

Predictors of Fertility among Egyptian Females at Reproductive Age at El-Manial Maternity Hospital

Hanan Fahmy Azzam*

Lecturer of Maternal & Newborn Health Nursing, Faculty of Nursing, Cairo University

*Hananha_azzamaz@yahoo.com

Abstract: Background: The most common and well documented risk factors which can contribute to female infertility include over weight or underweight; hormonal imbalances; fibroid; reduced oocyte quality; chromosomal abnormalities; sexually transmitted diseases; age older than 27; history of pelvic inflammatory diseases; smoking and alcohol intake; and immune system disorders. **Aim** of this study was to explore the predictors that might affect Egyptian female fertility. **Subject & Methods. Design:** A Descriptive design was adopted in this study to explore the predictors that might affect Egyptian female fertility. **Sample,** a total of 300 married infertile women was recruited from the outpatient gynecological clinic at El Manial Maternity Hospital, Cairo University, Egypt according to the certain criteria. **Tools** utilized for Data collection were collected by using an interviewing questionnaire schedule. **Results of the present study** revealed that age of the woman (P=0.008); age at marriage (P=0.007); BMI (P=0.010); eat snacks (P=0.043); fatty saturated diet (P=0.029); polycystic ovary (P=0.040); cervicitis (P=0.012); utilized contraceptives methods (P<0.001); frequency of sexual intercourse/week (P=0.028) were a predictors that might affect the female fertility. **The study concluded that,** the women with the following profile: older age at marriage, overweight and obese, depending on fatty saturated diet, eat snacks, had history of polycystic ovarian syndromes, had cervicitis, used contraceptive methods, might be at risk for the occurrence of infertility. **Recommendation,** based on the findings of the present research the following recommendation is suggested: Raise women's awareness regarding to adopting healthy life style as follow dietary program and practice exercising.

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1. Introduction

Infertility is a widespread problem that has an emotional, psychological, social and economic impact on couples and society (Ricci, 2009). Infertility is a medical diagnosis of the reproductive system, and is defined as the inability to achieve pregnancy after one year of frequent, unprotected intercourse (Orshan, 2008). Primary infertility applies to a man or woman who has never been able to conceive while, secondary infertility applies to an inability to conceive after one or both partners have conceived previously (Ricci, 2009). Women older than 35 years having difficulty conceiving may receive a diagnosis of infertility before a full 12 months. (Covington and Burns, 2006).

Worldwide, the prevalence of infertility is approximately 13%, with the range from 7-28%, depending on the age of the woman (kumar Ashim et al., 2007). In Egypt, El-awady and Abdelazeem (2008) reported that the prevalence of the primary and secondary infertility was 2.5% and 7.9% respectively; also, they added that, the overall prevalence of infertility is 10.4%. In normal fertile couples having frequent, timing intercourse, the success of conception is estimated to be approximately 20-25% (Kelly-Weeder & Cox, 2006).

Approximately 90% of couples with unprotected intercourse will conceive within one year (Fraser & Cooper, 2010).

Ricci (2009) mentioned that, the risk factors which can contribute to female infertility include over weight or under weight (can disrupt hormone function); hormonal imbalances leading to irregular ovulation; fibroid; tubal blockages; reduced oocyte quality; chromosomal abnormalities; sexually transmitted diseases (STDs); age older than 27; history of Pelvic inflammatory disease (PID); smoking and alcohol intake; decreased frequency of coitus; congenital anomalies of the cervix and uterus; and immune system disorders.

Rowe (2006) reported that, as a woman ages beyond 35years (particularly after age 40years), the likelihood of becoming pregnant is less than 10% per month, and a woman's peak fertility is in her early 20s. In addition, Gurevich (2010) indicated that, healthy couples younger than 30 years who have regular sexual intercourse and use no contraception have a 25% to 30% chance of achieving pregnancy each month.

Worldwide, PID is one of the leading causes of ectopic pregnancy and preventable infertility which affect women's upper reproductive tract,

including the structures of the uterus, ovaries, and fallopian tubes (salpingitis) which is considered the most common manifestation of the disease (Bosky, 2007). Moreover, PID is known to be a long-term consequence of sexually transmitted diseases as well as of bacterial vaginosis, pelvic surgery, and other gynecologic procedures that cross the cervix (Morse, 2010). In the same context, women who are not treated for PID right away can experience serious complications, ranging from infertility to ectopic pregnancy to chronic pelvic pain (Mardh, 2004).

Many lifestyle choices can negatively affect female fertility. Women who smoke are three times likelier to have difficulty conceiving and less likely to become pregnant with infertility treatment and the more cigarettes a woman smokes the less her chances of conceiving (Zavos & Panayiotis, 2011). Also, they added that, women smokers who do become pregnant have more miscarriages. Moreover, Zosia (2011) reported that tobacco smoke can reduce female fertility by affecting hormonal function within the ovary which can reduce the number and quality of eggs; and ultimately could impair fertilization.

