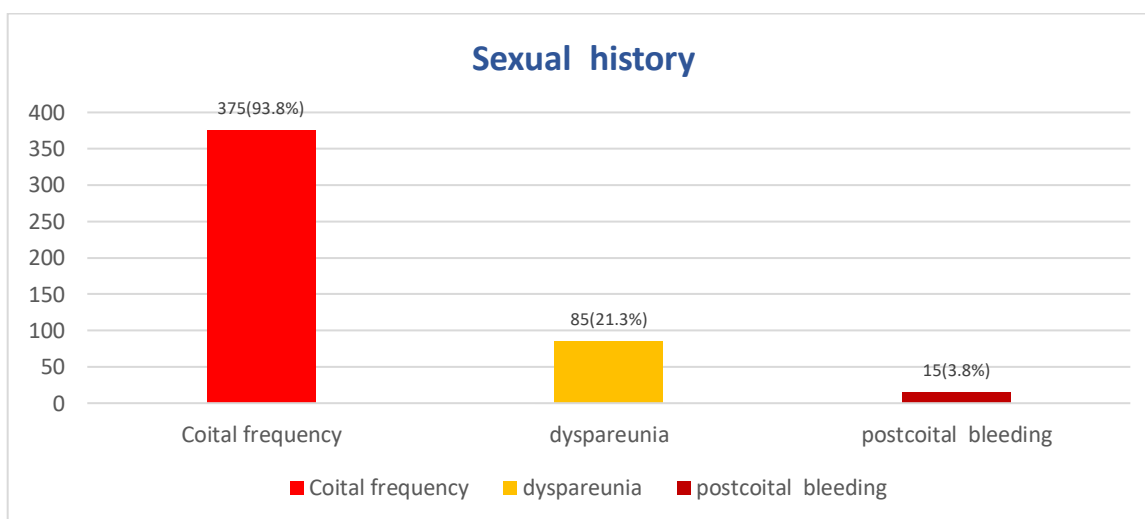


Figure 3.10: Distribution of sexual history among patients with secondary infertility

Patients suffering from secondary infertility divided into subgroups based on age range and compared with lifestyle-related factors. In Table (3.7), results indicated only a significant association in the number of patients among body mass index classification, p value < 0.001 .

Table 3.7: Distribution of marital history factors, BMI and their differences with age groups among the patients suffering from secondary infertility

Variable	Group	18 - 28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
Consanguinity	Yes	42(30%)	63(34.62%)	17(21.79%)	0.119[NS]
	No	98(70%)	119(65.38%)	61(78.21%)	
Recurrent Marriage	Yes	3(2.14%)	8(4.4%)	3(3.85%)	0.542[NS]
	No	137(97.86%)	174(95.6%)	75(96.15%)	

BMI	Normal Weight	72(51.43%)	57(31.32%)	21(26.92%)	<0.001[S]
	Overweight	42(30%)	69(37.91%)	28(35.90%)	
	Obesity	26(18.57%)	56(30.77%)	29(37.18%)	
Results are presented as N= number of subjects and percentage, p<0.05 considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

On the other hand, age groups of the participants compared with the menstrual history factors were studied. Results shown that number of patients associated significantly only in case of dysmenorrhea, p value =0.003, as presented in Table (3.8).

Table 3.8: Distribution of menstrual history factors and their differences with age groups among the patients suffering from secondary infertility (n=400)

Variable	Group	18 - 28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
Regularity Of menstrual cycle (M.C)	Yes	77(55%)	106(58.24%)	40(51.28%)	0.571[NS]
	No	63(45%)	76(41.76%)	38(48.72%)	
Heavy menstrual bleeding	Yes	4(2.86%)	4(2.2%)	2(2.56%)	0.931[NS]
	No	136(97.14%)	178(97.8%)	76(97.44%)	
Intermenstrual. Bleeding	Yes	2(1.43%)	3(1.65%)	2(2.56%)	0.820[NS]
	No	138(98.57%)	179(98.35%)	76(97.44%)	
Dysmenorrhea	Yes	31(22.14%)	58(31.87%)	10(12.82%)	0.003[S]
	No	109(87.86%)	124(68.13%)	68(87.18%)	
Secondary Amenorrhea	Yes	8(5.71%)	9(4.95%)	5(6.41%)	0.885[NS]
	No	132(94.29%)	173(95.05%)	73(93.59%)	
Results are presented as N= number of subjects and percentage, p<0.05 considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

Also, this study examined the obstetric history factors and their association with age groups among the patients suffering from secondary infertility. Only ectopic pregnancy was shown a significant association with age groups, $p < 0.05$ as shown in Table (3.9).

