

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES SCHOOL OF MEDICINE
DEPARTMENT OF HUMAN ANATOMY**



**The Prevalence and Associated Factors of Uterine Myoma at the
Gynecology ward in Three Governmental Hospitals, Addis Ababa,
Ethiopia, 2023**

**A Thesis Submitted to the Department of Anatomy, School of Medicine,
College of Health Science, Addis Ababa University in Partial Fulfillment
of the Requirement for the Award of Degree of Master of Science
(MSC) in Human Anatomy**

**December, 2023
Addis Ababa, Ethiopia**

Form of Declaration

This is to certify that Mekdes Sisay's thesis, The Prevalence and Associated Factors of Uterine Myoma at the Gynecology Ward in Three Governmental Hospitals, Addis Abeba, Ethiopia, 2023, submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Human Anatomy, complies with university regulations and meets the accepted standards concerning originality and quality. This work was not submitted as part of another university's course of study, and all sources of information used in this work have been properly acknowledged.

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ACRONYMS AND ABBREVIATIONS

AUB	Abnormal Uterine Bleeding
AOR	Adjusted Odd Ratio
BMI	Body Mass Index
CSA	Central Statistical Agency of Ethiopia
CI	Confidence Interval
COC	Combined Oral Contraceptive
DRERC	Departmental Research Ethics Review Committee
DM	Diabetes Mellitus
ECM	Extracellular Matrix
FIGO	Federation of International Gynecologists and Obstetricians
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HTN	Hypertension
LNGIUS	Levonorgestrel Intra-Uterine Device
IRB	Institutional Review Board
MRN	Medical Record Number
MRI	Magnetic Resonance Imaging
OR	Odd Ratio
OPD	Outpatient Department
ODK	Open Data Kit
SPSS	Statistical Package for Social Science
UAE	Uterine Artery Embolization
UF	Uterine Fibroids
UL	Uterine Leiomyomas
US	Ultrasonography
USA	United States of America

LIST OF TABLES

Table 1: Socio-demographic characteristics of women who were admitted to the Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	17
Table 2: Obstetrics and Gynecology characteristics of women who admitted Gynecology ward the study governmental hospitals, Addis Ababa, Ethiopia, 2023	19
Table 3: Frequency of Reproductive history of women who admitted Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	19
Table 4: Frequency of Medical History and behavioral character of women who were admitted to the Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	20
Table 5: Frequency of clinical presentation of women who were admitted Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	22
Table 6: Frequency of myoma subtype and management of myoma among women with uterine myoma	22
Table 7: Bi-variable and Multivariable Logistic Regression analysis results of factors associated with uterine myoma in study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	24

LIST OF FIGURES

Figure 1: The conceptual framework for the prevalence and related determinants of uterine myoma at the gynecology ward in three government hospitals in Addis Ababa, Ethiopia, 2023,.....	10
Figure 2: Schematic illustration of the sample process for selective governmental hospitals in Addis Ababa, Ethiopia, 2023.....	14
Figure 3: Prevalence of uterine myoma among women who admitted Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.....	21

Table of Contents

ACRONYMS AND ABBREVIATIONS.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES	vi
ABSTRACT	x
1. INTRODUCTION	1
1.1 Background.....	1
1.2: Statement of the problem.....	3
1.3: Significance of the study.....	4
2. LITERATURE REVIEW	5
2.1: Uterine Myoma.....	5
2.2: Prevalence of Uterine Myoma	5
2.3: Association factors.....	6
2.3.1: Sociodemographic Factor.....	6
2.3.2: Reproductive Factors	7
2.3.3: Medical Factors	8
2.3.4: Personal behavior	9
Conceptual framework	10
3. OBJECTIVE.....	11
3.1. General objective	11
3.2. Specific objectives	11
4: METHODOLOGY	12
4.1: Study Area	12
4.2: Study period.....	12
4.3: Study design.....	12
4.4: Population	12
4.4.1: Source population.....	12

4.4.2: Study Population	12
4.5: Eligibility Criteria	13
4.5.1: Inclusion Criteria.....	13
4.5.2: Exclusion Criteria.....	13
4.6: Sample Size Determination	13
4.7: Sampling procedure	14
4.8: Operational definition	14
4.9: Study variables.....	15
4.9.1: Dependent variable.....	15
4.9.2: Independent variables.....	15
4.10: Data collection tools and procedures	15
4.11: Data quality control	16
4.12: Data analysis and processing	16
4.13: Ethical consideration.....	16
5. RESULT	17
5.1 Prevalence of uterine myoma.....	17
5.2 Socio-demographic characteristics	17
5.3 Reproductive characteristics of the respondents.....	18
5.4. Past Medical History of the Respondents	20
5.5. Behavioral Characteristics of the Respondents.....	20
5.6. Clinical presentation of uterine myoma.....	21
5.7. Factors associated with the occurrence of uterine myoma	23
6. DISCUSSION.....	26
7. LIMITATIONS OF THE STUDY	28
8. CONCLUSION	28
9. RECOMMENDATION.....	29
REFERENCES	30

ANNEXES.....	34
Annex I. Information sheet	34
Annex II. Hospital consent form.....	35
Annex III. Checklist.....	36

ABSTRACT

Introduction: Uterine myomas, also known as leiomyomas and uterine fibroids, are monoclonal tumors that develop from the myometrium's smooth muscle cells. The prevalence of myoma varies amongst specific research and countries from 4.5% to 68.6%. Uterine fibroids can also be related to reproductive problems, including decreased fertility, miscarriages and pregnancy loss, and negative obstetric results.

Objective: To assess the prevalence and associated factors of uterine myoma at the gynecology ward in three governmental hospitals, Addis Ababa, Ethiopia, 2023.

Methodology: Two years of medical data of women admitted to the gynecology ward at Gandhi Memorial Hospital, Tikur Anbessa Specialized Hospital, and St. Paul's Hospital between January 1, 2020, and December 31, 2021, were reviewed retrospectively as part of a cross-sectional institution-based study. The study's sample size was 422, and it ran from March 15 to June 30, 2022. Open Data Kit (ODK) gathered the data via a checklist. The statistical program SPSS-25 was used to analyze the data. To figure out a correlation between the dependent and independent variables, bivariate and multivariate logistic regression analysis was employed.

Result: The medical records of 422 patients in total were reviewed, and the prevalence of uterine myoma was 22.7%. The mean and standard deviation Age was 42 ± 13 SD years with the range of 18-70 years. Of them, 144(34.1%) belonged to the 40–50 age group. Of the women who had Uterine Myoma majority had pelvic pain which is 37(8.8%). Intramural patterns of uterine myoma were found in 39(9.2%) of women. The identified associated factors for uterine myoma include age, para, pattern of menstrual cycle, and early women's age at menarche.

Conclusion: This study found a higher prevalence of uterine myoma than previous studies with similar designs. Uterine fibroids were more commonly seen in women in the early reproductive age group than in those in the later age groups, multi parous women, women with irregular menstrual cycle patterns, and early age at menarche.

Keywords: prevalence, associated factors, uterine myoma, Addis Ababa, Ethiopia.

