

**A PREVALENCE OF DYSMENORRHEA AND ITS
CORRELATING LIFESTYLE FACTORS AMONG FEMALE
STUDENTS IN PRIVATE EDUCATIONAL INSTITUTIONS**

A Dissertation submitted to
**THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY,
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**MASTER OF PHARMACY
IN
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This is to certify that the dissertation work entitled “**A Prevalence of Dysmenorrhea and its Correlating Life Style factors among female students in Private Educational Institutions**” submitted by the student bearing **Reg. No: 261740204** to “**The Tamil Nadu Dr. M.G.R. Medical University**”, Chennai, in partial fulfillment for the award of Degree of **Master of Pharmacy** in Pharmacy Practice was evaluated by us during the examination held on.....

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DECLARATION

I do hereby declared that the dissertation “**A prevalence of Dysmenorrhea and its Correlating Life Style factors among female students in Private Educational Institutions**”, Chennai, for the partial fulfillment of the degree of **Master of Pharmacy in Pharmacy Practice**, is a bonafide research work which has been carried out by me during the academic year 2017-2018, under the guidance and supervision of **Dr. N. VENKATESWARAMURTHY, M.Pharm, Ph.D.**, Professor & Head, Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Kumarapalayam.

I further declare that this work is original and this dissertation has not been submitted previously for the award of any other degree, diploma, associate ship and fellowship or any other similar title. The information furnished in this dissertation is genuine to the best of my knowledge.

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1. INTRODUCTION

Dysmenorrhea is a painful/cramping sensation in the lower abdomen often accompanied by other biological symptoms including dizziness, fatigue, sweating, backache, nausea, vomiting and diarrhea that occurring just before or during the menstruation.¹ It begins soon after menarche and is the most common gynecologic complaint among adolescent and adult females.² The prevalence of dysmenorrhea among adolescents and young women had been varied between 64%-93%. Prevalence increases in adolescent and decreases with age. The studies conducted in Hong Kong University and Iraq students were reported as 80% and 85.3%.³

In worldwide the rate of prevalence is between 50.9% and 87.4%. In India 65% of women were reported with dysmenorrhea. About 76.1% of women still believe that dysmenorrhea is a natural part of a women's menstrual cycle and only 14.8% believe that treatment is necessary.⁴ Dysmenorrhea might negatively affect relationships, academic, professional performance, social and recreational activities.⁵

Dysmenorrhea is classified into two types; primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is characterized by pain during menstruation without organic lesion in pelvic caused by increased endometrial prostaglandins production. Secondary dysmenorrhea is painful menses associated with medical gynecological disorders such as endometriosis, adhesions, cysts, pelvic tumors. Hence the prevalence of primary dysmenorrhea varies from 45 to 95% globally.⁶ An excess of prostaglandins during menstruation is responsible for menstrual cramps and it is established as the main causative factors for dysmenorrhea.⁷

It results in the loss of 600 million working hours and two billion dollars worth of productivity each year in the United States.⁸ During the days of menstrual bleeding, at least one out of three young women had to be absent due to the intensity of the pain or expressed their limitation to do daily activities.⁹ Some studies revealed that there is no relationship between BMI and PD. Whereas, in some studies shows PD in underweight subjects. In addition, studies provide U shaped relationship between BMI and PD, indicating the both overweight and obese females are at the higher risk of having PD.¹⁰

Dysmenorrhea not only cause physiological discomfort but also affects overall quality of life and ability to take part in daily activities.¹¹ Increased severity of dysmenorrhea associated

with age, smoking, higher body mass index, earlier age at menarche, nulliparty, longer and heavier menstrual flow and history of dysmenorrhea. Women using oral contraceptive generally report less severe dysmenorrhea. Depression and stress have also been shown to increase the risk of dysmenorrhea.¹²

The management of secondary dysmenorrhea requires the treatment of the primary cause, non-pharmacological methods which include fatty diet restriction, exercise, rest, heat application, spinal manipulation, acupuncture, have been reported in several studies to ease the pains of primary dysmenorrhea.¹³ In pharmacological treatment mefenamic acid as a non-steroidal anti-inflammatory drug (NSAID) to reduce the dysmenorrhea pain.¹⁴

Although primary dysmenorrhea is common among adolescent and young adult females, not all of them will require medication. However, 25% of women experience menstrual pains that force them to use medication.¹⁵ Girls with dysmenorrhea have significantly lower quality of life than those without dysmenorrhea. Healthcare professionals should be made aware that adolescent girls who suffer from dysmenorrhea are likely to have a lower quality of life.¹⁶

Dysmenorrhea is the leading cause of morbidity leading to limitation of daily activities and recurrent absenteeism in adolescent. Generally it has negative impact on economic, social, academic and sport activities of many female students.¹⁷ Several national and international studies have investigated the epidemiology of dysmenorrhea and PMS amongst young females; however the differences in age and socio-demographic characteristics of target population resulted in wide variation in the prevalence of both disorder.¹⁸

A recent large-scale survey demonstrated that reporting of problematic periods, indicating that pain alone is not sufficient to make a period a clinical problem.¹⁹ The menstrual cycle is a very important indicators of women's reproductive health and endocrine function, and some of these menstrual cycle, premenstrual pain and discomfort at the time of menstruation, and heavy menstrual discharge, might affect the general and reproductive health of a women, as well as her productivity.²⁰ Adolescent girls need the support of their governments to provide adequate infrastructure, access to affordable sanitary products, and gender equity for them to manage their periods.²¹

Due to the relative immaturity of the hypothalamic pituitary ovary axis in the first 2 years following menarche, more than half of the menstrual cycles are anovulatory. This results in irregular cycles where cycle frequency can vary from less than 20 days to more than 90 days. After the first 1-2 years, the capacity for oestrogen positive feedback on the anterior pituitary develops with the subsequent mid-cycle LH surge and ovulating, resulting in regulation of the menstrual cycle.²²

There is limited and inconsistent evidence on the effectiveness of non pharmacologic therapies for primary dysmenorrhea. Expert consensus and a small study suggest that topical heat may be as effective as NSAIDs, but there is insufficient evidence for acupuncture, massage and yoga. Exercise and nutritional interventions (supplementation or increased intake of omega-3 fatty acids and vitamin B) may provide some benefit.²³

The way menstrual beliefs and practices prevail in many societies in one way or the other impacts women's emotional state, mentality, lifestyle and most importantly health.²⁴ Menstrual hygiene has recently received increased, global attention as a public health and human rights issue, especially in low resource countries.²⁵

Majority of girls go through similar situations as discussed, where they came to know about menses after they attained menarche. Even after attaining menarche they are vulnerable to detailed knowledge of it. There might be a good number of girls who aren't aware of Pre Menstrual Syndrome (PMS). Lack of education is the major reason behind the vulnerable situation of females in rural as well as in urban areas.²⁶

Premenstrual syndrome (PMS) is a cyclic somatic or psychopathological disorders associated with the existence of the corpus luteum and the influence of ovarian steroid metabolites on the level and activity of neurotransmitters. This condition can be considered physiological even though the severity of symptoms may be troublesome. Women of childbearing age in most of their menstrual cycles experience at least a few of the 150 symptoms of premenstrual syndrome.²⁷

Menstruation is stigmatized in our society. This stigma built up due to traditional beliefs in impurity of menstruating women and our unwillingness to discuss it normally. We don't know what may have been the reason that forced the holy men to refer to menstruating women as

'unclean'. But all religions (excluding Sikhism) refer to menstruating woman as “ritually unclean”.²⁸ A large number of beliefs and taboos relating to menstruation exist in society. These are mainly related to movements of the individual, restrictions of food and food habits, avoidance of certain day-to-day rituals, and so on; however, they are becoming less commonly practiced. Many bans and sociocultural prohibitions are still noticed in menstruation and menstrual practices, which result in adolescent girls remaining unaware of the scientific realities and clean health practices, which lead to negative health outcomes.²⁹

Menstrual health management (MHM) has received some attention over the last decade in low and middle-income countries (LMICs) and several interventions (e.g. awareness-raising interventions and interventions to provide sanitary products, such as menstrual cups and disposable sanitary pads) have been implemented in practice. The ultimate goal of the MHM interventions is to ensure that women and girls can manage their periods in a way that is not only healthy but that enables their full participation in school, work and other activities.³⁰ Attitude of parents and society in discussing the related issues are barriers to the right kind of information, especially in the rural areas. Menstruation is thus considered to be a matter of embarrassment in most cultures.³¹

Aerobic sport activities such as walking and swimming in comparison with the anaerobic and strength sport activities are very much effective in reducing the PMS psychological symptoms. It is clear that performing sport activities in comparison with medicinal treatments are without side effects and therefore they are devoid of any risks. Sports such as walking, cycling, swimming and mild running are favorable methods for settling down and elimination of the premenstrual tension.³²

Approximately, 50% of all menstruating women experience primary dysmenorrhea (PD) and 10–15% report severe symptoms, described as sharp, intermittent, or continuous pain, usually in the pelvis or lower abdomen within the first 48 hr of menstruation.³³

1.1. Assessment of pain:

Pain intensity was assessed using a visual analogic scale (VAS) ruler. On the front side of the ruler one end was labelled “no pain” and the other “worst pain possible.” On the back of

A common assumption made when using the VAS is that it provides a linear measure of pain. The VAS provides a continuous scale for subjective magnitude estimation and consists of a straight line, the limits of which carry a verbal description of each extreme of the symptom to be evaluated. The line is usually 10-cm long and vertical, though different lengths and orientations have been used and proven satisfactory. The VAS is often used to evaluate the analgesic properties of various treatments and accomplished by measuring either pain relief or pain severity. The simultaneous measurement of both has been suggested but is rarely observed.³⁶

The International Association for the Study of Pain (IASP) defined pain as an “unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.” It is widely believed that pain has a profound effect on a person’s quality of life (QoL).³⁷ The Short Form-36 Health Survey is a generic measure of QoL and consists of 8 subscales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), emotional role. The validity and reliability of SF-36 is well established in different disease conditions and settings. Scores for each variable are summed, then transformed into a Likert scale ranging from 0 (worst) to 100 (best).³⁸

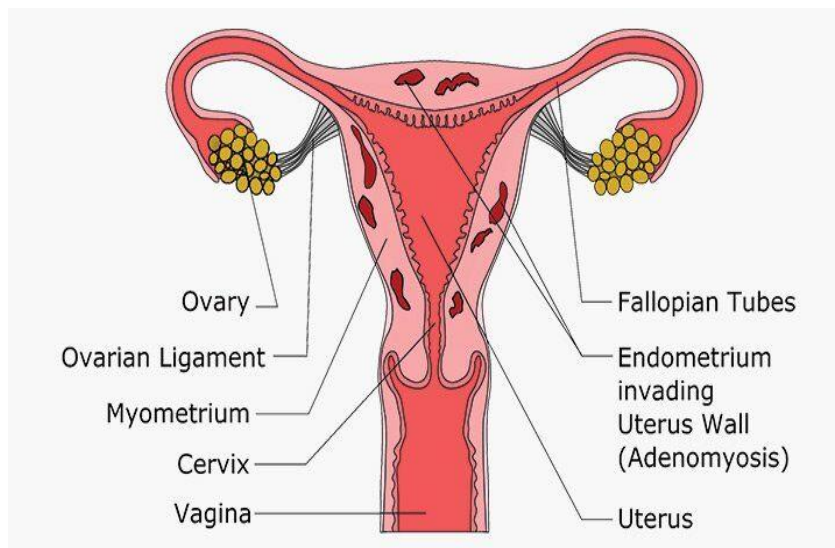


Fig no 2: Female Reproductive Organ

1.2. Physiology of menstrual cycle:

Women have a long reproductive lifespan of an average 36 years, from menarche at 8.5 to 13 years to menopause (defined as 1 year of anovulation) at around 51 years. Puberty takes 2.3 years, beginning with breast development followed by pubic hair development and axillary hair growth and concluding with menarche (first menstrual period). The ‘textbook’ menstrual cycle (interval from first day of menses to begin of next menses) in young healthy women with proven fertility is 28 days.³⁹

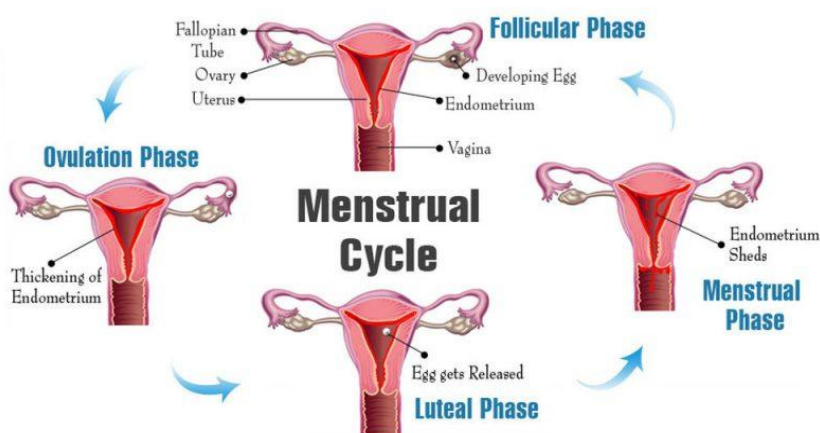


Fig no 3: Phases of menstrual cycle

Women’s reproductive physiology, including hormonal function, is reflected by menstrual cycle pattern. Disturbances in any of the stages of menstrual cycle (i.e., follicular and luteal phase) may affect the oocyte quality, ovulation, conception, implantation, or survival of the embryo. Thus, the menstrual cycle length and the length of follicular and luteal phases are good prognostic factors of reproductive health.⁴⁰

Menstrual function has a central role in women’s physical and reproductive health. Menstrual disturbances have been associated with adverse health outcomes, including increased risks for coronary heart disease, type 2 diabetes mellitus, cardio metabolic disease and reduced fecund ability. Therefore, it is important to identify factors associated with menstrual cycle dysfunction. Depression and anxiety-related disorders are among the leading causes of years of life lost due to premature mortality or disability in the USA. There is a 2:1 female-to male ratio in the prevalence of this disorders.⁴¹

Sanitary pads or tampons are used to absorb the menstrual flow. Both pads and tampons need to be changed regularly (at least every four hours). Using tampons has been associated with an increased risk of a rare illness called toxic shock syndrome (TSS).

Follicular phase

The follicular phase starts on the first day of menstruation and ends with ovulation. Prompted by the hypothalamus, the pituitary gland releases follicle stimulating hormone (FSH). This hormone stimulates the ovary to produce around five to 20 follicles (tiny nodules or cysts), which bead on the surface. Each follicle houses an immature egg. Usually, only one follicle will mature into an egg, while the others die. This can occur around day 10 of a 28-day cycle. The growth of the follicles stimulates the lining of the uterus to thicken in preparation for possible pregnancy.

Ovulation

Ovulation is the release of a mature egg from the surface of the ovary. This usually occurs mid-cycle, around two weeks or so before menstruation starts. During the follicular phase, the developing follicle causes a rise in the level of oestrogen. The hypothalamus in the brain recognizes these rising levels and releases a chemical called gonadotrophin-releasing hormone (GnRH). This hormone prompts the pituitary gland to produce raised levels of luteinizing hormone (LH) and FSH. Within two days, ovulation is triggered by the high levels of LH. The egg is funneled into the fallopian tube and toward the uterus by waves of small, hair-like projections.

Life span of the typical egg is only around 24 hours. Unless it meets a sperm during this time, it will die. When you want to have a baby you can improve your chance of getting pregnant if you know about ovulation and the ‘fertile window’ in the menstrual cycle.

Luteal phase

During ovulation, the egg bursts from its follicle, but the ruptured follicle stays on the surface of the ovary. For the next two weeks or so, the follicle transforms into a structure known as the corpus luteum. This structure starts releasing progesterone, along with small amounts of

oestrogen. This combination of hormones maintains the thickened lining of the uterus, waiting for a fertilized egg to stick (implant). If a fertilized egg implants in the lining of the uterus, it produces the hormones that are necessary to maintain the corpus luteum. This includes human chorionic gonadotrophin (HCG), the hormone that is detected in a urine test for pregnancy.

The corpus luteum keep producing the raised levels of progesterone that are needed to maintain the thickened lining of the uterus. If pregnancy does not occur, the corpus luteum and dies, usually around day 22 in a 28-day cycle. The drop in progesterone levels causes the lining of the uterus to fall away. This is known as menstruation.⁴²

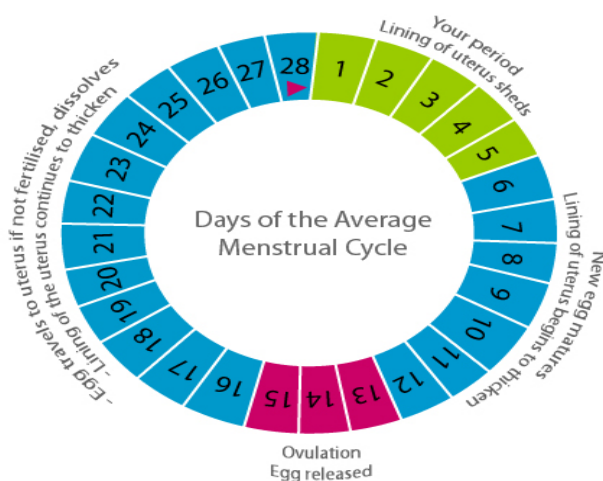


Fig no 4: Days of the Average Menstrual Cycle

Estradiol and progesterone are both highly lipophilic and easily pass through the blood-brainbarrier. Infact, animal studies and post-mortem studies in reproductive and postmenopausal women indicate the estradiol and progesterone are accumulated in the brain, with the high-concentration of progesterone found in the amygdale. The estradiol receptors (ER α and ER β) and the progesterone receptors (PRA and PRB) are highly expressed in brain are as associated with reproduction, cognitive function, and emotional processing such as the hypothalamus and the limbic system.⁴³

Numerous physical, emotional and cognitive changes over the course of the ovarian cycle have been recorded and in general, these are directly related to fluctuations in the levels of the hormones estradiol and progesterone. The menstrual cycle can exert an important influence over food consumption. The studies have reported changes in feeding behavior, in terms of the

quantity and types of foods consumed during the phases of the menstrual cycle especially between the follicular and luteal phases. In this way, the female steroid hormones especially estradiol and progesterone, can by means of regular fluctuations over the course of the ovarian cycle, influence food intake. The control of the cycle thus plays a central role in the maintenance of energy balance and consequently over the stability of the body weight.

