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Research Article

**A SURVEY TO ASSESS THE IMPACT OF UTERINE FIBROIDS  
AMONG WOMEN IN BATHINDA REGION****Kaur Shubhdeep<sup>1</sup>, Kaur Ramanjeet<sup>2</sup>, Patil R.K<sup>3</sup>, Kaur Hashmeet<sup>4</sup>, Patil H.C<sup>5</sup>**<sup>1</sup>B. Pharm (Student), Adesh Institute of Pharmacy and Biomedical Sciences, Bathinda.<sup>2</sup>Associate Professor, Adesh Institute of Pharmacy and Biomedical Sciences, Bathinda.<sup>3</sup> Professor & HOD , Adesh Institute of Pharmacy and Biomedical Sciences, Bathinda.<sup>4</sup>Pharm D(student), Adesh Institute of Pharmacy and Biomedical Sciences, Bathinda.<sup>5</sup> Professor & Principle Adesh Institute of Pharmacy and Biomedical Sciences, Bathinda**Article Received:** August 2021**Accepted:** August 2021**Published:** September 2021**Abstract:**

*A uterine fibroid is a widespread benign(non- cancerous) tumor of smooth muscle of the uterus. They are the most common pelvic tumor in women of childbearing age, and in at least 50% of affected women are asymptomatic. The aim and objective of the study was to assess the quality of life of women's with symptomatic uterine fibroids and to assess the knowledge regarding uterine fibroids among women. The study was conducted at Department of gynecology at Adesh Hospital, Bathinda. The duration of the study was 3 months. The study was started after getting approval from AIPBS, Departmental Research Committee Adesh University, Bathinda, Punjab. The confidence interval of the study was selected as 95% and the sample size was calculated through epi info. Overall, 112 participants were enrolled in the study as per sample size. Women of age group 30-45 years with uterine fibroids and complaints of heavy menstrual bleeding and other symptoms were included as cases. After a written informed consent form, a self-made questionnaire was used to collect information about severity of symptoms, due to uterine fibroids. The recorded data will be analyzed as per objectives of the study and the data analysis was done using MS.excel. Uterine fibroids causing several menstrual symptoms (heavy bleeding with blood clots, prolonged and frequent periods, irregular /Unpredictable periods) and bladder and bowel symptoms (frequent urination during the daytime, frequent urination during the nighttime, pressure or tightness in pelvic area) that can have negative impact on quality of women's life. Patients feel weakness /fatigue, sad, discouraged or hopeless and felt stressful and embarrassment due to this disease condition which a result interferes daily activity.*

*Key-words: Menstrual symptoms, bladder and bowel symptoms, Anemia, Infertility, Quality of life, Uterine fibroids,*

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**INTRODUCTION:**

Uterine fibroids also called as uterine leiomyomas, uterine myomas or uterine leiomyomata are benign growth of womb (uterine) muscle, they consists of a layer of smooth muscle and are accompanied by the connective tissues of the uterus[1].Most of the leiomyomas develop in the fundus and body of the uterus and only 3% are found in the cervix. They most often occur at the end of childbearing age . Sometimes they exist alone but in most cases are multiple or diffuse and if the uterus contain too many leiomyomas to count, it is called uterine leiomyomatosis[2].They are more common in overweight women and may have some genetic determinants that are less common in smokers. Most fibroids develop as ladies gets older, and tend to shrink later menopause [3]. Uterine fibroids are usually a mass of spherical tissue that can vary from a few millimeters to few centimeters in diameter. The blood supply enters at the periphery of the tumor and the nucleus is relatively free of blood vessels, which is a possible cause for the various forms of degeneration and necrosis that are seen in the center of some leiomyomas. Uterine fibroids are divided into four types which are mainly classified according to the location in the uterus:[4-6]

**Subserosal fibroids** :Subserosal fibroids are the fibroids which develop on the outside of the uterus, just below the endometrium and continue to grow outward.

**Intramural fibroids** : Intramural fibroids are the most common type of fibroids. These are the fibroids which are develop entirely within the muscle wall of the uterus and making the uterus appear larger than usual (this can give rise to “serious symptoms”).

**Submucosal fibroids** :Submucosal fibroids develop just under the inner wall of the uterine cavity. Submucosal fibroids are the fibroids which have the most impact on excessive menstrual bleeding and might cause miscarriage and infertility problems.

**Pedunculated fibroids** : Pedunculated fibroids are the fibroids that develop on a small stalk and attach them to the outer or inner wall of the uterus.