Table 3.9: Distribution of obstetric history factors and their differences with age groups among the patients suffering from secondary infertility (n=400)

Variable	Groups	18 - 28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
Miscarriage	Yes	13(%)	11(%)	4(%)	0.407[NS]
	No	127(%)	171(%)	74(%)	
Ectopic Pregnancy	Yes	2(%)	9(%)	0(%)	0.041[S]
	No	138(%)	173(%)	78(%)	
Molar Pregnancy	Yes	1(%)	1(%)	1(%)	0.820[NS]
	No	139(%)	181(%)	77(%)	
Post-Partum Bleeding or Infection	Yes	26(%)	34(%)	11(%)	0.643[NS]
	No	114(%)	148(%)	67(%)	
Results are presented as N= number of subjects and percentage, $p < 0.05$ considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

In Table (3.10), The following gynecological history variables were present: persistent pelvic pain, abnormal vaginal discharge, dysuria, PID, tubal obstruction, and uterine fibroid, polycystic ovary syndrome and also compared their association with age groups.

Table 3.10: Distribution of gynaecologic history factors and their differences with age groups among the patients suffering from secondary infertility

Variable	Groups	18 - 28 Years N= 140	28 - 38 Years N=182	38 – 48 Years N=78	P Value
Chronic Pelvic Pain	Yes	12(8.6%)	24(13.2%)	7(9%)	0.354[NS]
	No	128(91.4%)	158(86.8%)	71(91%)	
Abnormal Vaginal Discharge	Yes	70(50%)	76(41.8%)	26(33.3%)	0.051[NS]
	No	70(50%)	106(58.2%)	52(66.7%)	
Painful Urination	Yes	2(1.4%)	8(4.4%)	1(1.3%)	0.184[NS]
	No	138(98.6%)	174(95.6%)	77(98.7%)	
PID	Yes	24(17.1%)	31(17%)	7(9%)	0.207[NS]
	No	116(82.0%)	151(83%)	71(91%)	
Tubal Blockage	Yes	21(15%)	26(14.3%)	15(19.2%)	0.588[NS]
	No	119(85%)	156(85.7%)	63(80.8%)	
Uterine Fibroid	Yes	1(0.7%)	6(3.3%)	5(6.4%)	0.053[NS]
	No	139(99.3%)	176(96.7%)	73(93.6%)	
PCOS	Yes	32(22.9%)	40(22%)	16(20.5%)	0.923[NS]
	No	108(77.1%)	142(78%)	62(79.5%)	
<p>Results are presented as N= number of subjects and percentage, p<0.05 considered significantly associated, [S]= Significant, [NS]= Non significant.</p>					

Chi-square test

This study also involved in the assessment the medical history factors and investigated their associate among age groups. History of diabetes mellitus and hypertension were observed to be significantly associated with age groups of patients suffering from secondary infertility, $p < 0.001$ as reported in Table (3.11).

Table 3.11: Distribution of medical history factors and their differences with age groups among the patients suffering from secondary infertility

Variable	Groups	18 - 28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
DM	Yes	3(2.1%)	6(3.3%)	11(14.1%)	<0.001[S]
	No	137(97.9%)	176(96.7%)	67(85.9%)	
Thyroid Disease	Yes	2(1.4%)	7(3.8%)	4(5.1%)	0.278[NS]
	No	138(98.6%)	175(96.2%)	74(94.9%)	
Hyperprolactinemia	Yes	3(2.1%)	4(2.2%)	1(1.3%)	0.880[NS]
	No	137(97.9%)	178(97.8%)	77(98.7%)	
Hypertension	Yes	5(3.6%)	5(2.7%)	10(12.8%)	0.002[S]
	No	135(96.4%)	177(97.3%)	68(87.2%)	
Rheumatologically Diseases	Yes	2(1.4%)	2(1.1%)	4(5.1%)	0.087[NS]
	No	138(98.6%)	180(98.9%)	74(94.9%)	
Psychotic Diseases	Yes	0(0%)	0(0%)	1(1.3%)	0.126[NS]
	No	140(100%)	182(100%)	77(98.7%)	
Results are presented as N= number of subjects and percentage, $p < 0.05$ considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

