

**RISK FACTORS OF SECONDARY INFERTILITY AMONG FEMALES ATTENDING
THE OUTPATIENT CLINIC AT THE OBSTETRICS AND GYNECOLOGY
TEACHING HOSPITAL IN KERBELA – 2022**

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Abstract

Background: Infertility is a worldwide public health issue, defined as the inability to conceive pregnancy within one year despite regular unprotected intercourse.

Objectives: This study aims to determine the risk factors associated with secondary infertility in females attending the outpatient clinic at Obstetrics and Gynaecology teaching hospital in Karbala.

Subjects and Methods: A cross-sectional descriptive study was conducted involving the women who attended the infertility unit in the obstetric and gynaecological teaching hospital in Karbala Governorate for infertility evaluation and treatment. among 400 respondents aged 18-45 years. the survey was conducted from March 2022 to May 2022 using a self-administrated structured questionnaire in Karbala province which is located in central Iraq.

Result: Regarding the risk factor 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 risk factors of secondary infertility about 44.3% had irregularity of menstrual cycle, 43% had abnormal vaginal discharge, 30% had consanguinity,24% had dysmenorrhea,22% had pcos,15.5% had tubal blockage,15.5% had pelvic inflammatory disease, 4.5% had premature ovarian failure,3% had uterine fibroid,5% had D.M, 5% had HTN.

Conclusions: Generally, the finding of the study showed that significant association between body mass index of patients, ectopic Pregnancy, diabetes mellitus, hypertension, family history of secondary infertility, premature ovarian failure (POF) and age groups.

Keywords: secondary infertility, risk factors, females.

INTRODUCTION

Infertility is a worldwide public health issue, defined as the inability to conceive pregnancy within one year despite regular unprotected intercourse...[1]

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. Around the world, 60–80 million new couples suffer from infertility each year. [[6]]. According to thorough research by

the World Health Organization (WHO) in 2012, one in four couples in underdeveloped nations suffers from infertility. Infertility affects between 8 and 12% of reproductive-aged couples worldwide [8]. However, in certain areas, such as the Middle East and North Africa (MENA) region, the percentages are significantly higher, reaching up to 30% in some communities.

Infertility is a source of instability in the lives of couples, particularly women, increasing the likelihood of divorce, decreasing the likelihood of entering into marriage, putting her at risk of family violence, and increasing the likelihood that her husband will marry another wife in religions where polygyny is permitted, such as the Islamic Arab world. [10]

According to research, maternal fertility in Iraq has been dropping since 2003, and the war-related situations have accelerated this decline. Iraqi women have an average fertility rate of roughly 4.5 children per woman. [11]

Infertility prevalence ranges from 3.5 % to 16.7 % in developed countries, and from 6.9 % to 9.3 % in developing countries, with an estimated overall median frequency of 9 % .[12]

The WHO estimated that 25% of couples in developing countries have been affected by infertility during their lifetime [13] and about 20% of couples in developed countries [14]

Male, female, combined, or unexplained variables can all be involved as causes of infertility. In further detail, the male factor might manifest as defective sperm morphology (teratozoospermia), low sperm count (oligospermia), poor sperm motility (asthenospermia), and other disorders..[15]

[16] Depending on the sexual history, gender, socioeconomic standing, lifestyle, and cultural background of those it affects, infertility has a variety of causes and effects. There is limited evidence about socioeconomic and demographic factors related to infertility [16], [17]. Infertility is caused by situations that may be avoided, including infection, poor menstrual hygiene, lifestyle choices, advancing maternal age, age at marriage, delaying childbirth, socioeconomic status, occupational risks, anovulation, and ovarian failure. [16], [18].

Many women in underdeveloped nations have infertility due to avoidable conditions such as sexually transmitted infections, tubal damage, polycystic ovary syndrome, and pelvic inflammatory diseases. [19]. Endometriosis ([20], submucosal fibroids, reproductive system disorders, and Infertility are also brought on by other, frequently unavoidable factors, such as chromosomal and genetic causes. Prothrombin G20210A mutation has once more been identified as an unknown factor in women's recurrent miscarriages. [22]. Environmental exposure has been linked to danger to female fertility. ([23]). Infertility can also occur due to unknown and unexplained factors.[16]

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.

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.[29]

Subjects and Methods

Study design, setting, and time

A cross-sectional descriptive study was conducted involving the women who attended the infertility unit in the Obstetric and Gynecological teaching hospital in Kerbala Governorate for infertility evaluation and treatment. among 400 respondents aged 15-50 years. the survey was conducted from March 2022 to May 2022 using a self-administrated structured questionnaire in Karbala province which is located in central Iraq.