In the context of the regulation of food intake, leptin is a substance that also has been implicated in the control of appetite and of energy expenditure and in the homeostasis of body weight. Leptin is a hormone secreted by several tissues, among them adipose tissue and the ovaries. Initially, leptin was regarded as an anti-obesity hormone, which regulated food intake by monitoring the energy reserves through interaction with leptin receptors in the hypothalamus. Nowadays it is known that the concentration of leptin in the follicular phase of the menstrual cycle is lower than that during the luteal phase, while significant positive correlations have been found between the increased expression of leptin and the increase in the concentration of steroid hormones.⁴⁴

WHO has defined Adolescence as the period between 10-19 years of life. Adolescent girls constitute about 1/5th of the total female population in the world. Adolescence in girls has been recognized as a special period which signifies the transition from girlhood to womanhood. Menstruation is a phenomenon unique to all females.

Menstruation is generally considered as unclean in the Indian society. Isolation of the menstruating girls and restrictions being imposed on them in the family, have reinforced a negative attitude towards this phenomenon. The first menstruation is often horrifying and traumatic to an adolescent girl because it usually occurs without her knowing about it. There is a substantial lacuna in the knowledge about menstruation among adolescent girls.

Many studies have revealed this gap and they showed that there was a low level of awareness about menstruation among the girls when they first experienced it. The studies have revealed that most of the adolescent girls had incomplete and inaccurate information about the menstrual physiology and hygiene.

It also revealed that mothers, television, friends, teachers and relatives were the main sources which provided information on menstruation to the adolescent girls. Good hygienic practices such as the use of sanitary pads and adequate washing of the genital area are essential during menstruation. Hygiene-related practices of women during menstruation are of considerable importance, as it has a health impact in terms of increased vulnerability to reproductive tract infections.⁴⁵

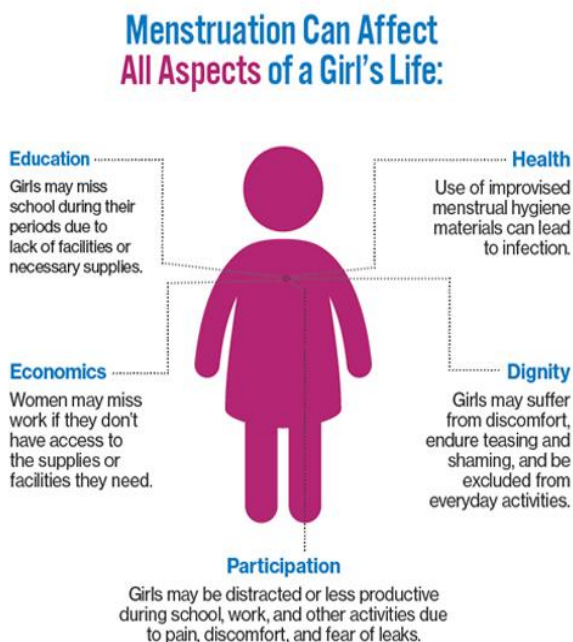


Fig no 5: Effect of menstruation in Girls Life

1.3. Menstrual disorders:

Dysmenorrhea (Painful Cramps)

Dysmenorrhea is severe, frequent cramping during menstruation. Pain occurs in the lower abdomen but can spread to the lower back and thighs. Dysmenorrhea is usually referred to as primary or secondary.

- Primary dysmenorrhea is cramping pain caused by menstruation. The cramps occur from contractions in the uterus and are usually more severe during heavy bleeding.
- Secondary dysmenorrhea is menstrual-related pain that accompanies another medical or physical condition, such as endometriosis or uterine fibroids .

Menorrhagia (Heavy Bleeding)

Menorrhagia is menstrual flow that lasts longer and is heavier than normal. The bleeding occurs at regular intervals (during periods). It usually lasts more than 7 days and women lose an excessive (more than 80mL) amount of blood. Menorrhagia is often accompanied by dysmenorrhea because passing large clots can cause painful cramping.

Amenorrhea (Absence of Menstruation)

Amenorrhea is the absence of menstruation. There are two categories: primary amenorrhea and secondary amenorrhea. These terms refer to the time when menstruation stops:

- Primary amenorrhea occurs when a girl does not begin to menstruate by age 16. Girls who show no signs of sexual development (breast development and pubic hair) by age 13 should be evaluated by a doctor. Any girl who does not have her period by age 15 should be evaluated for primary amenorrhea.
- Secondary amenorrhea occurs when periods that were previously regular stop for at least 3 months.

Oligomenorrhea (Light or Infrequent Menstruation)

Oligomenorrhea (Light or Infrequent Menstruation) is a condition in which menstrual cycles are infrequent, greater than 35 days apart. It is very common in early adolescence and does not usually indicate a medical problem.

Premenstrual Syndrome (PMS)

Premenstrual syndrome (PMS) is a set of physical, emotional, and behavioral symptoms that occur during the last week of the luteal phase (a week before menstruation) in most cycles. The symptoms typically do not start until at least day 13 in the cycle, and resolve within 4 days after bleeding begins. Women may begin to have premenstrual syndrome symptoms at any time during their reproductive years, but it usually occurs when they are in their late 20s to early 40s.⁴⁶

1.4. Menstruation is considered as physiological rhythms:

The monthly menstrual cycle represents one of many physiological rhythms essential for life. The heart beat and daily sleep-wake cycle represent obvious rhythms. Less obvious are the physiological processes inside the body such as the rhythmicity of the sex hormones that drive the menstrual cycle and others that regulate growth and metabolism.

These rhythms also interact with each other through synchronization of cellular activities with the external environment through feedback mechanisms that promote dynamic stability, such as the interaction between circadian rhythms, sleep and the menstrual cycle. Perturbations of the body's rhythmic processes are associated with disorders such as disturbed circadian rhythmicity with premenstrual dysphoric disorder (PMDD) or abnormal expression of the circadian clock gene and spontaneous abortion. It is during this time that women experience worsening of chronic diseases such as diabetes and inflammatory bowel disease, bloating, poor sleep quality and premenstrual syndrome (PMS) or PMDD.

Moreover, the luteal phase is also accompanied by decreasing amino acid levels and elevated nitrogen utilization. Women with PMS and PMDD have an increased appetite, food cravings and excess calorie intake which are associated with cyclical changes in serotonin during this period. These biochemical changes suggest nutrient utilization is affected by changing sex hormones between phases. The luteal phase of the menstrual cycle may be considered a normally stressed physiology.⁴⁷ The possibilities that one woman might influence the menstrual cycle of another has both practical and theoretical implications. The practical implications are the potential of a pheromone or some other signal influencing the timing of ovulation that would assist in reproductive scheduling.

The theoretical implication is of understanding synchronous ovulation as the product of natural selection in human biological evolution. Several types of behavior are known to influence menstrual cycle and ovulation in humans. Prolonged and intensive breast feeding, loss of body fat below certain levels, psychological stress and ingestion /injection of hormones.⁴⁸

1.5. Menstruation is considered as taboo in our culture:

Due to cultural expectations and restrictions many girls were not adequately informed about the realities of menstruation. As a result, they feel subnormal, diseased, or traumatized. Unprepared girls were frightened, confused, and feel embarrassed by menarche likely to develop negative attitudes towards menstruation. Even touching of menstruating women was considered toxic, they were prohibited from cooking and from taking certain foods like pickle. These prohibitions are more in the rural areas than in the urban areas. They were also not allowed to participate in religious activities or to contact religious articles. Menstruating girls are also not allowed to bath and wash hair, as it is believed to impede blood flow.

1.6. Types of Absorbents Used during Menstruation:

The preference of sanitary protection material is based on personal choice, cultural acceptability, economic status, and availability in local market. Along with basic sanitation facilities, one should be also provided with soap and menstrual absorbents to manage menstruation hygiene. The choice of absorbents varies among rural and urban women and girls. In rural areas, the most preferred absorbents are reusable cloth pads and in urban areas women prefer to use commercial sanitary pads.

Chlorine-bleached Kraft or sulphate pulp is used by manufacturers to produce fluff pulp as absorbent used to make disposable sanitary products. Nowadays, many deodorized and non-deodorized sanitary products are available in the market made of synthetic fiber rayon. These deodorized products contain chemicals like organochlorines which have antibacterial activity. Different menstrual products are used by women/girls.

1.7. Reusable and Washable Cloth Pads

They may be sustainable sanitary option but must be hygienically washed and dried in the sunlight. The sun's heat is a natural sterilizer and drying the cloths/cloth pads under it sterilizes them for future use. These cloth pads are reusable so they are cost-effective, easily available, and eco-friendly. They also need to be stored in a clean dry place for reuse to avoid contamination.

1.8. Commercial Sanitary Pads

They are easily available at many stores, chemist shops, or online. They are expensive, compared to cloth pads, non-reusable, and not very environment-friendly. The cotton used in their making is not 100% natural and may contain pesticides.

1.9. Tampons:

They are the type of absorbent that provides internal protection. They are kind of plug of soft material (cotton) which is inserted into the vagina to absorb the menstrual flow before it leaves the body. They are expensive, not easily degradable in nature and hence not very environmental friendly. Nowadays, sea sponge tampons are available in the markets which are a natural alternative to synthetic tampons.

1.10. Reusable Tampons

These are washable tampons made up of natural materials like bamboo, wool, cotton, or hemp. They are also knitted or crocheted using the natural absorbent material like cotton or wool. They are inserted into the vagina to absorb menstrual flow same as the disposable tampons.

1.11. Menstrual Cups

They may be a new technology for poor women and girls and an alternative to sanitary pads and tampons. They are like cups made of medical grade silicone rubber which makes the cup easy to fold and get inserted into the vagina to collect menstrual blood. They can be worn up to 6–12 hours depending upon the amount of menstrual flow, so it needs to be removed and emptied less frequently. They are reusable and environment-friendly. It offers sustainable, practical, and cost-effective alternative where sanitation conditions are not good.



Fig no 6: Menstrual aids

1.12. Bamboo Fiber Pad:

Instead of wood pulp, bamboo pulp is used as an absorbing material in these sanitary pads. It has more absorbing capacity and is safer to use. They are affordable, easily decomposed, and environment friendly pads which also possess antibacterial properties. This provides infection and irritation-free menstruation.

Also, bamboo charcoal pads are available in the market with advantage that blood stains are not clearly visible and are also reusable in nature. Nowadays, low-cost sanitary pads for rural women made from waste banana tree fiber were sold under trade name “Saathi” in India. They are environment friendly and decompose within six months after use. Besides these products, women in the remote rural areas also use natural materials like cow dung, leaves, and mud.

1.13. Water Hyacinth Pads:

Menstrual pads manufactured using water hyacinth is sold under trade name “Jani.” They are cost-effective, easily biodegradable, and eco-friendly in nature.

1.14. Menstrual waste disposal techniques used by women

Appropriate disposal of used menstrual material is still lacking in many countries of the world. Most of the countries have developed techniques to manage their fecal and urinary wastes but, because of lack of menstrual management practices in the world, most of the women dispose of their sanitary pads or other menstrual articles into domestic solid wastes or garbage bins that ultimately become a part of solid wastes.

Toilet facilities in India lack bins for the disposal of sanitary pads and hand washing facilities for menstruating women to handle menstrual hygiene. In urban areas, where modern disposable menstrual products are used they dispose of them by flushing in toilets and throwing in dustbins or through solid waste management, but in rural areas, there are many options for disposing menstrual waste such as by burying, burning, and throwing in garbage or in pit latrines.

In rural areas, mostly women use reusable and noncommercial sanitary materials like reusable pads or cloths. Thus, they generate lesser amount of menstrual waste as compared to women in urban areas who rely on commercial disposable pads. The menstrual material was disposed of according to the type of product used, cultural beliefs, and location of disposal. In slum areas, women dispose their menstrual waste into pit latrines as burning and burial were difficult due to limited privacy space.

The reason behind that is it was seen by men or used in witchcraft. In some cases, girls threw away their used menstrual clothes without washing them. Also many were reported being absent from school due to lack of disposal system, broken lock/doors of toilets, lack of water tap, bucket, and poor water supply. In some schools, incinerators or “feminine hygiene bins” are used for disposing menstrual waste material but due to shyness or fear of being seen by others they refrained from using it. The behavior of women regarding disposal is different when being at home and away from home.

At home, they dispose the waste by wrapping and throwing in the dustbin along with other domestic waste. The disposing habits change according to the place. In public places, prior to having knowledge about the consequences of flushing the pads, they flush them in the toilets or wrap and throw them in the dustbins.

Where dustbins are not placed they leave the soiled pads wrapped or unwrapped in the toilet corners. This makes the toilets dirty, breeding place for flies and mosquitoes, and also unhygienic for other toilet users and cleaners. In many cities, the persons who manage the public toilets always complain of blockage of sewage system because of flushing of sanitary pads or rags in the toilet.

1.15. Consequences of menstrual waste disposal:

The sanitation systems were designed with urine and feces in mind; they are unable to cope with the menstrual absorption materials. These absorption materials clog the sewer pipelines as they are unable to pass through and cause the system backflow. Materials like tampons, cotton wool, toilet paper, and other organic materials used for menstrual management might be decomposed in pit latrines/landfills except the plastic inlay of the commercial sanitary pads. Sanitary napkins might decompose over a period of about one year except its plastic lining in on-site sanitation.

In rural areas, pit latrines once full they were covered with soil and new pit was dug but due to space limitations this was not practiced in urban areas. It was reported that some women and girls wrap their used menstrual cloths and packs in polythene bags before disposing in pit latrines which prevents them from decomposition.

Nowadays, mostly women/girls prefer commercial sanitary pads and tampons which are made up of super absorptive materials like polyacrylate. These pads and tampons when flushed in the toilets they get saturated with liquid and swell up, thus resulting in sewage backflow, a serious health hazard. The adhesive wing and the perforated plastic layers in the commercial sanitary napkins are not easily biodegradable.

The sewage blockages were mostly due to accumulation of excessive quantity of solid waste or sand which results in hardening of the sludge in the pits. Blockage of sewage system is a global problem and major contributing factor is flushing of menstrual products in toilets. Deodorised sanitary products used by women/girls contain chemicals used in bleaching such organochlorines which when buried in the soil disturb the soil micro flora and decomposition takes time.

People living along side river banks throw menstrual waste into water bodies which contaminate them. These materials soaked with blood were breeding places for germs and pathogenic microbes. Sanitary products soaked with blood of an infected women/girl may contain hepatitis and HIV viruses which retain their infectivity in soil and live up to six months in soil.

The clogged drainage with napkin as to be unblocked and cleaned manually by conservancy workers with their bare hands without proper protection and tools . This exposes the workers to harmful chemicals and pathogens. Incineration is a better technique to dispose of menstrual waste but burning of pads releases harmful gasses that effects health and environment. Burning of inorganic material at low temperature releases dioxins which are toxic and carcinogenic in nature.⁴⁹

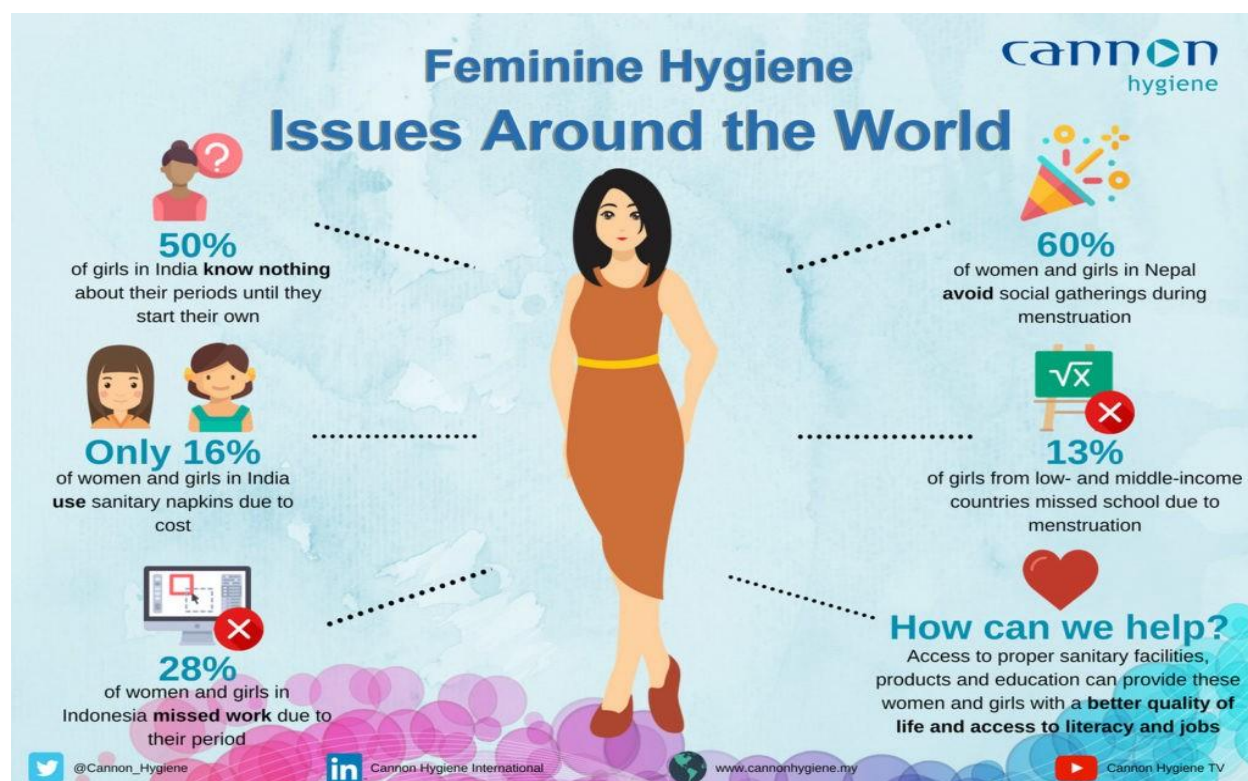


Fig no 7: Feminine Hygiene Issues around the world

1.16. Present status of sanitary napkins in India:

Every Woman's Health Right, a study by concluded that out of India's female population (355 million), only 12 % use sanitary napkins. Over 88% women depend on different alternatives like unsatisfied or rugs, ashes and husk sand. Some Serious women diseases such as Reproductive Tract Infection (RTI) are 70% more commonly visible among these women.