Also, study was involved in the assessment of family history factors and investigate their differences among age groups. history of early menopause was not reported among participants. Family infertility significantly associated with age groups of patients, $p=0.002$ as indicated in Table (3.12).

Table 3.12: Distribution of family history factors and their differences with age groups among the patients suffering from secondary infertility

Variable	Groups	18 - 28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
Female Infertility	Yes	31(22.1%)	23(12.6%)	4(5.1%)	0.002[S]
	No	109(77.9%)	159(87.4%)	74(94.9%)	
Menstrual Cycle Irregularity	Yes	2(1.4%)	2(1.1%)	1(1.3%)	0.965[NS]
	No	138(98.6%)	180(98.9%)	77(98.7%)	
PCOS	Yes	11(7.9%)	10(5.5%)	4(5.1%)	0.618[NS]
	No	129(92.1%)	172(94.5%)	74(94.9%)	
Uterine Fibroid	Yes	0(0%)	0(0%)	1(1.3%)	0.126[NS]
	No	140(100%)	182(100%)	77(99.7%)	
DM	Yes	1(0.7%)	1(0.5%)	1(1.3%)	0.820[NS]
	No	139(99.3%)	181(99.5%)	77(98.7%)	
Thyroid Disease	Yes	2(1.4%)	1(0.5%)	2(2.6%)	0.396[NS]
	No	138(98.6%)	181(99.5%)	76(97.4%)	
Results are presented as N= number of subjects and percentage, $p<0.05$ considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

Evaluation of the sexual history of infertile women was also performed. Results indicated that about 375 of the participants were reported a regular coital frequency and other sexual history such as dyspareunia about 21.3% of the participants, there was a statistical significant association in the number of this factor in age groups among the patients suffering from secondary infertility, p value <0.05. Also, only 4% of the participants were confirmed a postcoital bleeding, as presented in Table (3.13)

Table 3.13: Distribution of Sexual history factors and their differences with age groups among the patients suffering from secondary infertility

Variable	Groups	18 -28 Years N= 140	28 - 38 Years N=182	38 - 48 Years N=78	P Value
Coital Frequency	Yes	129(92.1%)	170(93.4%)	76(97.4%)	0.292[NS]
	No	11(7.9%)	12(6.6%)	2(2.6%)	
Dyspareunia	Yes	36(25.7%)	42(23.1%)	7(9%)	0.011[S]
	No	104(74.3%)	140(76.9%)	71(91%)	
Postcoital Bleeding	Yes	6(4.3%)	8(4.4%)	1(1.3%)	0.441[NS]
	No	134(95.7%)	174(95.6%)	77(98.7%)	
Results are presented as N= number of subjects and percentage, p<0.05 considered significantly associated, [S]= Significant, [NS]= Non significant.					

Chi-square test

Chapter Four

Discussion

4. Discussion

Infertility is a very important issue for couples of childbearing age all over the world (Al-Mahmood and Al-Ajeely, 2020). It is different from other diseases because it is considered a special reproductive health problem. Although infertility has a great effect on couples, their families, and the whole community, it is not a life-threatening condition(Al-Mahmood and Al-Ajeely, 2020) .

Iraq, in the last thirty years, has faced several instability crises in health problems and one of these problems is fertility status, few studies exist on women's infertility in Iraq(Odah, Mubark and Jawad, 2019).

The current study showed that the mean age of the study participants was 30.3 ± 6.9 years, and the majority of the participants were bachelor's degrees, house wives and lived in an urban area also, about 68% of the participants pointed to have an average monthly income, which was consistent with the result obtained by Abeer Miri Abdullah in Iraq(Abdullah, Shadhan and Al-Ogaili, 2016), and similar to other study obtained by Solaiman Afroughi and Mehran Pouzesh in Iran (Afroughi and Pouzesh, 2018). Also it agree with cross-sectional study in Ethiopia reported that the participants were bachelor's degrees, house wives and lived in an urban area(Bayu *et al.*, 2020).

