

Impact of Lifestyle Factors on the Risk and Progression of Uterine Fibroids: A Review

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Abstract: Uterine fibroids are responsible for several prevalent gynaecological issues among women. They are frequently asymptomatic; nonetheless, they may induce various symptoms, including abnormal uterine bleeding, pelvic pressure, urine incontinence or retention, and pain. Furthermore, women with uterine fibroids may experience increased instances of dyspareunia and non-cyclic pelvic discomfort. Despite the prevalence of bleeding and pelvic discomfort as primary symptoms associated with uterine fibroids in the literature, systematic investigations examining fibroid symptoms remain scarce. The present paper provides a comprehensive overview of uterine fibroids with a focus on the associated lifestyle factors.

Keywords: Uterine Fibroids, Leiomyoma, Lifestyle Factors, Obesity, Diet, Physical Activity, Insulin Resistance, Reproductive Health, Ayurveda, Yoga.

Introduction: -

Uterine leiomyomas, commonly referred to as fibroids, represent the most frequently occurring benign tumours among women of reproductive age. A substantial proportion of affected women, estimated to be nearly half, remain asymptomatic and are often unaware of their condition. Fibroids vary widely in size, ranging from very small nodules to large masses exceeding thirty centimetres, and may occur as single growths or as multiple lesions. Epidemiological evidence indicates that by the age of fifty, approximately 70% of White women and more than 80% of Black women develop at least one fibroid. Despite their benign nature, fibroids can lead to considerable morbidity in a subset of women and markedly impair quality of life. Symptomatic individuals commonly report pelvic discomfort unrelated to menstruation, menstrual disturbances such as heavy or painful periods and irregular bleeding, as well as pressure-related complaints including abdominal bloating, frequent urination, and bowel disturbances. Fibroids may also interfere with reproductive function, contributing to reduced fertility, early pregnancy loss, and adverse pregnancy outcomes such as pelvic pain,

preterm labour, abnormal fetal positioning, increased likelihood of cesarean delivery, and postpartum haemorrhage. Enlargement of the abdomen due to large fibroids is often perceived negatively by affected women. Among those who experience symptoms, pelvic pressure, abdominal bloating, and abnormal bleeding are the most frequently reported, occurring in nearly one-third of cases. The burden of fibroids is notably higher among Black women, who tend to present with larger, more numerous, and more symptomatic tumours. Clinically significant fibroids are less common after menopause but show higher prevalence during the perimenopausal period. Histologically, fibroids are benign, hormone-responsive tumours arising from the uterine wall and are composed mainly of smooth muscle cells and extracellular matrix. They are particularly common after the onset of sexual maturity, affecting approximately 20–30% of women, most frequently between the ages of 30 and 50 years. Uterine fibroids account for nearly 29% of gynaecological hospital admissions among women aged 15–54 years (Sadia et al., 2025).

Category	Specific Symptoms / Manifestations
Asymptomatic Cases	Absence of clinical symptoms in nearly 50% of affected women; fibroids often remain undiagnosed
Menstrual Abnormalities	Heavy and prolonged menstrual bleeding (menorrhagia), dysmenorrhea, intermenstrual bleeding, gushing-type bleeding, increased pad/tampon use
Pelvic Pain and Discomfort	Non-cyclic pelvic pain, pelvic pressure, pelvic discomfort, dyspareunia
Pressure-Related Symptoms	Abdominal bloating, increased urinary frequency, urinary retention or incontinence, bowel disturbances (constipation)
Reproductive and Fertility Issues	Subfertility, infertility, early pregnancy loss, miscarriage
Pregnancy-Related Complications	Pregnancy discomfort, premature labor, malpresentation, increased risk of cesarean section, postpartum hemorrhage
Abdominal Changes	Abdominal enlargement due to large fibroids, cosmetic concerns
Psychosocial Impact	Reduced quality of life, physical discomfort, emotional distress