Obesity has a strong association with infertility and menstrual irregularities, while, some of the ovulation problems and menstrual changes are explainable by women with polycystic ovarian syndrome (PCOs) who are also obese, and women who do not have PCOs but are overweight also have the same problems (Sallmen, 2006). In addition, Hoeger, (2006) found that obesity at 23 years and at 7 years both independently increased the risk of menstrual problems by the age 33 years. In the same context, Garcia, (2006) reported that overweight and obesity in early adulthood may increase the risk of menstrual problems and infertility. Also, added that 20% over ideal weight is considered obese, and a body mass index (BMI) of 25-30kg/m² is considered overweight and a BMI of over 30 is considered obese.

Ovulatory disorders are the leading cause of female infertility, resulting in the disruption of hormones, menstrual cycles, and conception; and approximately 15% of such disorders are linked to weight disorders, mainly being overweight and obese (Hirschberg, 2009). Also, added that women who are overweight and obese are less likely to respond to fertility drugs, because excess weight interferes with the proper absorption of a variety of drugs used in infertility treatment.

Moreover, abnormal hormones can be addressed as a result of excess weight which can negatively impact on ovulation and cause over-production of insulin, which may cause irregular ovulation (Boyles, 2007). Also, there is a link between obesity, excess insulin production and the infertility condition known as polycystic ovarian

syndrome which associated with irregular menstrual cycles, anovulation (decreased or stopped ovulation), obesity and elevated levels of male hormones (Pasquali & Gambineri, 2006).

Cottrell (2010) reported that, frequent vaginal douching is associated with adverse reproductive health outcomes as increased the risk of pelvic inflammatory disease, secondary infertility, and ectopic pregnancy. Also, added that douching may impact on health because it disturbs the chemical and microbial balance of the vagina and possibly leading to bacterial vaginosis and other bacterial infections. Moreover, douching may force pathogens up through the cervix causing uterine infections where organisms are more likely to cause pelvic inflammatory disease, an infection linked with infertility (Boskey, 2007).

The nurse has a crucial role in the prevention and management of infertility, the nurse should perform careful assessment for the presence of risk factors as age, chronic disease, stress, and poor diet. Also, education is another important role, that the nurse should teach the couples the signs and timing of ovulation, the most effective times for intercourse, other fertility awareness behaviors that the nurse may inform the women about avoiding douches and avoiding artificial lubricant. Moreover,, the nurse may teach the women about home assessment of cervical mucus and basal body temperature (BBT) recording. The nurse can alleviate some of the anxiety associated with diagnostic testing by offering explanation about timing and reasons for each test. In addition, the nurse should be familiar with the fertility problem, the couple's stage of coping, and fertility centers for referral (Ricci, 2007 and Davidson, London and Ladewing, 2006).

Significant

Infertility has a profound emotional, psychological and economic impact on affected couples and society (Davidson, London and Ladewing, 2006). According to statistics collected by the Centers for Disease Control (2011) reported that 6.1 million women between the ages of 15 to 44 years have an impaired ability to have children, and 2.1 million married couples are experiencing infertility, also, statistics found that 9.2 million women had made use of infertility services at some time in their life. However, in Egypt there is scattered nursing researches that determine factors affecting female fertility; so, the current study will explore the profile of infertile women and determine the factors affecting female fertility. Also, this study will contribute to improve the nursing practice especially in relation to women follow – up and monitor for

early detection of problems that may predispose to infertility.

Operational Definition

Predictors: in the current research refers to factors that might affect female fertility as measured by interviewing questionnaire schedule.

Aim

The aim of this study was to explore the predictors that might affect Egyptian female fertility.

Research Question

1- What are the Predictors that might affect Egyptian females at reproductive age?

2. Subjects and Methods

Design

A Descriptive design was adopted in this study to explore the predictors that might affect Egyptian female fertility.

Setting

The setting used to carry out this research was the outpatient gynecological clinic at El Manial Maternity Hospital, Which is a university, affiliated hospital providing free health care to outpatient gynecologic patients, as well as inpatient. The total annual patient visits to outpatient infertility clinic are 2219 (statistic department, 2010) and care is provided by physicians, as well as professional and diploma nurses who are responsible for giving nursing care.

Sample

A total of 300 married infertile women were recruited for the study according to the following inclusion criteria: women having primary or secondary infertility, at the reproductive age, and can read and write. Women who had tubal factors of infertility and their husbands were responsible for infertility were excluded.

Tool

Tool used to collect data was the interviewing questionnaire schedule. It was designed and filled by the researcher and the content of tool was determined through an extensive review of literatures about infertility. This tool includes data related to **a)Socio-demographic characteristics and women lifestyles** as age, educational level, occupation, duration of marriage, weight, height, and calculation of BMI, nutritional habits as kind of diet, had snakes, and cigarettes smoking; **b)obstetrical profile** as Parity, number of abortion, mode & place of previous delivery, age at marriage, menstrual history as (age at menarche, regularity, interval,

duration and amount of menstrual flow, consistency, using of medications to regulate her menstruation, or to induce ovulation, and menstrual abnormalities); **c) medical history** includes chronic disease as anemia, diabetes, heart disease, renal disease, liver disease, thyroid problems, and toxoplasmosis; **d) gynecological and sexual history** as ,pelvic inflammatory disease, vaginitis, cervicitis, polycystic ovarian syndrome, and types & duration of contraceptive methods if used, frequency of intercourse/week, had dyspareunia, use of chemical lubricants for intercourse and use of antiseptic douches immediately after intercourse.