The findings of a different study done in Egypt contrast the study that secondary infertility is more common among women in rural than in urban regions by Eman Mohammed Eraky and Eman M. Seif El-Nasr(Eraky and El-nasr, 2016).The results that appeared in this research are due to reasons including that the women participating in the questionnaire are mostly from the urban area.

Regarding the characteristics of subfertility about half of the participants reported using contraception, the participants used oral contraceptive pills or injectable type for more than one year. The results agree with a cross-sectional study

obtained by Rasheed M. Salah in Egypt is similar to the results of the research, in which about near half infertile women used a contraceptive (Salah *et al.*, 2013).

This finding contradicts to a study conducted in Cairo and India, which reported that the rates of contraception for each other's 39%, 2.92% (Eraky and El-nasr, 2016), (Shamila and Sasikala, 2011) respectively.

The difference in the results of the research may be due to social and individual reasons, including the wide spread of contraceptives of various types in recent years in Iraq, allowing them to be easily and quickly obtained by women through the private sector. In addition, most of the men may reject using male contraception because of cultural values, which led to excessive use by women and using the contraceptive for long periods which delays the return to fertility and lead to secondary infertility.

On the other hand, the mean age of 1st marriage (20.77 ± 5.39) & mean duration of marriage (9.28 ± 5.42), results also illustrated that 30% of the women with subfertility were had consanguinity, the results disagree with the results obtained by studies done in Egypt it reported that near half of the sample had first-degree relative relation with their husbands (Eraky and El-nasr, 2016), the discrepancy between these studies might be due to the small sample size in this study.

The current study reported that about one third of the secondary infertility women had normal-weight followed by 35% of them were overweight and 28% of them were obese. The results agree with results obtained by the study done in Tikrit, Iraq reported that the most frequent cases of women with secondary infertility were normal weight 39.1%, over weight 35.9 %, and obese 25% (Al-Mahmood and Al-Ajeely, 2020) , and it agrees with other studies obtained in India, Baghdad, Iran and Turkey (Singh *et al.*, 2017), (Eleawi, Abdul-Karim and AL-Salihi, 2015), (Afroughi and Pouzesh, 2018), (Dağ and Dilbaz, 2015) respectively.

Also, a cross-sectional study of women with secondary infertility in china showed that underweight women 16.39%, normal weight 12.49 %, over weight 12.60% and obese 23.13%, underweight and obese women had high incidences of secondary infertility, and the incidence of secondary infertility was highest in the obesity group (Anbesu, Aychiluhm and Alemayehu, 2022), this difference in results is due to the lifestyle of women in this study.

The current study showed that the mean age at menarche (13 ± 0.82), mean duration of the menstrual cycle (24.46 ± 2.35), and mean numbers days of the menstrual cycle (5.14 ± 1.14), 44.3 % of women had irregular of menstrual cycle, this results similar to results obtained in the three study areas (40%, 44.85%, 44.11% respectively) in India while in Egypt reported that 52.5% of the women had irregular menstruation, (Shamila and Sasikala, 2011) and (Eraky and El-nasr, 2016) respectively.

On the other hand, results also illustrated that 24.8% of women had dysmenorrhea, 2.5% heavy menstrual bleeding ,1.8%, had intermenstrual bleeding, and 5.5% had secondary amenorrhea while a study done in Egypt showed that 21% of women had dysmenorrhea,12% heavy menstrual bleeding , 13% intermenstrual bleeding (Eraky and El-nasr, 2016), the discrepancy between these studies might be due to variations in the sample size.