**CAUSES OF UTERINE FIBROIDS**

The cause of uterine fibroids is not yet clear, but it is now known that genetic and epigenetic factors, growth factors, cytokines, chemokines, sex steroids and extracellular matrix (ECM) components are involved in the occurrence and growth of uterine fibroids [7-8]. Progesterone and Estrogens are considered to be the major regulators of growth of leiomyomas . The effects of progesterone and

estrogens on their target tissues are mediated by growth factors such as cytokines and chemokines[9-12]. Progesterone and estrogen act as physiological regulators of gene expression and activates nuclear receptors which are transcription factors themselves. Therefore, progesterone and estrogen play a key role in regulating the genes which control growth of cell .Some studies have shown that both the steroids are important for growth of leiomyoma, but progesterone can affect the proliferation of leiomyoma more than estrogen. Several growth factors (TGF- $\beta$ ,TGF- $\alpha$ , VEGF,EGF, HB-EGF,aFGF, bFGF, PDGF, IGF, activin-A and myostatin)[13-17],cytokines (TNF- $\alpha$ , GM-CSF, erythropoietin, IL-15, IL-11, IL-13, IL-6, IL-1,)[18-23]as well as the chemokines and their receptors (CCR1, CCR3, CCR5, CXCR1, CXCR2,MCP-1, MIP-1 $\alpha$ , MIP-1 $\beta$ , RANTES, Eotaxin, Eotaxin-2, IL-8, ) [23,24] have been demonstrated to play key roles in the myometrial and leiomyoma biology. Extracellular matrix is an important growth factor for leiomyoma which can be used as a reservoir for growth factors, chemokines,cytokines, angiogenic and inflammatory response mediators[25].Fibroids ECM (extracellular matrix) contains the major subtypes of collagen , fibronectin and proteoglycans[25-28].

**RISK FACTORS FOR DEVELOPING UTERINE FIBROIDS:**

There are some most common risk factors for developing uterine fibroids. The occurrence expands with the age during reproductive year[29].In terms of race, Black and Latina women have a higher incidence than in white women[30]. Women with fibroids in first degree relatives are at higher risk[31] and premature(early) menarche (before the age 11)[32]. Complete pregnancy is related with a lower occurrence of fibroids [33] and women with children have a lower incidence of fibroids as compared with women who have not given birth [34]. (HRT)Hormonal Replacement Therapy while Although menopause lowers the chance of fibroids and the use of hormone replacement therapy expands this risk [35]. Hormonal contraception: OCP and progesterone-only injectable contraceptives have a protective effect on fibroids[34,35].Obesity: Weight gain and concentrated body fat are the risk factors for developing fibroids [36].

**UTERINE FIBROIDS SYMPTOMS :**

The most common symptoms in women’s with uterine fibroids are renal symptoms and menstrual symptoms. An enlarged uterus compresses the bladder and makes symptoms worse [37]. Symptoms usually include abnormal gynecological bleeding , heavy or painful menstrual bleeding, passing blood

clots during menstrual period, prolonged periods, frequent period or irregular periods, abdominal discomfort or flatulence, painful bowel movements, back/leg pains, frequent or delayed urination, and in some cases may also lead to infertility. Depending on the location of the fibroids, sexual intercourse may be painful. During pregnancy, it may be miscarriage, bleeding, premature labor or interference with the site of the embryo [38]. Although fibroids are common, fibroids are not a typical give rise to infertility and if they are located in a submucosal position, it is believed that this submucosal position will affect function of the lining and the potential of embryo implantation. In addition, fibroids larger in size can deform or block the fallopian tubes [39].

### DIAGNOSIS

The diagnosis is likely if bimanual pelvic examination reveals an enlarged, mobile and abnormal uterus that is perceptible above the pelvic symphysis, need picture confirmation. Gynecologic ultrasonography (ULTRASOUND) has become a standard tool for diagnosing uterine fibroids. Hysterosalpingogram is performed to detect fibroids in uterine cavity. This procedure involves an ultrasound scan while the contrast agent is injected from the cervix into the uterus. Make the fluid in the endometrial cavity visible, highlighting the structures in it, such as submucosal fibroids. If ultrasonography is inconclusive, the most accurate imaging test MRI (Magnetic resonance imaging) is done and it can also be used to find out the size and location of uterine fibroids [1,3,40].