Tool Validity

Tool was submitted to a panel of three medical and nursing experts in the field of obstetrics and gynecology to test the content validity. Modification was carried out according to the panel judgment on clarity of sentences and the appropriateness of content.

Ethical Consideration

An official permission was granted from the director of the El Manial Maternity Hospital. The researcher introduced herself to the women who diagnosed with infertility and met the inclusion criteria and informed them about the purpose of this study in order to obtain their acceptance to participate in this study. The researcher assured that the study posed no risk or hazards on them. All women were informed that the participation in the study was voluntary. A written consent was obtained from women who were willing to participate in the study.

Pilot Study

A pilot study was carried out on 10% of the total sample to check clarity of items and determine the feasibility of the study.

Procedure

Data was collected through a period of 9 month from May 2010 to January 2011. Researcher collected data after the women had been fully informed and consented for participation in the study. Data was collected through interviewing questionnaire schedule.

1. Interviewing schedule to collect data related to socio-demographic characteristics and lifestyles, obstetric profile, medical history, gynecological, and sexual history. The researcher met the women at outpatient gynecological clinic where they came for the first time or for follow up of their condition. The researcher asked questions in simple Arabic language and recorded the answers in the schedule. The

interview consumed about 20 minutes for each woman.

Also, Anthropometric assessment was carried out after obtaining the baseline data, that the researcher measured women height through tape measurement. and weight utilizing bath scale, accuracy was obtained through balancing zero prior to obtaining each weight and then body mass index is calculated by dividing the subject weight in kilograms by the square of her height in meters ($BMI = \text{kg} / \text{m}^2$). World Health organization (WHO) (2000); Jeannette, Robert and Cynthia (2004) categorized the body mass index as the following values: A BMI less than 18.5 is under weight; A BMI of 18.5 – 24.9 is normal weight; A BMI of 25.0 – 29.9 is overweight; A BMI of 30.0 – 39.9 is obese; A BMI of 40.0 is higher or severely (or morbidly) obese. The Anthropometric assessment was consumed about 10 minutes for each woman.

Information about the **assessment of menstrual flow amount** was obtained through asking women to point on the picture which illustrated the amount of blood stain in peripad and recorded based on Nichols and Zwelling (1997, p998) as (peripad blood stain < 10ml = scant; peripad blood stain 10: 25 ml = Mild; peripad blood stain 25: 50ml = moderate; peripad blood stain 50:80ml = heavy). Information about the **physical and gynecological assessment** was obtained from the physician to complete data related to these parts.

Statistical analysis

Collected data were coded and tabulated using personal computer. Statistical package for social science (SPSS) version 11 was used. The researcher used the descriptive as well as inferential statistics. The descriptive statistics include the arithmetic Mean as an average, describing central tendency of observation of each variable studied; the standard deviation as a measure of dispersion of results around the mean; and the frequency distribution and percentage of observation for each variable studied were used. Multiple regression analysis was also used as inferential statistics to examine the differences and similarities within the sample and to identify predictors that might affect female fertility at reproductive age. Statistical significance was considered at p-value <0.05.

3. Results

Findings of this descriptive research will be presented in two main sections: 1) description of the sample; 2) predictors that might affect female fertility.

I: Description of the Sample

This section includes: a) socio-demographic characteristics and women lifestyles, b) infertility

description, c) obstetrical profile, d) medical history, e) gynecological and sexual history.

a) Socio-demographic characteristics and lifestyles, the results indicated that the age range was 16-44 years with a mean of 28.62 ± 6.32 years. Forty-nine point seven percent of the sample was distributed at the age category (21 - 30 years); while 36.3% of them was distributed at the age category (31-40 years); 4% of them was distributed at the age category (41-44 years); and 10% of them was distributed at the age (≤ 20 years). Ninety-one percent of sample was housewives. High percentages of the sample (33.7%) had secondary school education, and low percentages of the sample (10%) had primary school education, while, (27.3%, 14.7%, and 14.3% respectively) of them can read & write, had preparatory and university education.