Sample and Sampling technique

A systematic sample was utilized on patients from the infertility consultant unit, which was the sole Governmental infertility facility in Karbala and only operated once a week. Data were collected on Wednesday when most ladies are present. The infertility outpatient 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 risk factors and secondary infertility 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

Inclusion criteria

The inclusion criteria were as follows:

- (1) Women who had failed to conceive after one year of regular unprotected sexual intercourse, without using any type of contraceptive, and had previously conceived;
- (2) Age range, women of reproductive age (15-49 years);
- (3) Iraqi nationality; and
- (4) Permanent residence in Kerbala.

Exclusion criteria

included the following:

- (1) Women who had not conceived previously after one year of regular unprotected sexual intercourse without using any type of contraceptive;
- (2) Being widowed or divorced;
- (3) Being separated for more than six months a year;
- (4) Temporary residence in Kerbala;
- (5) Refusing to participate in the study;
- (6) Breastfeeding or postmenopausal amenorrhea; and
- (7) Those with a clinical diagnosis of infertility due to male factor

Ethical consideration

The study was carried out with ethical permission from the research ethics committee at the college of medicine at the University of Kerbala and the Kerbala 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, as well as informed consent, 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.

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 85 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. 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.

Pilot study:

In March 2022, a piloted sample of 25 participants was conducted to test the reliability of the questions (test-retest) and the time required by the participant to answer the questions. This was done to assess the feasibility of the questionnaire and to overcome any difficult issues that may arise during data collection. The average time required to complete the questionnaire is 10-15 minutes.

The pilot research responses were not included in the final analysis.

Statistical analysis:

Information from the questionnaire from all participants was entered into a data sheet and assigned a serial identifier number. Multiple entries were used to avoid errors. The data analysis for this work was generated using The Statistical Package for the Social Sciences software, 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. 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.

Results and Discussion

The clinical demographic characteristics of the patient's group were summarized in figure (3.1), which illustrates the mean age of participants which was within the age group of (16-48) years old. The patient group was divided into subgroups based on age. Overall, results indicated that most of the study samples were within the age group of (27-37) years old. The frequencies of the education level among the patient's group Most of the participants have a bachelor's degree. Also, about 68% of the participants pointed to having an average monthly income and about two third were reported to be an employee, as presented in figures (3.3 & 3.4).

Table 3.1: Distribution of Menstrual cycle History among patients with secondary infertility

Variable	Group	NO.	%
Regularity of menstrual cycle (M.C)	Yes	223	55.8
	No	177	44.3
Menorrhagia	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

Table 3.2: Distribution of Gynaecologic History among patients with secondary infertility

Variable	Group	NO.	%
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
Pelvic Inflammatory Disease (PID)	Yes	62	15.5
	No	338	84.5
Tubal Blockage	Yes	62	15.5
	No	338	84.5
Polycystic ovary syndrome (PCOS)	Yes	88	22.0
	No	312	78.0
Premature ovarian failure (POF)	Yes	18	4.5
	No	382	95.5

Table 3.3: Distribution of medical history among patients with secondary infertility

Variable	Group	NO.	%
Diabetes mellitus (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	.3
	No	399	99.8
Cancer	Yes	0	0
	No	400	100

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

Variable Groups		16 - 26 Years N= 140	27 - 37 Years N=182	38 - 48 Years N=78	P Value
Consanguinity	Yes	42(30%)	63(34.62%)	17(21.79%)	0.119
	No	98(70%)	119(65.38%)	61(78.21%)	
Recurrent Marriage	Yes	3(2.14%)	8(4.4%)	3(3.85%)	0.542
	No	137(97.86%)	174(95.6%)	75(96.15%)	

Body mass index (BMI)	Normal Weight	72(51.43%)	57(31.32%)	21(26.92%)	<0.001
	Overweight	42(30%)	69(37.91%)	28(35.90%)	
	Obesity	26(18.57%)	56(30.77%)	29(37.18%)	

Chi-q test

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

Variable Groups		16 - 26 Years N= 140	27 - 37 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
	No	63(45%)	76(41.76%)	38(48.72%)	
Menorrhagia	Yes	4(2.86%)	4(2.2%)	2(2.56%)	0.931
	No	136(97.14%)	178(97.8%)	76(97.44%)	
Intermenstrual. Bleeding	Yes	2(1.43%)	3(1.65%)	2(2.56%)	0.820
	No	138(98.57%)	179(98.35%)	76(97.44%)	
Dysmenorrhea	Yes	31(22.14%)	58(31.87%)	10(12.82%)	0.003
	No	109(87.86%)	124(68.13%)	68(87.18%)	
Secondary Amenorrhea	Yes	8(5.71%)	9(4.95%)	5(6.41%)	0.885
	No	132(94.29%)	173(95.05%)	73(93.59%)	