### TREATMENT

Non-surgical treatment involves the use of medicines. Tranexamic acid is an artificial (synthetic) antifibrinolytic drug that is well tolerated through oral route. It gives non-hormonal therapy for sufferer with heavy bleeding during the menstruation [41]. Mefenamic acid is a non-steroidal drug. An anti-inflammatory drug (NSAID), is mainly used to treat dysmenorrhea (menstrual pain) It can moderately reduce the excessive menstrual bleeding in ladies without fibroids, although this is not as effective as that of tranexamic acid [42]. Gonadotropin-releasing hormone analogs (GnRH analogs) are the drugs (medications) that suppress the estrogen production in the ovaries. They are administered within three to six months and, if successful can lower fibroids by as much as 50% and give rise to osteoporosis [1]. An antiprogestin drug (mifepristone) reduces the bleeding associated with fibroids, but has side effects such as excessive growth (hyperplasia) of the endometrium [43]. Danocrine (Danazol) is an androgenic steroid hormone that is used to reduce

bleeding in women with uterine fibroids caused by drugs that stop menstruation. However, danazol did not shrink fibroids. Evista (Raloxifene) is used to prevent and treat the osteoporosis and reduce the fibroids size in postmenopausal women [1]. Low dose oral contraceptives pills containing estrogen or progestin only either combination pills are used to reduce uterine bleeding and cramps with uterine fibroids [39]. Medicines that lower estrogen levels can be used to temporarily slow or stop the growth of fibroids, especially before surgery. However, the drugs often causes menopausal symptoms such as dryness of vagina, hot flashes, and bone density decreased. The treatment cycle usually lasts three to six months. Fibroids often continue to grow after discontinuation of hormone therapy [44].

### SURGICAL TREATMENT

Surgical removal of uterine fibroids is usually done by hysterectomy (removal of the entire uterus) or myomectomy (removal of fibroids only). Multiple fibroids can be removed during myomectomy. Myomectomy can be performed in three different ways:

**Hysteroscopic myomectomy** – In hysteroscopic myomectomy, fibroids eliminated through the usage of a resectoscope that is an endoscopic device with a constructed in loop that could use excessive frequency electrical energy to cut tissue with either local or general anesthesia used and this is not recommended for the submucosal fibroids [45].

**Laparoscopic myomectomy** – Laparoscopic myomectomy requires the use of a laparoscope to make a standard open incision in the uterus to eliminate the fibroids. They are easier to remove when they are on a stem or near to the surface. The advantage is that it reduces morbidity rates and recovers faster than open or abdominal myomectomy.

**Laparotomic myomectomy** – Laparotomic myomectomy is also called abdominal myomectomy or open myomectomy and this is the most invasive surgical method to eliminate the fibroids. This is where an incision is made to eliminate the fibroid from uterus in the abdominal wall. A particularly extensive laparotomic procedure that might require any future delivery by Caesarean section.

**Endometrial Ablation** – In endometrial ablation, to prevent excessive menstrual bleeding, the lining of the uterus is destroyed or removed. This can be done with laser, electric current, wire loops, boiling water, freezing and other methods. In about three out of ten

women menstrual bleeding is lighter. But, after this operation women cannot have children [46].

**Myolysis** – In myolysis, the needle is placed into the fibroids generally directed by the laproscopy, and freezing or electrical current is used to eliminate the fibroids[37].

**Uterine artery embolization (UAE)** – Using intervention radiology methods, tiny particles of a compound called the polyvinyl alcohol which are administered through a catheter into the arteries feeding the fibroids and these tiny particles block the blood supply to the fibroids and starve it of blood and oxygen[1]. Medical literature describes and reported adverse reactions caused by uterine artery embolization including embolization errors, death, infection, ovarian function loss, failed fibroid expulsion, pain, foul vaginal odour, hysterectomy, and surgical embolization failure [47,40].

**Uterine artery occlusion (UAO)** – It involves clamping the involved uterine arteries rather than injection the polyvinyl alcohol particles, is currently being investigated as a potential alternative to (Uterine artery embolization) UAE[1].

#### METHODOLOGY:

After receiving permission from the AIPBS, Departmental Research Committee, the prospective observational analysis was carried out in Department of gynaecology at Adesh Hospital, Bathinda. The duration of the study was 3 months. The confidence interval of the study was selected as 95% and the sample size was calculated through epi info. Overall, 112 participants were enrolled in the study as per sample size. Inclusion Criteria was as women age group 30-45 years. Patients with uterine fibroids and Patients with complaints of heavy menstrual bleeding and other symptoms. Patients who are not willing to participate and pregnant and lactating women were excluded. The data collected was collated, tabulated and summarized for statistical analysis. Results are depicted through Microsoft Excel.