1.17. Effect of cost plays a major role in buying sanitary napkins:

In a survey, around 70% of women in India say that their family can't afford to buy them. Union Health Ministry was launched in 2012 to increase access, affordability and use of Sanitary Napkins among adolescent girls in rural areas. Under this scheme, packs which contain six SNs are provided to Below Poverty Line (BPL) girls at a subsidized cost of Rs 1 per pack. Girls in the Above Poverty Line (APL) category need to pay Rs 6 per pack of sanitary napkins, which is again very nominal.

On an average a woman spends 2100 days of her life menstruating but accessibility and affordability of menstruation products is largely absent, which restricts women's mobility and affects the development of adolescent girls. In rural India problem is exacerbated as many women have not seen sanitary napkin, nor are they aware about their use. Many poor women menstruate on their skirts or use the same set of cloths for months together.

In the Indian competitive market, Maximum of the available sanitary napkins are beyond the purchasing power of lower income group women. On an average pack of 10 sanitary napkins (Medium Quality) costs about INR30-40. Hence, statistically average spending per woman per month would be around INR 48, which is too much expensive for a women belonging to low-income group family. For ordinary village woman, the choice would often be between buying milk for the children or sanitary napkins for her. On an average a woman spends 2100 days of her life, menstruating but accessibility and affordability of menstruation products is largely absent, which restricts women's mobility and affects the development of adolescent girls.

In May 2012, Arunachalam Muruganantham, who is popularly known as the 'Menstrual Man' in India, found the root cause of high cost of the product which lies in its fixed cost for machinery, which is necessary to convert fiber used in sanitary napkins into absorbent cellulose. Till now most of the companies in Indian market are importing this machine. For an average entrepreneur in this segment, this cost is too high to manage.

He has developed a simple machine which can be replaced this expensive machine and convert fiber into absorbent cellulose. there was one study on the habits of menstrual hygiene among unmarried women (n=36,7850) held in the year 2007-08 at all India, this study provides

strongest reason for low usage of sanitary napkins is its high cost. Therefore if we can reduce its cost, number of users can be increased gradually. There are some small industries which are doing really well to bring revolution in this product segment.⁵⁰

Limited accesses and affordability of sanitary napkins and washing facilities are one of the reasons for constrained school attendance and ill health due to infection. The inconsistent supply of water in the schools and lack of privacy contributes to low attendance. Many girls, although physically present in the school, were unable to perform well due to poor concentration and attention resulting from the constant worry.⁵¹

The states have an option to choose and involve self-help groups for manufacturing and marketing sanitary napkins subsequently. For the safe disposal of the napkins at the community level, deep-pit burial or burning is the available options. Another alternative is the installation of incinerators in schools that could be manually operated.

The Tamil Nadu state government in India is already running a successful scheme in some districts, where girl schools have sanitary napkin vending machines and incinerators.⁵¹ Menstruation is a natural event, a key priority for women and girls is to have the necessary knowledge, facilities and cultural environment to manage it hygienically and with dignity. However, the importance of menstrual hygiene management is mostly neglected by development practitioners within the Water, Sanitation and Hygiene (WASH) and other related sectors such as reproductive health practitioners.

1.18. Menstrual hygiene and management:

Menstruating women and girls are considered impure, unclean, and unfit for the public sphere. This perception is exacerbated by the lack of washing and bathing facilities, materials and spaces that can help women and girls manage the menstrual discharge with dignity and safety. Sanitation and hygiene facilities conception and design completely ignore this need of women and girls to manage menstrual discharge.

Hygiene programs ‘teach’ girls and women how to be hygienic without explicitly providing the requisite materials, spaces, water and washing agents that cater for menstruation. By ignoring disposal facilities and mechanisms for contaminated materials, they reinforce the

stigma and shame surrounding menstruation. By talking about gender and user friendly design but remaining silent about menstruation, programmatic discourse reinforces stereotypes and refrains from breaking taboos and a view of the world that systematically ignores female users. WASH projects across the world focus on women because they are the managers and ensure proper use, maintenance and sustainability. Very few of these address the menstrual water, sanitation and hygiene needs of women.

The practical dimensions are well recognized. Poor menstrual hygiene is linked to high reproduction tract infections, urinary tract infections, bacterial vaginosis, vulvovaginal candidiasis and dysmenorrhea – indicating linkages with higher anemia and infertility.

If girls and women are to live healthy, productive and dignified lives, it is necessary that they are able to manage menstrual flow effectively. Therefore, access to appropriate water, sanitation and hygiene services, including clean water for washing their clothes that are used to absorb menstrual blood, and having a place to dry them, having a private place to change clothes or disposable sanitary napkins, facilities for disposal of used clothes and napkins and access to information to understand the menstrual cycle and how to manage menstruation hygienically are the prerequisites for effective menstrual bleeding management.⁵²

Lack of information, misconceptions and adverse attitudes to menstruation may lead to a negative self-image among girls who are experiencing menses for the first time and the culture of silence around menstrual hygiene further increases the perception of menstruation as something shameful that needs to be hidden.

Thus, to break the silence of a taboo and successfully manage menstrual hygiene, adolescents need to understand the biologic change they are experiencing and be equipped with the skills to cope with it. Generally, it is desirable to have a school teacher or a health worker to be the first source of information ensuring that right knowledge and skill has been imparted to the adolescents. Evidence also showed that the quality of educators can have a huge impact on sexuality education including information being provided related to menstruation.⁵³



Fig no 8: WASH and MHM self-efficacy

1.19. Management of menstrual pain:

Pharmacological Treatment:

Nonsteroidal anti-inflammatory drugs:

NSAIDs are a class of medications that are very effective in reducing pain associated with dysmenorrhea. Some NSAIDs are available without a prescription while others require a prescription; prescription NSAIDs are probably no more effective than non-prescription NSAIDs as long as an adequate dose is taken. NSAIDs are most effective if they are started as soon as bleeding or other menstrual symptoms begins, and then taken on a regular schedule for two to three days.

Birth control pills:

Birth control pills and other forms of hormonal birth control (e.g, patch, vaginal ring, injection, hormone-releasing intrauterine device, and contraceptive implant) also represent effective treatments for women with dysmenorrhea. These treatments work by thinning the lining

of the uterus, where prostaglandins are formed, thereby decreasing the uterine contractions and menstrual bleeding that contribute to pain and cramping. As women may choose to use NSAIDs and hormonal contraceptive simultaneously to control dysmenorrhea.

Obviously, hormonal methods of birth control do not make sense for women who are trying to become pregnant. However, for other women (whether or not they need birth control for preventing pregnancy), using hormonal contraception usually reduces dysmenorrhea within several months of starting it.

Women who start a hormonal birth control treatment continuously often have intermittent light bleeding or spotting, especially during the first two to three months of treatment; this usually declines with time. When bleeding occurs, it is usually lighter and associated with less severe cramping compared with before the treatment.

Traditionally, hormonal birth control treatments (pills, patch, ring) are taken so that the woman has monthly bleeding. However, women who prefer not to have bleeding each month and those who wish to minimize dysmenorrhea can use these contraceptives continuously to avoid or minimize pain associated with the menstrual period. Taking the treatment continuously means the following:

Women who take a birth control pill would take one "active" pill per day for 21 or 24 days (depending upon the brand of pill), and then open a new pack of pills and do the same. This can be done indefinitely, although many women stop taking their pill for several days every 9 to 12 weeks; many women will have some bleeding during this time.

- Women who use the patch would apply a new patch once per week for 9 to 12 weeks, and then use no patch for several days; most women will have some bleeding during this time.
- Women who use the vaginal ring would insert a new ring every three to four weeks for 9 to 12 weeks, and then use no ring for several days; most women will have some bleeding during this time.

Women who use injections of medroxyprogesterone acetate are given one injection every 12 weeks. Most women have some intermittent spotting or bleeding for the first few months; this

usually decreases with time. However, after women have received four or more injections (one year or more of use), most have little to no bleeding.

Intrauterine device (IUD):

The intrauterine device (IUD) that contains the hormone levonorgestrel can reduce dysmenorrhea by as much as 50 percent. In a study performed in teenage girls 12 to 17 years of age, use of a smaller, lower-dose levonorgestrel IUD was noted to reduce dysmenorrhea.⁵⁴

Non-pharmacologic treatments:

Treatments that do not require the use of a medication can also help to reduce the pain of dysmenorrhea. In some cases, these treatments are not as effective as medications, although they can be combined with a medication to increase the pain-relief benefit.⁵⁵

Heat:

Applying heat to the lower abdomen with a heating pad, hot water bottle, or self-heating patch can significantly reduce pain, often as well as treatment with an NSAID. It is important to avoid burning the skin with a heating pad or hot water bottle that is too hot; a temperature approximately 104°F (40°C) is recommended. The heat can be applied as often as it is needed. Using heat in addition to ibuprofen may speed the relief of pain.⁵⁶

Dietary, vitamin, and herbal treatments:

A variety of dietary and vitamin therapies have been studied for the relief of dysmenorrhea. However, the studies involved a small number of women and do not provide sufficient information regarding safety or efficacy. While a review of published studies suggested that ginger powder could have some effect.

Exercise:

Exercise seems to reduce menstrual symptoms, including pain, in some studies. Exercise has a number of benefits, so it is reasonable to try exercising to reduce painful periods.⁵⁷

Complementary or alternative medicine:

There is some evidence that complementary medicine practices such as yoga or acupuncture are effective in reducing painful periods. However, further study is needed to confirm the safety and efficacy of these treatments. Further information about complementary and alternative medicine is available from the National Center for Complementary and Integrative Health.⁵⁸

Transcutaneous electrical nerve stimulation:

Transcutaneous electrical nerve stimulation (TENS) is a treatment that involves the use of electrode patches, which are applied to the skin near the area of pain.⁵⁹ TENS has been used to treat pain caused by many conditions, and may help to reduce dysmenorrhea in some women. The patient wears a small battery pack on a belt, which generates a mild electrical current that passes to the electrodes. The electrical current is believed to stimulate the release of chemicals that block or reduce painful nerve impulses. An analysis of several studies showed that TENS does not relieve pain as well as medications; however, it may be a useful alternative for women who cannot or prefer not to take pain-relieving medications.⁶⁰

Surgical options:

At least two surgical procedures have been developed to treat dysmenorrhea. Both of these surgeries involve cutting or destroying the uterine nerves, which prevents the transmission of pain signals. However, no surgery has been shown to provide long-term relief of pain. Furthermore, surgery may be associated with complications.⁶¹ These may be related to regret of nerves or pain signals being transferred by alternate routes. As a result, surgical treatments for dysmenorrhea are not generally recommended.⁶²

2. LITERATURE REVIEW

Alsaleem MA *et al.*, (2019)⁶³ was conducted cross sectional study to assess the prevalence of dysmenorrhea and associated menstrual symptoms and their self-management technique among 197 female students of aged between 18 to 23 years .Dysmenorrhea was reported by more than two third of the girls(70.6%).In the 139 girls ,who reported dysmenorrhea ,its related information on severity of pain ,medication use and care seeking behaviour.severe pain (35.2%) respondents.About 66% reported using medications for pain relief and use of herbal medicine(69.1%).The gastrointestinal problems were the most common symptoms experienced by the students.Only (23%) reported consulting a doctor for their dysmenorrhea while most of them consulted with friends and family.Increasing the awareness can help in relieving the burden of the common health problems.

Heba A *et al.*, (2018)⁶⁴ was conducted cross sectional study were 956 female students are involved. The majority(80.34%)of dysmenorrhic females reported having moderate/severe pain.There is high proportion of dysmenorrhea among palestinian female university students.Skipping breakfast was the strongest predictor for moderate and severe dysmenorrhea.Increased awareness regarding factors that might influence the intensity of dysmenorrhic pain is needed .

Gebeychu MB *et.al.*, (2017)⁶⁵ was performed a cross sectional study on prevalence,Impact and management practice of dysmenorrhea among university of gondar students,northwestern ethiopia.The prevalence of dysmenorrhea was about 77.6% about half (50.6%) of the participant reported the family history of dysmenorrhea and experienced continuous type of pain(53%)which last 1-2 days(47.8%).Abdominal spasm(70.4%),back pain(69.7%)fatigue,and weakness(63.5%)were the most commonly experienced dysmenorrhea symptoms.The study revealed the high proportion of dysmenorrhea.The study suggest the need for educating adolescent girls on appropriate and effectiveness management of dysmenorrhea.

Martinez FM *et.al.*, (2018)⁶⁶ was performed the cross sectional study on life among 258 young female university students.The prevalence of dysmenorrhea was of (74.8%),and about (38.3%) as severe pain and 58% as moderate pain as reported.The lifestyle variable revealed the

following risk factor;drinking cola drinks,duration of the menstrual flow,eating meat and having a first-degree relative affected by dysmenorrhea.

Omidvar S *et.al.*, (2015)⁶⁷ was conducted the cross sectional on 1000 healthy females aged 11-28 years. Prevalence of dysmenorrhea was about 70.2%. About(23.2%) of the dysmenorrheic girls experienced pain for 2-3 days.The most common symptoms in both dysmenorrheic and non-dysmenorrheic girls during the menstrual periods was tiredness and second most prevalent symptoms was back pain.A small proportion of girls sought pharmacological management (25.5%) and 83.25 depended on non-pharmacological methods.Only 14.2% had sought medical advice.Sub optimal use of the medical advice and the barriers to seek medical attention by dysmenorrheic females need exploration. It is important that health education on puberty and menstruation is regarded as inadequate for many girls in India.

Chia CF *et.al.*, (2013)⁶⁸ was conducted the cross-sectional questionnaire survey on 240 undergraduate (128 medical and 112 non-medical) students. The most common impacts on daily life included reduced ability to concentrate and or disturbance with study(75%) and changes in normal physical activity (60%).Regarding the comparison of medical and non-medical students, the former used fewer pharmacological strategies among the various management approaches investigated. Health education on the existence of effective treatment from medical practitioners could help women whose dysmenorrhea was not controlled by self-management.

Hong Ju *et.al.*, (2013)⁶⁹ was conducted longitudinal or case-control or cross-sectional studies with large community-based to accurately determine the prevalence of dysmenorrhea and risk factors of dysmenorrhea.The prevalence of dysmenorrhea varies between 16% and 91% in women of reproductive age, with severe pain in 2%-29% of the women studied in articles published between 2002 to 2011.This review confirms that dysmenorrhea improves with increased age, parity and use of oral contraceptive and is positively associated with stress and family history of dysmenorrhea .

Eryilmaz G *et.al.*, (2010)⁷⁰ was conducted the descriptive study on prevalence of dysmenorrhea among adolescents in eastern turkey: its effects on school performance and relationships with family and friends. About (68.1-72.2%) female adolescents suffered from dysmenorrhea. Pain mostly lasted for one to three days(56.6%), followed by less than 1 day(23.5%) and more than 4

days (14.9%). The main visible adverse effects were an inability to focus on the courses, absenteeism from school and missing exams. One third of the subjects had problems onto family members. The duration and intensity of pain adversely affected school and attitude towards their families and friends.

Polat A *et.al.*, (2008)⁷¹ was performed prevalence of primary dysmenorrhea in young adult female university students. About 1266 students were anonymously surveyed by the doctors. 45.3% were found to suffer pain in each menstruation. 42.3% in some times and 12.2% in none. 66.9% were established to take analgesic drugs. This study revealed that college health care providers should screen routinely for dysmenorrhea among the students and offer treatment. As dysmenorrhea reportedly affects school performance, attendance, school administrators should devote more attention to providing health education on this topic to their students.

3. NEED OF THE STUDY

There are still many misconceptions and misbelieves regarding issues related to puberty and its hygiene. Unfortunately dysmenorrhea is not well studied in world-wide due to the fact that females suffering from dysmenorrhea have usually been educated that is normal to experience these pains, an incorrect assumption encouraged by families and most healthcare providers. As per my knowledge, no studies were conducted about dysmenorrhea in study area. This study aims to determine the prevalence of dysmenorrhea and correlate the life style factors with dysmenorrhea. This study helps to educate women regarding the lifestyle factors correlate with the dysmenorrhea.

4. AIM AND OBJECTIVES

Aim of the study:

To find out the prevalence of dysmenorrhea and its correlating life style among female students in private institutions.

Objectives:

- To study the prevalence of dysmenorrhea among female students in private institutions.
- To find out the relationship between the lifestyle factors influence on dysmenorrhea.
- To determine menstrual characteristics of students suffered with dysmenorrhea.

5. PLAN OF THE WORK

The entire study was conducted for a period of 6 months. The study design is given below

Phase I:

- To identified the scope.
- Literature review.
- Obtained consent from the students participated in the study.
- Prepared the questionnaire.

Phase II:

- To determine the socio-demographic status and life style factors among female students.
- To determine the menstrual characteristics of student suffered with dysmenorrhea.

Phase III:

- Evaluation and documentation of data.
- Submission of results.

6. METHODOLOGY

Study site

Private Institutions , kumarapalayam.

