

# Predictors of uterine fibroid among Egyptian women At Reproductive Age

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**Abstract:** Uterine fibroid (Leiomyomas) is the most common benign gynecological tumors affecting as many as 25% of women in the reproductive age. **Aim:** The aim of the current study is to explore the predictors that might affect on the occurrence of uterine fibroid among women at reproductive age. **Subject and methods:** A descriptive explatory research design was adopted in this study. **Setting:** The study was conducted in inpatient and outpatient gynecological clinic at El Manial Maternity Hospital. **Sample:** A non-probability Convenience sample of 120 gynecological women were diagnosed as uterine fibroid and were chosen based on certain inclusion criteria. **Tool:** Interviewing questionnaire schedule was used to collect the needed data. **Results:** revealed that high BMI ( $P=0.02$ ); Eating fatty saturated diet ( $0.031$ ); drinking caffeinated beverage ( $0.001$ ) ; past history of hypertension ( $p<0.05$ ); high lipid profile ( $p=0.010$ ) and family history of uterine fibroids ( $P=0.04$ ) ; age at menarche ( $P= <0.05$ ) ; age at onset of fibroid ( $P= <0.05$ ) ; parity ( $<0.05$ ), and use of hormonal contraceptive methods ( $p= ; 0.040$ ) all of these factors affect the occurrence of uterine fibroid. **Conclusion:** The study concluded that, women with the following risk factors might be at risk for the occurrence of uterine fibroid. **Recommendations:** based on the findings of the current study the following are suggested: Raise women's awareness regarding adopting healthy life style, ideal body mass index, follow dietary program and practice exercising can prevent the occurrence of this problem.

**Keywords:** Predictors – Risk factors - Reproductive age – Uterine fibroid.

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## 1. INTRODUCTION

Uterine fibroids (Leiomyomas) represent the most common benign tumors of the female reproductive system. They cause significant morbidity and deterioration in the quality of life of many women worldwide (Downes et al, 2010, Sparic et al, 2016). It has been estimated that about 40–60% of all hysterectomies are due to the presence of uterine fibroids (Catherino, Eltoukhi & Al-Hendy, 2013). The accurate prevalence of fibroids is largely unknown because the majority remains asymptomatic and undiagnosed (Khan, Shehmar, & Gupta, 2014). Leiomyomas cause significant morbidity due to abnormal uterine bleeding and pelvic pressure symptoms, infertility polycystic ovarian syndrome and repetitive abortions, all of these morbidity have great impact on the quality of life of many women and the healthcare system in general (Donnez & Dolmans, 2016; Sparic et al, 2016).

The causes of fibroids remain unknown. There are some theories that can explain the potential causes of uterine fibroid among reproductive age women. One of these theories is that women of childbearing age are most likely to develop fibroids, but symptoms usually do not appear until a woman is between 35 and 50 years old. Even though fibroids tend to run in families, it is unclear if the condition is hereditary because no genetic patterns have been observed.

A study conducted by Digna, Edwards, Baird, Katherine & Hartmann (2013) revealed that, there is an association between age at Menarche especially before 10 years old, compared with women whose menarche occurred after 16 years of age. On the other hand, hormones may have an impact on the development of uterine fibroids. It is believed that, estrogen and progesterone may cause an increase in fibroid growth. When a woman is pregnant, fibroids grow more rapidly because of increased hormone levels, and the fibroids shrink after menopause because of decreased hormone

levels (Falcone & Parker, (2013). Also, obesity is thought to be a risk factor for the development of uterine leiomyoma (Babah, Oluwole and Afolabi, 2014) as additional 10 kg in weight, the risk of uterine fibroids rises 21%. The gain of body fat contributes to an increased conversion of androgens into estrogens and thus increases the bioavailability of uterine fibroid.

Moreover, several studies have shown an inverse relationship between parity and the risk of fibroids. A relative risk of fibroids among parous women of 0.5 %, compared with nulliparous, and a progressive decline in risk relative to the number of births have been reported (Baird and Dunson, 2013). In addition, women with high lipid profile is liable to develop uterine fibroid (Tommaso, Fuchs, Wellons, Lewis and Margalit et al., 2019). Also, a study conducted by Kurz, (2014) reported that hypothyroidism is associated with the presence of uterine leiomyoma.