#### RESULTS:

The study was conducted at Department of gynaecology at Adesh Hospital, Bathinda. The duration of the study was 3 months. The study was started after getting approval from AIPBS, Departmental Research Committee Adesh University, Bathinda, Punjab. The confidence interval of the study was selected as 95% and the sample size was calculated through epi info. Overall, 112 participants were enrolled in the study as per sample size. The data analysis was done using MS-excel.

**Table no.1 Age of the patients**

Age of the patients	Number of patients
30-35 years	40
36-40 years	49
41-45 years	23

Out of 112 patients maximum number of patients were in the age group of 36-40 years i.e. 49 followed by 40 from age group 30-35 years, 23 patients of 41-45 years of age.

Figure no. 1. Patients age.

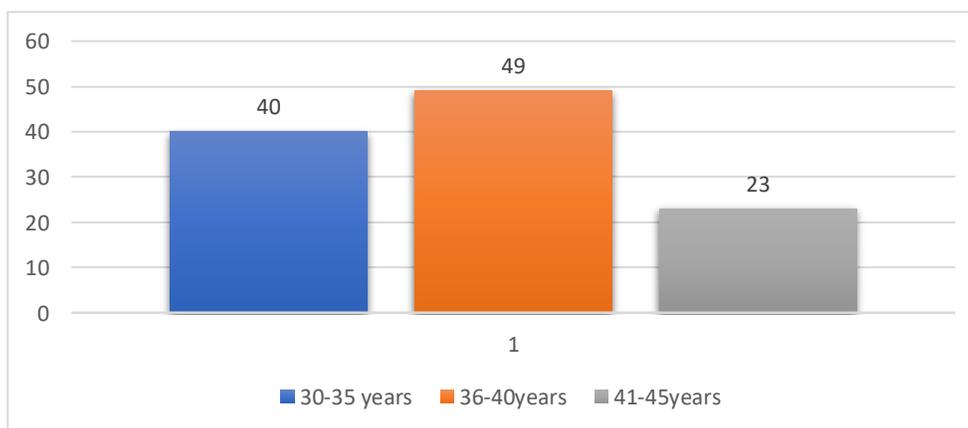


Table no. 2. Patients knowledge regarding uterine fibroids

Do you know what uterine fibroids are?	Number of patients
Yes	71
No	41

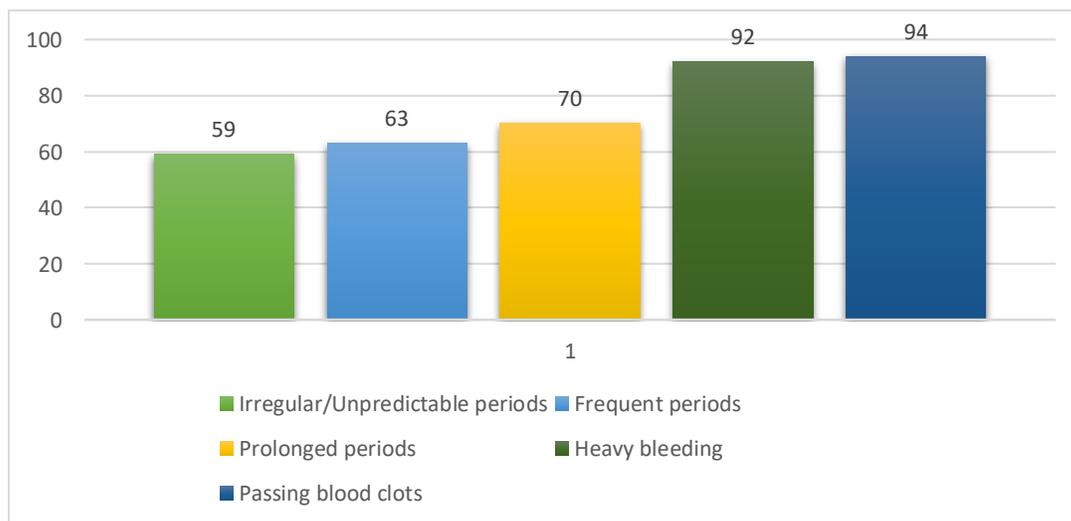
Out of 112 patients, it was observed that 71 patients have heard about fibroids and know the symptoms of uterine fibroids, while remaining 41 patients are not aware about the term uterine fibroids.

