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## Epidemiological and socio-clinical burden of uterine fibroids in a low-resource setting: A cross-sectional study

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### Abstract

**Background:** Uterine fibroids are the most common benign tumours affecting the female reproductive system, representing a significant global public health burden. Despite their high prevalence, particularly during reproductive years, fibroids often remain underdiagnosed or poorly managed due to cultural, social, and systemic barriers.

**Aim:** This study aimed to examine the socio-clinical characteristics, prevalence, and associated risk factors of uterine fibroids among women.

**Methods:** A cross-sectional descriptive study was conducted using clinical records. Data were collected on patient demographics, age at menarche, parity, anthropometric indices, clinical presentations, and uterine size. Statistical analysis was performed using  $P=0.05$ .

**Results:** The highest prevalence of fibroids was observed among women aged 40-64 years, 50.4%, closely followed by 22-39 years, 48.6% with a significant decline post-menopause. Early menarche (Before age 12) and nulliparity were strongly associated with increased fibroid risk. Although 64% of fibroid cases occurred in nulliparous women. Clinical presentations included menorrhagia (38.1%), abdominal mass (28.7%), and infertility (26.2%), consistent with classic fibroid symptoms. Over 60% of cases had a significantly enlarged uterus (12-30 weeks gestational size). 25.3% of women presented more than three years after symptom onset. Age and multiparity were the only statistically significant risk factors; anthropometric measures, such as BMI and weight, showed no significant association.

**Conclusion:** Uterine fibroids remain a prevalent and impactful gynaecological condition, especially among women of African descent. Age and nulliparity are key risk factors, while delayed diagnosis exacerbates the disease burden. Enhanced public awareness, early screening, and accessible treatment options are crucial in mitigating the reproductive and psychosocial consequences of fibroids in resource-limited settings.

**Keywords:** Uterine fibroids, African women, infertility, menorrhagia, nulliparity, age

### Introduction

Uterine fibroid, is the most common benign tumour in women of reproductive age <sup>[1]</sup>. It is a global burden with a 3-4 fold preference for women of African descent <sup>[2]</sup>. It occurs in 25-50% of women of reproductive age but could be as high as 70% in a woman over 50 years <sup>[2]</sup>. prevalence of fibroids 4.5% to 9.4%; UK, 9.8% to 17.8% Italy 66-85% Ghana <sup>[2]</sup>.

The Incidence ranges from 60-80% in African-American women to 40-70% in Caucasians, between the age ranges of 35-50 years respectively <sup>[2, 3]</sup>. Igboeli *et al.*, revealed that women in Sub-Saharan Africa have a 70-80% lifetime risk of uterine fibroids <sup>[3]</sup>. The incidence is 4.5 to 68.6% across the continent (Europe, Asia, Africa, North and South America <sup>[3, 4]</sup>.

Uterine fibroids are common among the black race, elevated body mass index (BMI), age, premenopausal status, hypertension, positive family history, consumption of food additives, and soybean milk <sup>[2-5]</sup>. It is a major source of health challenges to women of reproductive age in Nigeria and around the globe <sup>[5]</sup>.

The most common symptoms include abnormal and excessive uterine bleeding, abdominal and pelvic pain, gastric disorders like bloating and constipation, voiding symptoms, infertility and obstetric complications <sup>[1, 3-5]</sup>. The major known stimulators of uterine growth are estrogen and progesterone in leiomyoma tumour growth, the exact pathophysiology of uterine leiomyomas remains unknown <sup>[6, 7]</sup>.

Treatment includes medical therapy, surgical intervention, and uterine artery embolization or ablative techniques [7]. These depend on the patient's age, the reason for treatment, the concern of fertility preservation and the patient's preference [2, 5, 6].

The treatment of UF is based on the symptoms, size, rate of growth and desire for fertility, and treatment options include expectant management, medical therapy, uterine artery embolization and surgery like myomectomy and hysterectomy [8]. The Study aims to determine the trend of social and clinical presentation of fibroids in a tertiary hospital of a low-resource setting. Awareness of the characteristics of fibroid would improve the diagnosis and treatment.