Moreover, Shen, Wu, Lu, & Ren (2016) investigate the relationship between role of diet in the genesis of fibroid, the results found that intake of fruits, vegetables, and carotenoids reduce the risk of uterine fibroids among women, where as a high intake beef, other red meat, and ham can increase the chance of getting uterine fibroid in the future. Although the exact prevalence figures are not available mostly because of limited population-based researches and variability of clinical presentation (Ofori et al. 2012). Also data are difficult to compare due to differences in the study population and Screening methods (Zimmermann et al. 2012). Despite their common occurrence, data with regard to the etiology and risk factors of leiomyomas are scanty when compared to other neoplasms, most likely due to their benign nature and low mortality rate. So, this study aims to explore the predictors of uterine fibroid that might affect women at reproductive age.

### Significance of study

Uterine fibroid has a major public health concern and has a major impact on quality of life. According to a 2010 World Health Organization report, fibroids affects between 20-25% of women, and close to 235 million women which represent 6.6% of global women population are estimated to have been affected worldwide (Ezeama, Ikechebelu, Obiechina and Ezeama, 2012). The findings gained from this study will considered a base line data among Egyptian women with uterine fibroid to help the health services policy makers to focus on preventive measures or using non-pharmacological methods to deal with this tumor rather than using surgical techniques. In addition, findings of this study will contribute to nursing practice especially in relation to early detection of risk factors that might predispose to uterine fibroid as well as, providing health education for women to lessen their liability to acquire uterine fibroid as well as promote their health through weight reduction, screening, exercise and eating healthy diet.

### Aim of the study.

The aim of this study is to explore the predictors of uterine fibroid that might affect women at reproductive age.

### Research Question.

1-What are the predictors of uterine fibroid among Egyptian women at reproductive age?

## 2. SUBJECTS AND METHODS

**Design:** descriptive explanatory research design was adopted in this study.

### Sample

A non-probability convenience sample of 120 gynecological women was recruited uterine according to the following inclusion criteria : uterine fibroid diagnosed by ultrasonography, age 30-50 years, premenopausal or postmenopausal, had hysterectomy, myomectomy .Women Who are pregnant, or doing hysterectomy due to malignant cancer were excluded from the study.

### Setting

The study was conducted at inpatient gynecological ward (22, 32 and 33) and outpatient gynecological clinic at El Manial Maternity Hospital which situated at Kaser Al-Aini region and serves about 3736 cases (statistic department, 2015). It is Cairo University, affiliated hospital providing free health care to outpatient Gynecological patients, as well as inpatient. The outpatient gynecological clinic serves about 32.000 cases (statistic department, 2015) annually with various levels of socioeconomic status. The outpatient Gynecological clinic provides services such as gynecological care and laboratory investigation, measuring weight and height, using ultrasound examination to detect diseases and care is provided by physicians, as well as professional, diploma and high qualified nurses who are responsible for giving nursing care

**Tools for data collection:**

A structured interview questionnaire tool will be developed by the researcher after reviewing extensive & recent literature. 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, and cigarettes smoking, drinking caffeinated beverage; Family history of uterine fibroid; **b) Obstetrical profile** as gravida, 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; **c) medical history** includes chronic disease as hypertension, diabetes and high lipid profile; **d) gynecological history** such as , vaginitis, cervicitis, types & duration of contraceptive methods, clinical symptoms associated with uterine fibroid .

**Tool Validity and Reliability**

Tool was submitted to a panel of 5 experts of medical and nursing in the field of obstetrics and gynecology to test the content validity, some questions was omitted from the tool based on the results of pilot study. Chonbach alpha was used to test the internal reliability of the tool (.80)

**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 uterine fibroid 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, anonymity and confidentiality of each woman were protected by the allocation of a code number for each woman and the women had the right to withdraw at any time if she wants without any effect on the care she will receive from the hospital.