Table 1: Common Symptoms and Clinical Manifestations of Uterine Fibroids

Review of Literature: -

He et al. (2013) investigated the relationship between lifestyle factors—such as diet,

physical activity, and stress—and uterine fibroids in a Chinese population. This case-control study included 73 women with fibroids and 210 women without fibroids, with diagnoses confirmed through ultrasound or surgery. Information on diet, activity levels, and stress was collected using a validated questionnaire. Statistical analysis was performed using logistic regression while controlling for factors like age and reproductive history. The results indicated that higher intake of fruits and vegetables, as well as greater occupational physical activity, were associated with a lower risk of fibroids, particularly among premenopausal women. Specifically, these factors showed a protective effect in reducing fibroid risk. On the other hand, higher BMI was found to increase the risk of fibroids in premenopausal women. However, these associations were not significant in postmenopausal women. Overall, the study suggested that a healthy diet and active lifestyle may help reduce the risk of uterine fibroids, especially before menopause.

Borah et al. (2014) examined the impact of uterine fibroids on women's lives using a large survey conducted in the United States. The study included 968 women from different racial backgrounds who reported having symptomatic fibroids. The findings revealed that women often delayed seeking treatment, with an average delay of 3.6 years, and many consulted multiple healthcare providers before receiving a diagnosis. Fibroids were found to significantly affect daily life, including work and career. About 28% of employed women reported missing work due to symptoms, and nearly one-quarter felt that their condition limited their career growth. In terms of treatment preferences, most women preferred non-surgical options, and many expressed a desire to preserve their uterus and fertility, especially those under 40 years of age. The study concluded that uterine fibroids have a considerable impact on physical, emotional, and professional aspects of women's lives, highlighting the need for better management strategies and patient-centered care.

Khyade (2017) conducted a prospective study over one year involving 50 women of reproductive age (30–55 years) who presented with menstrual complaints. The findings showed that uterine fibroids were most common in women aged 41–45 years (46%), followed by those aged 46–50 years (24%) and 36–40 years (11%). The most frequently reported symptom was heavy menstrual bleeding (menorrhagia), seen in 78% of cases. Other symptoms included dysmenorrhea (30%), polymenorrhea (22%), abdominal pain (22%), metrorrhagia (10%), urinary problems (8%), and vaginal discharge (12%). A smaller number of women reported infertility, abdominal lump, and other complaints. The study concluded that uterine fibroids are a common condition among women in the reproductive age group and can cause multiple symptoms that negatively affect their daily life and overall well-being.

Mehere and Naik (2019) presented a case study of a 35-year-old woman who visited the outpatient department of an Ayurvedic hospital with complaints of irregular and scanty menstrual flow along with occasional abdominal pain. Ultrasonography confirmed the presence of uterine fibroids. The patient was treated using Ayurvedic oral medications along with Panchakarma therapy. After six months of treatment, there was noticeable improvement in her symptoms, including normalization of menstrual cycles and reduction in discomfort. The study concluded that Ayurvedic treatment can provide significant relief in fibroid cases. However, since this was a single case, the authors emphasized the need for larger clinical trials to validate these findings. The study also aimed to understand the role of Ayurvedic treatment (Chikitsa), particularly focusing on Granthi (growths) and Shodhana therapy in fibroid management.

Sun et al. (2019) investigated how visceral fat (fat stored around internal organs) is related to the development of uterine fibroids in adult women. Data on general health and lifestyle were collected using questionnaires, while body fat measurements were obtained using bioelectrical impedance analysis. In other words, as these measurements increased, the risk of fibroids also increased. Among these, waist-to-hip ratio showed a particularly strong association. Although visceral fat and body fat percentage were also linked to fibroid size, the relationship was relatively weak. Additionally, these obesity indicators tended to increase with age in women with fibroids. The study suggested that abdominal fat, especially visceral fat, plays a key role in increasing fibroid risk. It also highlighted that simple measurements like waist-to-hip ratio can be used as a practical screening tool, particularly for identifying high-risk women during the perimenopausal stage. The authors emphasized the importance of proper nutrition and lifestyle changes, including diet and exercise, in preventing fibroid development.