The weight range of the sample was 38-162 kilograms, with a mean of 73.40 ± 17.00 kilograms; and the height range of the sample was 1.43-1.76 meter, with a mean of 158.1 ± 6.212 meter, regarding to BMI categories of the sample, the results revealed that 1.3% of the sample was under-weight, while, 24.4% of the sample was normal weight. However, 33.3% of the sample was overweight, while 35% of the sample was obese, and 6% of the sample was morbidly obese, with mean BMI of 29.3 ± 6.31 (table, 1). Fifty seven percent of the sample had snacks between meals, and 42.3% of them depend on fatty-saturated diet. While, 2% of the sample was cigarettes smokers with a number range of 5-20 cigarettes/ day with a mean of 10.3 ± 6.02 cigarettes.

b) Infertility description, 57% of the sample had primary infertility, while 43% had secondary infertility. Mean duration of infertility was 4.32 ± 3.55 years.

c) Obstetrical profile, Age range at marriage was 15-40 years with a mean of 25.99 ± 7.53 years. Regarding to the menstrual history, age range at menarche was 8-20 years with a mean of 12.88 ± 1.51 years; 61% of the sample had irregular menstruation; menstrual duration range was 2-15 days with a mean of 4.55 ± 1.66 days; also, women had moderate, mild, and heavy amount of menstruation (54%, 12%, & 31.7% respectively), and only 2.3% of them had scanty menstruation. Forty point seven percent of the sample had menstrual abnormalities as oligomenorrhea, menorrhagia, and hypermenorrhea (50%, 32.8%, and 17.2%, respectively). In addition, 28% of the sample used hormones to regulate their menstruation, while, 85% used it with the purpose of

induce ovulation. Regarding to parity, 43% of the sample had secondary infertility, and 17.3% of them had history of abortion, while 25.7 % of them completed their pregnancy (15.7 % primipara, and 10 % multipara).

Fifty-seven point one percent of them were delivered by cesarean section (CS), while, 28.6% of them were delivered by normal vaginal delivery (NVD), and 14.3% of them were delivered by vaginal delivery with episiotomy. Eighteen-point three percent of the sample used different methods of contraception such as intrauterine device, contraceptive pills and contraceptive injections (58.2%, 21.8%, and 20% respectively) with mean duration of contraceptive use was 19.60 ± 12.745 month.

d) Medical history, results indicated that 15.3% of the sample had history of medical disease as anemia, renal disease, rheumatic fever, hypertension, rheumatoid arthritis, diabetes mellitus, hyperthyroidism, and toxoplasmosis (45.6%, 21.7%, 10.8 %, 8.6 %, 8.6 %, 6.5 %, 6.5%, and 6.5% respectively).

e) Gynecological and Sexual history, results indicated that 79.7% of the sample had history of gynecological disease as vaginitis, polycystic ovary (PCO), cervicitis, and pelvic inflammatory disease (29 %, 36.3%, 32.2%, and 2.5% respectively). Mean sexual intercourse/week was 3.04 ± 1.46 times, 52% of the sample had sexual intercourse (3-4 times), while, 36.4% of them had sexual intercourse (<3 times); and only 10.6% of them had sexual intercourse (>4 times); 16.7% of the sample had dyspareunia; 8.7% of the sample used antiseptic douches immediately after intercourse and only 1.3% of the sample used chemical lubricants for intercourse.

II: Predictors that might affect female fertility

This section includes Predictors that might affect female fertility. Multiple regression Analysis was carried out using Socio-demographic and lifestyles predictors, obstetrical predictors, and gynecological & sexual predictors, as independent variables and female fertility as dependent variable to explore the predictors that might affect female fertility.

1. Demographic and lifestyles Predictors. Results indicated that age, BMI, fatty saturated diet and had snacks were important predictors that might affect the female fertility ($P=0.008$, 0.010 , 0.029 & 0.043 respectively); However, educational level, and cigarettes smoking were not statistically significant ($P = 0.380$, & 0.735 respectively) (figure, 1).

2. Obstetric Predictors. Results indicated that, age at marriage, use of family planning methods, menstrual irregularities, menstrual abnormalities, and mode of previous delivery were a predictors that might affect the female fertility ($P=0.007$, <0.001 , <0.001 , <0.001 & <0.001 respectively). However, age at menarche was not statistically significant ($P = 0.319$) (figure, 2).

3. Gynecological and Sexual Predictors. Polycystic ovary, cervicitis and frequency of sexual intercourse / week were a predictors that might affect the female fertility ($P= 0.040$, 0.012 & 0.028 respectively). On the other hand, history of pelvic inflammatory disease (PID), vaginitis, dyspareunia, use of chemicals lubricants for intercourse, and use of antiseptic douches immediately after intercourse were not statistically significant ($P = 0.238$, 0.772 , 0.340 , 0.678 , & 0.244 respectively) (figure, 3&4).

Table (1): Distribution of the Sample According to Category of Body Mass Index (n=300)

| Body Mass Index Category | Frequency | % |
|---------------------------------|-----------|------|
| A BMI < 18.5 (under weight) | 4 | 1.3 |
| A BMI 18.5-24.9 (normal weight) | 73 | 24.4 |
| A BMI 25-29.9 (over weight) | 100 | 33.3 |
| A BMI 30-39.9 (obese) | 105 | 35 |
| A BMI >40 (morbidly obese) | 18 | 6 |