**Pilot Study**

A pilot study was conducted on a group 12 women to ensure clarity of the questions, some questions was omitted from the tool based on the results of pilot study, so the subjects excluded from the total sample. The pilot study lasted five months.

**Procedure**

The Study was conducted through the following phases: Preparation and interviewing phase.

**1-Preparation phase**

This phase was concerned with managerial arrangements to carry out the study in addition to the construction & preparation of the study tool. The preparation phase ended with pilot study that was carried out on 12 of women with uterine fibroid conducted to assess the feasibility of the study as well as the clarity and objectivity of the study tools.

**2. Interview phase:**

Data were collected through a period of 8 months began from 28\9\2016 and ended at 30\5/2017. The research investigator meets the women at inpatient gynecological department ( section 22,32 and 33 ) 3 times per week afternoon and meets the study sample from outpatient gynecological clinic at morning after introducing herself to the women and explained the purpose and the nature of the study to gain their cooperation to be recruited in this study , Each woman was interviewed individually to collect data utilizing interview schedule tool related to demographic characteristics and lifestyles, obstetric profile, medical and gynecological history. The research investigator met women at Outpatient gynecological clinic as well as, in the Inpatient gynecological department ,The researcher asked questions in a simple Arabic language and recorded the answers in the structured interview tool sheet) this part lasted for 20-125 minutes for each woman.

Also, during this phase, anthropometric assessment was done. The research investigator measured women height through tape measurement and weight utilizing bath scale, and accuracy was obtained through balancing zero prior to obtaining each weight and then body mass index (BMI) was calculated by dividing the subject weight in kilograms by the square of

her height in meters ,(BMI= Kg/m<sup>2</sup>)". (WHO 2011) .The categorized of body mass index classified into : BMI<18.5 kg/m<sup>2</sup> (underweight); BMI of 18.5 -24.9 kg/m<sup>2</sup> (normal or appropriate weight); BMI of 25-29.9 kg/m<sup>2</sup> (overweight); BMI 30- 39.9 kg/m<sup>2</sup> (obese) and BMI greater than or equal to 40 kg/m<sup>2</sup> (severe or morbid obesity).

**Statistical analysis**

The collected data were categorized, tabulated and analyzed using statistical package for social science (SPSS) program version 20 . Descriptive and inferential statistical tests were applied (e.g. mean, stander deviation, frequency and percentage as well as Chi-square test was used. A p-value < 0.05 was considered significant.

**3. RESULTS**

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

**1. Description of the study sample:** The age of the study sample ranged between 30-50 years with a mean of 41.4 ± 5.3 years. 75% of the study sample was distributed at the age category (41 -50 years); while 25.0% of them was distributed at the age category of (30-40 years); Fifty three point three percent of the study sample lives in urban area. More than half of the study sample (59.2%) were housewives Less than half of the study sample (45.8%) had secondary school education and only 5% of them can read & write.; 82.5% were married and the age at marriage was range between 13- 25 years and monthly income was reported insufficiency by 78.3% by the study sample.

Regarding to BMI categories of the study sample, the results reveals that 37.5% of the sample was obese, and only 3.3. % of the sample was underweight. (Table, 1).

**Table (1) Distribution of the Sample According to Category of Body Mass Index (n=120)**

Body Mass Index Category	Frequency	%
BMI < 18.5 (under weight)	4	3.3
BMI 18.5-24.9 (normal weight)	34	28.3
BMI 25-29.9 (over weight)	25	20.8
BMI 30-39.9 (obese)	45	37.5
BMI >40 (morbidly obese)	12	10

Moreover, Ninety percent of the study sample depends on fatty diet ; 61.4% didn't eat fruits on regular basis and almost the study sample reported they prefers to eat red meat and only 31.3% from them reported they eat red meat once /week at regular basis and 58.3% from the study sample consumed more than three cups of caffeinated beverage .

**Past history of medical disease among the study sample-**

Eighty eight point three percent of study sample (n= 106) had past history of hypertension with a mean age of 39. 4 ± 5.3 ;37.5% has a previous history of diabetes mellitus. Moreover, 83.3% reported high level of lipid profile with a mean of age at 39.2 ±5.3 years old.