Deepa et al. (2021) presented a case study of a 40-year-old woman diagnosed with uterine fibroids who initially sought conventional medical treatment but refused surgery. She then underwent yoga and naturopathy therapy for 11 days. Before treatment, ultrasound findings showed a bulky uterus with fibroids and features of adenomyosis. After the intervention, the size of the fibroid reduced significantly. Although the findings are promising, the authors noted that this was a single case study and recommended further research with larger sample sizes to confirm the effectiveness of such interventions.

Jenabi et al. (2022) conducted a meta-analysis to examine the relationship between BMI and uterine leiomyoma (fibroids). A total of 10 studies were included in the analysis. The results clearly indicated that both overweight and obese women have a higher risk of developing

uterine fibroids compared to women with normal body weight. Specifically, the risk was moderately increased in overweight women and even higher in obese women. These findings were supported by both relative risk (RR) and odds ratio (OR) values, which consistently showed a positive association. The study concluded that increased body weight is an important risk factor for uterine fibroids and highlighted the need for greater clinical attention, as fibroids can lead to serious health complications in women.

Muawad et al. (2022) conducted a case–control study to identify risk factors associated with uterine fibroids among Saudi women. The study included 478 participants from two medical centers in Riyadh, with fibroid cases confirmed through ultrasound. Information on demographic characteristics and potential risk factors such as parity, diabetes, hypertension, smoking, physical activity, and family history was collected through interviews and medical records. The results showed that more than half of the participants were obese. A family history of fibroids and obesity were also found to increase the risk. In contrast, women who had given birth previously showed a reduced risk of fibroids. The study concluded that age, obesity, and genetic factors are important contributors to fibroid development, while parity may have a protective effect. Identifying these risk factors early can help in reducing complications associated with fibroids.

Ngorili et al. (2022) conducted a study to understand the epidemiological factors linked with uterine fibroids. The study included a total of 166 women, among whom the largest proportion (34.9%) belonged to the 31–40 years age group. It was observed that most participants (57.2%) were from urban areas. In terms of reproductive history, 13.2% of women were nulliparous, while 14.5% were multiparous or grand multiparous. Additionally, 19.3% of the women were not using any form of contraception. Regarding clinical presentation, abdominal lump was the most commonly reported complaint (41%), followed by abnormal uterine bleeding (24.1%) and metrorrhagia (21.7%). Ultrasonography findings revealed that submucosal fibroids were the most prevalent type, seen in 38.6% of cases, followed by intramural fibroids in 19.3% of women. Other types included submucosal polyps (14.5%), seedling fibroids (13.9%), and subserosal fibroids (10.2%). The study concluded that uterine fibroids are most frequently observed in women aged 31–40 years, with abdominal lump and abnormal uterine bleeding being the most common symptoms, and submucosal fibroids being the predominant type.

Baird et al. (2023) investigated the role of pregnancy-related factors in reducing the risk of uterine fibroids. This study was conducted on a cohort of Black women aged 23–35 years who had no prior diagnosis of fibroids at the beginning of the study. Participants were

followed over five years, with regular ultrasound screenings conducted to detect fibroids. Detailed pregnancy histories were collected, and statistical analysis was performed to assess the relationship between reproductive factors and fibroid incidence. The findings showed that childbirth has a protective effect against fibroids, and this effect can last for up to 12 years after the last birth. Women who had given birth within the past three years showed a significantly lower risk of developing fibroids compared to those who had not given birth or had given birth more than 12 years earlier. Breastfeeding for more than six months further reduced the risk. However, short-term breastfeeding did not show a significant effect. The study also observed that unplanned cesarean sections might reduce the protective effect of childbirth. Overall, the study concluded that pregnancy and breastfeeding have long-term protective effects against uterine fibroid development.