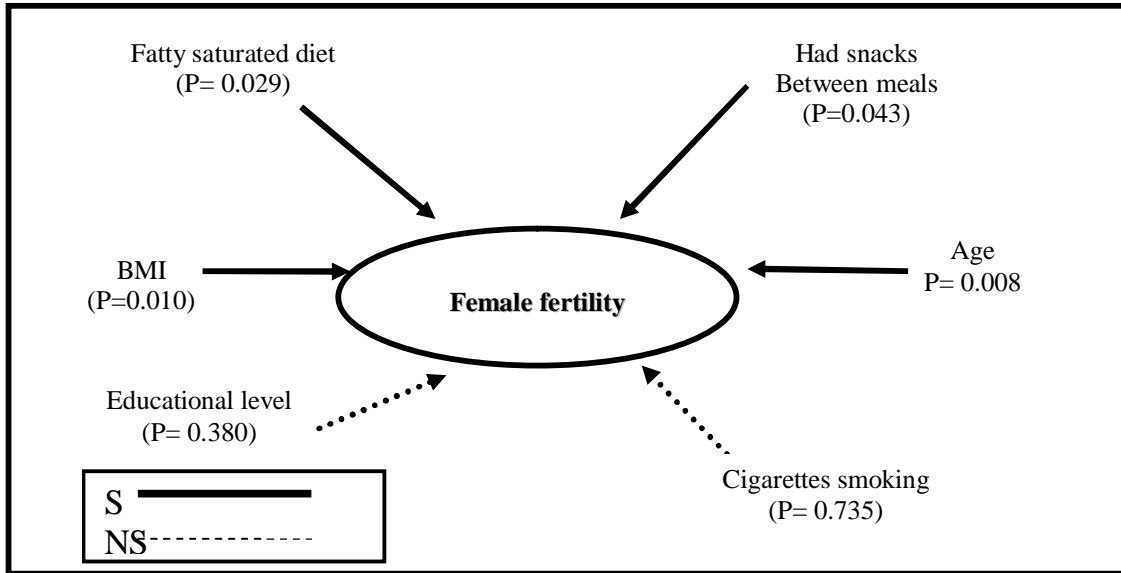


Figure (1) Socio-demographic and Lifestyle Predictors That Might Affect Female Fertility