**Family history of uterine fibroid among the study sample:** The study findings shows that 79.2% of the study sample had family history of uterine fibroid and the mother was the main first family member suffering from this problems followed by their sister as reported by (16.8 %) respectively. (Table, 2)

**Table (2) distribution of Family history among women with uterine fibroid.**

Family history	Frequency	Percent%
No	25	20.8
Yes	95	79.2
<b>Whose :</b>		
Mother	79	83.2
Sister	16	16.8

**Menstrual history of the study sample:** The results shows that 65.8% of the study sample (n= 79) had early menarche at age of <14yrs; 56.7% reported the duration of menstrual flow ranged from (7-9 days) with a mean  $6.7 \pm 1.4$ .

**Obstetrical profile of the study sample:** More than half of the study sample 77.8% (n= 77) their gravida more than once with a mean of  $3.2 \pm 1.7$ . More than half of the study sample 70.7% of them their parity ranged between (1-3 times) with mean of  $2. \pm 1.4$ . The results also show that about 53.3% of the study sample had history of abortion (twice); 72.2% (n= 65) their age at 1st.delivery was <25yrs while only 12.2% their age were >30 yrs.

Regarding to type of surgical operation performed among the study sample , table (3) show that (60.2%) of the study sample had hysterectomy compared to 39.2% had myomectomy

Table (3) Type of Surgical operation done among the study sample:

Current Gynecological history	Frequency	Percent%
<b>Myomectomy</b>		
No	73	60.8
Yes	47	39.2
<b>Hysterectomy</b>		
No	47	39.2
Yes	73	60.8

Regarding to the types of contraceptives methods used by the study sample, Fig (1) reveals that 57.5% from the study sample used hormonal contraceptives pills with a mean duration of  $7.8 \pm 4.4$  years.

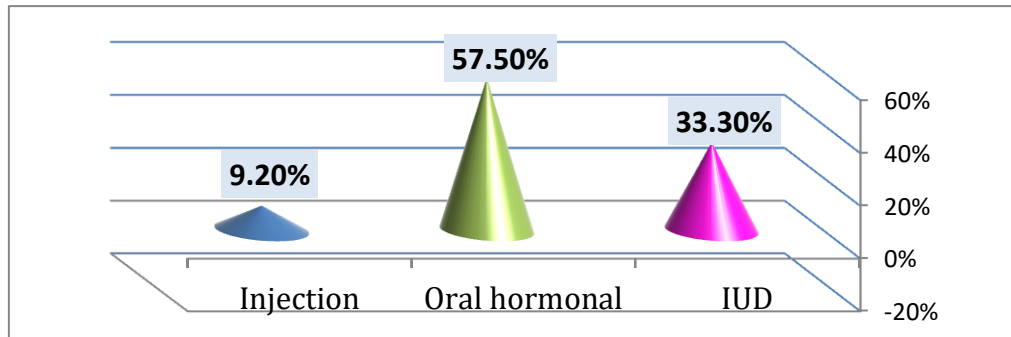


Fig (1): Description of types of Contraceptive method used by the study sample

In addition, the clinical presentation associated with uterine fibroid among the study sample, table (4) shows that different clinical presentation of uterine fibroid reported by the study sample as 66.7 and 62.5 % of the study sample complains from pressure symptoms and pelvic abdominal mass compared to 45.8% who reported dysfunctional uterine bleeding .