## Methodology

### Study Site

The study was conducted at the Obstetrics and Gynaecology department of the Lagos State University Teaching Hospital (LASUTH), Ikeja, and Lagos State.

### Study Design

This study employed a retrospective, descriptive design to collect data on abdominal myomectomy. The surgical review and clinical outcomes, carried out in the Department of Obstetrics and Gynaecology at Lagos State University Teaching Hospital. The department runs 4 gynaecological clinics weekly under the supervision of consultant staff. Surgery cases are admitted into the gynaecological ward for preoperative and anaesthetic reviews a few days before the scheduled operation days. Operations are carried out in the gynaecological suites in the main operating theatre and transferred afterwards to the gynaecological ward for postoperative care. Patients are booked for clinic follow-up weeks after surgery and then monthly for 3 months. The study will be conducted over a 6-month period.

### Study Population

The study population consisted of women who had myomectomy in gynaecology at the Lagos State University Teaching Hospital during the period of study.

### Sample size determination

$$N = \frac{[Z\alpha\sqrt{(1+1/m)p(1-p)} + Z\beta\sqrt{P_0(1-P_0)/m + P_1(1-P_1)}]^2}{(P_0 - P_1)^2}$$

**Sampling Method:** Simple non-probability random sampling.

### Selection of patients

All women who had myomectomy alone served as participants in this study.

### Inclusion criteria

Post-myomectomy patients alone.

### Exclusion criteria

All other gynaecological operations patients.

### Study Procedure and Data Collection

This retrospective study was hospital-based women who had myomectomy in the Gynaecology department of Lagos State University Teaching Hospital, will be consecutively recruited over six months.

Case notes of gynaecological patients who had abdominal myomectomy at LASUTH between January 2019 and December 2024 were reviewed retrospectively. The information was

obtained from case folders, anaesthetist operation charts, surgeons' and nurses' operating theatre records and gynaecological ward. Other gynaecological operations during the period under review was excluded. The sociodemographic characteristics of the patients, comorbidities, previous surgeries and previous obstetric history, indications for myomectomy, uterine size, number of nodules, weight and locations of fibroids was retrieved.

Preoperative assessments and investigations were noted, and pertinent intraoperative data include figures were also recorded for each patient included in the study.

### Statistical Analysis

The data obtained was analyzed using the Statistical Package for Social Sciences (SPSS 26.0). Demographic and baseline variables was summarized using descriptive statistics expressed as mean (standard±deviation) or median and range for continuous variables and percentages for categorical variables. Comparison of continuous variables was done using the student's t- test and categorical variables were compared using the Chi square or Fisher's exact test as appropriate. Multivariable logistic regression was used to examine the relationship between predictor and outcome variables. Odd ratios were calculated at 95% confidence interval. P-values < 0.05 were considered significant.

### Ethical considerations

This study adhered to the principles of medical ethics and ensure participant confidentiality. Approval was obtained from the LASUTH Health Research and Ethics Committee before data collection. Informed consent was obtained from all participants, and they have the right to withdraw from the study at any time without consequences.

## Results

### Social Demography

The sociodemographic characteristics of the participants are presented in Table 1. The age distribution revealed that nearly half of the respondents were within the mid-life category (40-64 years), accounting for 50.4% of the sample. This was closely followed by those in the youth category (22-39 years), who comprised 48.6%. Only a negligible proportion (0.7%) were in late adulthood (65-82 years). The mean age was 39.52 years (SD=0.515), suggesting that the study population was largely composed of women in their reproductive and mid-life stages. With respect to marital status, the majority were married (70.1%), followed by singles (27.9%), while divorced and widowed participants accounted for less than 1% each. Religion was dominated by Christianity (84.0%), with Islam representing 15.5%. Occupationally, more than half were self-employed (56.4%), while 38.7% were in paid employment. A small fraction were students (2.0%), retirees (0.7%), or unemployed (1.2%). Educational attainment showed that 58.6% had tertiary education, 12.7% had completed secondary education, while only 1.2% reported basic education. Regarding age at menarche, normal menarche was predominant (54.6%), while late menarche accounted for just 6.0%. Collectively, these findings highlight a relatively young to mid-life, educated, and economically active population, with the majority having experienced normal reproductive onset.