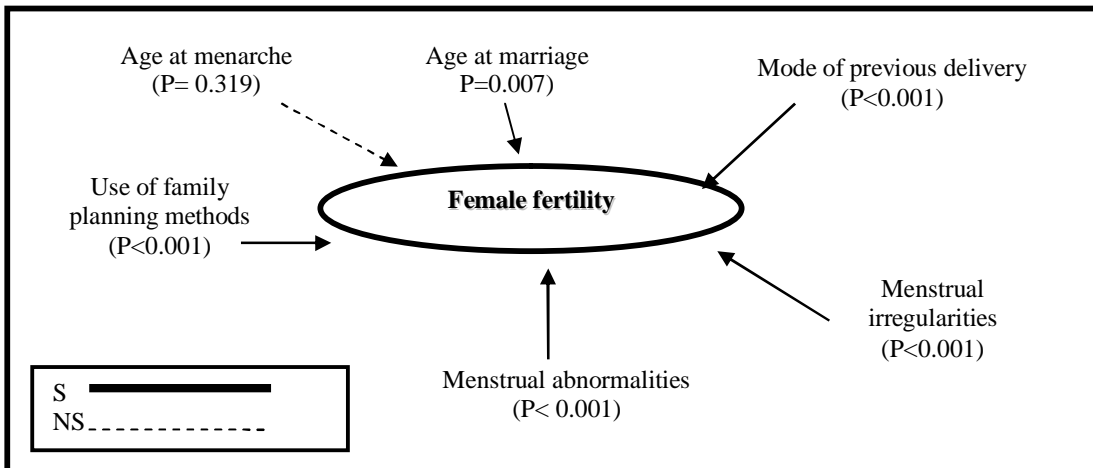


Figure (2) Obstetric Predictors That Might Affect Female Fertility

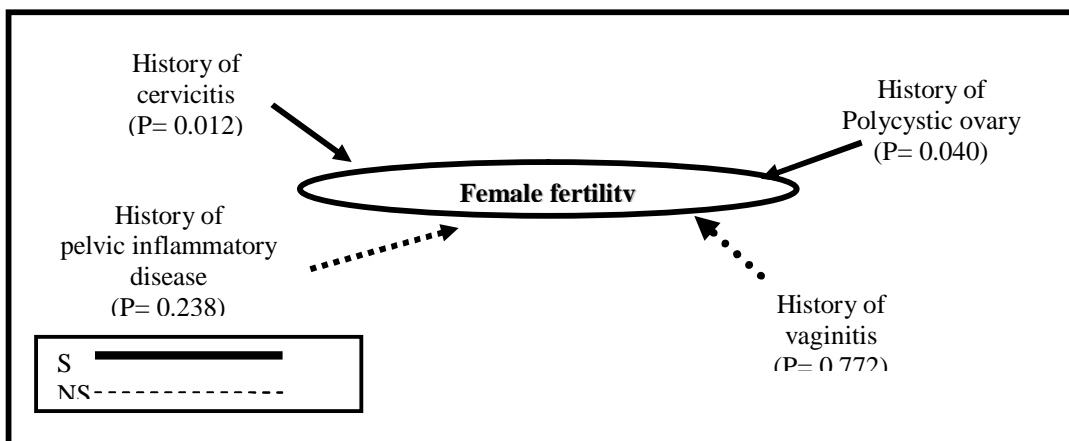


Figure (3) Gynecological Predictors That Might Affect Female Fertility

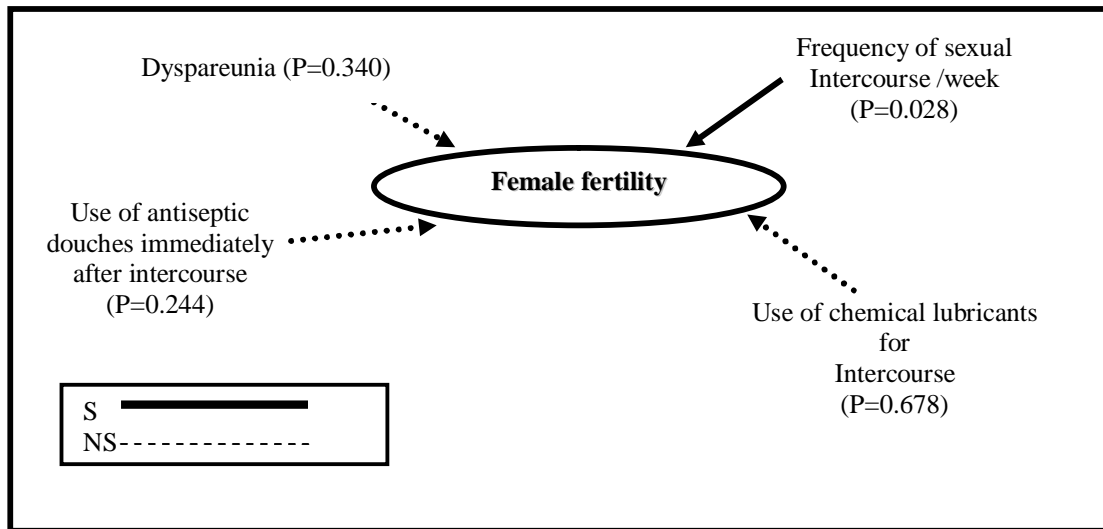


Figure (4) Sexual Predictors That Might Affect Female Fertility

Discussion

This research presents important findings related to Predictors that might affect females fertility that women may have risk factors that can contribute to infertility, and those risk factors can be genetic, environmental or related to lifestyle, and the most common and well documented risk factors for infertility in women are age, obesity, pelvic inflammatory diseases, polycystic ovarian syndrome, timing & frequency of sexual intercourse, and menstrual abnormalities. Results of this research by utilizing the Multiple regression Analysis showed that demographic characteristics and lifestyle predictors as age of the women, body mass index, fatty saturated diet, and had snakes are a predictors that might affect the female fertility, while educational level and cigarettes smoking didn't affect the female fertility. Age of the women, body mass index, and fatty saturated diet play a crucial role in declining the female fertility.

Findings of this research indicated that slightly less than half of the sample was in the age range 31-44 years old and only tenth of the sample was (≤ 20 years). This finding is matched with the data in the study of Gurevich, (2010) who reported that, as a woman ages beyond 35 years (and particularly after age 40 years), the likelihood of becoming pregnant is less than 10% per month. Moreover, this finding is supported by Rowe, (2006) who reported that fertility reach peak in most women in the 20s, and gradually begins to decline in the late 20s, and around age 35, fertility starts to decline at a much more rapid pace. This natural declining in the fertility by aging may be due to women are born with all eggs they ever have, while they are born with over a million eggs, and by puberty just 300,000 are left, from this huge number

of eggs, only 300 will ever become mature and be released in the process of ovulation. Also, way before menopause begins, women' bodies reproductive capabilities slow down, becoming less effective at producing mature, healthy eggs. As women age and become closer to menopause, their ovaries respond less well to the hormones that are responsible for helping the eggs ovulate (Gurevich, 2010).

More than two-thirds of sample was overweight and obese, slightly less than half of them depending on fatty saturated diet on their meals, and had snakes between meals and these factors have a significant relation with declining female fertility. These findings are supported by Pasquali & Gambineri (2006), who reported that obese women are characterized by comorbidities particularly type 2 diabetes mellitus and cardiovascular diseases, also, they develop some specific problems, including fertility-related disorders. Moreover, findings are matched with the data of the study of Pasquali, Gambineri & Pagotto (2006) who reported that women who extremely overweight were 43% less likely to conceive than women who were either of average weight or slightly obese. He added that weight and menstrual irregularity are related and weight loss of 15lbs (6.5kg) in anovulatory obese women results in restoring ovulation and return to fertility for many women.