Table (4) Clinical Presentation of uterine fibroid among the study sample

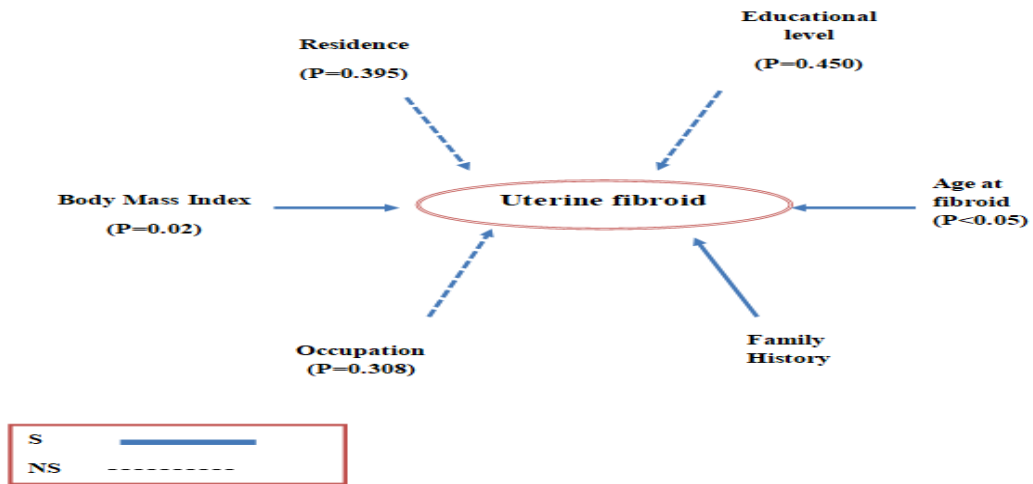
Clinical presentation	N	%
Dysfunctional Uterine bleeding	55	45.8
Pelvic abdominal mass	75	62.5
Pain	43	35.83
Infertility	22	18.33
Pressure symptoms	80	66.7

\* Number is not mutually exclusive

**2): Predictors that might affect uterine fibroid**

This section includes predictors that might affect uterine fibroid incidence. Chi-Square test Analysis was carried out using socio-demographic and lifestyles predictors, obstetrical predictors, and gynecological, as independent variables and uterine fibroid as dependent variable to explore the predictors that might affect uterine fibroid.

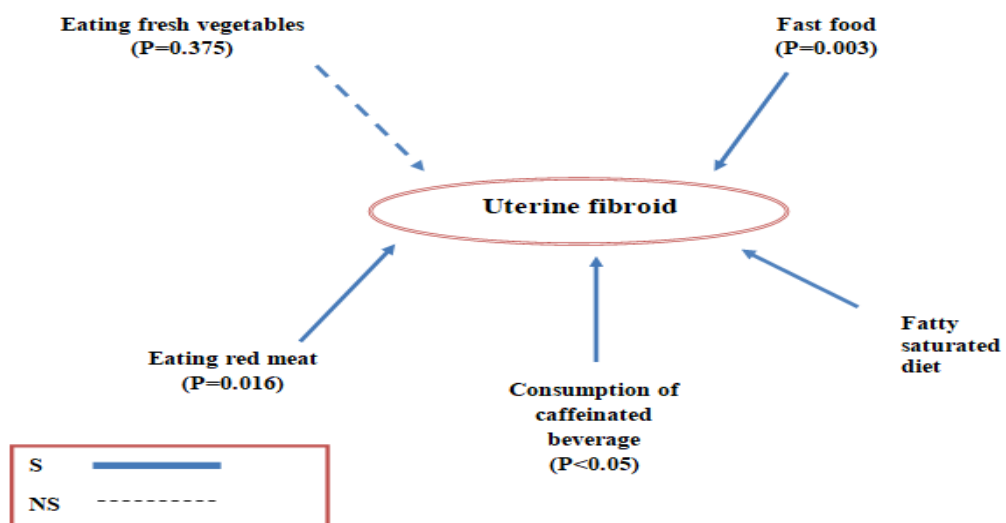
**A.Demographic Predictors.** Results indicated that maternal age, and BMI were important factors as predictor variables that might affect the incidence of uterine fibroid ( $P < 0.05$  &  $P = 0.02$  respectively), however, residence, educational level, and Occupation were not statistically significant ( $P = 0.395, 0.450, 0.308$  &  $0.160$ ) (figure, 2)