Table no. 3. Various symptoms that participant experienced

Symptoms	Number of patients
<b><u>Menstrual Symptoms</u></b>	
Heavy bleeding	92
Passing blood clots	94
Prolonged periods	70
Frequent periods	63
Irregular /Unpredictable periods	59
<b><u>Bladder and bowel symptoms</u></b>	
Daytime frequent urination	67
Nighttime frequent urination	52
Pressure symptoms	97
<b><u>Other symptoms</u></b>	
Weakness /fatigue	86
Constipation	79
Backache /leg pains	57

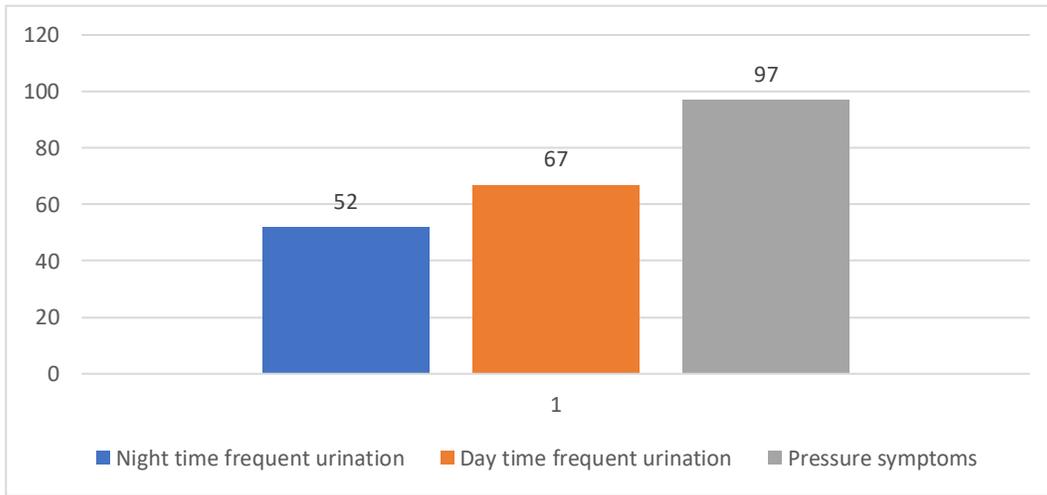
Out of 112 patients, 59 patients had complain of irregular /unpredictable periods,63 patients experience frequent periods,70 patients had prolonged periods during menstruation, 92 patients experience heavy bleeding and 94 patients had complain of passing blood clots during menstrual period.

Figure no.2. Common menstrual symptoms



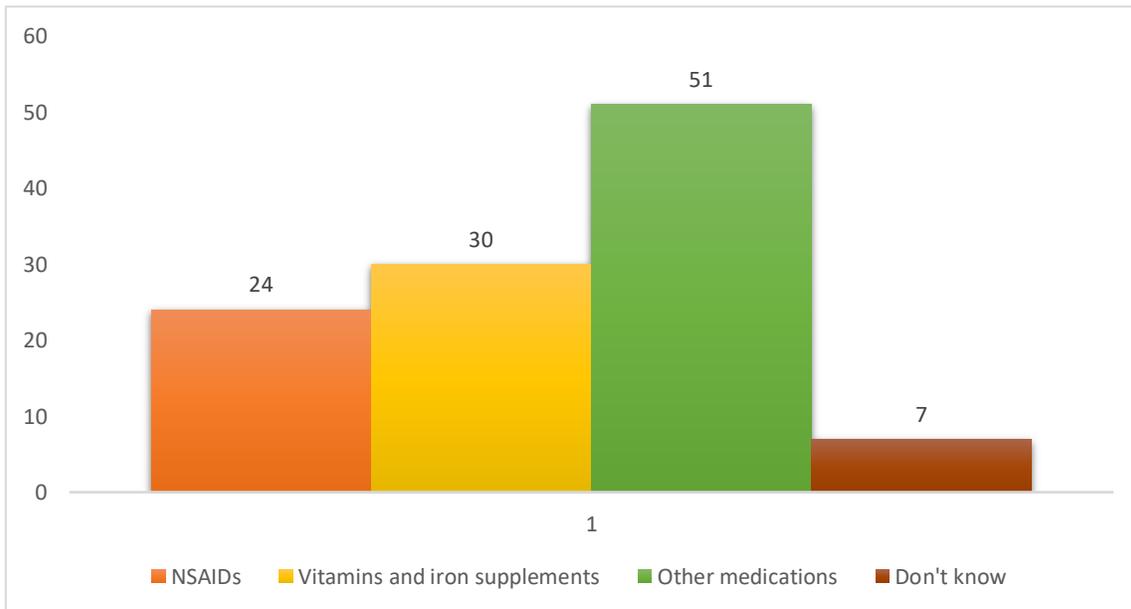
Out of 112 patients, 52 patients experience frequent urination during the nighttime, whereas 67 patients experience frequent daytime urination and 97 of them had complain of pressure or tightness in pelvic area.