### Clinical features of participants

The clinical characteristics of the participants are outlined in Table 2. In terms of body weight, 41.1% of women had normal

weight (50-70 kg), while 23.9% were overweight (70-90 kg) and 4.0% obese ( $\geq 90$  kg). Underweight participants accounted for 5.5%. The BMI distribution revealed that 15.0% were of normal weight, while 11.0% were overweight and 6.2% obese. A smaller proportion (2.5%) was underweight. Uterine size varied considerably, with one-third (33.2%) corresponding to 12-20 weeks' gestation, followed by 23.4% between 21-30 weeks, and 13.0% between 31-40 weeks. Only 2.7% had a uterine size below 11 weeks. Parity analysis revealed that most participants were nulliparous (64.6%), while 35.4% were multiparous. The most common clinical presentation was menorrhagia (37.4%),

followed by abdominal swelling (28.7%) and infertility (26.2%). Less frequent symptoms included painful menstruation (4.2%), irregular menstruation (0.7%), post-menopausal spotting (0.2%), and urinary or vaginal complications ( $< 1\%$ ). Regarding symptom duration, 45.1% had symptoms for 0-6 months, 16.5% for 7-12 months, 7.0% for 13-24 months, while a quarter (25.2%) reported chronic symptoms lasting more than three years. These findings emphasize that heavy bleeding and abdominal swelling were the leading complaints, with many women presenting late after a prolonged symptomatic period.

**Table 1:** Characteristics of the study population

Variable	Frequency	Percentage
Age	195	
(22-39yrs.)	202	48.6%
(40-64yrs)	3	50.4%
(65-82yrs)	1.52 $\pm$ (.515)	0.7%
Age (Mean SD)	N=400	
<b>Marital Status</b>	2	
Divorced	281	0.5%
Married	112	70.1%
Single	3	27.9%
Widow	N=398	0.7%
<b>Religion</b>	336	
Christian	62	84.0%
Islam	N=398	15.5%
<b>Occupation</b>	155	
Employed	3	38.7%
Retiree	226	0.7%
Self employed	8	56.4%
Student	5	2.0%
Unemployed	N=397	1.2%
<b>Education</b>	5	
Basic	51	1.2%
Secondary	235	12.7%
Tertiary	N=291	58.6%
<b>Age at Menarche</b>	24	
Late Menarche	219	6.0%
Normal Menarche	N=243	54.6%

**Table 2:** Clinical Features

Variable	Frequency	Percentage
<b>Weight</b>	22	
Underweight (50-below)	165	5.5%
Normal weight (50-70)	96	41.1%
Overweight (70-90)	16	23.9%
Obese (90-above)	2.355 $\pm$ (.6962)	4.0%
Weight (Mean SD)	N=299	
<b>BMI</b>	10	
Underweight (18.5-below)	60	2.5%
Normal Weight (18.5-24.9)	44	15.0%
Overweight (25-29.9)	25	11.0%
Obese (30-above)	2.60 (.865)	6.2%
BMI (Mean SD)	N=139	
<b>Uterine Size</b>	11	
0-11 weeks	133	2.7%
12-20 weeks	94	33.2%
21-30 weeks	52	23.4%
31-40 weeks	N=290	13.0%
<b>Parity</b>	259	
Nulliparous	142	64.6%
Multiparous	N=401	35.4%
<b>Presentation</b>		
Infertility	105	26.2%
Painful Menstruation	17	4.2%
Abdominal Swelling	115	28.7%
Menorrhagia	150	37.4%

Irregular Menstruation	3	.7%
Post-menopausal Spotting	1	.2%
Protruding mass from vaginal	1	.2%
Recurrent difficulty in pressing urine	2	.5%
Vaginal discharge	2	.5%
	N=396	
<b>Symptoms Duration (years)</b>		
0-6 Months	181	45.1%
7-12 Months	66	16.5%
13-24 Months	28	7.0%
3 Years & Above	101	25.2%
	N=376	