Regarding the obstetrical history of women with secondary infertility, the study showed that the mean period of secondary infertility (4.5 ± 3) years and postpartum bleeding or infection 17.7%, miscarriage 7%, ectopic pregnancy 2.7%, molar pregnancy 0.7%, gravidity less than 5 pregnancies 95%, more than 5 pregnancies 4.8% and history of parity without child 18.3%, 1-2 child 65%, more than 3 children 16.8%, another research conducted by Sarah Musa in Qatar is similar

to the results of the research (Musa and Osman, 2020), while a study was conducted in Ethiopia, the results differed from the results of the research reported that miscarriage 58%, postpartum bleeding or infection 20%, gravidity less than 5 pregnancies 83%, more than 5 pregnancies 16.1% and history of parity without child 18. %,1-2 child 47%, and more than 3 children 34% (Akalewold *et al.*, 2022), the difference in the results is due to the difference in sample size between the two studies and the sampling technique.

Regarding the frequent characteristic of secondary infertility in gynecological history that the abnormal vaginal discharge at about 43% of them, the symptomatic vaginal discharge was an important cause of secondary infertility for women who attended the infertility clinic at Gynaecology and Obstetrics Teaching Hospital in holy kerbela Governorate which was consistent with the result obtained by F E Okonofua, K A Ako-Nai, M D Dighitoghi in Nigerian that women with secondary infertility have higher rates of genital infection than women with primary infertility (Egbe *et al.*, 2020).

Another research conducted by Rasheed M. Salah in Egypt is similar to the results of the research, in which the prevalence of genital infections was higher in secondary infertile women at 45.5% (Salah *et al.*, 2013).

In another study conducted by Nathalie Dhont in Kigali, Rwanda, agrees with the result of the research in which abnormal vaginal discharge was more common in women with secondary infertility (Dhont *et al.*, 2011), this result disagrees to result obtained by studies done in Ethiopia in which the abnormal vaginal discharge was about 20 %. The results of the current study appeared higher than the results of the Ethiopian study due to many reasons, including the excessive use of antibiotics, including vaginal douches, which made bacteria more resistant to treatment. The other reason is the openness and increased travel of men to other countries and the

practice of illegal relations for some led to an increase in vaginal infections in many wives, in addition many wives have excessive use of contraceptives for long periods.

Regarding PCOS in women with secondary infertility was found 22%, and uterine fibroid was 3%, this finding similar to study in Saudi Arabia which showed that about 21% of secondary infertile females had PCOS and 3% had uterine fibroid (Alamri *et al.*, 2020). While these results disagree study done in Ethiopia in which PCOS in women with secondary infertility was found 35%, and 25% had uterine fibroid (Akalewold *et al.*, 2022), because of the difference in the size of the samples led to a contradiction between the results of the two studies.

In addition, the study showed that the participants who had tubal blockage, and pelvic inflammatory disease were 15.5% for each one, chronic pelvic pain for more than 6 months 10.8%, dysuria 2.8, these results agree with the study done in Ethiopia in which the tubal blockage 17%, pelvic inflammatory disease 7.6%, chronic pelvic pain for more than 6 months 10% in women with secondary infertility (Akalewold *et al.*, 2022), and disagree with the study done in Qatar by Sarah Musa (Musa and Osman, 2020). In this study, the results appeared to be much lower than the results of the study in Qatar due to the small size of the sample and the technique. This is a hospital-based study, and the results may not be representative of the general population.

When comparing the results of the current study on the medical history of women with secondary infertility with a study conducted in Egypt, a great similarity was found between the two studies which show that the frequency of diabetes mellitus, hypertension, thyroid diseases, and kidney disease (5%, 5%, 3.3%, 1% respectively) While Egyptian study was the frequency of diabetes mellitus, hypertension, thyroid diseases, and kidney disease (14%, 5%, 7%, 10% respectively) (Eraky and El-nasr, 2016), also this finding similar to the study done on thyroid

diseases in Pakistan by Dua Zhaira who reported that the frequency of diabetes mellitus, hypertension, thyroid diseases was (7.9%,3%,5.7% respectively)(Zhaira *et al.*, 2019).