Study method

Prospective Cross sectional study

Study period

6 months of duration

Sample size

Expected sample size (n=323) were calculated by using Raosoft sample size calculator with 95% confidence interval. (<http://www.raosoft.com/samplesize.html>)

In our study 789 samples were used.

Inclusion criteria:

All female students between age group of 17-25years in private institutions who all are willing to participate in the study are included.

Exclusion criteria:

- Subject with previous history of any gynecological problems.
- Subject with irregular periods.
- Subject with chronic health problems, psychiatric problems and type pelvic pathology (fibroids, pelvic inflammatory diseases) are excluded.
- Subject using any medication atleast for last 3 months.
- Pregnant women and lactating mother were excluded from the study.
- Subject who are not willing to participate in the study.

7. RESULTS

Table no: 1 Prevalence of dysmenorrhea

S.No	Menstural Status	No of population (n=789)	Percentage(%)
1	Dysmenorrhea	576	73
2	No dysmenorrhea	213	26.99

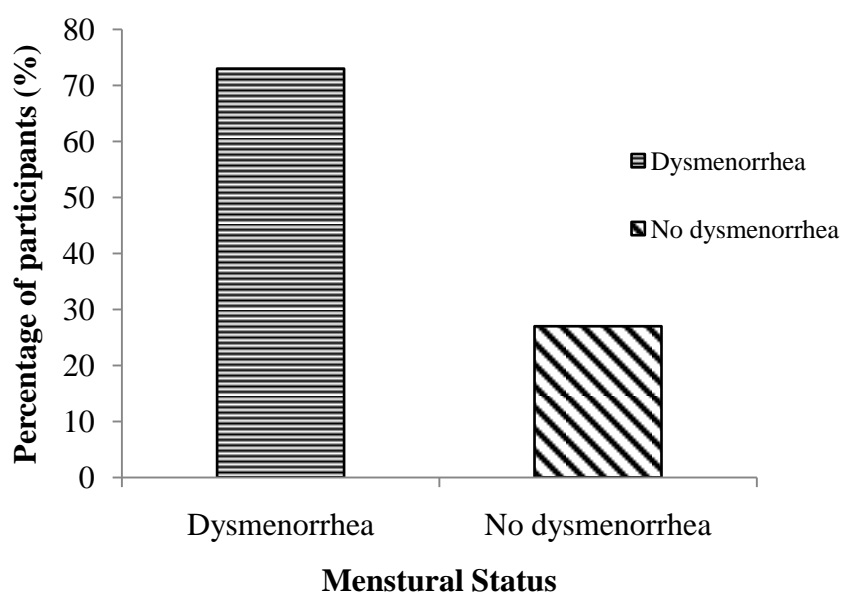


Fig no: 9 Prevalence of dysmenorrhea

Table no: 2 Categorization of study participants according to course of study

S.No	No of Medical students involved in study (n= 319)		No of non medical students involved in the study (n=470)	
	Dysmenorhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	224 (70.2)	95 (29.8)	352 (74.89)	118 (25.10)

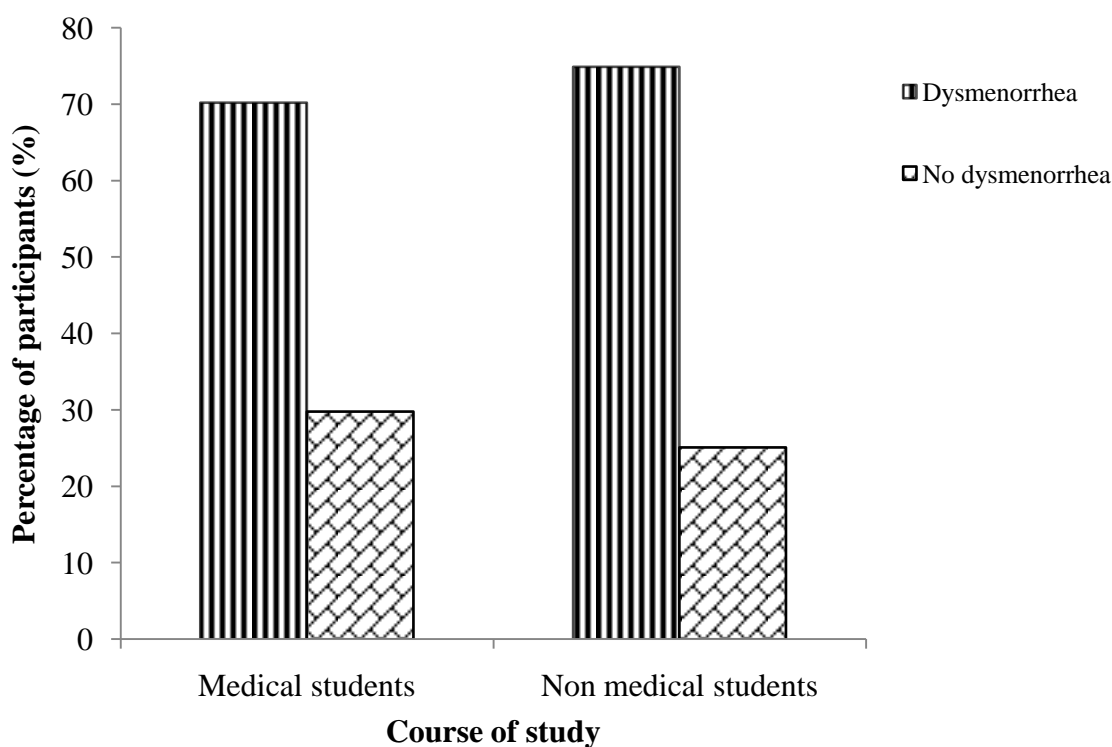


Fig no: 10 Categorization of study participants according to course of study

Table no: 3 Age of menarche in study population

S.No	Age of Menarche	No of Students with Dysmenorrhoea n=576 (%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352(%)	Without Dysmenorrhoea n=118 (%)
1	≤12 yrs	27 (4.69)	13(6.10)	15(6.6)	10 (10.5)	12(7.67)	3 (2.54)
2	13-15 yrs	393 (68.23)	121 (56.81)	145 (64.7)	50 (52.6)	248 (70.5)	71(60.2)
3	> 15 yrs	156 (27.1)	79(37.09)	64 (28.6)	35 (36.84)	92 (31.8)	44(37.3)

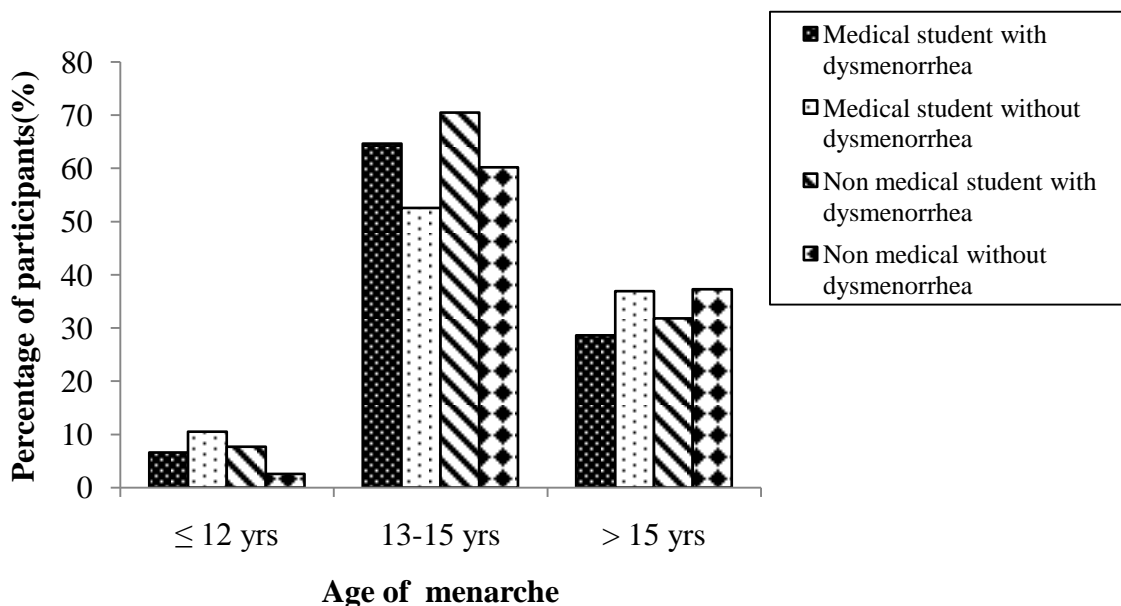


Fig no: 11 Age of menarche in study population

Table no: 4 Family history of dysmenorrhea in the study population

S.No	Family History	No of Students with Dysmenorrhea n=576(%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	Yes	461 (80.03)	38 (17.84)	160 (71.42)	12 (12.6)	301 (85.5)	26 (22.0)
2	No	115 (19.97)	175 (82.16)	64 (28.57)	83 (87.3)	51 (14.5)	92 (77.1)

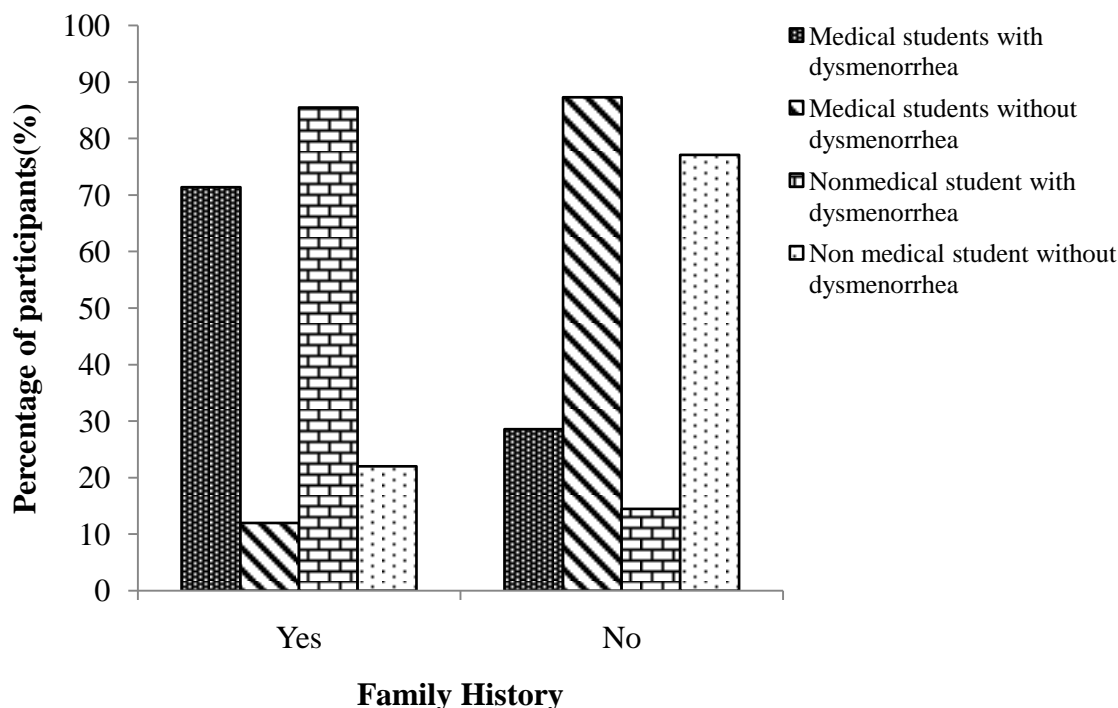


Fig no: 12 Family history of dysmenorrhea in study population

Table no: 5 Amount of Water intake by participants

S. No	Water intake	No of Students with Dysmenorrhea n=576(%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	< 1ltr	51 (8.85)	1 (0.46)	0 (0)	0 (0)	51 (14.5)	1 (0.9)
2	1 to 2 ltr	281 (48.78)	105 (49.29)	26 (11.61)	79 (83.2)	255 (72.4)	26 (22.0)
3	> 2 ltr	244 (42.36)	107 (50.23)	198 (88.4)	16 (16.8%)	46 (13.1)	91 (77.1)

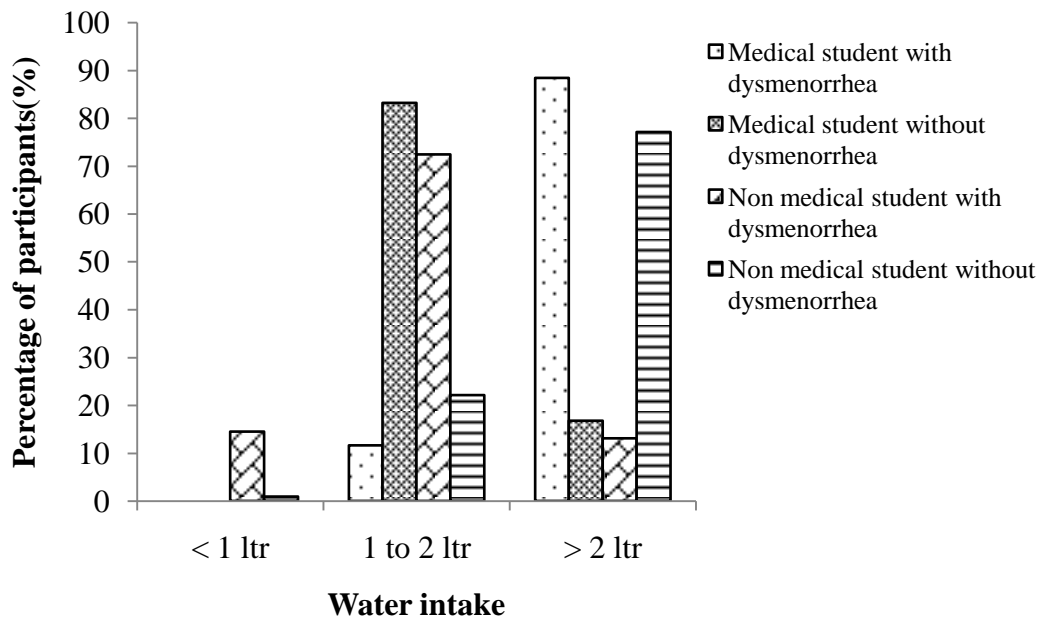


Fig no: 13 Amount of Water intake by participants

Table no: 6 Frequency of physical exercise

S. No	Physical exercise	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	Never	431 (74.83)	23 (10.79)	120 (53.57)	13 (13.68)	311 (88.35)	10 (8.47)
2	Occasional	132 (22.92)	43 (20.19)	100 (44.64)	21 (22.11)	32 (9.09)	22 (18.64)
3	Regular	13 (2.26)	147 (69.01)	4 (1.79)	61 (64.21)	9 (2.57)	86 (72.88)

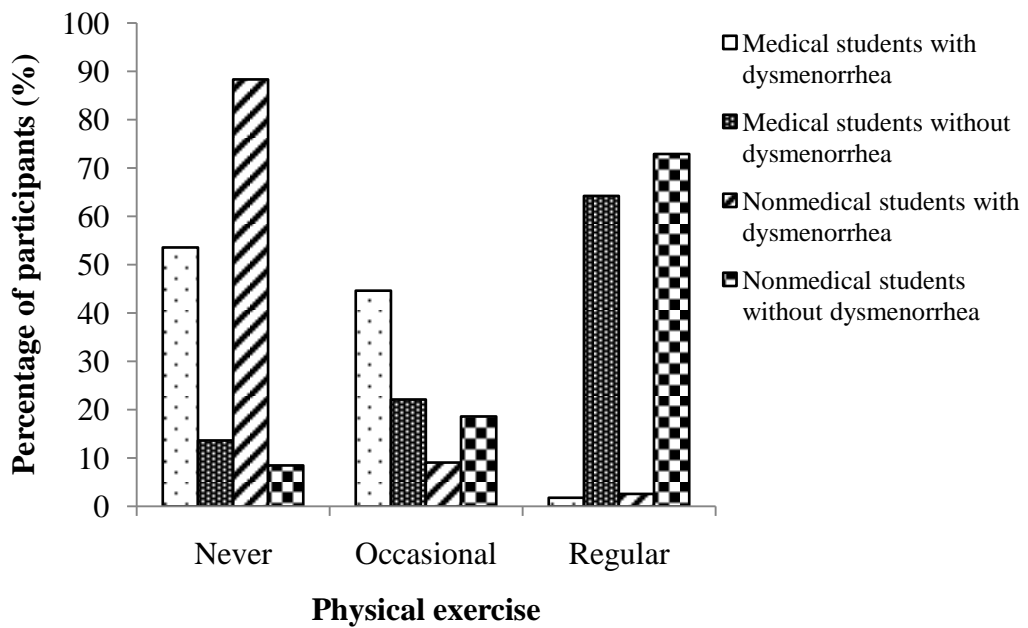


Fig no: 14 Frequency of physical exercise

Table no: 7 Cooking oil used by participants

S.No	Type of cooking oil	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	Sunflower	431 (74.83)	23 (10.79)	120 (53.57)	13 (13.68)	311 (88.35)	10 (8.47)
2	Groundnut	132 (22.92)	43 (20.19)	100 (44.64)	21 (22.11)	32 (9.09)	22 (18.64)
3	Coconut	13 (2.26)	147 (69.01)	4 (1.79)	61 (64.21)	9 (2.57)	86 (72.88)
4	Palm	22 (3.82)	32 (15.02)	15 (6.7)	23(24.21)	7 (1.99)	9(7.62)