**Figure (2)**  
**Demographic factors affecting fibroid**

**b-Nutritional habits:**

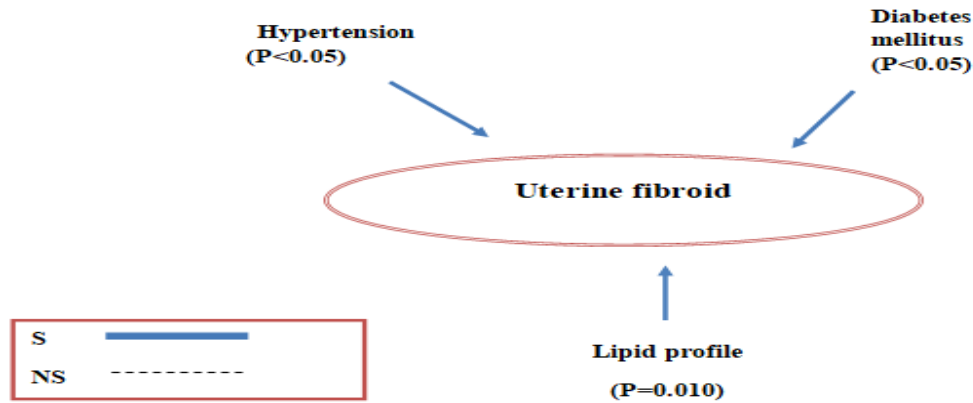
Results indicated that eating fast food ,fatty saturated diet, drinking caffeinated beverage and eating red meat were important factors as a predictor variables that might affect the incidence of uterine fibroid ( $P = 0.003, 0.031, 0.001$  &  $0.000$  respectively) on the other hand, not fresh vegetables ,was found not statistically significant differences ( $P = 0.375,$ ) (figure, 3)



**Figure (3)**  
**Nutritional habits affecting fibroid**

**c-Medical factors:**

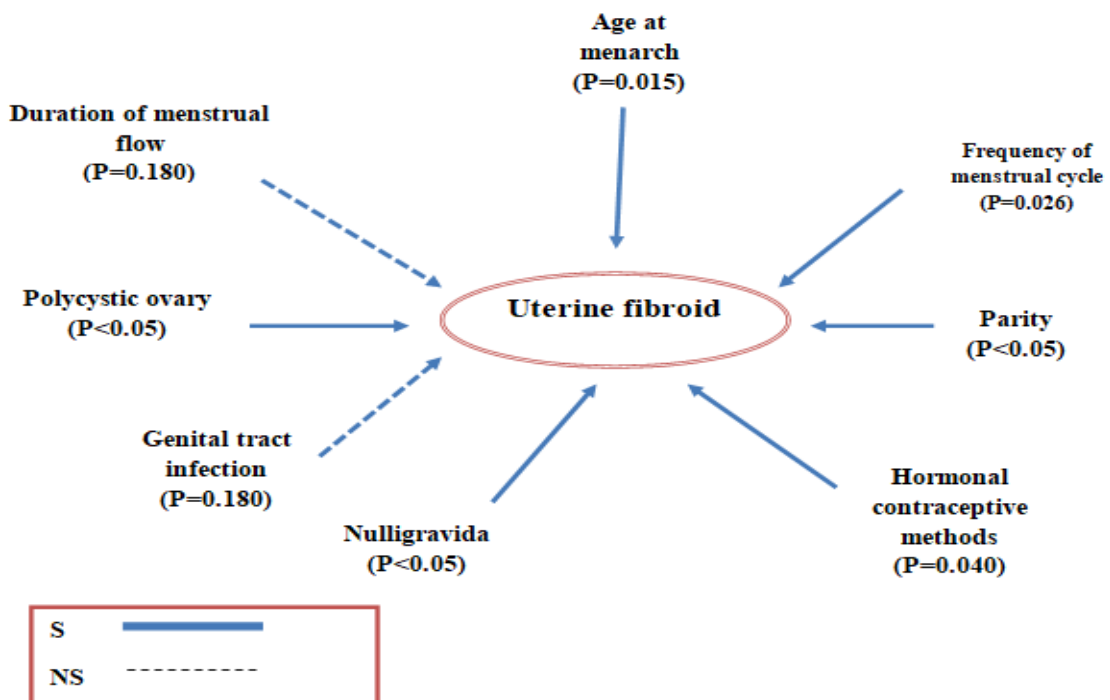
Results indicated that ,history of chronic disease as :hypertension ,diabetes mellitus , high lipids profile and family history of uterine fibroids were found an important factors that might affect the incidence of uterine fibroid ( $p < 0.05$  , $P = < 0.05$  &  $0.010$  respectively) (figure,4) .