In the same context, these findings are supported by (Steeg, 2007) who reported that women with BMI of 30 or more had the most trouble conceiving during their reproductive life, women with BMI of 35 was found to be 26% less likely to achieve a spontaneous pregnancy than women who were normal weight, and women with BMI of 40 or more was 43% less likely to get pregnant. In addition,

Chavarro, Rich-Edwards, Rosner and Willett (2008), found that eating disorders, constant stress, depending on carbohydrate and junk food intake had been shown to lead weight gain which had in turn linked to fertility problems. These findings may be related to that the main factor implicated in the association between obesity and fertility-related disorders is insulin excess, which accompanies insulin resistance, consequently, hyper-insulinaemia may be directly responsible for the development of androgen excess, through its effects in reducing sex hormone-binding globulin synthesis and circulating concentrations, and in stimulating ovarian androgen production rates, which in turn, represents one of the major factors leading to altered ovarian physiology and associated Ovulatory disturbances. In addition, obesity-associated hyperleptinaemia may represent an additional factor involved in anovulation, not only through the induction of insulin resistance, but also through a direct impairment of ovarian function.

Unfortunately, the findings of this research don't support that cigarette smoking to be a predictor variable that might affect female fertility and there is no clear understanding of this contradiction. However, this is may be due to the minority of the sample were smokers. This finding is contradictory with the data of the study of Deleon (2011), who reported that, women who smoke are three times likelier to have difficulty conceiving. Also, added that, tobacco smoke lead to diminished oviductal functioning in women which could impair fertilization. Also, this finding is in contrast to data from Zosia (2011) who found that, smoking can reduce female fertility by affecting hormonal function within the ovary, and also can reduce the number and quality of eggs.

Findings of this research indicated that obstetrical factors as age at marriage, menstrual irregularities, menstrual abnormalities, mode of previous delivery, and use of contraceptive methods are predictor variables that might affect female fertility while, age at menarche, didn't affect the female infertility. Age at marriage, menstrual irregularities, menstrual abnormalities, mode of previous delivery, and use of contraceptive methods play a fundamental role in declining the female fertility. Findings of this research indicated that slightly less than third of the sample married at early age and more than third of them married at old age. This finding is matched with the data in the study of Yang, Shen, Chen, and Chen (2011) who reported that, the prevalence rate of infertility was increased in the women whose marriage age were younger than 20 years or elder than 29 years old. Also, this finding is similar to the data of the study of Vahidi, & Adalan (2009) who found that, age at marriage had a negative association with decreased female fertility.

In addition, this is in agreement with Orshan,(2008) who reported that women waiting until after age 35 to have children may having trouble getting pregnant. Also, this finding is matching with study findings of Madara (2008), reported that, women who married at elder age may have a 50% decrease in their fertility rate.

Moreover, slightly less than two-thirds of the sample had menstrual irregularities and more than one-third of them had menstrual abnormalities as oligomenorrhea, menorrhagia, hypermenorrhea, and polymenorrhea. So, there is an association between menstrual irregularity, menstrual abnormalities, and the declining of female fertility which in turn reduce chances of achieving pregnancy. These findings are supported by Small (2011), who reported that, women with irregular menstruation had reduced probability of pregnancy compared with regular menstruation. Also, the findings is in agreement with the data of Sallmen, (2006) who demonstrate that, ovulation problems and menstrual irregularities are experienced by women diagnosed with polycystic ovarian syndrome, endometriosis, uterine fibroid (Hoeger, 2006). This may be due to that those previously mentioned problems may blocked fallopian tubes, disturbed the reproductive hormones which are positively linked with increased incidence of female infertility. Moreover, Boyles, (2007) who found that, endometriosis can affect fertility because the endometrium can scar and cause blockages within the ovaries or fallopian tubes, and women may have very heavy periods. Also, Pasquali, Patton, and Gambineri, (2007) reported that, about 30% to 50% of women with endometriosis are infertile, making it one of the top three causes for female infertility.

Using of contraceptive methods especially Intrauterine Devices (IUDs) is a fundamental indicator of the female infertility. Almost half among those who used contraceptive methods utilized IUD. Corcoran, (2008) reported that, the most profound complications of IUDs are infection, pelvic inflammatory diseases, and infertility. Also, added that, the serious complications due to infection associated with an IUD may prevent women from being able to become pregnant in the future. This infection may be related to that while inserting IUD into uterus it is possible that bacteria will hitch a ride on the IUD device, enter the uterus causing it to become infected and damaged which can lead to infertility. Moreover, Epstein, (2010) added that, with the progesterone-releasing IUD, 70% of women notice gradual lessening of menstrual bleeding after two years of use and 30% may notice a complete cessation of menses, this is may be due to that progesterone hormone can cause thinning of the lining of the uterus, and in some women,

pharmaceutical contraception has been shown to adversely affect or destroy the cervical fluid needed for conception, so, indicated to female infertility. In contrast, with the data of Delborge et.al.,(2002) who demonstrated that, the use of IUD doesn't affect future fertility of women wishing to become pregnant following removal of IUD.