**Figure no. 3 Common bladder and bowel symptoms**



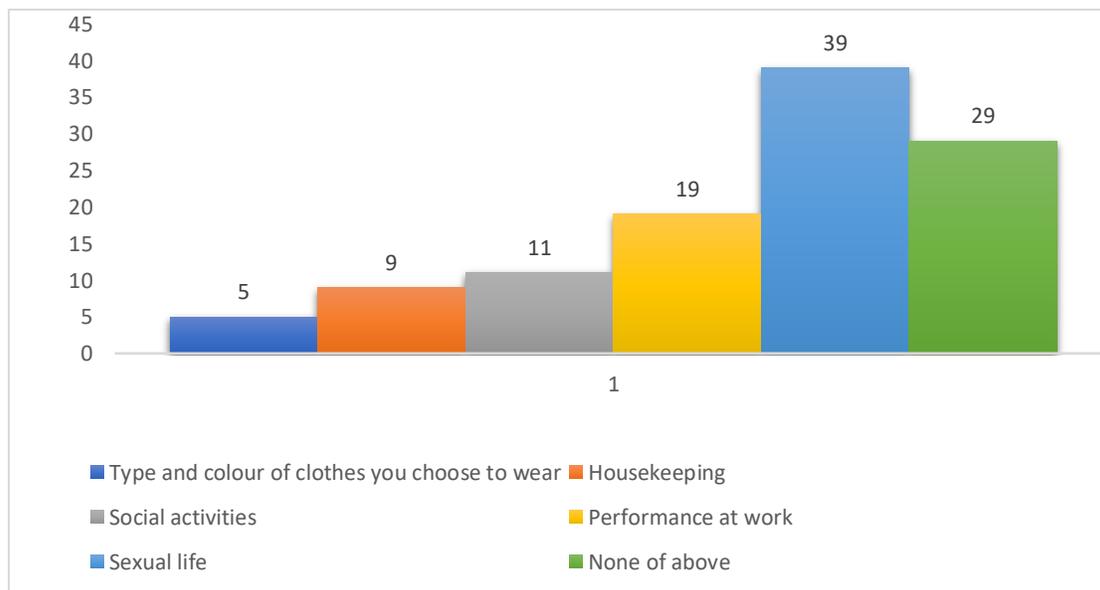
Out of 112 patients, 86 patients feel weakness /fatigue due to heavy bleeding. 79 patients had complained of constipation out of 112 patients. The results shows that 57 patients experience severe backache/leg pain, 34 patients experience moderate backache/leg pain, 7 patients experience mild pain and 14 patients experience no backache/leg pains . The outcomes shows that 26 patients feel sad, discouraged or hopeless a little of the time, 55 patients feel sad, discouraged or hopeless some of the time, 21 patients feel sad, discouraged or hopeless due to this condition all of the time. Out of 112 patients 69 women felt stressful and embarrassment due to this disease condition.

**Figure no. 4. Medications taken by patients**



It was observed that out of 112 patients, 24 patients use NSAID's to relieve the symptoms, 30 patients take vitamins and iron supplements, 51 patients take other medications for treatment of uterine fibroids and remaining 7 patients were not aware about medication taken by them.

Figure no.5. Activities negatively affected by symptoms



Out of 112 patients, about 39 patients stated that their sexual life was negatively affected by uterine fibroids symptoms, followed by performance at work (19 patients), social activities (11 patients) housekeeping (9 patients), type and colour of clothes you choose to wear (5 patients) .

### CONCLUSION:

This was a prospective observational study conducted on a total 112 patients as per sample size over a period of 3 months at Adesh Hospital, Bathinda. The survey has shown that there is generally good knowledge about uterine fibroids. Out of 112 patients 71 patients are aware about the term uterine fibroids and its symptoms. In this survey maximum number of uterine fibroids patients were in age group (36-40 years) causing various menstrual symptoms (heavy bleeding, passing blood clots, prolonged periods, frequent periods, irregular /Unpredictable periods) and renal symptoms (daytime frequent urination, nighttime frequent urination, pressure or tightness in pelvic area) that can have negative impact on quality of women's life. Patients feel weakness /fatigue, sad, discouraged or hopeless and felt stressful and embarrassment due to this disease condition which a result interferes daily activity.