1. INTRODUCTION

1.1 Background

Uterine myoma (normally called leiomyomas and uterine fibroids) is a kind of benign lesion or neoplasm of the uterus that might be composed of smooth muscle cells and fibroblasts and are rich in extracellular matrix (ECM) (1).

Monoclonal tumors known as uterine myomas arise from the smooth muscle cells of the myometrium. These tumors can be single or numerous, ranging in size from microscopic to massive, and at times can expand outside the uterus into the abdominal cavity (2).

They consist mostly of extracellular matrix, which includes proteoglycan, fibronectin, and collagen. Type I and type III collagen is widely distributed, but the fibrils created by it are atypical in nature, resembling the collagen involved in keloid formation (3). Although the precise cause of leiomyomas is uncertain, changes in tissue growth factors, hormones, and genetics are assumed to be associated with intricate cause (4).

Menorrhagia with anemia symptoms, dysmenorrhea, pressure symptoms, abdominal distension, infertility, persistent stomach discomfort with intermittent spasms, dysuria, chronic bladder to bowel spasms, even peritonitis and renal impairment are common side effects of uterine fibroids (1, 2).

The occurrence of fibroids varies amongst specific research and nations (4.5% – 68.6%) mostly depending on the type of study, diagnosis technique, and racial/ethnic demography of the population under study (5). Although this likely be underestimated, up to 50% of women with uterine leiomyomas are asymptomatic (6). 30% of all women who are fertile are affected (7).

Fibroids have traditionally been classified as submucosal, intramural, or subserosal based on their location. FIGO (Federation of International Gynecologists and Obstetricians) classifies fibroids as submucosal, other (intramural and subserosal), and hybrid. Type 0 (pedunculated intracavitary), Type 1 (submucosal 50% and above), and Type 2 (submucosal less than 50%). Specifically, Type 3 refers to a 100% intramural fibroid with endometrial contact, Type 4 to 100% intramural fibroid with no endometrial contact, Type 5 to 50% and above intramural fibroid with subserosal component, Type 6 to 50% intramural fibroid with subserosal component, Type 7 to pedunculated subserosal, Type 8

(non-myometrial location, such as cervical, broad ligament, or parasitic fibroids) and hybrid fibroids (represented with a Type 2–5 fibroid) (8).

Gynecologists can prevent problems and treatment failure by using the FIGO classification system to help in treatment planning. In most circumstances, MRI is clearly superior to ultrasonography in the assessment of fibroids for treatment planning. Aside from the FIGO classification, where fibroids are located inside the uterus, including their laterality and anteroposterior (fundus, body, and lower uterine body) (8).

Uterine leiomyomas are classified as submucosal leiomyomas when they enter or are contained within the uterine cavity. Inside the uterine wall is where intramural leiomyoma is located. Serosal leiomyoma is found in the uterus's base. Many leiomyomas are mixed, and pedunculated leiomyomas are connected together through a stalk and may be submucosal or serosal (9).

Ultrasonography (US), using transvaginal and transabdominal modalities, has been used the most commonly because of its ease of use and low cost. While Ultrasonography is a cost-effective equipment, it has been criticized for its substantial operator reliance, which results in inferior reproducibility when compared to magnetic resonance (MR) imaging. While more expensive, MR imaging has been hailed as the most sensitive modality for evaluating uterine myoma, particularly for the detection of small fibroids. (10).

Pharmaceutical treatments can also be utilized to treat a myoma and/or reduce uterine bleeding, or they can be used as a pre-operative supplementary in order to enhance surgical outcomes (11).

Menstrual bleeding and pain related to myoma were both reduced by COCs and LNG-IUS. However, when it comes to minimizing pain and menstrual blood loss, LNG-IUS works better than COCs. The decrease in uterine volume and the rise in blood flow resistance may have a secondary effect (12).

Surgical intervention (hysterectomy and myomectomy) has historically been the mainstay of UF treatment. Although hysterectomy is the only treatment that can completely cure UFs, it comes at the expense of future fertility. For women who wish to preserve fertility, myomectomy represents a surgical alternative. Other conservative methods are additionally available and include uterine artery embolization (UAE), and myolysis (13).

1.2: Statement of the problem

Women who suffer the symptoms associated with uterine fibroids have an enormous burden. Since many fibroids have no symptoms, they are often misdiagnosed until they are discovered by accident (14).

Worldwide, uterine myoma affects 70% of white women and more than 80% of women were African women. The prevalence of uterine fibroids varies from 4.5 to 68.6% throughout the world's continents (Asia, Europe, Africa, and South and North America), while the occurrence of uterine myomas ranges from 217 to 3,745 per 100,000 women in America (5).

Uterine fibroids are one of the main reasons for hospitalizations for gynecological issues and are the maximum common cause of hysterectomy in the USA (15). In comparison to white women (10.3%), black women had a higher prevalence rate (18.5%)(16). The prospective hospital-based observational study was carried out in South India women's prevalence of uterine fibroid was 37.65% (17).

According to research on the prevalence of uterine fibroids in Sub-Saharan Africa, 70–80% of black women will have these growths for the duration of their lives, requiring intervention and action (18). Also, a retrospective analysis was carried out at the Nnamdi Azikiwe University Teaching Hospital in Nigeria, where uterine leiomyoma accounted for 117 (10.7%) of the 1094 gynecological admissions throughout the research period (19).

The symptoms of uterine myoma generally have a detrimental influence on women's health-related quality of life, productivity at work, and engagement in social and physical activities (20). There is little recognition approximately fibroids occurrence and factors in Ethiopia and therefore, the purpose of the study was to assess the prevalence of fibroids and identify potential risk factors for this gynecological illness.

1.3: Significance of the study

- The study's findings will benefit health care professionals and offer preliminary data for further investigations.
- The finding from this study would serve as input data for the Ministry of Health, Healthcare Institutions, and Healthcare Carriers to offer greater recognition of the issue.
- This study would serve as input data that are important to take suitable preventive measures and early detection and control of uterine myoma and to allocate the crucial budget.

2. LITERATURE REVIEW

2.1: Uterine Myoma

The most common type of benign gynecological tumors of the uterus are fibroids. They begin with the clonal proliferation of a single myometrial cell. Fibroids are highly frequent in women during their reproductive years, are extremely rare before menarche, and often retreat after menopause because to their hormonally responsive nature (3, 4).

2.2: Prevalence of Uterine Myoma

The frequency of fibroids differs between unique studies and nations mostly due to the type of study, the diagnosing method, and the racial/ethnic demography of the population under study (5). Age, age at menarche, BMI, and physical activity are the main risk variables, according to a study conducted in the United States on 986 premenopausal women, ages 35 to 49 (21).

The frequency of uterine myoma diagnoses varied between 11.7% and 23.6%. Out of 1756 women participated in a cross-sectional online survey conducted in five Western European nations: France (358); Germany (345); Italy (351); Spain (352); and the United Kingdom (350) (22).