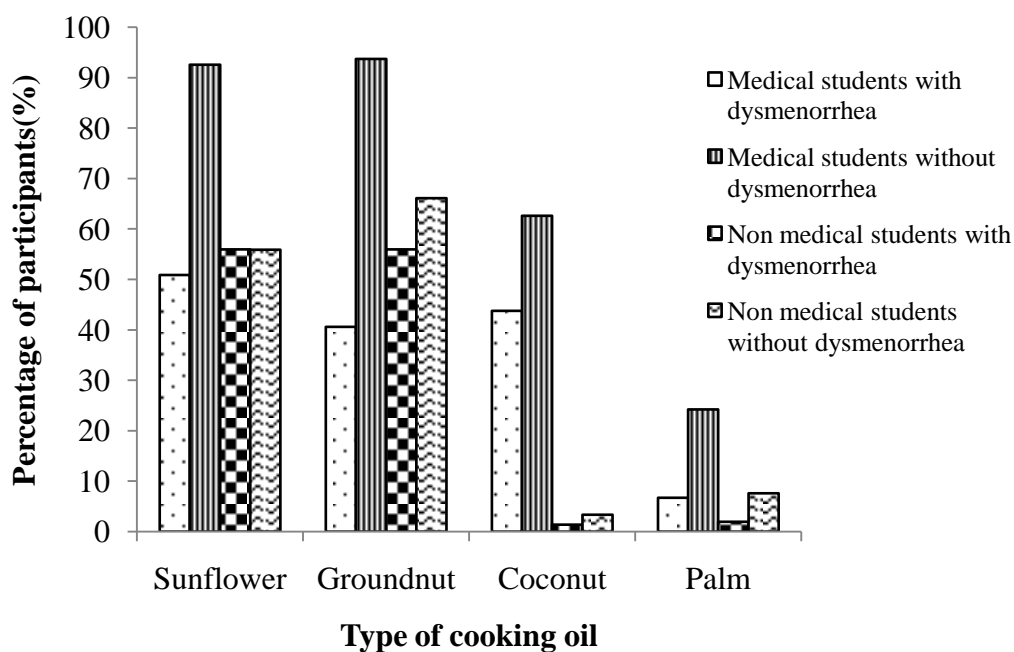


Fig no: 15 Cooking oil used by participants

Table no: 8 Frequency of consumption of fish

S. No	Frequency of consumption of fish	No of Students with Dysmenorrhoea n=576(%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352 (%)	Without Dysmenorrhoea n=118 (%)
1	Regularly	32 (5.56)	78 (36.61)	3 (1.34)	52 (54.74)	29 (8.24)	26 (22.04)
2	Occasionally	440 (76.39)	116 (54.46)	165 (73.66)	28 (29.47)	275 (78.1)	88 (74.58)
3	No	104 (18.05)	19 (8.92)	56 (25)	15 (15.79)	48 (13.6)	4 (3.39)

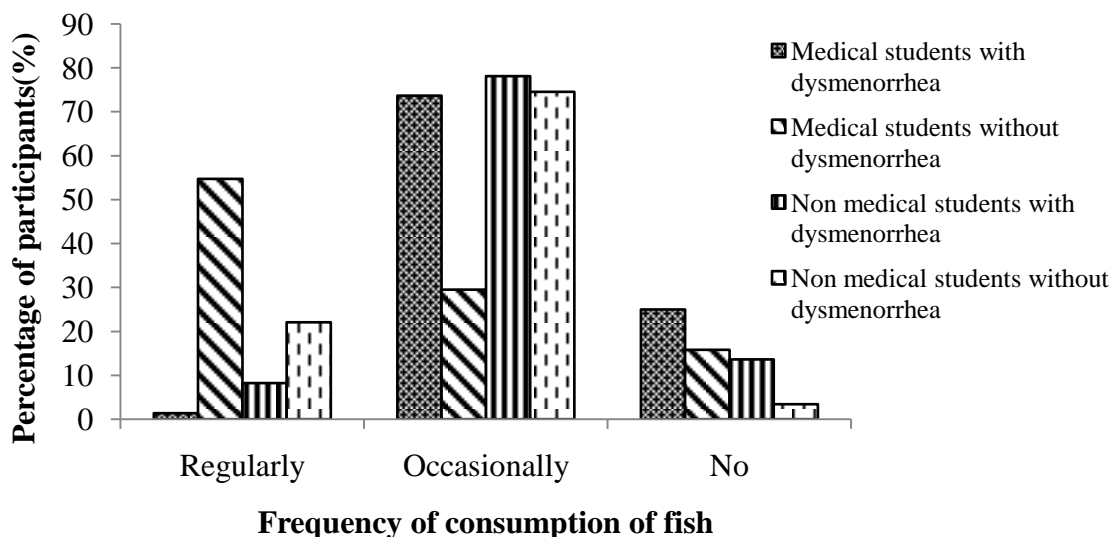


Fig no: 16 Frequency of consumption of fish

Table no: 9 Frequency of meat intake by the participants

S.No	Frequency of meat	No of Students with Dysmenorrhoea n=576(%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352(%)	Without Dysmenorrhoea n=118 (%)
1	Weekly Once	246 (42.70)	118 (55.39)	102 (45.54)	51 (53.68)	144 (40.91)	67 (56.78)
2	More than 2 times	240 (41.67)	85 (39.91)	74 (33.04)	37 (38.95)	166 (47.16)	48 (40.68)
3	No	90 (15.63)	10 (4.69)	48 (21.43)	7 (7.37)	42 (11.93)	3 (2.54)

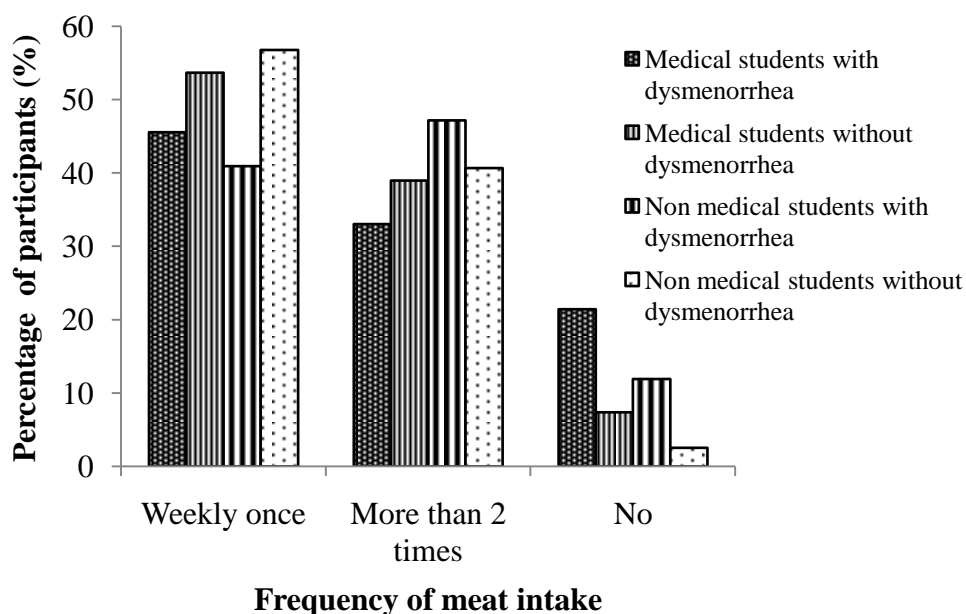


Fig no: 17 Frequency of meat intake by the participants

Table no: 10 Excess salt intake

S. No	Excess salt intake	No of Students with Dysmenorrhea n=576(%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	Weekly Once	246 (42.70)	118 (55.39)	102 (45.54)	51 (53.68)	144 (40.91)	67 (56.78)
2	More than 2 times	240 (41.67)	85 (39.91)	74 (33.04)	37 (38.95)	166 (47.16)	48 (40.68)

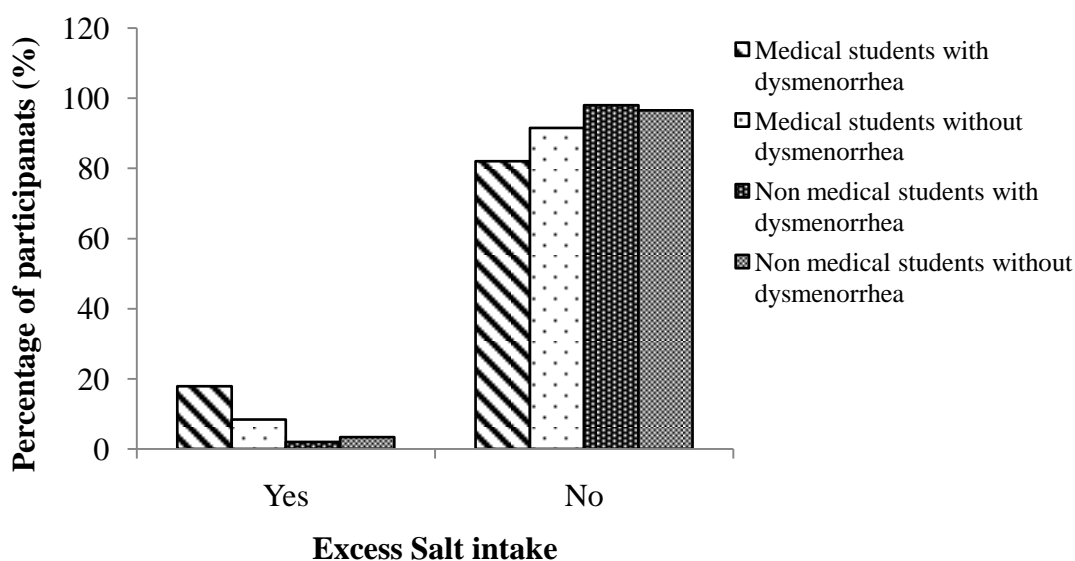


Fig no: 18 Excess salt intake

Table no: 11 Habit of eating fruits

S. No	Eating Fruits	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	Yes	30 (5.21)	125 (58.68)	20 (8.93)	53 (55.79)	10 (2.84)	72 (61.02)
2	No	546 (94.79)	88 (41.31)	204 (91.1)	42 (44.21)	342 (97.16)	46 (38.98)

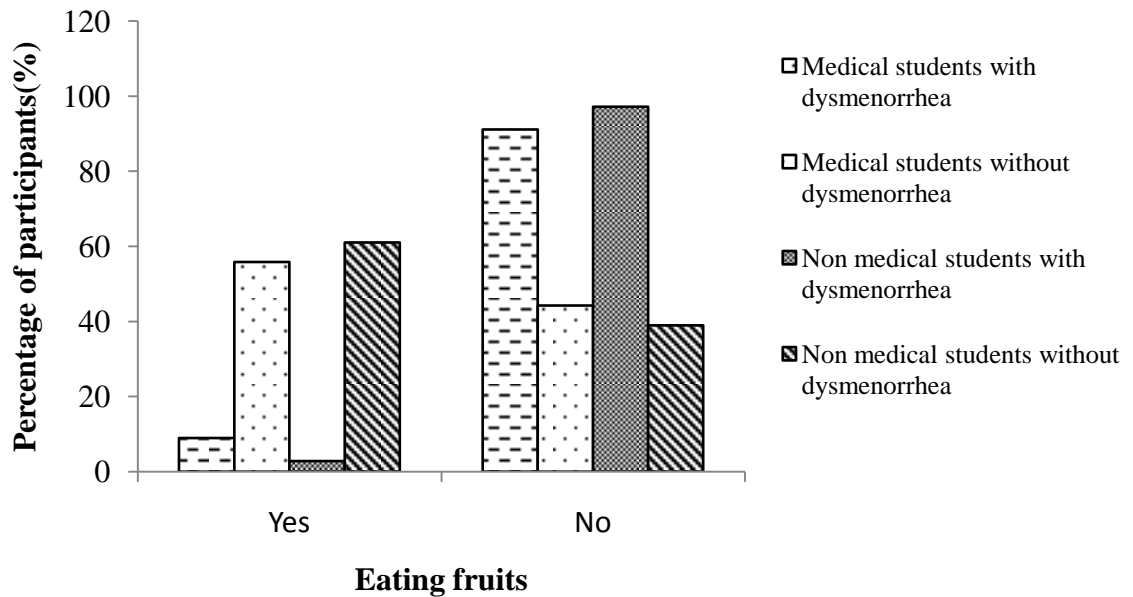


Fig no: 19 Habit of Eating Fruits

Table no: 12 Whole grains /Cereals intake by participants

S.No	Whole grains/Cereals intake	No of Students with Dysmenorrhoea n=576 (%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352 (%)	Without Dysmenorrhoea n=118(%)
1	Yes	266 (46.18)	164 (76.99)	70 (31.25)	61 (93.85)	196 (55.68)	103 (87.29)
2	No	310 (53.82)	49 (23)	154 (68.8)	34 (35.79)	156 (44.32)	15 (12.71)

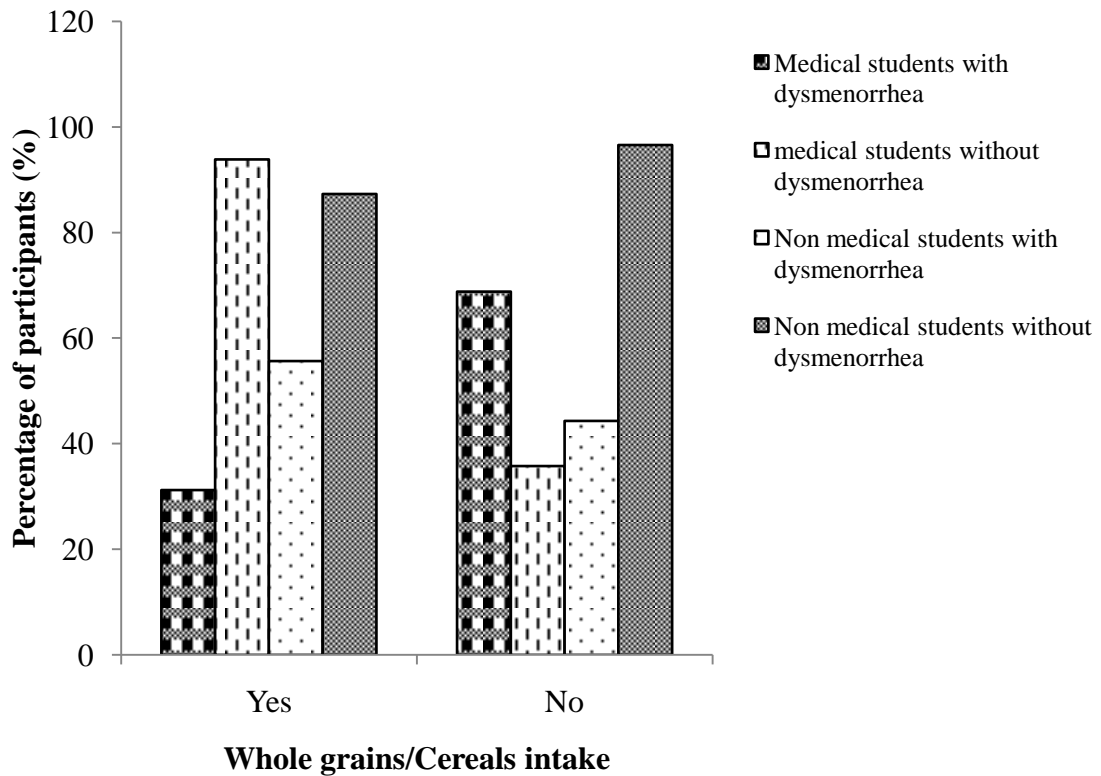


Fig no: 20 Whole grains /Cereals intake by participants

Table no: 13 Sweet product intake by participants

S. No	Sweet products intake	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	Do not take	130 (22.56)	60 (28.17)	101 (45.1)	8(8.42)	29(8.23)	52 (44.07)
2	Eat some days	313 (54.34)	135 (63.38)	72 (32.1)	75 (78.95)	241 (68.47)	60 (50.84)
3	Eat everyday	133 (23.09)	18 (8.45)	51 (22.8)	12 (12.63)	82 (23.29)	6 (5.08)

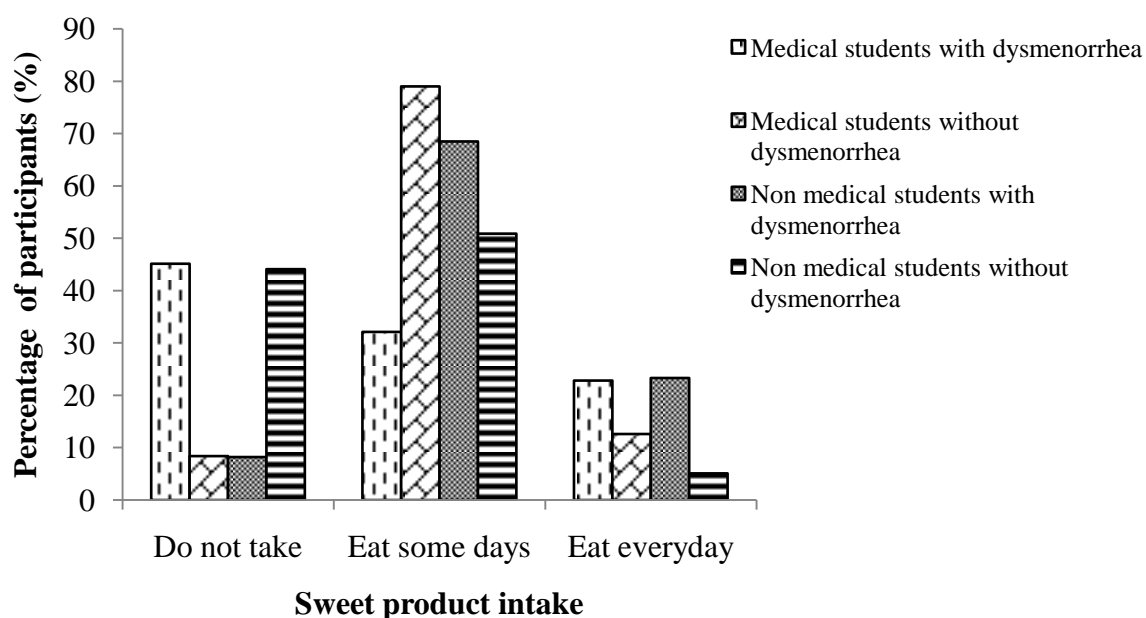


Fig no: 21 Sweet product intake by participants

Table no: 14 Frequency of drinking tea by participants

S.No	Frequency of drinking tea	No of Students with Dysmenorrhoea n=576 (%)	No of Students without Dysmenorrhoea n=213 (%)	Number of Medical students		Number of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352 (%)	Without Dysmenorrhoea n=118 (%)
1	Regularly	195 (33.85)	133 (62.44)	47 (20.98)	81 (85.26)	148 (42.05)	52 (44.07)
2	Occasionally	293 (50.87)	39 (18.31)	113 (50.45)	12 (12.63)	180 (51.13)	27 (22.88)
3	No	88 (15.28)	41 (19.24)	64 (28.57)	2 (2.11)	24 (6.82)	39 (33.05)