Okesola et al. (2023) examined the relationship between socio-demographic factors, body measurements, and antioxidant enzyme levels in relation to uterine fibroids among women in Ibadan, Nigeria. The study included 190 women, with equal numbers of fibroid and non-fibroid cases. Data on demographic characteristics and body measurements were collected using questionnaires, while blood samples were analyzed to measure antioxidant enzyme levels. The results showed that women aged 26–45 years had the highest occurrence of fibroids, indicating that this age range is particularly vulnerable. The study also found that late marriage and higher levels of education were associated with a higher prevalence of fibroids. Women with fibroids had higher body weight, BMI, and abdominal circumference, indicating a strong link between obesity and fibroid occurrence. The findings suggest that oxidative stress may play a role in fibroid development.

Baiju et al. (2024) conducted an interventional study to evaluate the effects of yoga on women with uterine fibroids. The study followed a single-group pretest-posttest design and included 42 women aged 25–45 years. The results showed significant reductions in fibroid size, endometrial thickness, and ovarian measurements. In addition, improvements were observed across all quality-of-life domains, including symptom severity, emotional well-being, daily activity, and overall health. The study concluded that regular yoga practice over three months can help reduce fibroid growth and significantly improve quality of life in affected women.

Akhmetgaliev et al. (2024) conducted a study to examine how uterine fibroids present in women with different body types, particularly comparing hypersthenic (heavier build) and normosthenic (normal build) individuals. The researchers reviewed both national and international studies and also collected primary data through anonymous questionnaires,

detailed dietary histories, and interviews. A total of 260 women diagnosed with uterine fibroids and treated through laparoscopic or open myomectomy were included. These participants were divided into two groups based on their body mass index (BMI). The findings showed that pregnancy history was somewhat similar in both groups, with most women having one pregnancy. A notable proportion of women had undergone previous surgeries such as cesarean section. A very high percentage in both groups reported a history of pelvic inflammatory diseases. Dietary analysis revealed frequent consumption of foods such as beef, pork, potatoes, cabbage, and bakery items, while the intake of fish, seafood, dairy products, and olive oil was relatively low. Based on these observations, the study concluded that obesity plays an important role in the development of uterine fibroids. It may influence fibroid formation through hormonal and inflammatory pathways. Obesity can lead to insulin resistance and increased insulin levels, which may stimulate the growth of smooth muscle cells in the uterus and increase hormone levels, thereby promoting fibroid development.

Harmon et al. (2024) examined the relationship between body weight and the development and growth of uterine fibroids using a prospective cohort study design. The study followed 1,693 Black/African American women aged 23–35 years in Detroit over a period of five years, with ultrasound examinations conducted every 20 months. Unlike previous studies, this research used repeated measurements of BMI and imaging to track fibroid development more accurately. The findings showed a complex, non-linear relationship between BMI and fibroid incidence. Women with moderately high BMI (30 to $<35 \text{ kg/m}^2$) had a slightly increased risk of developing fibroids, while those with very high BMI ($\geq 40 \text{ kg/m}^2$) showed a lower incidence. The effect of BMI on fibroid growth was relatively small. The study suggested that this non-linear pattern may be due to the influence of body fat on inflammation and hormone levels. It also emphasized the need for further research focusing on different types of body fat and their biological effects on fibroid development.

Shravani et al. (2025) carried out a cross-sectional study to examine the epidemiology and clinicopathological features of uterine fibroids. This research was conducted in the Department of Obstetrics and Gynecology at GITAM Medical College, Visakhapatnam, from September 2022 to July 2024. The study included 165 patients who underwent surgical treatment for uterine fibroids. The findings revealed that the majority of patients (44.2%) were in the age group of 41–50 years. Menstrual disturbances were the most common symptom, reported by 74.5% of patients, followed by abdominal pain (35.1%), dysmenorrhea (20.6%), urinary complaints (17.6%), infertility (13.3%), white discharge per vagina (12.7%),