**Table 3:** Comparison of age at menarche and fibroid weight (Fibroid Nodules)

Variables	0.5-1000grams	1100-2000grams	2100-3000grams	3100-4000grams	4200-5000gram
Late Menarche	7(63.6%)	3(27.3%)	1(9.1%)	0(0.0%)	0(0.0%)
Normal Menarche	62(63.9%)	17(17.5%)	6(6.2%)	9(9.3%)	3(3.1%)

Fishers exact: T-test=1.807, P-value=.738#

Fisher's exact test was used to explore potential associations between categorical patient characteristics and various fibroid-related outcomes (Table 3 comparisons). These analyses provided insight into possible relationships that might not be captured through standard parametric tests due to the small or uneven sample distributions.

The comparison between age at menarche and body weight revealed no statistically significant association (Fisher's exact test=3.954,  $P=0.225$ ), although descriptive frequencies suggested that normal menarche occurred more frequently across all weight categories. Similarly, the relationship between age at menarche and fibroid weight (nodules) was not significant (Fisher's exact test=1.807,  $P=0.738$ ), indicating that age at onset of menstruation did not significantly influence fibroid mass accumulation.

**Table 4:** Correlation analysis of continuous variables with a scatter plot representation

Variable	Age	Weight	Height	Uterine Size
Age	1	.170**	-.065	-.099
Weight	.170**	1	-.051	-.034
Height	-.065	-.051	1	.037
Uterine Size	-.099	-.034	.037	1
Number of Fibroids	.231**	-.014	-.058	.363**

Correlation is Significant at the 0.01 level (2-tailed)

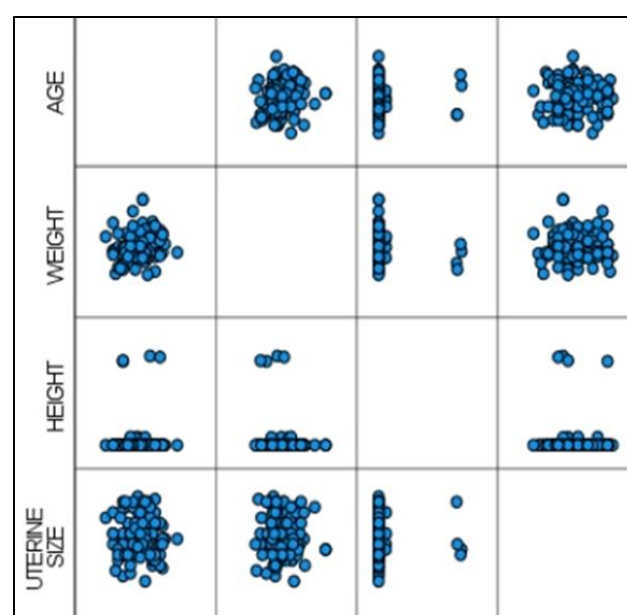
Pearson's correlation coefficients were computed to examine the relationships among five continuous variables: age, body weight, height, uterine size, a scatterplot matrix was also generated to visualise these associations.

Age and Weight revealed a small but statistically significant positive correlation was observed between age and weight ( $r=.170$ ,  $P=.003$ ), indicating that older women tend to have slightly higher body weight.

Other Variables in the analysis revealed no statistically significant relationship as correlations weren't detected between height and other variables, or between body weight and uterine size. The scatterplot matrix visually reinforced these results, as Positive linear trends were evident in the relationships between age and body weight.

All these findings taken together indicated that age emerged as a significant factor. By contrast, body weight, BMI, and height were not significantly associated with fibroid burden. These results underscore the importance of age and uterine morphology as clinical markers in understanding fibroid progression, while anthropometric measures such as weight and BMI appear to

exert minimal influence. As also represented Figure 1.