A comparable study was carried out in UK and Italy women with an analysis of uterine fibroids revealed significantly more frequent bleeding symptoms than women without a medical diagnosis: frequent periods (28.4% vs. 15.2%), irregular and predictable periods (36.3% vs. 23.9%), heavy bleeding (59.8% vs. 37.4%), extended bleeding (37.3% vs. 15.6%), bleeding between periods (33.3% vs. 13.5%) (23).

73 women with uterine myomas were found in a cross-sectional study that used data from the Seveso Women's Health Study, a population-based cohort study in Italy. The study included 341 premenopausal women aged 30 to 60 who had an intact uterus and were not using intrauterine devices or oral contraceptives, pregnant, or nursing (24). The prevalence of uterine fibroids was found to be 2.68% among the 112,403 women who received regular prenatal care, including an ultrasound survey, in retrospective assessment of women who gave birth at 39 hospitals in China (25).

Based on the location of the fibroid study done in India suggested that more intramural fibroids were prominent (59.12%) during the study period which possesses a favorable correlation with inducing spontaneous abortion (26).

The prospective hospital-based observational study was carried out in South India, the study indicated that 37.65% of women between the ages of 26 and 55 who visited the gynecology outpatient department for abdominopelvic bulk, pain, and irregular menstruation over a three-year period also had uterine fibroids (17).

In a different study conducted in Nigeria, surgical operations for uterine fibroids were performed at Aminu Kano Teaching Hospital out of 465 major gynecological procedures, happening in 115 instances. This suggests that 24.7% of major gynecological procedures for uterine myomas were performed during this period (27). A cross-sectional study looking at pregnant ladies attending antenatal care in Cameroon at the Limbe and Buea Regional Hospitals shows the prevalence of uterine fibroids in pregnancy was 16.7% (28).

A prospective study done in Ghana, 244 trans-abdominal pelvic ultrasound scan images of women were collected prior to the study, 35.2 % of the sampled individuals said that they were formerly recognized with fibroids. However, only 71.1% of those who were enrolled in the study had fibroids confirmed. Furthermore, Of the 158 patients, 28.9% had never been diagnosed with fibroid disease before (29). The prevalence of myoma in Addis Ababa, Ethiopia was 15.3% (62/404) among pregnant women who underwent caesarian section as observed or palpated myoma intraoperatively. The number of individuals who underwent pre-operative diagnostic ultrasonography screening was not disclosed (30).

2.3: Association factors

2.3.1: Sociodemographic Factor

2.3.1.1: Age

Risk factor for the development of fibroids is age. With 40.2% (467) of all cases seen during the time falling into the age group of 30-39, and 85.0% (987) of cases falling into the age group of 30-plus, the age group had the highest proportion of instances. The incidence decreased from 32.9% (382) at the age range of 40–49 to 0.42% (5) at the age group of 60 and above, while the frequency increased from 0% below 20 years to a maximum of 40.3%

in the age group of 30-39. The prevalence was 15.0% (174) for the age group 20–29 and 11.5% (133) for the age group 50–59 (31).

A cohort study done in Buffalo, New York City at different hospitals on 3,303 women who had tubal sterilization treatments and were between the ages of 17 and 44, becoming older was the biggest risk factor for uterine fibroids (32). According to a cross-sectional study conducted in Turkey, the prevalence declined after the age of 50 and peaked at 33% in the 41–50 age range (33). According to a Ghanaian survey, there were the most people in the 35–39 age group (n = 642, 26%) and the fewest people in the 60–64 age group (n = 6, 0.24%) (34).

2.3.2: Reproductive Factors

2.3.2.1: Para and Gravida

Different research registered a defensive impact of being pregnant at the occurrence of uterine myoma, with a five-fold reduction in the likelihood of fibroids occurring with high parity (3 or greater delivery). The risk of myoma is reduced with the range of births, no matter the status of familiarity of myoma (35). A case-control research reveals that the nulliparous group had a risk 2.2 times lower (OR 2.254, 95% CI 1.310–3.876) for uterine myoma than the highest risk group with parity ≥ 1 (36).

The risk of fibroids has been inversely correlated with the number of living children, with this correlation being strongest in white women. White women who had two or more children had a 70% lower risk (OR 0.3; 95% CI: 0.2, 0.4) than white women who did not have children (32). A prospective study done among Korean women shows that Compared to nulliparous women, parous women had a significantly decreased incidence of UL (HR 0.40; 95% CI 0.30–0.53) (37).

2.3.2.2: Menarche and pattern of Menstrual Cycle

A New York-based study found a correlation between menstrual pattern and myoma, with heavy menstrual flow being linked to a higher incidence of uterine fibroids for both White women (OR = 1.4; 95 percent CI: 1.0, 1.8) and African-American women (OR = 1.4; 95 percent CI: 0.8, 2.5). Menstrual bleeding lasting more than six days were linked with a higher risk for White women (OR = 1.5; 95 percent CI: 1.1, 2.0) but not for African-American women (OR = 0.8; 95 percent CI: 0.3, 1.8). Longer menstrual bleeding (per day)

were linked with a 13% increase in the incidence of fibroids for White women (OR = 1.13; 95 percent CI: 0.9, 1.2) (32).

An Iraqi study found that the prevalence of uterine fibroids is higher in women who menarche sooner (55.6% at 11 years and 44.9% at 12 years) than in women who menarche later (18.2% at 13 years and 18.5% at 14 years). According to this study, early menarche was strongly linked with an increased chance of developing uterine fibroid (38).

2.3.2.3: Contraceptive use

According to a study conducted in North-East Slovenia, women who have never used contraceptives had a greater risk of uterine myoma (27.0%) than women who have taken contraceptive tablets sooner or later in their lives (19.7%), from which was concluded that taking birth control tablets would possibly have a defensive function with inside the prevalence of fibroids. Also in this study, results confirmed that the type of contraception used determines the occurrence of fibroids. Compared to women who took progestin pills (33.3%), fibroids occurred significantly less frequently (13.3%) in women who used combined oral contraceptives (39).

2.3.3: Medical Factors

2.3.3.1: Hypertension

A slight positive correlation was observed between the incidence of myoma and medication-treated hypertension in a prospective cohort study of black women in the United States. But only uterine myoma that was confirmed by a hysterectomy was found to be favorably linked with treated hypertension based on the confirmation approach (40).

2.3.3.2: BMI

- There was a strong correlation ($p=0.003$) between BMI and the risk of uterine myoma, and the incidence of uterine fibroid increased with BMI (36). According to another study, women with BMIs between 25 and 29.9 kg/m² were more likely to have fibroids (27.4%) than women with BMIs between 18.5 and 24.9 kg/m² (17.6%), $p=0.002$) (39).

2.3.4: Personal behavior

2.3.4.1: Physical activity

The risk of fibroids appears to be lower in women who routinely exercise than in those who do not. The study also found a dose-response pattern, with women in the maximum class of workouts having a significantly lower chance of developing fibroids (OR=0.6, 95% CI 0.4-0.9) for the highest class compared to the lowest class, or roughly ≥ 7 hrs/week Vs < 2 hrs/week (41).