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### REFERENCES:

- [http://www.medicinet.com/uterine\\_fibroids/discussion-269.htm](http://www.medicinet.com/uterine_fibroids/discussion-269.htm).
- Philip Thomason. Leiomyoma, Uterus (Fibroid) [online]. 2008 May 6. Available from: URL: <http://emedicine.medscape.com/article/405676-overview>.
- Goto A, Takeuchi S, Sugimura K, Maruo T. "usefulness of Gd-DTPA contrast-enhanced dynamic MRI and Serum determination of LDH and its isozymes in the differential diagnosis of leiomyosarcoma from degenerated leiomyoma of the uterus". *Int. J. Gynecol. Cancer* 12 (4): 354-61.
- Krysiewicz, S., Infertility in women: diagnostic evaluation with hysterosalpingography and other imaging techniques. *American Journal of Roentgenology*, 1992. 159(2): p. 253-261.
- Murase, E., et al., Uterine Leiomyomas: Histopathologic Features, MR Imaging Findings, differential Diagnosis, and Treatment. *Radiographics*, 1999. 19(5): p. 1179-1197.
- Ahmadi, F., et al., Uterine Leiomyoma: Hysterosalpingographic Appearances. *International Journal of Fertility and Sterility*, 2008. 1(4): p. 137-144
- Walker, C.L. and E.A. Stewart, Uterine fibroids: the elephant in the room. *Science*, 2005. 308(5728): p. 1589-1592.
- Islam, M.S., et al., Uterine leiomyoma: available medical treatments and new possible therapeutic options. *Journal of Clinical Endocrinology & Metabolism*, 2013. 98(3): p. 921-934.

9. Maruo, T., et al., Sex steroidal regulation of uterine leiomyoma growth and apoptosis. *Human Reproduction Update*, 2004. 10(3): p. 207-20.
10. Ciarmela, P., et al., Growth factors and myometrium: biological effects in uterine fibroid and Possible clinical implications. *Human Reproduction Update*, 2011. 17(6): p. 772-790.
11. Kim, J.J. and E.C. Sefton, The role of progesterone signaling in the pathogenesis of uterine Leiomyoma. *Molecular and Cellular Endocrinology*, 2011. 358(2): p. 223-31.
12. Chegini, N., Proinflammatory and profibrotic mediators: principal effectors of leiomyoma Development as a fibrotic disorder. *Seminars in Reproductive Medicine*, 2010. 28(3): p. 180-203.
13. Flake, G.P., J. Andersen, and D. Dixon, Etiology and pathogenesis of uterine leiomyomas: a Review. *Environmental Health Perspectives*, 2003. 111(8): p. 1037-54.
14. Ciarmela, P., et al., Activin-A and Myostatin Response and Steroid Regulation in Human Myometrium: Disruption of Their Signalling in Uterine Fibroid. *Journal of Clinical Endocrinology & Metabolism*, 2011a. 96(03): p. 755-65.
15. Ciarmela, P., E. Wiater, and W. Vale, Activin-A in myometrium: characterization of the Actions on myometrial cells. *Endocrinology*, 2008. 149(5): p. 2506-16.
16. Ciarmela, P., et al., Presence, actions, and regulation of myostatin in rat uterus and Myometrial cells. *Endocrinology*, 2009. 150(2): p. 906-14.
17. Sozen, I. And A. Arici, Interactions of cytokines, growth factors, and the extracellular matrix in the cellular biology of uterine leiomyomata. *Fertility and Sterility*, 2002. 78(1): p. 1-12.
18. Hatthachote, P. And J.I. Gillespie, Complex interactions between sex steroids and cytokines in the human pregnant myometrium: evidence for an autocrine signaling system at term. *Endocrinology*, 1999. 140(6): p. 2533-40.
19. Litovkin, K.V., et al., Interleukin-6 -174G/C polymorphism in breast cancer and uterine Leiomyoma patients: a population-based case control study. *Experimental Oncology*, 2007. 29(4): p. 295-98.
20. Luo, X., et al., Gene expression profiling of leiomyoma and myometrial smooth muscle cells in response to transforming growth factor-beta. *Endocrinology*, 2005. 146(3): p. 1097-1118.
21. Ding, L., X. Luo, and N. Chegini, The expression of IL-13 and IL-15 in leiomyoma and Myometrium and their influence on TGF- $\beta$  and proteases expression in leiomyoma and Myometrial smooth muscle cells and SKLM, leiomyosarcoma cell line. *Journal of the Society for Gynecologic Investigation*, 2004. 11: p. 319A.
22. Kurachi, O., et al., Tumor necrosis factor- $\alpha$  expression in human uterine leiomyoma and its down -regulation by progesterone. *Journal of Clinical Endocrinology & Metabolism*, 2001.86(5): p. 2275-2280.
23. Syssoev, K.A., et al., Expression of mRNA for chemokines and chemokine receptors in tissues of the myometrium and uterine leiomyoma. *Bulletin of Experimental Biology and Medicine*, 2008. 145(1): p. 84-89.
24. Sozen, I., D.L. Olive, and A. Arici, Expression and hormonal regulation of monocyte Chemotactic protein-1 in myometrium and leiomyomata. *Fertility and Sterility*, 1998. 69(6): P. 1095-1102.
25. Malik, M., et al., Why leiomyomas are called fibroids: the central role of extracellular matrix in symptomatic women. *Seminars in Reproductive Medicine*, 2010. 28(3): p. 169-179.
26. Wolanska, M., et al., Extracellular matrix components in uterine leiomyoma and their Alteration during the tumour growth. *Molecular and cellular biochemistry*, 1998. 189(1): p. 145-52.
27. Arici, A. And I. Sozen, Transforming growth factor-beta3 is expressed at high levels in Leiomyoma where it stimulates fibronectin expression and cell proliferation. *Fertility and Sterility*, 2000. 73(5): p. 1006-1011.
28. Norian, J.M., et al., Transforming growth factor beta3 regulates the versican variants in the Extracellular matrix-rich uterine leiomyomas. *Reproductive Sciences*, 2009. 16(12): p. 1153-1164.
29. Evans, P. And S. Brunzell, Uterine fibroid tumors: diagnosis and treatment. *Am Fam Physician*, 2007.75(10):p. 1503-8.
30. Baird, D.D., et al., High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. *American Journal of Obstetrics and Gynecology*, 2003.188(1):p.100-7.
31. Ligon, A.H. and C.C. Morton, Genetics of uterine leiomyomata. *Genes Chromosomes Cancer*, 2000.28(3):p.235-45.
32. D'Aloisio, A.A., et al., Association of intrauterine and early-life exposures with diagnosis of Uterine leiomyomata by 35 years of age in the Sister Study. *Environ Health Perspect*, 2010. 118(3): p.375-81.
33. Chen, C.R., et al., Risk factors for uterine fibroids among women undergoing tubal