**Fig 1:** Shows the visual relationships between age, body weight, and fibroid burden

## Discussion

Uterine fibroid is a global burden with a preference for women of African descent. Fibroid poses a physical, physiological, economic and mental burden to women. The study showed a wide range of socio-clinical characteristics of fibroids. The prevalence of uterine fibroids exhibits a strong age-related pattern, with the highest incidence observed among women aged 40 to 59 years (50.4%) and 22 to 39 years (48.6%). These findings are consistent with the broader body of literature, which identifies the reproductive years particularly between ages 20 and 39 as the period of highest susceptibility. Its incidence significantly declines post-menopause and is rare in women under 20 [7, 8]. Compelling epidemiological evidence suggests that women aged 40 to 60 are 4 to 11 times more likely to develop fibroids compared to their younger counterparts [8, 9].

A pivotal study by Selo-Ojeme *et al.* highlights a fourfold increased risk of fibroid development in women over 40, with a notably higher likelihood of encountering multiple fibroid growths [10]. This trend is particularly pronounced among African women, with approximately 70% estimated to develop fibroids by the age of 50 years [9]. Corroborating global patterns,



studies from the United States and eight other countries report a high prevalence among women aged 45 and older [9, 11].

In Nigeria, research by Udobi utilizing ultrasound diagnostics confirms a markedly higher fibroid prevalence in women aged 40 to 49 relative to younger cohorts [12]. Additionally, studies by Olotu *et al.* identify a significant incidence of fibroids among women in their 30s [13]. The consistent findings across multiple regions underscore the critical role of reproductive hormones particularly estrogen and progesterone in the pathogenesis of uterine fibroids, while also affirming the rarity of their occurrence before menarche or following the onset of menopause [12-14]. More recent study show that fibroids predominate more at age 35 to 44 years, then decline with advancing age and a 53% reduction at menopause [5].

The study has indicated that 54% of women commenced menstruation between the ages of 13 and 15, whereas only 6% initiated menstruation at the age of 16 or older. Early menarche is recognised as a significant risk factor for the development of uterine fibroids, attributed to prolonged exposure to reproductive hormones [7, 15]. Furthermore, research has demonstrated that menarche occurring at or before the age of 11 is linked to a 25% increased risk of developing uterine fibroids in comparison to those whose menarche occurs at ages 12 or 13 [11]. Conversely, Udodofi identified a correlation between late menarche, defined as beginning at age 16 or older, and a decreased risk of fibroids, with those commencing menstruation between the ages of 13 and 15 following suit [12]. In contrast Akwuruoha *et al.* found no relationship between the age at menarche showed no significant association with fibroids [16]. This indicates that other factors are responsible for fibroid growth other than menarche.

The clinical features observed in this study population are consistent with the well-documented presentations of uterine fibroids. Most patients were within the normal (27.5%) or overweight categories, with a mean weight score suggestive of a trend toward higher body weight, which has been identified as a potential risk factor for fibroid development, supporting the association between increased adiposity and fibroid growth due to estrogen excess. As documented by other studies [7].

In this study, uterine size was significantly enlarged, with approximately 60% measuring between 12-30 weeks of gestational age, indicating a considerable burden of fibroids. Another study found that over 70% of cases had fibroids sized between 12 to 28 weeks [14]. This may be attributed to late presentation, which stems from poor health-seeking behaviour. Late diagnoses are often associated with more severe symptoms. As previously mentioned, more women are likely to be diagnosed if they undergo scans before clinical symptoms appear [15]. They can increase uterine size as much as 36 weeks; however, most were between 13 and 16 weeks at presentation [7, 9]. A 45.3% of patients sought medical care within six months of symptom onset, often after self-diagnosing and self-medicating. In contrast, 25.3% experienced symptoms for over three years, indicating potential delays in seeking help due to lack of awareness, cultural, economic constraints, and persistent myths, learned helplessness and orthodox treatment as conditions worsen [16]. These findings underscore the considerable reproductive health challenges and quality-of-life issues associated with uterine fibroids. They also highlight the necessity for enhanced early detection strategies, improved patient education, and more accessible treatment options, particularly in resource-limited settings.