2.3.4.2: Alcohol Use

Regular alcohol use was found to have a slight positive correlation with uterine myoma. The risk had a significant relationship with the number of years that drinkers have used alcohol (beer and liquor) (42). A study done in Slovenia shows were consumption of alcohol was not statistically significantly associated with fibroids (39).

2.3.4.3: Cigarette Smoking

According to a descriptive study, current cigarettes use was linked to myoma in African Americans (AOR = 1.97, 95% CI: 1.11, 3.51) and in Caucasians (AOR = 3.00, 95% CI: 1.07, 8.38) (18). A study done in New York shows that smoking was an associated factor of uterine myoma in a lifetime, smoking more than one pack each day equals 1.6 times (32).

Conceptual framework

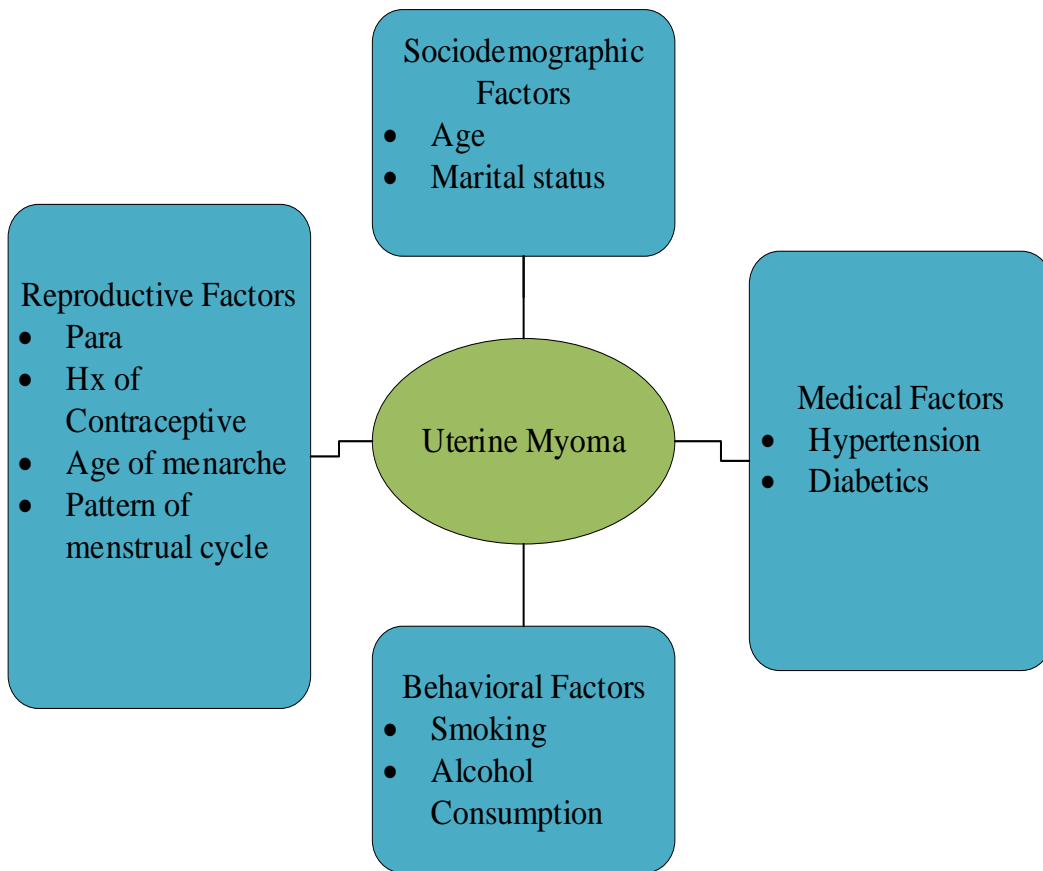


Figure 1: The framework conceptualizing the impact of an independent variable on a dependent variable (uterine myoma) (32-42).

3. OBJECTIVE

3.1. General objective

- To assess the prevalence and associated factors of uterine myoma at the gynecology ward in three governmental hospitals, Addis Ababa, Ethiopia, 2023.

3.2. Specific objectives

- To assess the prevalence of uterine myoma at the gynecology ward in three governmental hospitals, Addis Ababa, Ethiopia, 2023.
- To determine risk factors of uterine myoma at the gynecology ward in three governmental hospitals, Addis Ababa, Ethiopia, 2023.
- To determine the sub-type of uterine myoma at the gynecology ward in three governmental hospitals, Addis Ababa, Ethiopia, 2023.

4: METHODOLOGY

4.1: Study Area

The study was conducted in Addis Ababa, the largest city in Ethiopia with a total area of 527 square kilometers and the capital of the Federal Democratic Republic of Ethiopia. At an elevation of about 8000 feet (2440 meters) above sea level, the city is located at the southern foot of Mount Entoto.

The Central Statistical Agency of Ethiopia (CSA) conducted the national census in 2007, which reported an estimated population size of 3,384,569 in Addis Ababa. The population of Addis Ababa is projected to reach 5,460,591 in 2023. The percentage of women living in Addis Ababa is higher than that of men, per the results of the most recent census.

Addis Ababa had more than 52 hospitals, 12 of them state run, and more than 40 private. The study was carried out at three governmental hospitals:- St. Paul's Hospital, Tikur Anbessa Specialized Hospitals, and Gandhi Memorial Hospital.

4.2: Study period

The study was carried out between March 15 and June 30, 2022.

4.3: Study design

The retrospective cross-sectional study was carried out.

4.4: Population

4.4.1: Source population

All women come to the gynecology OPD in selected governmental hospitals in Addis Ababa city.

4.4.2: Study Population

Women who were admitted to the gynecology ward in selected governmental hospitals whose medical information has been recorded from January 01, 2020 - December 31, 2021.

4.5: Eligibility Criteria

4.5.1: Inclusion Criteria

All medical charts of women who were admitted to the gynecology ward in the selected governmental hospitals between January 01, 2020 - December 31, 2021 were included.

4.5.2: Exclusion Criteria

- Medical charts of patients with missing or incomplete variables were eliminated.
- Patients whose charts were lost from the MRN during data collection were excluded.

4.6: Sample Size Determination

So far, no study has been completed in Ethiopia to investigate the prevalence and associated factors of uterine myoma, and only a few studies have been published on its result following surgical intervention. As a result of the projected prevalence of these conditions being 50%, the sample size was determined using a single population proportion formula. The following assumptions were used:

n_i = minimum sample size required for the

Z- Standard normal distribution curve value for the 95% with CI (1.96)

d – Marginal error of 5%

p –Prevalence of uterine myoma

n – Sample size ; $n_i = \frac{(z\alpha/2)^2 \cdot p(1-p)}{d^2}$

$n_i = \frac{(1.96)^2 \times 0.5 (1-0.5)}{0.05^2} = 384$

0.05^2

The total sample size determined was 422, assuming a 10% non-response rate

4.7: Sampling procedure

Three government hospitals were chosen based on by their convenience. The sample size was assigned to the three hospitals in proportion to the total number of patients. During the study period, women's two-year medical record numbers (MRN) were gathered from the Gynecology ward's health management information system (HMIS) registration record at chosen hospitals. A simple random sampling procedure (using MRN) was used to choose 422 sampled medical cards from a total of 3,286 medical cards. The cards were then searched from patients' chart rooms by data clerks using MRN. Other charts were used to replace medical record charts that were lost from the MRN archive office.