and abdominal mass (12.7%). A small percentage of patients also presented with vaginal mass and other symptoms. Among menstrual disorders, menorrhagia was the most frequent (56.9%), followed by metrorrhagia, polymenorrhagia, polymenorrhea, and postmenopausal bleeding. Regarding fibroid types, intramural fibroids were the most common (61.8%), followed by multiple fibroids (15.6%), submucous fibroids (10.3%), cervical fibroids and subserous fibroids (each 4.8%), and broad ligament fibroids (2.4%). Histopathological examination showed that the majority of patients had proliferative endometrium (69.7%) and chronic cervicitis (72.7%). The study concluded that uterine fibroids are more common in women of reproductive age, especially in the fourth and fifth decades of life, are rare before puberty, and tend to stop growing after menopause. Intramural fibroids were identified as the most common type, and proliferative as well as simple hyperplastic endometrium were the most frequent microscopic findings.

Akhtar et al. (2025) explored the association between lifestyle factors and the severity of symptoms in women with uterine fibroids in a resource-limited setting. This descriptive cross-sectional study was conducted at Mardan Medical Complex over six months and included 177 women diagnosed with fibroids. Data were collected through structured questionnaires and confirmed using pelvic ultrasound. Statistical analysis revealed that marital status was significantly associated with the severity of fibroid symptoms, with married women reporting more severe symptoms. However, other factors such as BMI, education level, contraceptive use, physical activity, diet, and stress did not show a significant relationship with symptom severity. Most participants reported moderate stress levels and low physical activity. The study concluded that social factors, particularly marital status, may influence how women experience fibroid symptoms. It also suggested that healthcare interventions should consider social and cultural aspects in addition to clinical factors, especially in low-resource settings.

Singh et al. (2025) conducted a pilot study involving 22 patients diagnosed with uterine fibroids. The participants were divided into two groups: a trial group and a control group. The trial group received Ayurvedic medicines along with Uttarbasti using a specially prepared medicated oil, while the control group received similar treatment but with sesame oil. After three months, patients in the trial group showed significant improvement in symptoms, with some cases showing complete disappearance of fibroids and others showing reduction in size. In contrast, the control group did not show notable improvement. The study concluded that specific Ayurvedic interventions may be effective in reducing fibroid size and symptoms.

Lifestyle Factors Associated with Uterine Fibroids: -

Lifestyle factors significantly influence the development and progression of uterine fibroids. Epidemiological research indicates that modifiable behaviours, including dietary choices, physical activity, body weight, substance use, and stress levels, might influence hormonal equilibrium and metabolic processes, thereby affecting the risk of fibroid development. Divergences in lifestyle behaviours among women, especially across various employment and residential contexts, may influence the occurrence and severity of uterine fibroids. Comprehending these lifestyle-related factors is crucial for recognizing preventable risk aspects and for formulating effective methods for illness prevention and health promotion. Increasing research indicates that extended periods of sedentary behaviour approximately double the probability of uterine fibroid development. Dietary patterns marked by a substantial consumption of processed foods and a deficiency of fresh fruits and vegetables are consistently linked to an increased prevalence of fibroids (Zhang et al., 2021). Additionally, psychosocial stress, inadequate sleep, and specific environmental exposures have been recognized as probable moderators of fibroid growth (Thompson et al., 2022). Race and age are two significant risk factors for uterine fibroids (UFs). Western research indicate that African American women are at a greater risk of uterine fibroids than White women. Furthermore, women aged 41 to 60 are ten times more susceptible to developing uterine fibroids than those aged 21 to 30. Other studies have indicated that women over the age of 40 are four times more likely than those under 40 to develop uterine fibroids (Stewart et al., 2017; Pavone et al., 2018; Lurie et al., 2005; Selo-Ojem et al., 2008).