Chi-q test

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

Variable Groups		16 - 26 Years N= 140	27 - 37 Years N=182	38 - 48 Years N=78	P Value
Diabetes Mellitus (DM)	Yes	3(2.1%)	6(3.3%)	11(14.1%)	<0.001
	No	137(97.9%)	176(96.7%)	67(85.9%)	
Thyroid Disease	Yes	2(1.4%)	7(3.8%)	4(5.1%)	0.278
	No	138(98.6%)	175(96.2%)	74(94.9%)	
Hyperprolactinemia	Yes	3(2.1%)	4(2.2%)	1(1.3%)	0.880
	No	137(97.9%)	178(97.8%)	77(98.7%)	
Hypertension	Yes	5(3.6%)	5(2.7%)	10(12.8%)	0.002
	No	135(96.4%)	177(97.3%)	68(87.2%)	
Rheumatological Diseases	Yes	2(1.4%)	2(1.1%)	4(5.1%)	0.087
	No	138(98.6%)	180(98.9%)	74(94.9%)	
Psychotic Diseases	Yes	0(0%)	0(0%)	1(1.3%)	0.126
	No	140(100%)	182(100%)	77(98.7%)	

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

Variable Groups		16 - 26 Years N= 140	27 - 37 Years N=182	38 - 48 Years N=78	P Value
Female Infertility	Yes	31(22.1%)	23(12.6%)	4(5.1%)	0.002
	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
	No	138(98.6%)	180(98.9%)	77(98.7%)	
Polycystic ovary syndrome (PCOS)	Yes	11(7.9%)	10(5.5%)	4(5.1%)	0.618
	No	129(92.1%)	172(94.5%)	74(94.9%)	
Uterine Fibroid	Yes	0(0%)	0(0%)	1(1.3%)	0.126
	No	140(100%)	182(100%)	77(99.7%)	
Diabetes Mellitus (DM)	Yes	1(0.7%)	1(0.5%)	1(1.3%)	0.820
	No	139(99.3%)	181(99.5%)	77(98.7%)	
Thyroid Disease	Yes	2(1.4%)	1(0.5%)	2(2.6%)	0.396
	No	138(98.6%)	181(99.5%)	76(97.4%)	
Premature ovarian failure(POF)	Yes	1(0.7%)	1(0.5%)	6(7.7%)	<0.001
	No	139(99.3%)	181(99.5%)	72(92.3%)	

Chi-q test**Discussion:**

Infertility is a very important issue for couples of childbearing age all over the world (1). It is different from other diseases because it is considered a special reproductive health defect. Although infertility has a great effect on couples, their families, and the whole community, it is not a life-threatening condition (1)

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(2).

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 Solaiman Afroughi1 and Mehran Pouzesh in Iran (3) and similar to other study obtained by Abeer Miri Abdullah in Iraq(4).also agree with cross-sectional study study in Ethiopia reported that the participants were bachelor's degrees, house wives and lived in an urban area(14).

Another research conducted in Egypt, the results differ from the results of the research, in which the percentage of secondary infertility among women in rural areas is higher than in urban area by Eman Mohammed Eraky and Eman M. Seif El-Nasr (6)

The results that appeared in this research are due to reasons including that the women participating in the questionnaire are mostly from the city

Regarding the risk factor of secondary infertility 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 Mekdes Akalewold done in Ethiopia reported that about the near half of women with secondary infertility used contraceptive for more than 1 year (5) and another research conducted by Rasheed M. Salah in Egypt is similar to the results of the research, in which about near half infertile women used a contraceptive (7). 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% (6) , (8) 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 values cultural areas , which led women the excessive 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 secondary infertility 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 (6), 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 infertile women had normal-weight followed by 35% of them had overweight women and 28% of them had 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% (1), and it agrees with other studies obtained in India, Baghdad, Iran and Turkey (9), (10), (3), (11) 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 (12), 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, (8) and (6) respectively.

On the other hand, results also illustrated that 24.8% of women had dysmenorrhea, 2.5% menorrhagia, 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% menorrhagia, 13%, intermenstrual bleeding (6), 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 the most of women had ante-natal care 96.3%, postpartum bleeding or infection 17.7%, abortion 7%, ectopic pregnancy 2.7%, molar pregnancy 0.7% while gravity less than 5 pregnancies 95% while 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 Qatari is similar to the results of the research (13) while a study was conducted in Ethiopia, the results differed from the results of the research reported that abortion 58%, postpartum bleeding or infection 20%, gravity less than 5 pregnancies 83%, more than 5 pregnancies 16.1% and history of parity without child 18.3%, 1-2 child 47%, and more than 3 children 34% (14), the difference in the results is due to the difference in sample size between the two studies and the sampling technique.