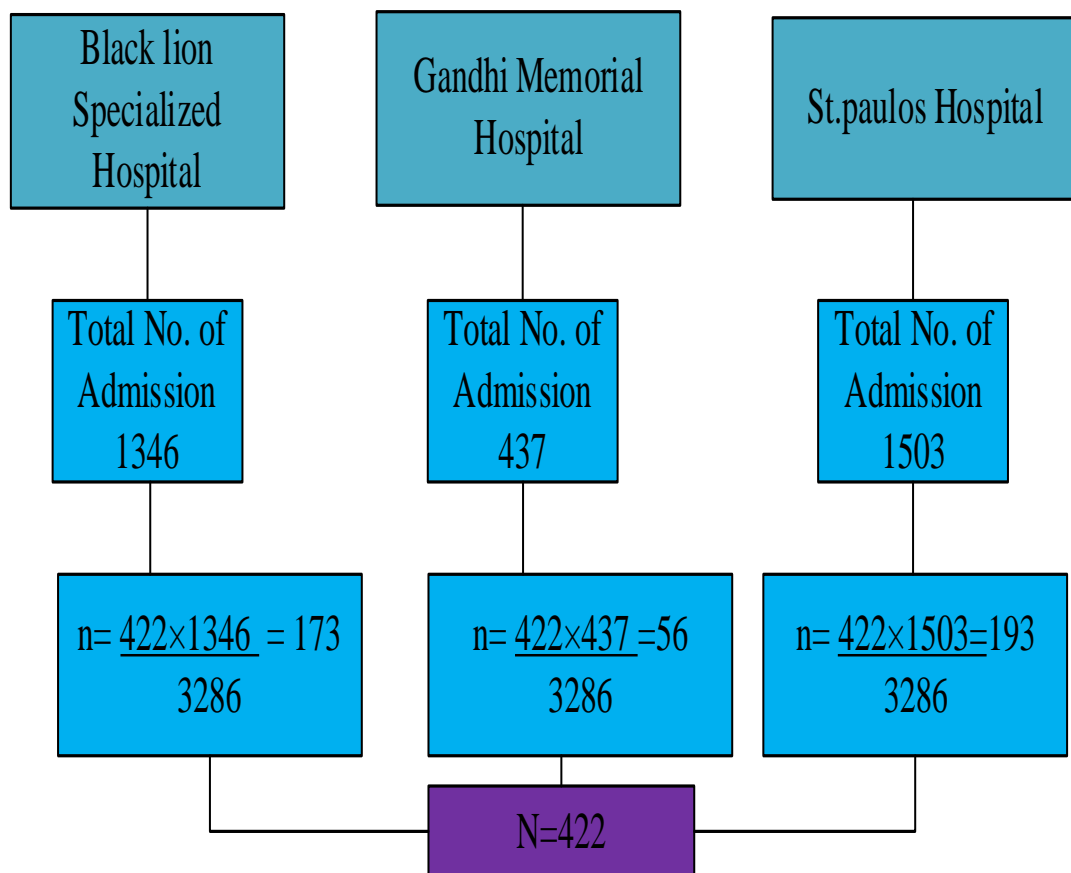


Figure 2: Schematic presentation of the sampling procedure for a selective governmental hospital in Addis Ababa, Ethiopia, 2023.

4.8: Operational definition

- Smoking: - smoke > 2 pieces/day
- Alcohol consumption: - >1 drink/day

4.9: Study variables

4.9.1: Dependent variable

Uterine myoma, fibroid, or Leiomyoma

4.9.2: Independent variables

Sociographical variables

- Age
- Marital status

Medical variables

- Hypertension
- Diabetic

Reproductive variables

- Para
- Age of menarche
- Pattern of menstruation
- Use of contraceptive

Behavioral factors

- Smoking
- Alcohol consumption

4.10: Data collection tools and procedures

- MRN was first taken from the HMIS registration book. Then all variables can be accumulated from patient records in clinical cards primarily based on inclusion and exclusion criteria. The checklist was used to collect the data. Open Data Kit (ODK) version 1.25.2 software and the Kobo Toolbox server were used to collect and store the data which advances the quality of the data. One health officer for supervision and Three BSc nurses were recruited for data collection by using the Open Data Kit (ODK).

4.11: Data quality control

To ensure data quality, data collecting checklists taken from various works of literature and adjusted according to the aims of this study were evaluated for clarity, understandability, consistency, and completeness prior to data collection. Data collectors and supervisors were trained on data collection methodologies and data collection materials from the Open Data Kit (ODK). Before data collection, organized checklists were tested on 5% of the sample. The supervisor checked the data gathering procedure frequently to guarantee the accuracy and consistency of the acquired information, and any flaws discovered during the pre-testing phase were remedied. On each day of data collection, the collected data was reviewed for completeness and consistency.

4.12: Data analysis and processing

Following data collection with the Open Data Kit (ODK), the data had been sent to the SPSS-25 statistical tools for analysis. To resolve problems, data cleaning was undertaken to check for reliability, consistency, missing values, and variables. For categorical data, descriptive statistics, frequency distribution, and percentage were calculated and presented using a bar graph, pie chart, and tables. Continuous variables were summarized using mean and standard deviation. To differentiate the link between dependent and independent variables, bivariate and multivariate logistic regression analysis were used. In the multivariate analysis, factors with P 0.25 in the bivariate analysis were included. AOR with 95% CI was determined in the multivariate analysis. P 0.05 was considered as a significant factor in the development of uterine myoma.

4.13: Ethical consideration

Ethical approval was received from the Human Anatomy Department's Departmental Research Ethics Review Committee (DRERC), Addis Ababa University's Institutional Review Board (IRB), and the Addis Ababa City Administration Health Bureau. For the selected hospitals to collect data, an ethical clearance letter and a letter of cooperation were provided. Informed agreement from patients was not required in this study because it was based on secondary data, and anonymity was protected by omitting the patient's name and coding the patient medical history.

5. RESULT

5.1 Prevalence of uterine myoma

A two-year retrospective data collection (January 01, 2020 - December 31, 2021) yielded a total of 3,286 women admitted to the Gynecology ward in the selected Governmental hospitals from which 422 were selected. Out of these, 96 uterine myoma cases were found, making the prevalence of uterine myoma 22.7%.

5.2 Socio-demographic characteristics

The age of the patients ranges from 18-70 years, with a mean and standard deviation of 42 ± 13 SD years and the majority 144(34.1%) of the patients were between the ages of 40 and 50. More than half of the women 256(60.7%) came from Addis Ababa. The majority 343(81.3%) were married or living together. The majority of women, 170 (40.3%), had completed at least high school. (Table 1).