The results of the study showed frequent surgical history of about 38.3% of participants had a cesarean section for the last delivery, 15.3% had dilatation & curettage for the last miscarriage, 3.3% have appendectomy for the last years after delivery. this finding similar to the study done in Pakistan by Dua Zhaira (Zhaira *et al.*, 2019) .

while a cross-sectional descriptive study was conducted on 320 women in Menoufia reported that frequently surgical history about 16.4 % of participants had a cesarean section, 60% had dilatation & curettage, 19 % had appendectomy (Saeed, 2019).This difference in results is because caesarean section operations in Iraq increased abnormally, and there is no doubt that the health of Iraqi women was affected in one way or another by the economic situation and the circumstances of the wars that passed on Iraq, but this does not justify the high percentage of cesarean sections, the study in Iraq found that the cesarean delivery rate in Iraqi public hospitals is 32.2% and may reach 85.8% in private hospitals as well as the large number of private hospitals and the fear of many women from normal vaginal delivery(Alhaidari *et al.*, 2022).

The result of the study showed that the frequently positive family history of secondary infertility about 14.5 % of the participants agrees with a cross-sectional study done in three different areas from south India reported that the frequently positive family history of secondary infertility in Kanyakumari, Tirunelveli,Thiruvananthapuram(13.87%,17.81%,16.96%respectively)(Shamila and Sasikala, 2011)

Regarding the sexual history of women with secondary infertility in the study showed that the women used to have sexual intercourse with their husbands regularly, that is, from two to three times a week, as their percentage reached about 93% while 21% of the participants had dyspareunia and 3.7% of them had post-coital bleeding, this finding similar to the study done in a Southern Port City of Iran by Seyedeh Nazanin Sharif ('Prevalence and Risk Factors of Infertility in a Southern Port City of Iran', 2020), While another descriptive cross-sectional study in Egypt among women diagnosed with secondary infertility and reported a high frequency about(56.4 %, 78.5% respectively)of the participants having dyspareunia and post-coital bleeding(Saeed, 2019). The result of this study appeared less than the results of the study in Egypt because of the small size of the sample and the technique. If the size of the sample was larger, the results would have been similar.

Regarding the body mass index factors association with age. The current study illustrated that participants' age was significantly associated with the body mass index, the body mass index increases as age increases. This finding was in concordance with a study performed in the Grampian region of Scotland among 783 women who were diagnosed with secondary infertility showed that there was a statistically significant association between the age of the patients and the body mass index ($p < 0.003$); the body mass index increases as age increased(Yildiz *et al.*, 2012)

The current study also found that the age of women had a significantly higher association with dysmenorrhea, p value=0.003. This finding was in line with the result of a study carried out on women diagnosed with secondary infertility in India which found that there is a significant association between dysmenorrhea and the age of women , p value=0.009(Pradhan, Patel and Patel, 2021) .

Furthermore, the current study revealed that there was a significant statistical association between the age group of participants and ectopic pregnancy as a risk

factor of secondary infertility value, $p < 0.05$. It increases with age group. This finding was in concordance with an observational, descriptive, cross-sectional study done in Bengal by Gandhari Basu, which showed that there is a significant association between the age group of women and ectopic pregnancy (Basu *et al.*, 2014).

Furthermore, the current study revealed that there was a significant statistical association between the age group of participants and hypertension as a risk factor for secondary infertility, p -value = 0.002. It increases with age group. This finding was in concordance with, a cross-sectional study done in Iraq which showed that there is a significant association between the age group of women and hypertension in secondary infertile women value, $p=0.033$, also diabetes mellitus was a significant statistical association with the age group of a participant, p -value < 0.001 (Ch, 2022) and it disagrees with the results of a study in the city of Najaf because the difference in the average age. In this study, the ages were taken to reach 45 years (Abdullah, Shadhan and Al-Ogaili, 2016).

Family history of secondary infertility plays an important role as a characteristic for subfertility in females. The current study illustrated that there was a significant association between age groups and family history p -value of 0.002. This finding disagrees with Dr. Enas Mahdi, a cross-sectional study conducted for women with secondary infertility in Baghdad, Iraq that there was a significant association between the age of women and family history of infertility, p value < 0.05 (Ch, 2022)

This variation might be probably due to differences in the study population. Finally, the result of the present study showed that secondary infertility women in the younger age group suffering from dyspareunia more than the older age group p -value 0.011. This finding was in line with the result observed by Zakaria F. Sanad,

who stated that there was a significant association between dyspareunia and the older age group in secondary infertility women p value < 0.001 (Saeed, 2019) .