Additional factors that may elevate the likelihood of developing uterine fibroids include nulliparity, genetic predispositions, early menarche, obesity, and hypertension, while the use of contraceptive pills is seen as having a preventive effect against the formation of uterine fibroids, for reasons that remain ambiguous. Deletions on chromosome 7 are believed to be linked to the formation of uterine fibroids. Furthermore, numerous studies have demonstrated that each fibroid originates from a solitary cell possessing an inactive allele that emerged autonomously within the uterus. A Saudi study has associated somatic MED12 mutations with uterine fibroids (Donnez and Dolmans, 2016; Stewart et al., 2017; Pavone et al., 2018; Lurie et al., 2005; Selo-Ojem et al., 2008; Sparic et al., 2015; Townsend et al., 1970; Hashimoto et al., 1995; Ajabnoor et al., 2018).

Research indicates that pregnancy offers a protective effect against the formation of fibroids; specifically, having three or more deliveries is related with a five-fold reduction in the risk of uterine fibroids. Additional factors, such as tobacco use, have been investigated as a

determinant of UFs. Studies have revealed contradictory findings concerning the association between cigarette consumption and UFs (Okolo, 2008; Chiaffarino et al., 2016). Reproductive and environmental variables are thought to affect the risk of fibroids. Relevant data suggests that higher parity correlates with a reduced risk, potentially due to the expulsion of nascent fibroids as the uterus undergoes involution postpartum. The utilization of progestin-only injectable contraceptives correlates with a diminished risk. Conversely, early menarche, the utilization of oral contraceptives before to the age of 16, a history of infertility, a young age at first childbirth, current alcohol usage, and cigarette smoking are correlated with an elevated risk (Cambridge and Sealy, 2012). Certain research indicate that a high body mass index constitutes a risk factor. Particular genetic alterations have been associated with the development of fibroids (Gavli et al., 2015).

Sex steroids, specifically estrogen and progesterone, are believed to contribute to the enlargement of fibroids. This is predicated on the observation that uterine fibroids typically proliferate during the reproductive years and diminish after menopause. The levels of estrogen and estrogen receptors in fibroids are approximately tenfold more than those in the normal myometrium. Sex steroids are believed to facilitate the formation of fibroids by inducing aberrant production of growth factors (Laughlin et al., 2010). Estrogen and progesterone function as physiological regulators of gene expression by activating nuclear receptors, which serve as transcription factors. Estrogen and progesterone are pivotal in controlling genes that govern cell development (Sarkodie et al., 2016).

Currently, it is estimated that 70% of diseases are associated with an individual's lifestyle. The WHO observed in 2002 that alterations in food habits, decreased physical activity, and tobacco use are associated with the prevalence of certain chronic diseases in developing nations. Lifestyle factors, including nutrition, stress exposure, and physical activity, can either facilitate or impede bodily function. It is generally acknowledged that a nutritious diet and consistent exercise help sustain a well-functioning body (Jahanbin et al., 2014). Hormones are thought to be directly affected by these lifestyle choices. They are determinants of reproductive health, both directly and indirectly. Therefore, lifestyle factors can be adjusted to improve general well-being. They significantly influence reproductive health and can have either beneficial or detrimental effects (Opare-Addo et al., 2014).

Conclusion: -

Uterine fibroids are highly prevalent benign tumours that significantly affect women's physical, reproductive, and psychosocial health. The reviewed literature clearly indicates that

their development and progression are influenced by a combination of hormonal, genetic, metabolic, and lifestyle-related factors. While non-modifiable factors such as age, genetics, and ethnicity play an important role, modifiable lifestyle factors—particularly diet, physical activity, body weight, and metabolic health—emerge as key contributors that can be targeted for prevention and management. The findings also suggest that lifestyle-based interventions, including balanced nutrition, regular exercise, and stress management, may help reduce the risk and severity of fibroids. In addition, complementary approaches such as yoga and Ayurvedic therapies show potential benefits in symptom relief and overall well-being, although their effectiveness needs further scientific validation through large-scale studies.

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