Table 1: Socio-demographic characteristics of women who were admitted to the Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Variables	Category	Frequency	Percentage (%)
Residence	Addis Ababa	256	60.7
	Oromia	136	32.2
	Amhara	12	2.8
	SNNPR	6	1.4
	Afar	4	0.9
	Other	6	1.4
	Unknown	2	0.5
	Total		422
Age	18-28 yrs	75	17.8
	29-39 yrs	130	30.8
	40-50 yrs	144	34.1

	>50 yrs	73	17.3
	Total	422	100
Marital status	Single	39	9.2
	Married	343	81.3
	Divorced	22	5.2
	Widowed	18	4.3
	Total	422	100
Level of education	Illiterate	61	14.6
	Primary school	145	34.4
	Secondary school	170	40.3
	Higher education and above	35	8.3
	Unknown	11	2.6
	Total	422	100

5.3 Reproductive characteristics of the respondents

The majority of the women had two or more deliveries which was 227(53.8%), 71(16.8%) women had one delivery in their lifetime the rest 124(29.4%) women had no history of delivery. The majority of women 374(88.6%) don't use any form of contraceptive the rest 48(11.4%) women use a different type of contraceptive. 17(4%) injectable contraceptives, 18 (4.3%) used implants, 11(2.6%) used COC, 2 (0.5%) used IUCD (Table 2).

Table 2: Obstetrics and Gynecology characteristics of women who admitted Gynecology ward the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Variables	Category	Frequency	Percentage (%)
Para	Nulli para	124	29.4
	Primi para	71	16.8
	Multi para	227	53.8
	Total	422	100
Use of contraceptives	Yes	48	11.4
	No	374	88.6
	Total	422	100
Type of contraceptives	Implant	18	4.3
	Injectable	17	4
	COC	11	2.6
	IUCD	2	0.5
	Total	48	11.4

From all 422 cases, the majority of women had regular menstrual cycle history of 214 (50.7%), 75(17.8%) of women were in Menopause, 4(0.9%) of women had Amenorrhea, 129(30.6%) of women had an irregular cycle of menstruation (Table 3).

Table 3: Frequency of Reproductive history of women who admitted Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Variables	Category	Frequency	Percentage (%)
Pattern of menstrual cycle	Regular	214	50.7
	Irregular	129	30.6
	Amenorrhea	4	0.9
	Menopause	75	17.8
	Total	422	100

Age of Menarche	< 12 years	123	29.1
	12-14 years	148	35.1
	>14 years	114	27
	Unknown	37	8.8
	Total	422	100
History of Abortion	Yes	93	22
	No	327	78
	Total	422	100

5.4. Past Medical History of the Respondents

Of 422 women, 123 (29.1%) had pre-existing medical problems, 299 (70.9%) women had no history of pre-existing medical problems, of those women who had a pre-existing medical problem 54(12.8%) of women had Hypertension, 17(4%) women had DM and 9(2.1%) women had both Hypertension and DM. The remaining women had other medical problems like Asthma, Cardiac, and other medical problems (Table 4).

5.5. Behavioral Characteristics of the Respondents

Of all 422 cases, only 4 (0.9%) of women had a history of smoking, majority of women hadn't history of alcohol consumption 298 (70.6%) (Table 4).

Table 4: Frequency of Medical History and behavioral character of women who were admitted to the Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Variables	Category	Frequency	Percentage (%)
Pre-existing medical Problem	Yes	123	29.1
	No	299	70.9
	Total	422	100
Type of medical problems	HTN	54	12.9

	DM	17	4
	DM and HTN	9	2.1
	Other	43	10.1
	Total	123	29.1
Smoking Hx	Yes	3	0.7
	No	411	97.4
	Unknown	8	1.9
	Total	422	100
Alcohol Hx	Yes	89	21.1
	No	308	73
	Unknown	25	5.9
	Total	422	100

5.6. Clinical presentation of uterine myoma

Of the total respondents, the prevalence of uterine myoma was 96(22.7%) (Figure 3). Of the women who had Uterine Myoma majority had pelvic pain during their admission period which is 37(8.8%) (Table 5).

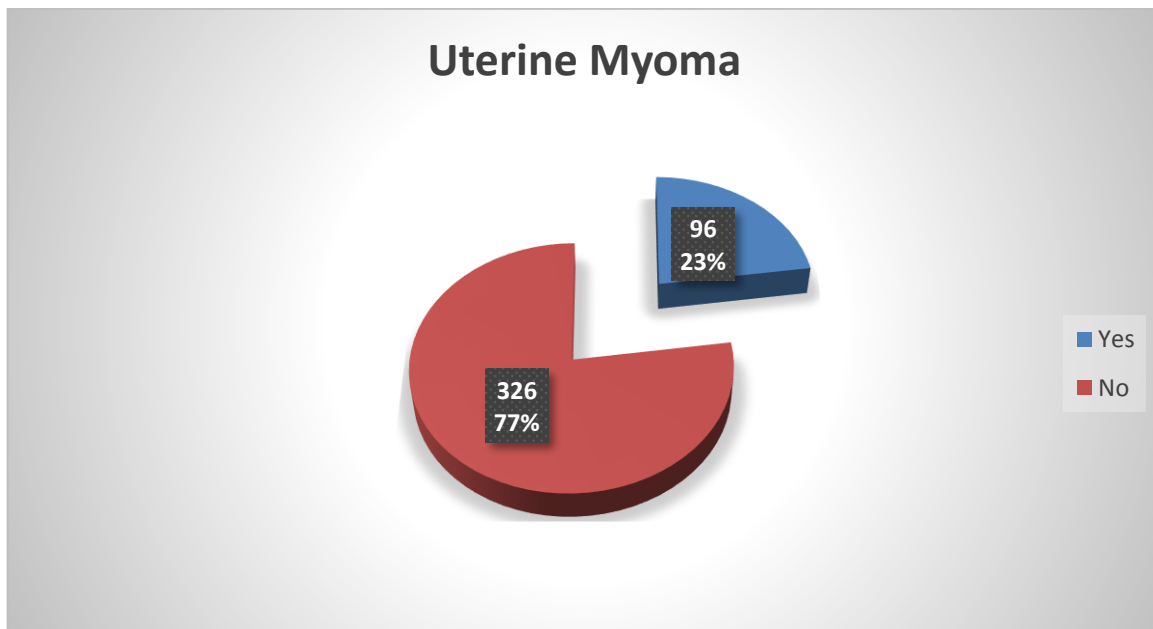


Figure 3. The prevalence of uterine myoma among women who were women who were admitted to the Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Table 5: Frequency of clinical presentation of women who were admitted Gynecology ward of the study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Variables	Category	Frequency	Percentage (%)
Clinical presentation	Abnormal vaginal bleeding	23	5.5
	Pelvic pain	37	8.8
	Abnormal bleeding and pelvic pain	27	6.4
	other	9	2.1
	Total	96	22.7

Out of 96(22.7%) cases of Myoma 22 (5.2%) women had a family history of uterine myoma and 74 (17.5%) women didn't have a family history (Table 6).

Table 6. Frequency of myoma subtype of myoma among women with uterine myoma.