- Sterilization. *Am J Epidemiol*, 2001.153(1):p.20-6
34. Wise, L.A., et al., Reproductive factors, hormonal contraception, and risk of uterine Leiomyomata in African-American women: a prospective study. *Am J Epidemiol*, 2004. 159(2): p.113-23.
  35. Templeman, C., et al., Risk factors for surgically removed fibroids in a large cohort of Teachers. *Fertil Steril*, 2009.92(4):p.1436-46.
  36. Terry, K.L., et al., Anthropometric characteristics and risk of uterine leiomyoma. *Epidemiology*, 2007.18(6):p.758-63.
  37. [http://www.womenshealth.gov/FAQ/uterine\\_fibroids.cfm](http://www.womenshealth.gov/FAQ/uterine_fibroids.cfm)
  38. <http://www.fibroidtumors.net>
  39. American Society of Reproductive Medicine Patient Booklet: Uterine Fibroids, 2003.
  40. Uterine Fibroids- The Merck Manuals Online Medical Library.
  41. Eder, S., et al., Efficacy and safety of oral tranexamic acid in women with heavy menstrual bleeding and fibroids. *Womens Health (Lond Engl)*, 2013.9(4):p.397-403.
  42. Lethaby, A., K. Duckitt, and C. Farquhar, Non-steroidal anti-inflammatory drugs for heavy menstrual bleeding. *Cochrane Database Syst Rev*, 2013.1:p. Cd000400.
  43. Engman M, Granberg S, Willians ARW, Meng CX, Lalitkumar PGL, Gemzell-Danielsson k (August 2009). "Mifepristone for treatment of Uterine Leiomyoma. A Prospective Randomized Placebo Controlled Trial", *Human Reproduction* 24 (8): 1870-9.
  44. <http://www.babycenter.in/preconception/susceptingaproblem/fibroid>.
  45. Polena, V., et al. "Long-term results of hysteroscopic myomectomy I 235 patients." *European journal of Obstetrics and Gynecology and Reproductive Biology*. 130 (2007): 232-237.
  46. Agdi M, and Tulandi T. "Endoscopic management of Uterine fibroids." *Best Practice and Research Clinical Th Obstetrics and Gynecology*, online publication Mar 2008.
  47. Wallach EE, Vlahos NF. "Uterine myomas: an overview of development, clinical features, and management". *Obstet Gynecol* 104 (2004), pp. 393-406.