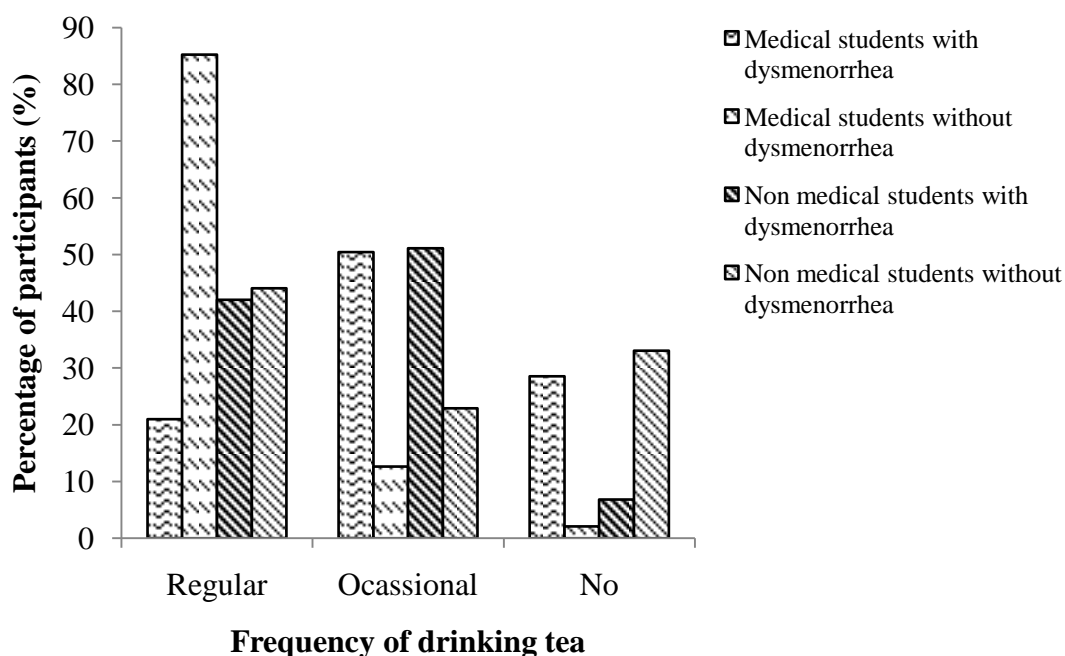


Fig no: 22 Frequency of drinking tea by participants

Table no: 15 Frequency of drinking coffee by participants

S.No	Frequency of drinking coffee	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	Regularly	176 (30.56)	59 (27.69)	64 (28.57)	42 (44.21)	112 (31.81)	17 (14.41)
2	Occasionally	336 (58.33)	57 (26.76)	114 (50.89)	14 (14.74)	222 (63.07)	43 (36.44)
3	No	64 (11.1)	97 (45.53)	46 (20.54)	39 (41.05)	18 (5.11)	58 (49.15)

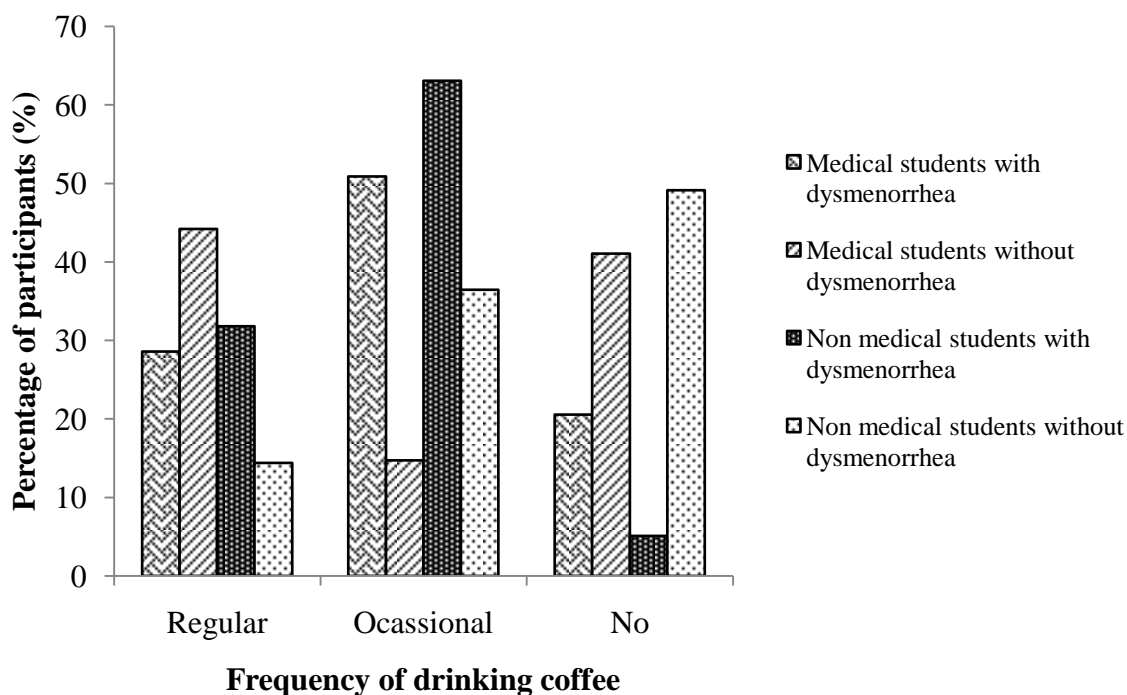


Fig no: 23 Frequency of drinking coffee by participants

Table no:16 Frequency of drinking soft drinks by participants

S. No	Frequency of drinking soft drinks	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	Regularly	41 (7.12)	16 (7.51)	11 (4.91%)	14 (14.73)	30 (8.52)	2 (1.69)
2	Occasionally	423 (73.44)	127 (59.62)	130 (58.04)	71 (74.74)	293 (83.24)	56 (47.46)
3	No	112 (19.44)	70 (32.86)	83 (37.05)	10 (10.53)	29 (8.24)	60 (50.85)

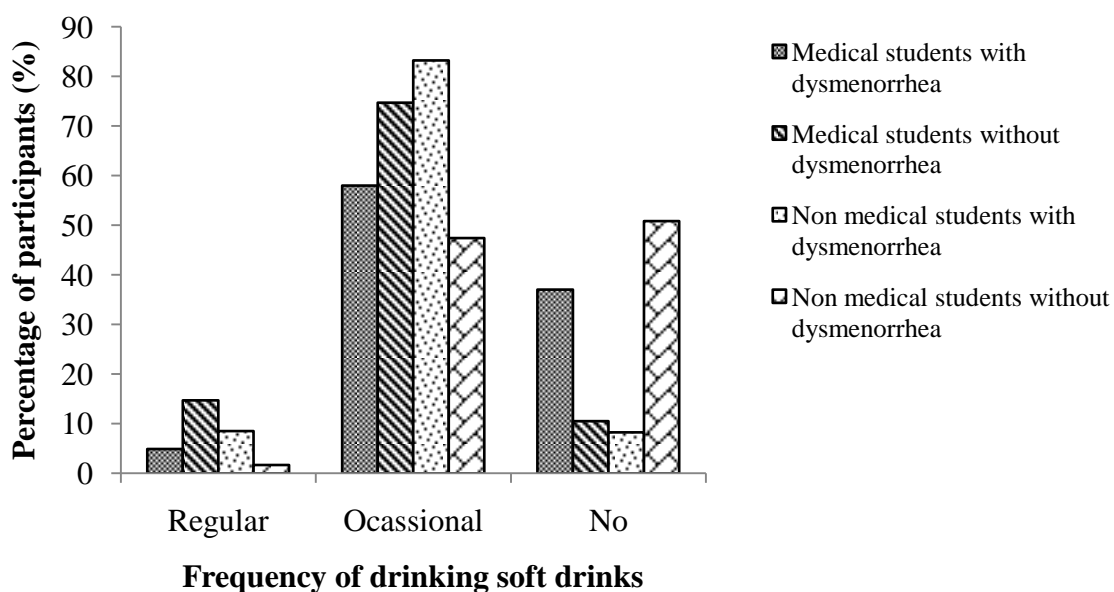


Fig no: 24 Frequency of drinking soft drinks by participants

Table no: 17 Frequency of eating chocolate by participants

S. No	Frequency of eating chocolate	No of Students with Dysmenorrhoea n=576 (%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352 (%)	Without Dysmenorrhoea n=118 (%)
1	Regularly	129 (22.39)	75 (35.21)	5 (2.23)	71 (74.74)	124 (35.23)	4 (3.39)
2	Occasionally	371 (64.41)	95 (44.60)	147 (65.63)	21 (22.11)	224 (63.64)	74 (62.71)
3	No	78 (13.54)	43 (20.19)	72 (32.14)	3 (3.16)	6 (1.70)	40 (33.89)

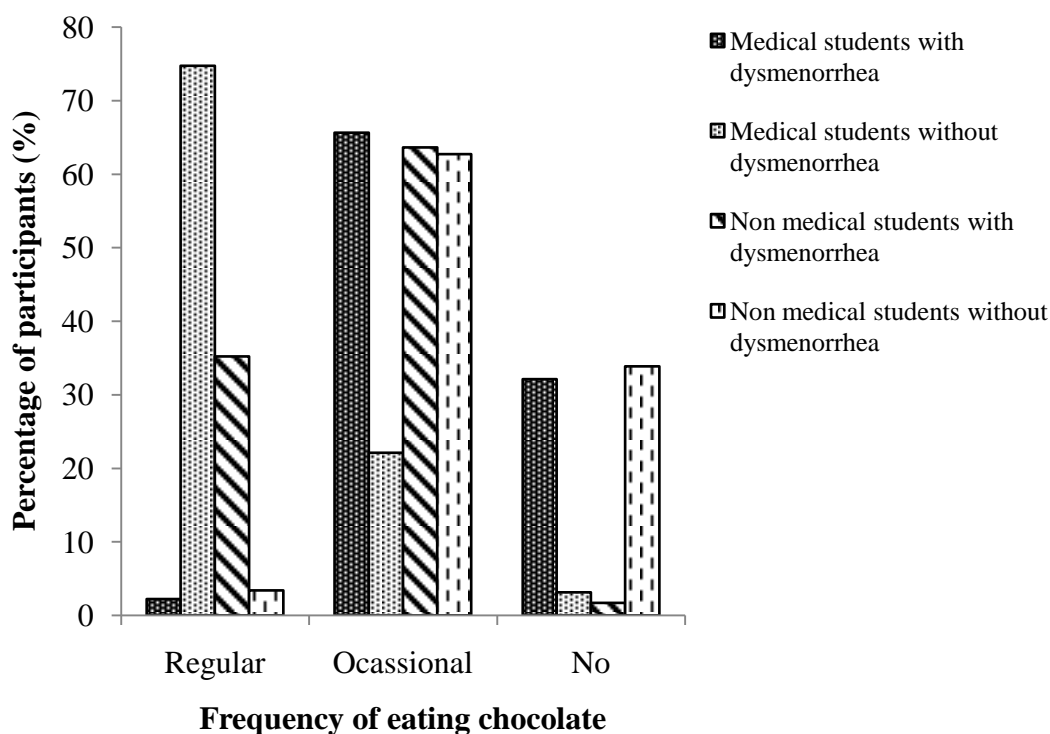


Fig no: 25 Frequency of eating chocolate by participants

Table No: 18 Habit of Eating Ice-cream by participants

S. No	Frequency of eating icecream	No of Students with Dysmenorrhoea n=576 (%)	No of Students without Dysmenorrhoea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhoea n=224 (%)	Without Dysmenorrhoea n=95 (%)	Dysmenorrhoea n=352 (%)	Without Dysmenorrhoea n=118 (%)
1	Occasional	520 (90.27)	157 (73.71)	190 (84.82)	88 (92.63)	330 (93.75)	69 (58.47)
2	No	56(9.72)	56 (26.29)	34 (15.18)	7 (7.37)	22 (6.25)	49 (41.53)

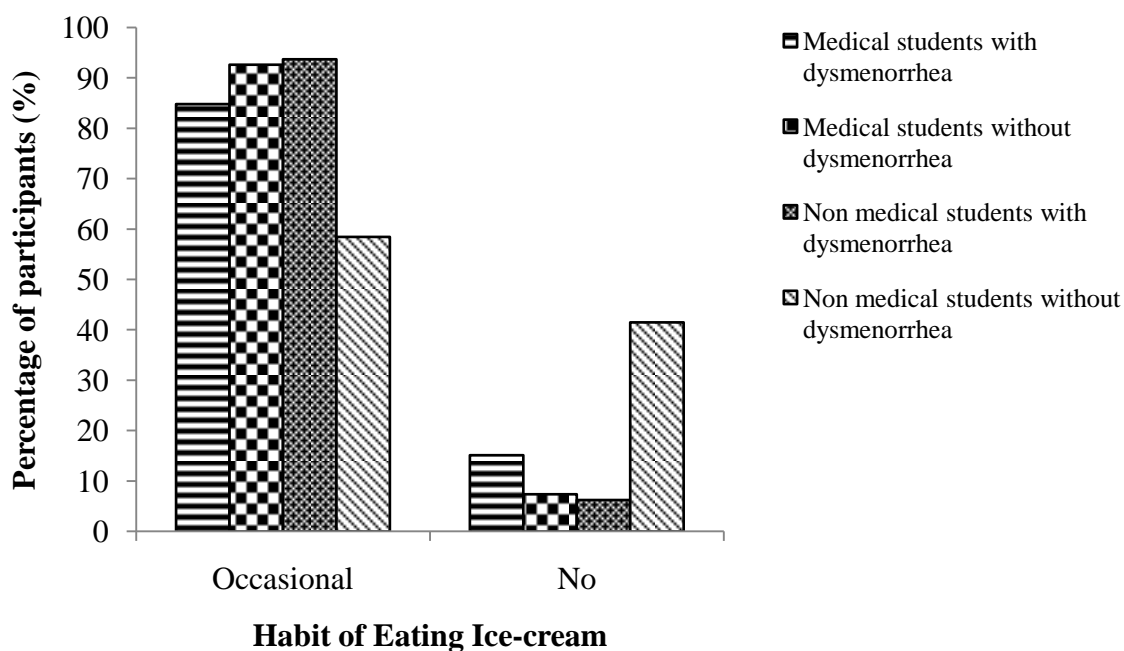


Fig no: 26 Habit of Eating Ice-cream by participants

Table no:19 Frequency of Eating Junk/Fast food by participants

S · N o	Frequency of eating junk/fast food	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352(%)	Without Dysmenorrhea n=118 (%)
1	Ocassional	524 (90.97)	170 (79.81)	190 (84.8)	88 (92.63)	334 (94.89)	82 (69.49)
2	No	52 (9.03)	43 (20.19)	34 (15.18)	7 (7.37)	18 (5.11)	36 (30.51)

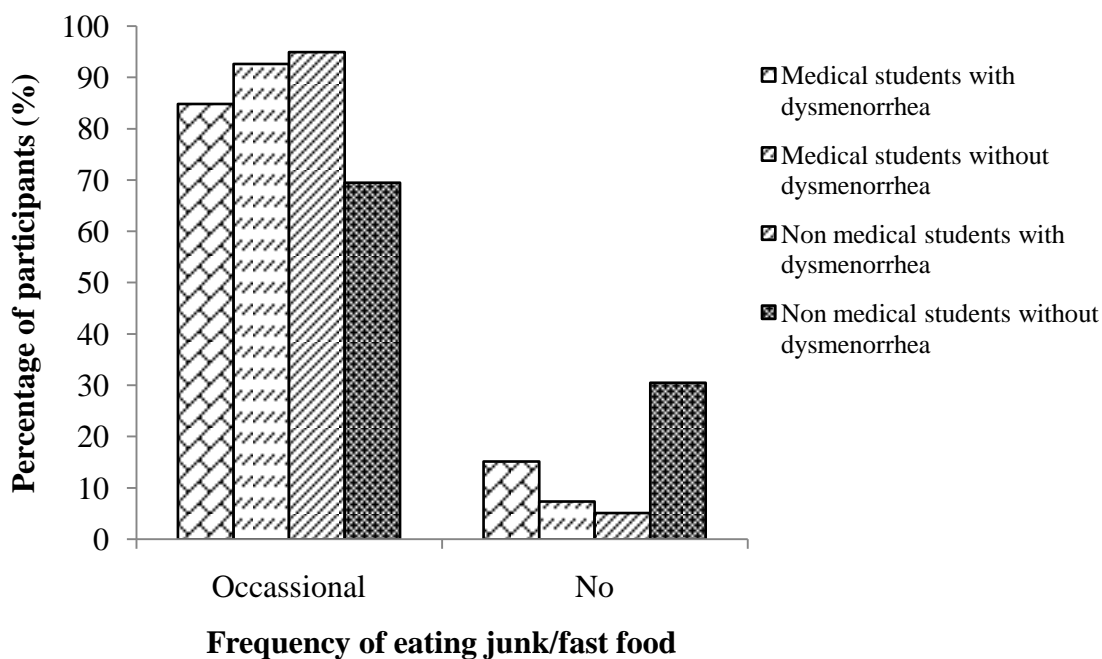


Fig no: 27 Frequency of eating junk/fast food by participants

Table No: 20 Frequency of eating Breakfast by participants

S.No	Eating Breakfast	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	Regular	21 (3.65)	154 (72.30)	14 (6.25)	55 (81.61)	7 (1.99)	99 (83.89)
2	Eat somedays	203 (35.24)	21 (9.86)	72 (32.14)	10 (10.53)	131 (37.21)	11 (9.32)
3	Do not eat	352 (61.1)	38 (17.84)	138 (61.60)	30 (31.58)	214 (60.79)	8 (6.78)