Variables	Category	Frequency	Percentage (%)
Family History	Yes	22	5.2
	No	74	17.5
	Total	96	22.7
Location of Uterine Myoma	Submucosal	4	0.9
	Intramural	39	9.2
	Subserosal	24	5.7
	Submucosal and Intramural	9	2.1
	Intramural and Subserosal	16	3.8
	All three pattern	4	0.9
Total	96	22.7	

5.7. Factors associated with the occurrence of uterine myoma

Explanatory variables such as marital status, age, age of menarche, menstrual cycle pattern, para, and use of contraception, history of medical problems, alcohol intake, and smoking status were investigated first by bivariable analysis in this study.

According to the p-value of the Binary logistic regression which had a P-value < 0.25 (95 % C.I), marital status, Age, Para, Patterns of menstrual cycle, and Age of menarche were factors associated with Uterine Myoma. The binary logistic model's significant variables were entered into the multiple logistic regression equation model.

Age groups between 29-39years, Multipara, Irregular pattern of menstrual cycle, and Age of menarche at 11 years and less were significantly linked with Uterine Myoma in multivariate logistic regression independent factors with P value 0.05 with (95% C.I).

The multivariable analysis found that the odds ratio for uterine myoma was 3.6 times higher in the age group 29-39 years than in the age group 18-28 years [AOR = 3.67; 95% CI: 1.801 - 7.387].

Multiparous women had a 58% lower chance of having uterine myoma than null parous women [AOR = 0.42; 95% CI: 0.203 - 0.869]. Uterine myomas were three times more common in women with an irregular menstrual cycle history than in women with a regular menstrual cycle history [AOR = 3.2; 95% CI: 1.761 - 5.923]. The odd ratio of uterine myoma was twice as high in women aged 11 and under at menarche as it was in those aged 14 and up [AOR = 2.4; 95% CI: 1.223 - 4.936] (Table 7).

Table 7. Bi-variable and Multivariable Logistic Regression analysis results of factors associated with uterine myoma in study governmental hospitals, Addis Ababa, Ethiopia, 2023.

Independent variables	Category	Yes	No	Bivariate analysis (COR)	Multivariate analysis (AOR)	P-value
Age (n=422)	18-28 yrs	32 (7.6%)	43 (10.2%)	1	1	
	29-39 yrs	20 (4.7%)	110 (26.1%)	4(2.114-7.924)	3.6(1.801-7.387)	0.001*
	40-50 yrs	27 (6.4%)	117 (27.7%)	3.2(1.735-5.995)	1.5(0.759-3.102)	0.2
	>50	17 (4%)	56 (13.3%)	2.4(1.205-4.986)	0.8(0.363-2.099)	0.7
Para (n=422)	Nulli para	15 (3.6%)	92 (21.8%)	1	1	
	Primi para	26 (6.2%)	89 (21.1%)	0.55(0.277-1.123)	0.59(0.271-1.327)	0.2
	Multi para	55 (13%)	145(42.34.4%)	0.43(0.229-0.805)	0.42(0.203-0.869)	0.01*
Marital Status (n=382)	Single	15 (3.6%)	24 (5.7%)	1	1	
	Married	76 (18%)	267 (63.3%)	2.1(1.097-4.393)	1.4(0.682-3.259)	0.3

Pattern of menstrual cycle (n=343)	Regular	76 (18%)	138 (32.7%)	1	1	
	Irregular	19 (4.5%)	110 (26.1%)	3.1(1.818-5.591)	3.2(1.761-5.923)	0.001*
Age of menarchy (n=385)	≤11yrs	18 (4.3%)	105 (24.9%)	2.9(1.548-5.4970)	2.4(1.223-4.936)	0.01*
	12-14 yrs	34 (8.1%)	114 (27%)	1.67(0.971-2.895)	1.1(0.630-2.198)	0.6
	>14yrs	38 (9%)	76 (18%)	1	1	

6. DISCUSSION

This hospital-based study studied the prevalence of uterine myoma and its risk variables in the gynecology wards of several governmental hospitals in Addis Abeba. The study found that 22.7% of women admitted to the Gynecology ward at selected governmental hospitals had uterine myoma. This is consistent with a cross-sectional study conducted in Nigeria, which found that the prevalence of uterine fibroids was 24.7% (27).

The above finding contradicted a study done in South India that found 37.65% of women had uterine fibroids, while a study done in Ghana found 36.9% of women had uterine fibroids (17, 29). This variation could be attributed to the study population and big sample size; earlier research utilized a larger sample size than this study, and the study population in previous studies comprised women aged 26 to 60. Because the majority of uterine myomas are asymptomatic, the diagnostic approach used throughout the study period taints the prevalence.

Furthermore, the prevalence in the current study was greater than in a cross-sectional study conducted in Addis Ababa governmental hospitals among pregnant women, where the prevalence was 15.3%, and a cross-sectional study conducted in Cameroon, where the prevalence was 16.7% (28, 30). The disagreement between the above conclusion and the current study was most likely owing to various demographic sources and sample sizes used in the investigations.

This study's findings are also discordant with cross-sectional studies conducted in the United Kingdom, Italy, and France, which reported 4.5%, 9.8%, and 4.6% (22). A study done in China reported 2.6% which was lower than this study (25). The variation between the above result and the current study was most likely due to racial differences; different literature shows that the prevalence of uterine myoma was higher among black women than white women, so this study was conducted among black women, and the population source was different.

In this study, uterine myoma incidence showed a statistically significant correlation between age groups 29-39 years. The current study's findings are consistent with those of previous studies conducted in Nigeria and Ghana (31, 34).

In the present study, women between the ages of 29 and 39 were 3.6 times more likely to develop uterine myoma than women between the ages of 18 and 28. This finding contradicts the findings of a study conducted in Bandung, which found that the age group 30-40 years was 63.6% less probable than the age group 20-30 years (36). Furthermore, the current study's findings were conflicting with a study conducted in New York, which indicated that age between 40 and 44 years was the highest risk factor, with a 6.3-fold increase over other age groups (32).

This gap occurred because in the previous studies, women who presented with clinical symptoms of uterine myoma were included and screened to determine the association between age and myoma, whereas in this study, all women with or without uterine myoma were included in the sample size and economic gap also affect the diagnosis method and this study was institutional based study.

In this study, uterine myomas were 3 times more likely associated with women with an irregular pattern of menstrual cycle history as compared to women with a regular pattern of menstrual cycle history with an odd ratio of 3.2 at (95% CI: 1.761 – 5.923). This is consistent with a case-control research conducted in Iran, which found a link between uterine myoma and irregular menstruation cycles (38). According to a Slovenian study, there is no link between uterine myoma and monthly pattern (39).

The disagreement between these studies might be due to some studies showing that the growth of myoma within the uterine cavity may distort the uterus lining may cause bleeding and the uterine may not contract properly, which means it can't stop the bleeding also, highly vascularized, which contributes to irregular bleeding or heavier which is symptomatic myoma. On the other hand, other studies show that 50% of myoma was asymptomatic so this study is only concerned about symptomatic uterine myoma.