**Figure (4)**  
**Medical factors affecting fibroid**

**d-Reproductive and gynecological Factors:**

Results indicated that age at menarche, frequency of menstrual cycle, ,Parity, and use of hormonal contraceptive methods were predictor variables that might affect the incidence of uterine fibroid ( $P = 0.015$ ,  $0.026$ ,  $< 0.05$ ,  $p = 0.01$ , respectively) , also, polycystic ovary and nulligravida were found a predictors that affects the incidence of uterine fibroid ( $p < 0.05$ ,  $p < 0.05$ ). Moreover, duration of menstrual flow, and genital tract infection were not statistically significant ( $P = > 0.05$ ). (Figure, 5)



**Figure (5)**  
**Reproductive and gynecological Factors affecting fibroid**



#### 4. DISCUSSION

This research presents important findings related to predictors that might affect uterine fibroid and those women may have risk factors that can contribute to uterine fibroid.

##### A- Demographic Predictors.

The study results revealed that the majority of study sample their age ranged from 41-50 years, with mean of  $41.4 \pm 5.3$  years. This results are closely resemble with Ofori & Antwi (2012) who reported that leiomyomas are common in the age groups of 41-50 years and least common in the age group of 60s. On the contrary, Stewart, Laughlin-Tommaso, Catherino, Lalitkumar, Gupta & et al (2016), who found that the incidence and evidence of uterine fibroids among women who have had hysterectomies increases with age, but the rate of increase slows at older ages. This suggests that the older premenopausal uterus is less susceptible to fibroid development. This discrepancy might be due different age group as well as due to different sample size.

Regarding to BMI of the sample, the study results found that 37.5% of the sample were obese., These findings agreed with Wise & Laughlin –Tommaso (2016) who found that higher body mass index (BMI) is associated with increased risk of fibroids .A study conducted by Yang, He, Zeng, & Li (2014), reported that uterine fibroids in women might be related to excess weight and central obesity. On the contrary, Bray & Torstenson (2018) state that BMI was not associated with fibroid number or size. This inconsistency might be due to different lifestyle habits, different BMI categories as well as due to different sample size.

##### B-Nutritional habits factors:

Findings of this study revealed that the majority of the study sample depend on fatty- diet, two-Third of the study sample didn't eat fruits on regular basis while majority of the study sample ate fresh vegetables and only more than third ate vegetables irregularly almost of the sample had reported that they preferred to eat red meat. These findings agreed with Pavone, Clemenza, Sorbi, Fambrini & Petraglia (2018), who mentioned that fruit intake was inversely associated with uterine fibroid risk, with the strongest reduction in risk observed for a high intake of citrus fruit, Dietary vitamin A was also inversely associated with fibroid risk, Moreover Parazzini, Di Martino, Candiani, & Viganò (2015) mentioned that there is an association between the risk of uterine myomas and the consumption of beef, other red meat, whereas a high intake of green vegetables seemed to have a protective effect, Parazzini & Martino (2015) stated that a protective effect has been demonstrated for consumption of fruits and green vegetables. This controversy might be due to different cultural and economic background, different educational levels as well as due to type and different sample size as well as due to different life style.

##### c-Medical factors:

The study findings revealed that more than half of (83.3 %) of the study sample had past history of high level of lipid profile with a mean of age  $9.2 \pm 5.3$  years old, This finding was in accordance with study done by Lilyan & Shaymaa (2012) who reported that patients with uterine fibroids lipid profile differs from that in women without uterine fibroids. Women with uterine fibroid have lower atherogenic index as compared to women without uterine fibroid. Larger volume of fibroid is associated with higher level of HDL-C. Moreover, recently, Uimari & Auvinen (2016) reported that a higher fibroid risk in women with metabolic syndrome, and with increasing low- density lipoprotein and triglyceride levels.