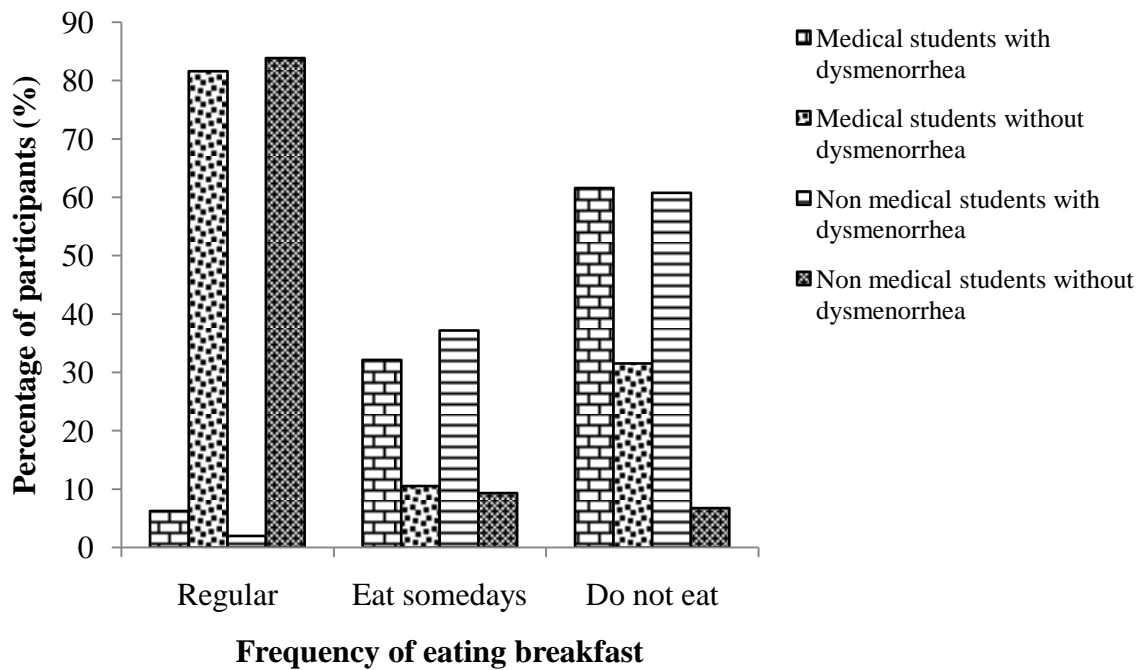


Fig no: 28 Frequency of eating Breakfast by participants

Table no: 21 Hours of sleep by participants

S.No	Hours of sleep	No of Students with Dysmenorrhea n=576 (%)	No of Students without Dysmenorrhea n=213 (%)	No of Medical students		No of Non medical students	
				Dysmenorrhea n=224 (%)	Without Dysmenorrhea n=95 (%)	Dysmenorrhea n=352 (%)	Without Dysmenorrhea n=118 (%)
1	≤ 6 hours	319 (55.38)	18 (8.45)	102 (45.53)	14 (14.74)	217 (61.65)	4 (3.38)
2	7 to 8 hours	217 (37.67)	107 (50.23)	97 (43.30)	24 (25.23)	120 (34.09)	83 (70.34)
3	> 8 hours	40 (6.94)	88 (41.31)	25 (11.2)	57 (60)	15 (4.26)	31 (26.27)

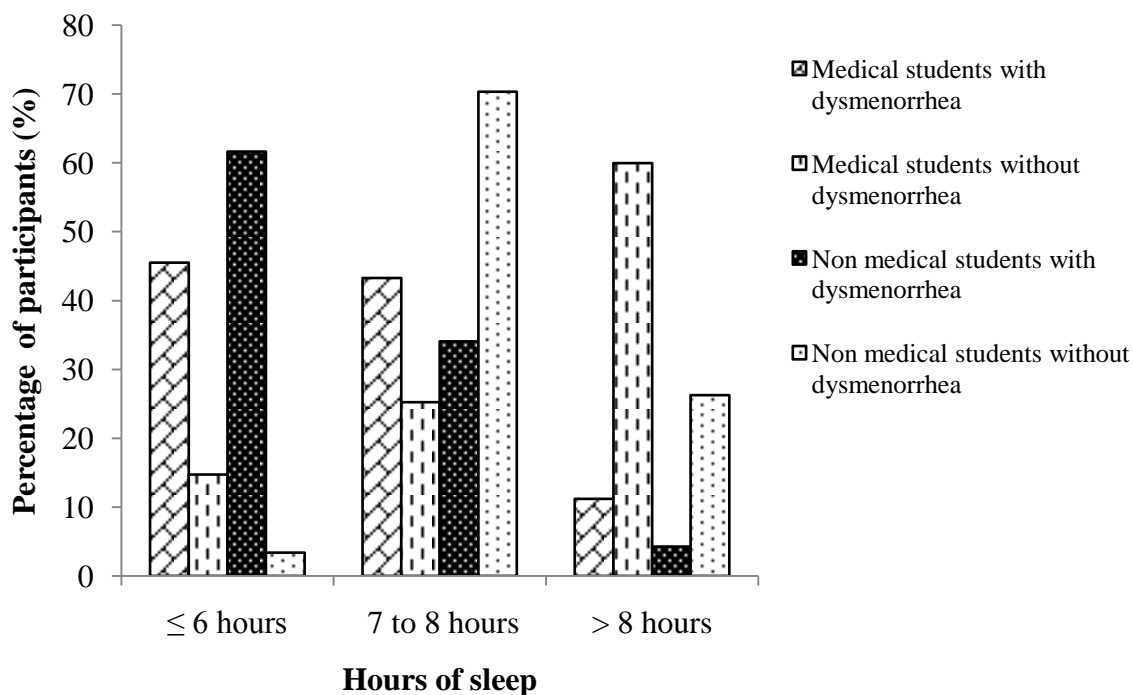


Fig no: 29 Hours of sleep by participants

Table no: 22 Hours of pain experienced by participants due to dysmenorrhoea

S.No	Hours of pain	No of students with dysmenorrhoea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352 (%)
1	48-72 hr	403 (69.97)	95 (42.4)	308 (87.5)
2	> 72 hr	173 (30.03)	129 (57.59)	44 (12.5)

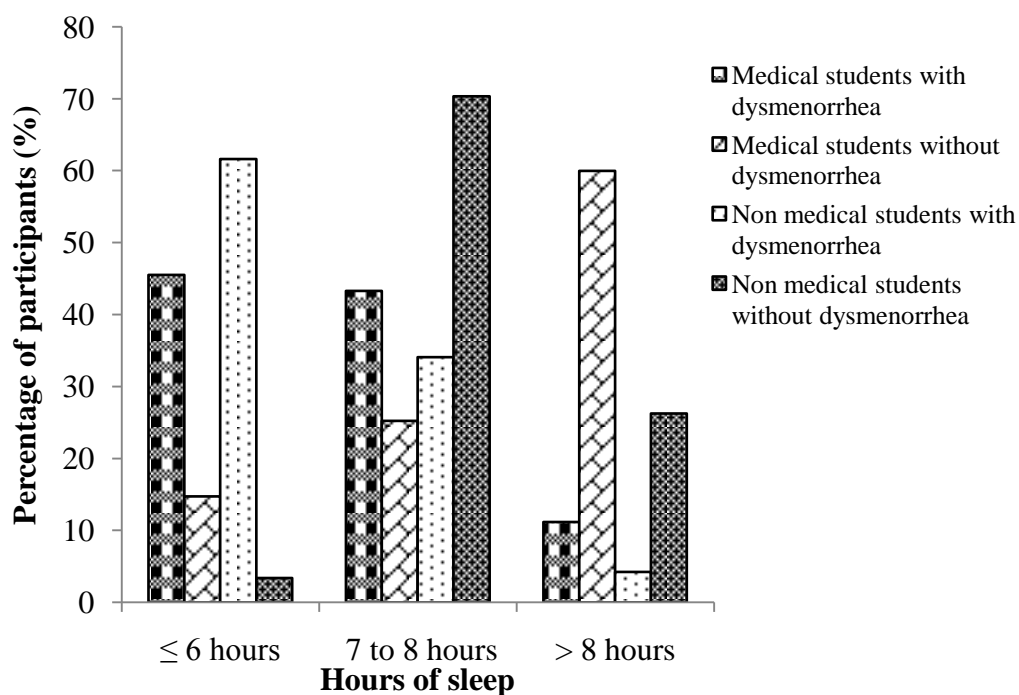


Fig no: 30 Hours of pain experienced by participants due to dysmenorrhoea

Table no: 23 Students answer to the question: Did you know about dysmenorrhoea before?

S.No	Know about dysmenorrhoea before	No of students with dysmenorrhoea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352 (%)
1	Yes	76 (13.19)	35 (15.6)	41 (11.65)
2	No	500 (86.81)	189 (84.4)	311 (88.35)

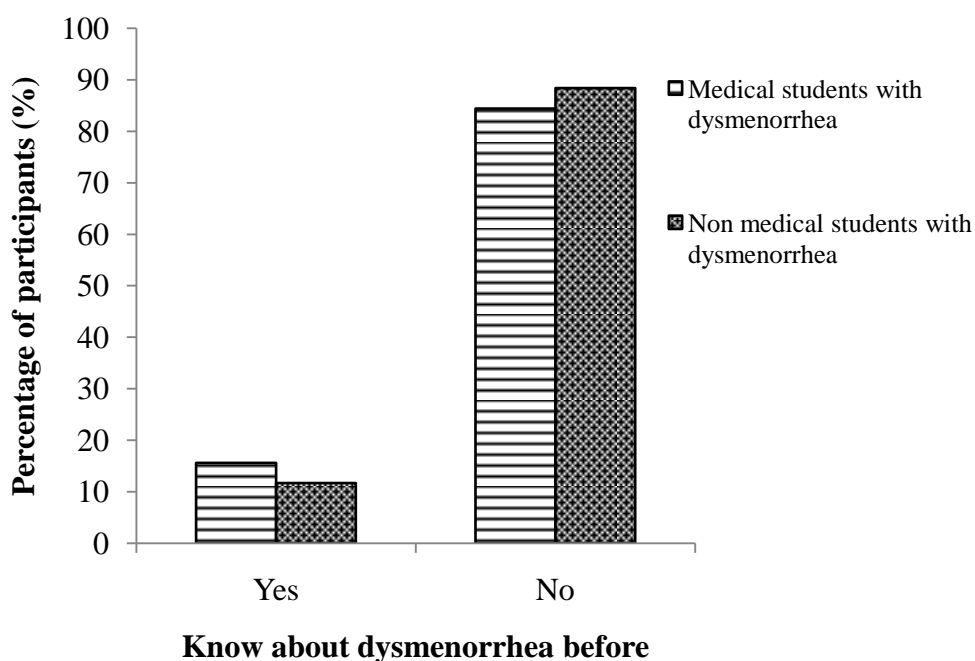


Fig no: 31 Students answer to the question: Did you know about dysmenorrhoea before?

Table no:24 Usage of Pain killer for management of dysmenorrhea

S.No	Usage of pain killer	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352 (%)
1	Yes	118 (20.49)	55 (24.6)	63 (17.9)
2	No	458 (79.51)	169 (75.5)	289 (82.10)

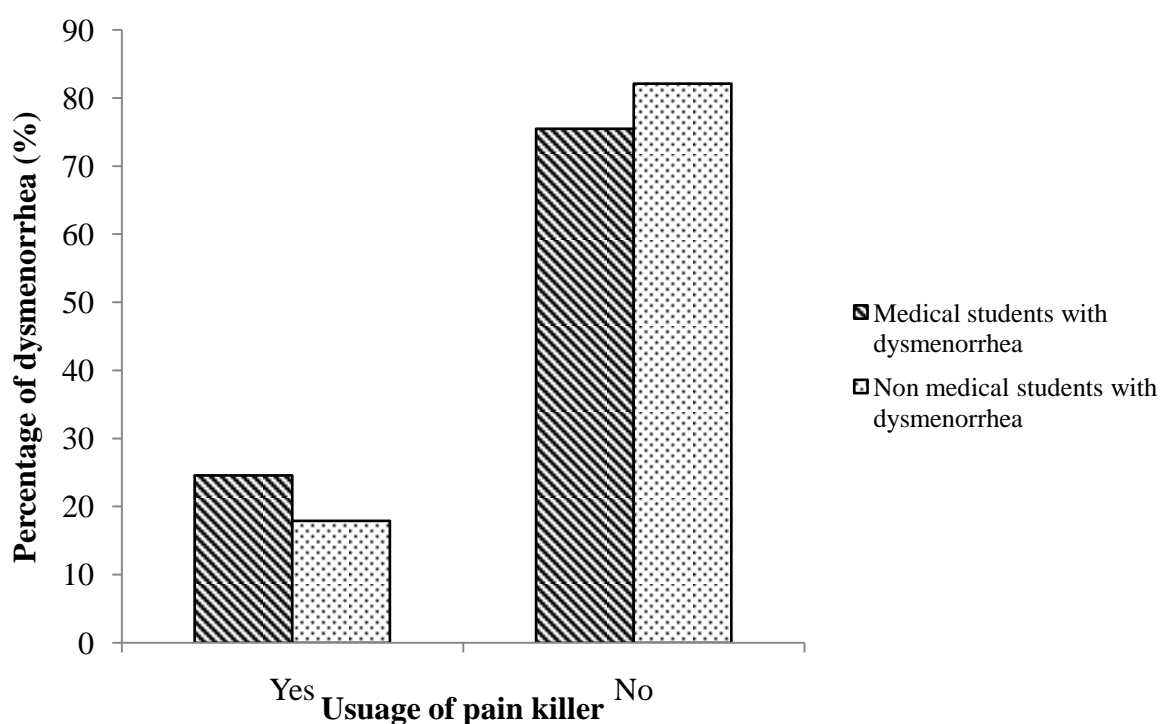


Fig no: 32 Usage of Pain killer for management of dysmenorrhea

Table no:25 Menstrual Cycle duration of participants

S.No	Menstrual cycle duration	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	22 to 28 days	453 (78.64%)	197 (87.95%)	256 (72.73%)
2	> 29 days	123 (21.35%)	27 (12.05%)	96 (27.27%)

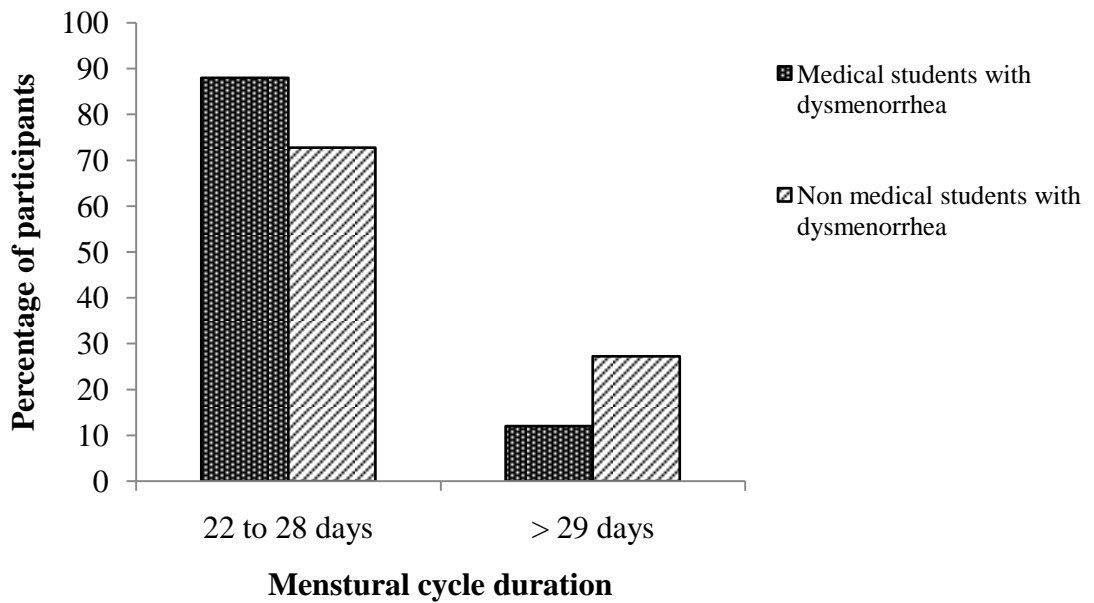


Fig no:33 Menstrual Cycle duration of participants

Table no: 26 First Experience of Menstrual pain

S.No	First experience of menstrual pain	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorrhea n=224 (%)	Dysmenorhea n=352(%)
1	During 1 st puberty time	380 (65.97)	152 (67.86)	228 (64.77)
2	1 to 2 years after puberty	196 (34.03)	72 (32.14)	124 (35.28)