Regarding the frequent risk factor of secondary infertility in gynecological history that the abnormal vaginal discharge at about 43% of them, the symptomatic vaginal discharge an important cause of secondary infertility for women who attended the infertility unit in the Obstetric and Gynecological teaching hospital in Karbala 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 (15)

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% (7) In another study conducted by Nathalie Dhont in Kigali, Rwanda, agree with the results of the research in which abnormal vaginal discharge was more common in women with secondary infertile (16), this results disagree to results obtained by studies done in Ethiopia in which the abnormal vaginal discharge 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 the polycystic ovarian syndrome in women with secondary infertility was found 22%, and had uterine fibroid 3%, this finding similar to study in Saudi Arabia which showed that about 21% of secondary infertile females had polycystic ovarian syndrome and had uterine fibroid 3% (17). While this results disagree study done in Ethiopia in which the polycystic ovarian syndrome in women with secondary infertility was found 35%, and had uterine fibroid 25% (14), 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%, premature ovarian failure 4.5%, dysuria 2.8, these result 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 (5), and disagree with the study done in Qatari by Sarah Musa (13) 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) (6),also this finding similar to the study done in thyroid diseases Pakistan by Dua Zhaira reported that the frequency of diabetes mellitus, hypertension, thyroid diseases 7.9%,3%,5.7% respectively (18).

The results of the study showed that the 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 abortion, 3.3% have appendectomy for the last years after delivery .this finding similar to the study done in Pakistan by Dua Zhaira (18). 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(19). 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 statistics of Iraqi ministry of health found that 60% of childbirths are caesarean sections in private hospitals and only 14% of cesarean deliveries are in government hospitals, as well as the large number of private hospitals and the fear of many women from normal vaginal delivery.

The result of the study showed that the frequently positive family history of secondary infertility about 14.5 % of the participants agree 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) (8).

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 (20) ,While another descriptive cross-sectional study in Egypt among women diagnosed with secondary infertility and reported a high frequently about(56.4 %, 78.5% respectively)of the participants having dyspareunia and post-coital bleeding (19). 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 associated with age. The current study illustrated that participants' age was significantly associated with the body mass index. the body mass index increase 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 increase as age increased(21).

The current study also found that the age of women has a significantly higher proportion 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(22).

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(23).

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 (24)and disagree 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(4)

Family history of secondary infertility plays an important role as a risk factor for secondary infertility in females. The current study illustrated that there was a significant association between age groups and the abnormal vaginal discharge more common in age groups (16-26) with a year's p -value of 0.002. This finding was disagree 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 (22).

This variation might be probably due to differences in the study population.

Regarding the premature ovarian failure factors associated with age. The current study illustrated that participants' age was significantly associated with premature ovarian failure. the premature ovarian failure increase as age increased p value < 0.001 . This finding was in concordance with a cross-section study performed in Arar city, Northern Saudi Arabia among 565 women who were diagnosed with secondary infertility showed that there was a statistically significant association between the age of the patients and premature ovarian failure (p -value =0.000) (17).

Finally, the result of the present study showed that secondary infertile 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 infertile women p value < 0.001 (19).

This study had some limitations: First, due to the cross-sectional nature of the study. Secondly,

the study included only those secondary infertile women who visited health facilities, with difficulty in collecting samples due to the time of the infertility consultation, which was on Tuesday of every week. In addition, some patients refused to participate in the questionnaire. Finally, the Corona pandemic played a major role in the difficulties, as it required a distance in the interview, as well as wearing a mask

Conclusion

- 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, cesarean section, dysmenorrhea, polycystic ovarian syndrome, tubal blockage, pelvic inflammatory disease, dilatation and curettage, family history of secondary infertility, premature ovarian failure, are considered risk factors for the occurrence secondary infertility.
- Results indicated that the significant association between body mass index of patients and age groups.
- Ectopic Pregnancy showed a significant association with age groups
- History of diabetes mellitus and hypertension were observed to be significantly associated among age groups of patients suffering from secondary infertility
- Family history of secondary and premature ovarian failure (POF) history was significant associate among age groups of patients
- Results also indicated that there was a high prevalence of dyspareunia among patients suffering from secondary infertility

Recommendation

1. Planned health education programs can be carried out to highlight the importance of contraceptive methods to women who visit primary health care centers and hospitals about how to use contraceptives correctly and what are the complications if they are used for long periods without medical guidance.
2. To increase women's understanding of the causes of infertility and how to prevent it, the Ministry of Health should use the media.
3. Conduct further research to determine the prevalence of risk factors for infertility among Iraqi women at the national level.

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