Nulliparous (64%) accounted for most of the fibroid cases, attesting to the role of fibroids on fertility. Fibroids could have both a causal or a cause-and-effect role on fertility [15]. Fibroid

could prevent conception from the distortion of the uterine cavity, blockage of the tubes miscarriages or prevent implantation [13].

In the reverse role, delayed childbirth enhances fibroid growth, a virgin uterus is an ambient environment for fibroid growth in the presence of estrogen and progesterone. Fibroid to be linked with nulliparity or low parity [7, 8, 13].

Research indicates that pregnancy may inhibit the growth of uterine fibroids. During the immediate postpartum remodeling, the delivery of the placenta initiates blood loss within the uterus, which can lead to hypotension, destroying microfibroids or the shrinkage of existing fibroids, accounting for low fibroids among multiparous women [7, 13]. Among African women Adebamawo of African Collaborative Center for Microbiome and Genomics Research (ACCME) Study Cohort ACCME showed that 17% risk reduction of uterine fibroids for every birth and a 59% risk reduction of UF among parous women [5]. However, some other studies were at variance linking multiparity to fibroid. Conversely, some other studies at variance have found fibroid to be more common among multiparous women because pregnancy placenta hormones, consisting of estrogen and progesterone, enhance fibroid growth [11, 14, 17].

The presentation of uterine fibroids is influenced by their size, location, and quantity. The study has demonstrated a range of common presentations associated with fibroids, with menorrhagia occurring in 38.1% of cases, abdominal mass reported in 28.7%, and infertility in 26.2%. These symptoms are recognised as classic manifestations of uterine fibroids. A study by Isah, *et al.* revealed that 38.4% of patients presented with menorrhagia, 35.9% with an abdominal mass, 34.3% with infertility, and 24.2% with abdominal pain [8]. Odugu in a southeast retrospective study showed 54.5% abdominal swelling, 55.5%, heavy menstrual losses [2]. Adawe in Uganda pelvic pain (72.2%), menorrhagia (63.3%), pelvic mass (22.2%) and infertility (10%). These differences could be due to the type of study, population size, geographical zones, culture, patients' reports and records [18]. Other presentations were dysmenorrhea, abdominal pain, urinary symptoms, uterine prolapse and vaginal discharge, which have been seen in other studies. Menorrhagia could also be hypomenorrhagia, causing anaemia from chronic blood loss. This could arise from increased surface area, reduced contractile power of the myometrial muscles, endometrial hyperplasia, and increased blood flow.

The study reveals that risk factors for fibroids were age and nulliparity. Emphasising age and nulliparity are key factors in the development and progression of uterine fibroids, with older women exhibiting a higher fibroid burden. While anthropometric measures such as weight, BMI, and height showed no significant association, as highlighted in some studies [7]. This finding suggests that, despite the known metabolic and hormonal roles of adipose tissue, general body composition may not be a reliable predictor of fibroid burden.

## Conclusion

These global insights show that a comprehensive approach to understanding this issue is essential. The study shows the pattern of fibroid in a low resource setting. The influence of reproductive hormones, namely estrogen and progesterone, on the growth of uterine fibroids cannot be overstated. It is essential to prioritize further research to uncover the underlying mechanisms and develop effective interventions. Addressing the challenges posed by uterine fibroids will empower affected women, and involves improving their overall health and quality of life. We must confront this issue head-on, ensuring that women everywhere

receive the care and attention they deserve.

### Recommendation

These findings suggest that fibroid screening and risk assessment should prioritise reproductive age over general body composition. Further research into hormonal and genetic influences is recommended to enhance understanding of individual risk. Sensitisation and targeted educational interventions are needed to encourage early presentation and timely treatment. Implementing effective health strategies that address the reasons for late presentations will improve health outcomes for women with symptomatic.

### Limitation

The study is retrospective and thus encumbered with missing data. A multicenter, prospective cohort study with large samples would give clarity to the trends in social characteristics of fibroids.

**Conflict of Interest:** Not available

**Financial Support:** Not available

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