This study had some limitations: First, due to the cross-sectional nature of the study. Secondly, the study included only those secondary infertility women who visited health facilities, with difficulty in collecting samples due to the time of the infertility clinic, which was on Wednesday of every week. In addition, some patients refused to participate in the questionnaire. Finally, covid-19 pandemic played a major role in the difficulties, as it required a distance in the interview, as well as wearing a mask.

Chapter Five

Conclusions and Recommendations

5.1 Conclusions

- The study concluded that the contraception plays an important role in secondary infertility in females and other factors such as abnormal vaginal discharge, irregular cycle, caesarean section, dysmenorrhea, polycystic ovarian syndrome, tubal blockage, pelvic inflammatory disease, dilatation and curettage, family history of secondary infertility are considered characteristic for the occurrence secondary infertility.
- Results indicated that there were significant association between body mass index, Ectopic pregnancy, D.M., HTN, Family history secondary infertility and dyspareunia of patients and age groups of patients suffering from secondary infertility.

5.2 Recommendations

1. Planned health education programs can be done to highlight the importance of contraceptive methods for women who visit primary health care centres and hospitals about how to use contraceptives correctly and what are their complications if used for long periods without medical guidance.
2. To raise women's understanding of the causes of infertility and how to prevent them, the Ministry of Health should use the mass media.
3. Further research should be done to determine the prevalence of the risk factors for infertility among Iraqi women on a national level.

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Appendices

Thank you very much for your consent to participate in this questionnaire characteristics of the females presented with secondary infertility attending infertility clinic at Gynecology and Obstetrics Teaching Hospital in Holy Kerbala Governorate – 2022. This questionnaire will be anonymous and the information provided will be used for research purposes only and the data will be treated confidentially with full protection of your privacy. You can specify your answer by placing a mark () in the square.

Socio-demographic variables:

Female history:

Age in years :..... .

Educational level: Illiterate read and write primary

Secondary college or higher

Monthly income: poor average good

Occupation: Housewife employer
student

Residence: rural urban

Reproductive characteristics:

Marital history

age at first marriage consanguinity recurrent marriage duration of marriage

lifestyle history

smoking BMI

Menstrual history :

age at menarche

regularity of menstrual cycle yes no duration of menstrual cycle

number of menstrual flow days heavy menstrual bleeding intermenstrual

bleeding dysmenorrhea secondary amenorrhea

Obstetric history

Gravid Para miscarriage ectopic pregnancy

molar pregnancy post-partum bleeding or infection

Gynecologic history

chronic pelvic pain abnormal vaginal discharge painful urination
pelvic inflammatory disease (PID)

tubal blockage yes no uterine fibroid polycystic ovarian syndrome(PCOS)

Medical history

diabetes mellitus (DM) thyroid disease hyperprolactinemia
hypertension cancer rheumatological diseases psychotic disease

others

Medication history

antihypertensive prolonged use of steroid hormonal therapy
prolonged high dose of non-steroidal anti-inflammatory drugs (NSAIDs) herbal use
cancer treatment treatment of-obesity antidepressant antipsychotic others

Surgical history

caesarean section dilatation & curettage appendectomy
road traffic accident(RTA) myomectomy

laparoscopy hysteroscopy laparotomy cystectomy others

Birth control history

contraception use and methods oral contraceptive pills intrauterine device
natural barrier methods contraceptive injection contraceptive patch
contraceptive implant contraceptive ring

Family history

female infertility menstrual cycle irregularity early menopause PCOS
uterine fibroid DM thyroid disease

Period of infertility in year

Sexual history

Coital frequency dyspareunia postcoital bleeding

جمهورية العراق



وزارة التعليم العالي والبحث العلمي
جامعة كربلاء
كلية الطب
معاون العميد لشؤون العلمية
شعبة الدراسات العليا

العدد: 427 / 1612

التاريخ: 2022 / 2 / 9

إلى / مستشفى النسائية والتوليد/ استشارية العقم
م/ تسهيل مهمة

الصادر

تحية طبية :

يرجى تفضلكم بتسهيل مهمة طالبة الدراسات العليا/دبلوم
عالي/طب اسرة (براق فرحان عبيد) في مشروع البحث الموسوم:

(Risk Factors of Secondary Infertility among women Attending
Outpatient Clinic at Obstetrics and Gynecology Teaching
Hospital in Karbala, 2022.)