The findings of the current study were contradicted with the findings of the study done by Parazzini & Chiaffarino (2014) who found that there is no association between hyperlipidemia and fibroids This discrepancy might be due to this study derived their data from medical records and subject interviews, moreover, neither study contained information on HDL-C, LDL-C or the atherogenic index. Regarding to the women past history of hypertension, the current study revealed that more than two-Third of the study findings had hypertension at age  $\geq 40$  yrs with mean of  $39.4 \pm 5.3$  years, This finding was in accordance with study done by Haan & Oudman (2015) who recently confirmed that there is a high prevalence of hypertension in women with fibroids and showed that this association was independent of age.,

Also, findings of the current study found that only more than third of the study sample had past history of diabetes mellitus, This finding agreed with study findings done by Edwards & Hartmann (2017) who observed that diabetes has inversely associated with fibroid risk. In addition, Wise & Laughlin-Tommaso (2016) suggested that other CVD risk factors, such as diabetes and lipid disorders, also increase the risk to develop uterine fibroids, On the contrary, study carried out by Bray & Torstenson (2018) who stated that Type 2 diabetes was not associated with fibroid number or size.



The lack of an association between type 2 diabetes and fibroid number and size could mean that the sample size was too small, additionally; it is possible that the effect of diabetes on fibroids is due to exposure to septic diabetes medications, which was not evaluated in the analysis.

Regarding to family history of uterine fibroid among the study results reveal that the mother was the main first family member suffering from this problems more than two-Third followed by the sister as reported by less than third respectively, This finding agreed with Mehine & Kaasinen (2016) who mentioned that positive family history was found to increase uterine fibroid risk, This effect may, however, be at least partly due to more frequent screening in relatives of women with UFs than in the general population. It may also be attributable to the role played by genetic factors in the development of uterine fibroid.

#### **d-Reproductive Factors:**

Moreover, the study findings reveal that more than two-Third of the study sample had early menarche at age of <14yrs, This in accordance with the study done by Wise, & Laughlin-Tommaso, (2016) who agreed that Menarche at an early age increases the risk of developing fibroids and is also considered a risk factor for other hormonally mediated diseases, such as endometrial and breast cancers. In addition, the study results found that more than half of the study sample their gravida more than once with mean of  $2 \pm 61$  years old, This findings agreed with the study done by Sparic, Mirkovic, Malvasi & Tinelli (2016) who confirmed that Parity has been inversely associated with a risk of fibroid development. This finding was also consistent with study by Bray & Torstenson (2018) who observed that having more children was associated with single fibroids, suggesting that the hormonal effects of pregnancy may reduce the number of fibroids present.

Moreover, the study findings reveals that more than half of the study sample used oral hormonal contraceptive methods with mean of  $7.8 \pm 4.4$  years old, This findings agreed with Khalil & Hakeem (2014) who stated that hormonal contraceptives used increase the risk factors for fibroid, On the contrary, these findings disagree with Wise & Palmer (2012) who showed no association or a risk only for oral contraceptive use before age 17, 22, 25 years old. Findings from earlier studies could be artifactual because oral contraceptives can reduce menstrual bleeding, a positive association could arise, especially in case-control studies of surgical fibroid cases, as women with fibroids may take oral contraceptives to control their symptoms. On the other hand, an inverse association could also arise, especially in cohort studies, because women taking oral contraceptives who develop fibroids may have a longer time-to-diagnosis because symptoms are hidden by the oral contraceptive effects

**The study concluded that,** women with the following profile: high BMI, Eating fatty saturated diet, drinking caffeinated beverage, past history of hypertension, high lipid profile, and family history of uterine fibroids, age at menarche, age at onset of fibroid, parity, and use of hormonal contraceptive, might be at risk for the occurrence of uterine fibroid.

## **5. 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 uterine fibroid.
- 3- Further studies are recommended regarding to the following issues:
  - The relation between uterine fibroid and underweight.
  - The impact of uterine fibroid on quality of life

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