This study revealed that multiparous women had a 58% reduced risk of uterine myoma than nulliparous women. This finding was consistent with a cross-sectional study conducted in New York, which found that the risk of myoma decreases with the range of births. Women with additional children had a 70% lower risk than women without children (32). Furthermore, the current study's findings are consistent with the findings of a Korean study, which found that parous women had a 60% lower incidence of myoma than nulliparous women (37).

The current study's findings, however, were conflicting with those published by a Japanese study, which found that the highest incidence of uterine myoma with parity 1 was 2.2 times greater than the nulliparous group (36).

Most studies describe parity as having a protective effect and speculate that this is due to the protective effect of postpartum uterine involution. The uterus rapidly returns to pre-pregnancy size after each pregnancy due to substantial remodeling of the tissue, and tiny fibroids are destroyed during this process.

In this investigation, uterine myoma was shown to be 2.4 times more common in women aged 11 years and younger than in women aged 14 years and older (AOR =2.4; 95% CI: 1.223 - 4.936). This is consistent with a study conducted in Korea, which found that those aged 14-15 years and 16 years at menarche had lower odds of myoma. Compared to women aged 12-13 years at menarche (37). Furthermore, this finding is consistent with a study conducted in Iraq, which found that the chance of developing uterine fibroid was greatly raised with the early age of menarche, or at 11 years old and below (38).

The theory was that women who had their menarche at a young age had more menstrual cycles and were exposed to more bioavailable estrogens throughout their lives, which are thought to promote the growth of uterine myoma. However, differences revealed in epidemiological research, including this study, show that menopausal women had a reduced risk of uterine myoma than premenopausal women.

7. LIMITATIONS OF THE STUDY

While data were acquired retrospectively by evaluating medical records due to poor registration of patient information in the study's facilities, some variables that may cause uterine myoma, such as diet, BMI, and physical activity, were not included in the study. It is challenging to reflect the general population because the study is hospital-based.

8. CONCLUSION

In this study, the prevalence of uterine myoma is higher than in previous studies with similar approach. The study concludes that uterine fibroid is more common in women of the reproductive age group than in women of older age groups. It is also more common in women with irregular menstrual cycle patterns than in those with regular patterns, in multiparous women than in nulliparous women, and in women of early age at menarche.

9. RECOMMENDATION

- This study was done only for symptomatic uterine myoma further studies are needed to know the prevalence of a symptomatic uterine myoma and risk factors.
- Similar research must be carried out by gathering prospective data and covering additional regions of Ethiopia.
- A population-based investigation is also advised in order to determine the prevalence of uterine myoma in the general population.

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ANNEXES

Annex I. Information sheet

Title of the study: To assess the prevalence and associated factors of uterine myoma in three governmental hospitals in Addis Ababa, Ethiopia, 2023.

Name of investigator: Mekdes Sisay (BSc, MSc candidate)

Name of institution: AAU

Introduction: This overview has been developed for Tikur Anbessa specialized hospital, Gandhi memorial hospital, and St Paul's hospital. The proposed study "retrospective study on the prevalence and associated factors of uterine myoma" was chosen by these government hospitals.

I am requesting permission from your office to conduct the aforementioned study in this facility. Please read the material below for a better understanding:

The study's goal is to investigate the prevalence and risk factors for uterine myoma in three governmental hospitals in Addis Ababa, Ethiopia, in 2023.

Procedure: In order to carry out the study and achieve the aforementioned goals, the relevant information will be acquired from the records and patient files. The checklist will include questions about the women who come to the gynecological ward's socio-demographic and clinical data.

Risk and benefit: Because the necessary information will be collected from medical documents, the participant will not be harmed. The study's findings will assist the responsible body in identifying the connected elements that will assist them in improving prevention and treatment services for the problem.

Confidentiality: All information obtained from the logbook and patient file will be kept confidential. No personal information about the patient will be recorded. This study's records will be kept private. Only the Principal Investigator will have access to the research records, which will be kept in a secured file.

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Annex II. Hospital consent form

This research will be carried out at Tikur Anbessa specialized hospital, Gandhi memorial hospital, and St Paul's hospital. The primary goal of this study is to determine the prevalence and risk factors for uterine myoma in three governmental hospitals in Addis Ababa, Ethiopia, in 2022. Such an evaluation is required for both preventive and therapeutic approaches to the problem.

As a result, the hospital's participation and engagement are extremely beneficial in generating the necessary information and will be greatly appreciated. Data for this study will be obtained retrospectively from patients' medical record cards. Any specific personal identifiers, such as the clients' names, will not be collected, and all information generated will be provided in its whole. Furthermore, the confidentiality of any personal information will be protected throughout the study process, with no unauthorized access permitted.

Finally, the hospital has complete discretion over whether or not to engage in this study. If you have any concerns or require additional information about the planned study, please contact the primary investigator, the university, or the following address.

Name : **Mekdes Sisay** (the principal investigator, BSc).

Phone number: 0921438879

As a result, if you want to take part in this study, please confirm your participation by signing here. Thank you kindly.

Hospital Participant-----

Principal investigator-----

Annex III. Checklist

Addis Ababa University, College of Health Science, School of Medicine, Human Anatomy Department

Table 1. shows the checklist used to examine the prevalence and risk factors for uterine myoma in three governmental hospitals in Addis Ababa, Ethiopia, in 2023.

MRN_____			
Part 1.socio-demographic characteristics			
No.	Variable	Response	skip
102	Age	_____ (yrs.)	
103	Residence	_____	
104	Level of education	_____	
Part 2. Reproductive history			
201	Para		
203	Age of menarchy		
204	Use of contraceptive?	1. Yes 2. No	
205	If yes for Q.no 204, what type of contraceptive did she use ?	1. COC 2. POP 3. Injectable 4.implant 5. IUCD 6. if others (specify)_____	
206	Menstrual cycle	1.regular 2.iregular 3.heavy bleeding	
207	Abortion history	Yes 2.No	

Part 3. Medical History			
208	Any medical problem? (more than one response is possible)	1.PID 2.Hypertension 3.Diabetes mellitus 5.If other specify_____	
209	Family history of uterine myoma?	1.Yes 2.No	
Part 3: personal behavior			
301	Smoking history or exposure ?	1.Yes 2.No	
302	Alcohol use	1.Yes 2.No	
Part 5: clinical history			
401	Does she have Myoma ?	1.Yes 2.No	If no, skip all question below
402	What are clinical Presentation ?	1.Vaginal bleeding 2.pelvic pain 3.If other Specify _____	
403	Type of uterine Myoma? more than one response is possible	1.Submucosal 2.Intramural 3.Serosal 4.pedunculated	
404	Method of diagnosis?	1.U/S 2.MRI	

		3.HSG 4.CT 5.If other specify_____	
405	Type of Management ?	1. pharmacological 2. Surgical 3.Both	If only surgical ,skip question no 406
406	If pharmacological managed type ?	1.Coc 2.NSAIDs 3.Iron 4. If other specify_____	
407	If surgically managed type ?	1.Hysterectomy 2.Myomectomy	