Regarding to the Gynecological factors, Results revealed that polycystic ovarian syndrome (PCOs) and cervicitis are predictor variables that might affect the female fertility. PCOs had a strong link with female infertility. Findings of this research indicated that more than one-third of those women who had gynecological problems complained from PCOs, and more than one-third of them complained from cervicitis. This finding is in agreement with the study data of Robert & David, (2009) who reported that, polycystic syndrome is linked to women's hormonal imbalances which include symptoms like irregular periods, repeat miscarriages, male-pattern hair loss, male-type facial and body hair, acne, and obesity, and those symptoms are associated with increased incidence of infertility. In addition, up to 40% of women with PCOS have insulin resistance, and up to 10% get type 2 diabetes by the time reach age 40 and high insulin level can increase the production of male hormones and make PCOS worse and ultimately infertility (Robert & David, 2009).

Moreover, Cervicitis also, is a predictor variable that might affect the incidence of infertility type. This finding is in agreement with Grueva and Borisov (2006) who reported that, infection (cervicitis) in the cervical canal was a sensitive indicator to female infertility which in turn cause weak in the ability of the sperm motility; abnormal changes in PH which kill sperms and thicken cervical secretion plug cervical canal and affect the penetration ability of the sperm.

On the other hand, pelvic inflammatory disease (PID), and vaginitis are not predictor variables that might affect female fertility. This is may be due to that less than one-third of the sample had vaginitis which may not affect female fertility while, the minority of them had PID. In contrast, Bosky (2007) reported that, PID is known to be long-term consequences of sexually transmitted diseases as well as of vaginitis (bacterial vaginosis), pelvic surgery, and other gynecologic procedures that cross the cervix. Also, the findings are not supported by Morse, (2010), who reported that, women who are not treated for PID right away can experience serious complications ranging from infertility to ectopic pregnancy to chronic pelvic pain.

Furthermore, Sexual factors such as frequency of sexual intercourse per week is a predictor variable that might affect the female

fertility while, use of chemicals lubricants for intercourse and use of antiseptic douches immediately after intercourse didn't affect female fertility.

Frequency of sexual intercourse per week is linked with the female infertility. The findings of the study revealed that tenth of the sample had sexual intercourse more than four times per week, more than half of sample had sexual intercourse from 3-4 times/week and, more than one-third of them had sexual intercourse less than three times/week. This is may be related to frequency of sexual intercourse too many (>4 times/week) is linked with premature sperms, while, too less sexual intercourse (<3 times/week) is linked with aging sperm. In spite of frequency of sexual intercourse is from 3-4 times/week is considered within normal (by review) but may be occur at wrong time (not around ovulation period). This finding is in agreement with Stanford, and Dunson (2007) who mentioned that, frequency and timing intercourse can impact on declining fertility rate, especially with low frequency intercourse. In addition, Robinson, and Ellis (2007) reported that, failure to conceive was appeared to be related to mistiming of intercourse. Moreover, Marshburn, Alanis, and Matthews (2009) indicated that timing intercourse is crucial in increasing women chances of conception which increases with the frequency of intercourse around the fertility days although the sperm concentration might be decreases slightly with higher frequency of intercourse.

Unfortunately, use of chemicals lubricants for intercourse, antiseptic douches immediately after intercourse and dyspareunia are not a predictor variable that might affect incidence of female infertility. This is might be due to the minority of the sample (1.3%) using chemicals lubricants for intercourse, Less than one-tenth of them using antiseptic douches immediately after intercourse, and more than tenth had dyspareunia. Agarwal et al, (2008) found that, using of vaginal lubricants during intercourse is not recommended which consequently decreased sperm motility and viability. Also, they added that careful selection of vaginal lubricants is required for women with vaginal dryness to avoid decreasing in sperm motility and viability.

In addition, contradicting finding with the data of Cottrell (2010) who reported that, frequent vaginal douching is associated with adverse reproductive health outcomes as increased the risk of pelvic inflammatory disease, secondary infertility, and ectopic pregnancy. Also, he added that, douching may impact on health because it disturbs the chemical and microbial balance of the vagina and possibly leading to bacterial vaginosis, dyspareunia and other bacterial infections. Moreover, douching may force

pathogens up through the cervix causing uterine infections where organisms are more likely to cause pelvic inflammatory disease, an infection linked with infertility (Boskey, 2007). In the same context, Cottrell (2006) in his study reported that, women who douched monthly were 2.5 times more likely to have a history of bacterial vaginosis than women who did not douche ($p < .001$), and women who douched weekly were 2.75 times more likely to have bacterial vaginosis ($p = .004$). And it concluded that there is an association between vaginal douching and bacterial vaginosis and that is a predispose factor in reducing fertility.

The study concluded that, women with the following profile: older age at marriage, overweight and obese, depending on fatty saturated diet, eat snacks, had history of polycystic ovarian syndromes, had cervicitis, long use of contraceptive methods, and might be at risk for the occurrence of infertility.

Recommendations, based on the findings of the present research, the following recommendations are suggested:

- 1- Raise women's awareness regarding to adopting healthy life style as follow dietary program, and practice exercising.
- 2- Proper treating of underlying medical problems that can impact female fertility.
- 3- Proper timing and frequency of intercourse to maximize achieving pregnancy.
- 4- Further studies are recommended regarding to the following issues:

- The relation between infertility and underweight.

The relation between infertility and chemical douching.

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