لغرض اكمال متطلبات البحث، شاكرين تعاونكم معنا خدمة
للحركة العلمية في بلدنا العزيز

... مع التقدير ...

أ.م.د. علي عبد الرضا أبو طحين
معاون العميد للشؤون العلمية

2022 / 2 / 9

**نسخة منه:

- مكتب السيد العميد المحترم للتفضل بالاطلاع مع التقدير.
- مكتب معاون العميد للشؤون العلمية المحترم للتفضل بالاطلاع مع التقدير.
- فرع طب الاسرة والمجتمع. للتفضل بالاطلاع مع التقدير.
- شعبة الدراسات العليا/الحفظ.
- الصادرة.

الخلاصة

الخلفية:

العقم هو مشكلة صحية عامة في جميع أنحاء العالم ، يتم تعريفه على أنه عدم القدرة على الحمل في غضون عام واحد على الرغم من الجماع المنتظم غير المحمي. العقم الأولي هو عدم القدرة على الإنجاب بعد عام من الجماع غير المحمي دون أي حمل سابق ، بينما يشير العقم الثانوي إلى الأزواج غير القادرين على الإنجاب بعد عام من الجماع غير المحمي بعد حمل سابق. حوالي ثلث أو أكثر من جميع حالات العقم ناتجة عن أسباب أنثوية ، وثلث آخر لأسباب ذكور ، والحالات المتبقية ناجمة عن عوامل مختلطة أو غير مفسرة.

الأهداف:

هدفت هذه الدراسة إلى التعرف على خصائص الإناث المصابات بالعقم الثانوي اللاتي يترددن على عيادة العقم بمستشفى النسائية والتوليد التعليمي في محافظة كربلاء المقدسة.

طرائق العمل :

أجريت دراسة مقطعية على النساء اللواتي حضرن عيادة العقم في مستشفى النسائية والتوليد التعليمي في كربلاء المقدسة للتقييم والعلاج. ومن بين 400 امرأة تتراوح أعمارهن بين 18 و 48 عاماً ، أجريت الدراسة في الفترة من مارس 2022 إلى يوليو 2022 باستخدام استبيان منظم ذاتياً في محافظة كربلاء الواقعة وسط العراق.

النتائج:

فيما يتعلق بخصائص العقم الثانوي ، أفاد حوالي 48٪ من المشاركات باستخدام وسائل منع الحمل ، و 24.7٪ من المشاركات استخدمن حبوب منع الحمل عن طريق الفم وحوالي 12.3٪ منهن استخدمن النوع القابل للحقن لأكثر من عام ، وخصائص أخرى من العقم الثانوي ، حوالي 44.3٪ كان لديهم عدم انتظام في الدورة الشهرية. الدورة الشهرية ، 43٪ لديهم إفرازات مهبلية غير طبيعية ، 24٪ يعانون من عسر الطمث ، 22٪ لديهم متلازمة تكيس المبايض ، 15.5٪ لديهم انسداد في قناة فالوب ، 15.5٪ لديهم مرض التهاب الحوض ، 3٪ لديهم ورم ليفي رحمي ، 5٪ مصابون بداء السكري ، 5٪ يعانون من ارتفاع ضغط الدم.

الاستنتاجات:

أظهرت نتائج الدراسة أن هناك ارتباطاً كبيراً بين مؤشر كتلة الجسم للمرضى ، والحمل خارج الرحم ، وداء السكري ، وارتفاع ضغط الدم ، والتاريخ العائلي العقم الثانوي والفئات العمرية.



جامعة كيرلاء
كلية الطب
فرع طب الأسرة والمجتمع



خصائص الاناث المصابات بالعمم الثانوي اللاتي يراجعن عيادة العمم
بمستشفى النساء والتوليد التعليمي بمحافظة كيرلاء المقدسة - 2022

رسالة مقدمة الى

مجلس كلية الطب - جامعة كيرلاء كجزء من متطلبات الحصول على درجة الدبلوم
العالي في طب الاسرة

من قبل

براق فرحان عبيد

بكالوريوس طب وجراحة عامة

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