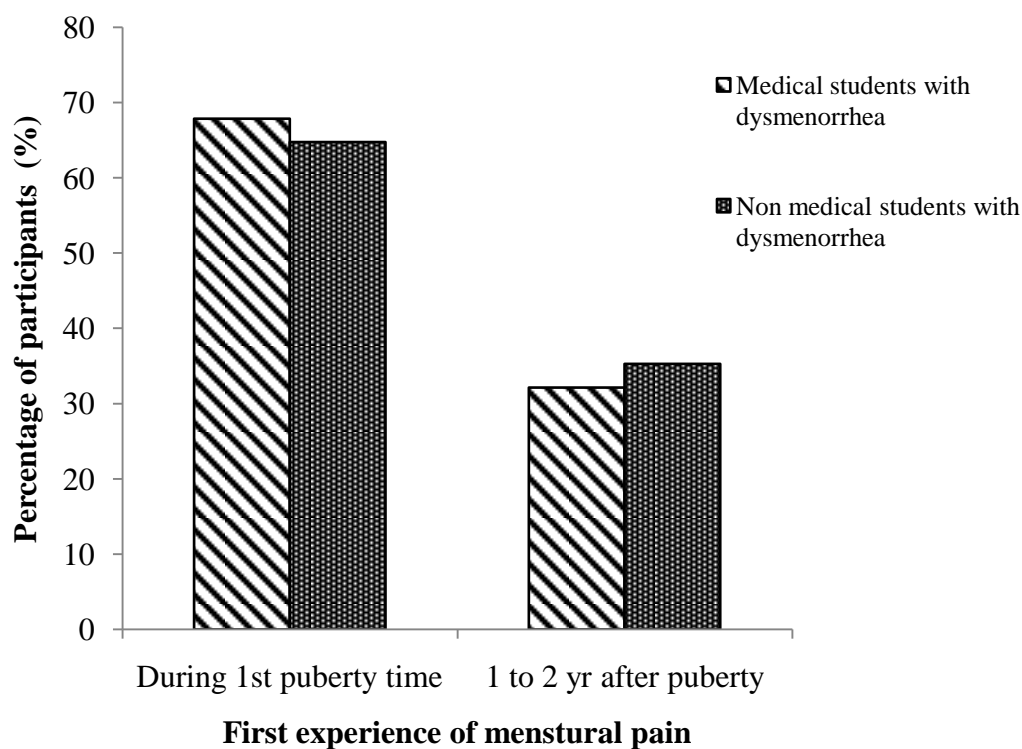


Fig no: 34 First Experience of menstrual pain

Table no: 27 Nature of Menstrual flow

S.No	Nature of Menstrual flow	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	≤ 3 pads (light)	17 (2.95%)	6 (2.68)	11 (3.13)
2	4 to 7 pads (moderate)	392 (68.05%)	146 (65.18)	246 (69.9)
3	> 7 pads (heavy)	167 (28.99)	72 (32.14)	95 (26.99)

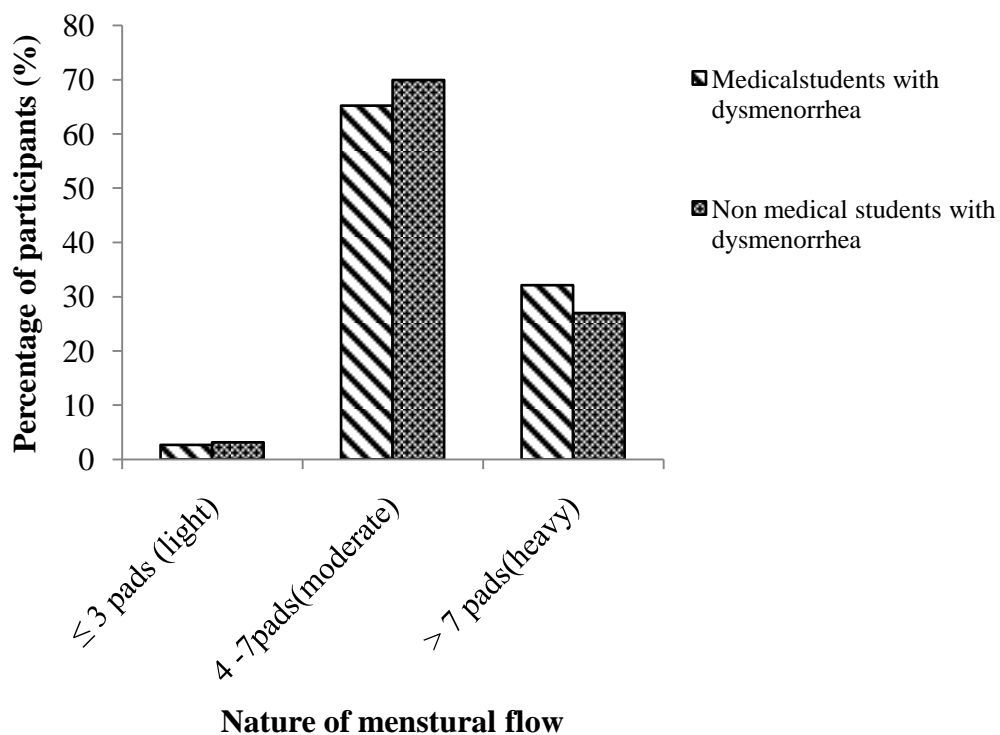


Fig no: 35 Nature of Menstrual flow

Table no:28 Pain character during periods

S.No	Pain character during periods	No of students with dysmenorrhoea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorrhoea n=224 (%)	Dysmenorrhoea n=352(%)
1	Sharp	136 (23.61)	43 (19.19)	93 (26.4)
2	Stinging	161 (27.95)	48 (21.42)	113 (32.10)
3	Mix	281 (48.78)	133 (59.4)	146 (41.47)

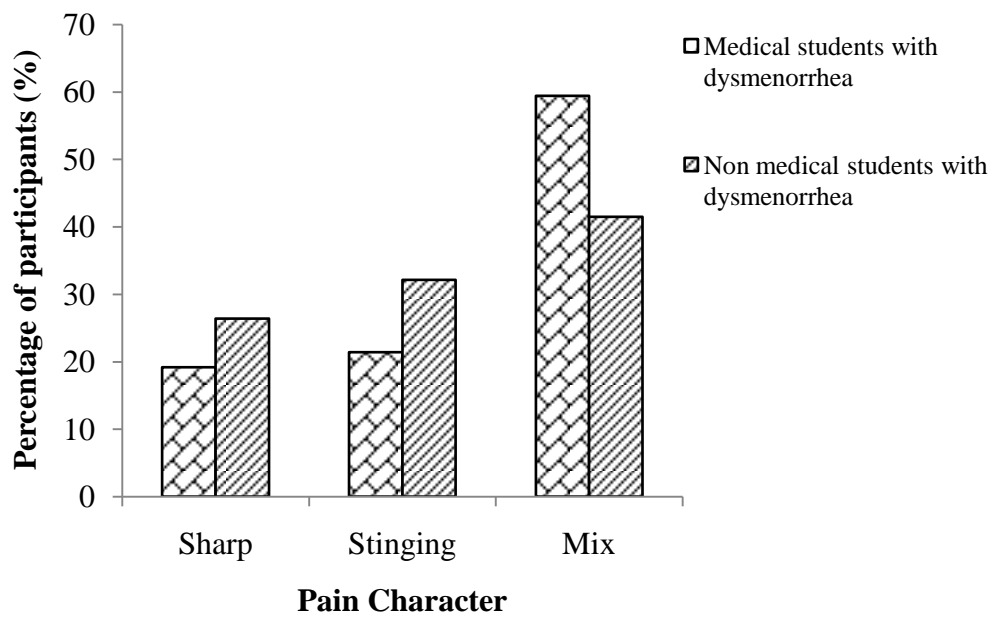


Fig no:36 Pain character during periods

Table no: 29 Mood During Periods

S.No	Mood during periods	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorrhea n=224 (%)	Dysmenorhea n=352(%)
1	Depressed	545 (94.62)	222 (99.12%)	323 (91.76%)
2	Anger	380 (65.97%)	170 (75.89%)	210 (59.66%)
3	Tendency to fight	278 (48.26%)	114 (50.89%)	164 (46.59%)

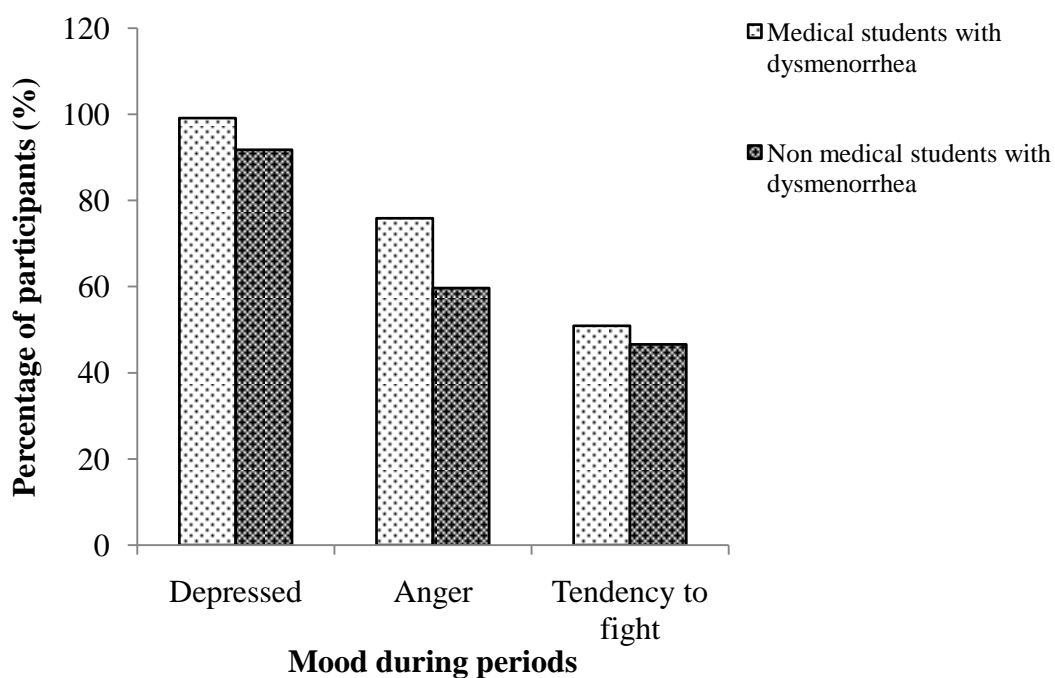


Fig no: 37 Mood During Periods

Table no: 30 Help seeker for menstrual pain

S.No	Help seeker for menstrual pain	No of students with dysmenorrhoea n=576(%)	Noof Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	No one	25 (4.34)	8 (3.57)	17 (4.83)
2	Friends	454 (78.82)	205 (91.52)	249 (70.74)
3	Mother	486 (84.38)	201 (89.73)	285 (80.97)
4	Sister	444 (77.08)	200 (89.29)	244 (69.32)

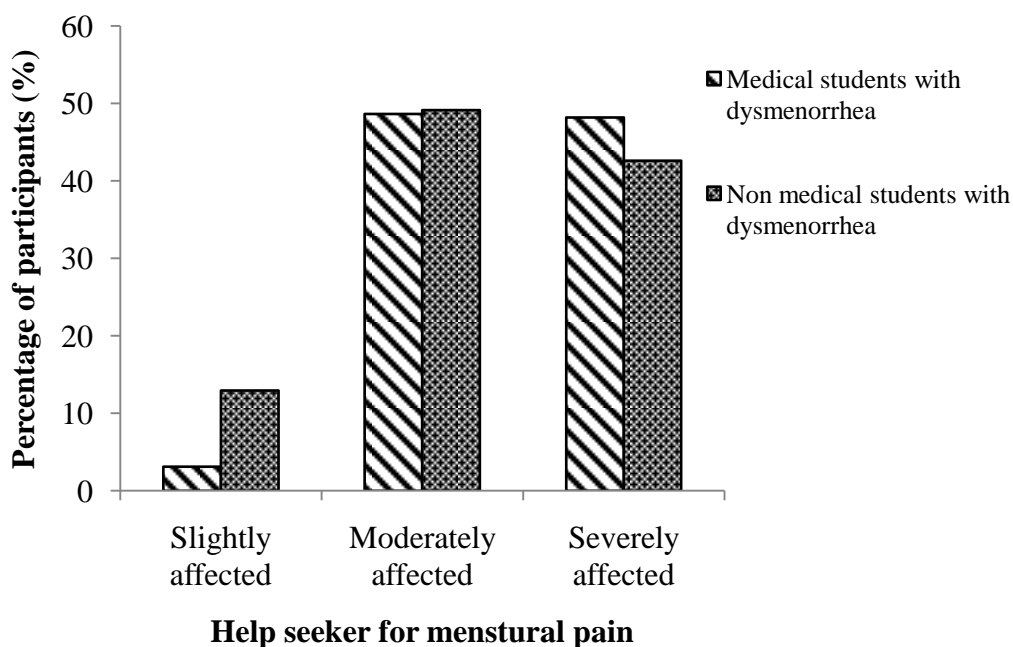


Fig no:38 Help seeker for menstrual pain

Table no:31 Limitation of daily activities due dysmenorrheal pain

S.No	Limitation of daily activities	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	Slightly affected	36 (6.25%)	7 (3.13)	29 (12.95)
2	Moderately affected	282 (48.96)	109 (48.66)	173 (49.15)
3	Severely affected	258 (44.79)	108 (48.21)	150 (42.61)

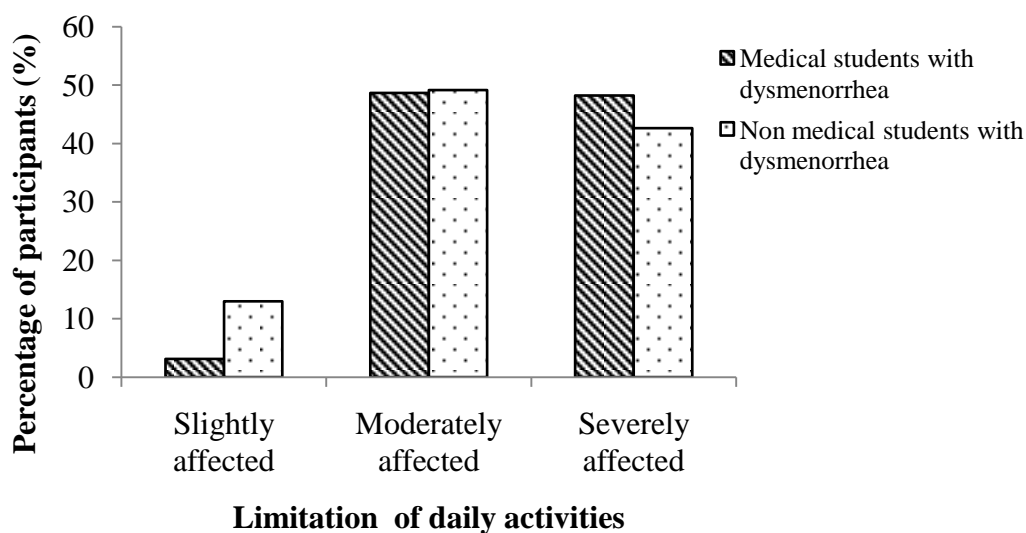


Fig no: 39 Limitation of daily activities

Table no: 32 Home remedies for dysmenorrhoea pain

S.No	Home remedies	No of students with dysmenorrhoea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	Walking	45 (7.81)	14 (6.25)	31 (8.81)
2	Massage	87 (15.10)	34 (15.18)	53 (9.96)
3	Heat Application	101 (17.53)	32 (14.29)	69 (19.60)
4	Herbal Tea	145 (25.17)	77 (34.37)	68 (19.32)
5	Lay on bed	540 (93.75)	213 (95.0)	327 (92.89)
6	Divert mind	452(78.47%)	185(82.59%)	267(75.85%)

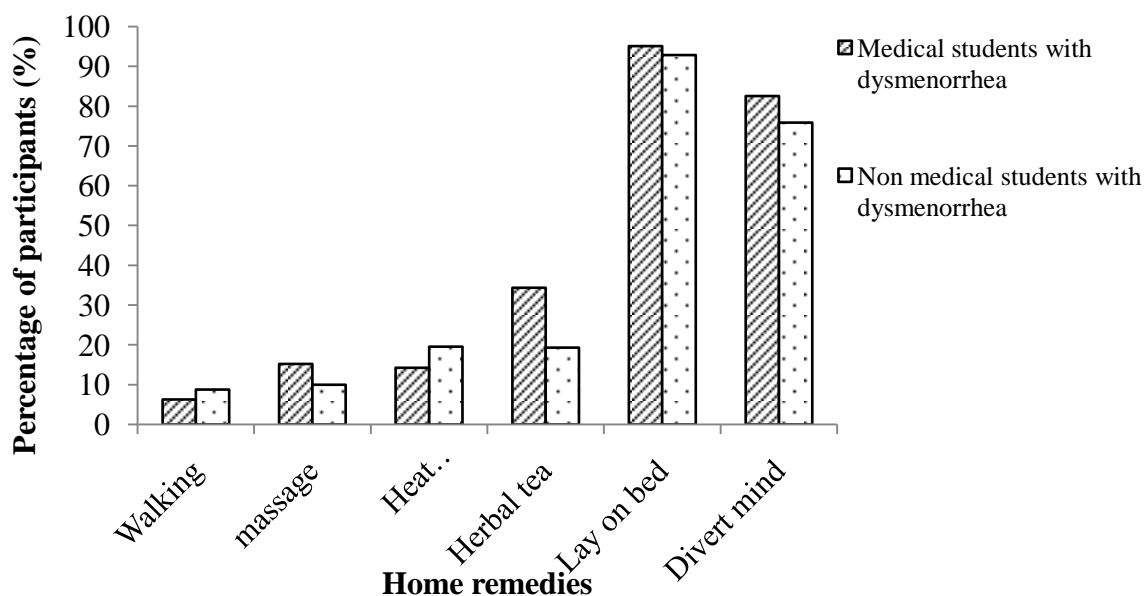


Fig no: 40 Home remedies for dysmenorrhoea pain

Table no: 33 Pain assessment Score

S.No	Pain assessment score	No of students with dysmenorrhoea n=576(%)	No of Medical students	
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	1-3 (mild)	0	0	0
2	4-6 (moderate)	108 (18.75)	41 (18.30)	67 (19.03)
3	7-10 (severe)	468 (81.25)	183 (81.69)	285 (80.97)

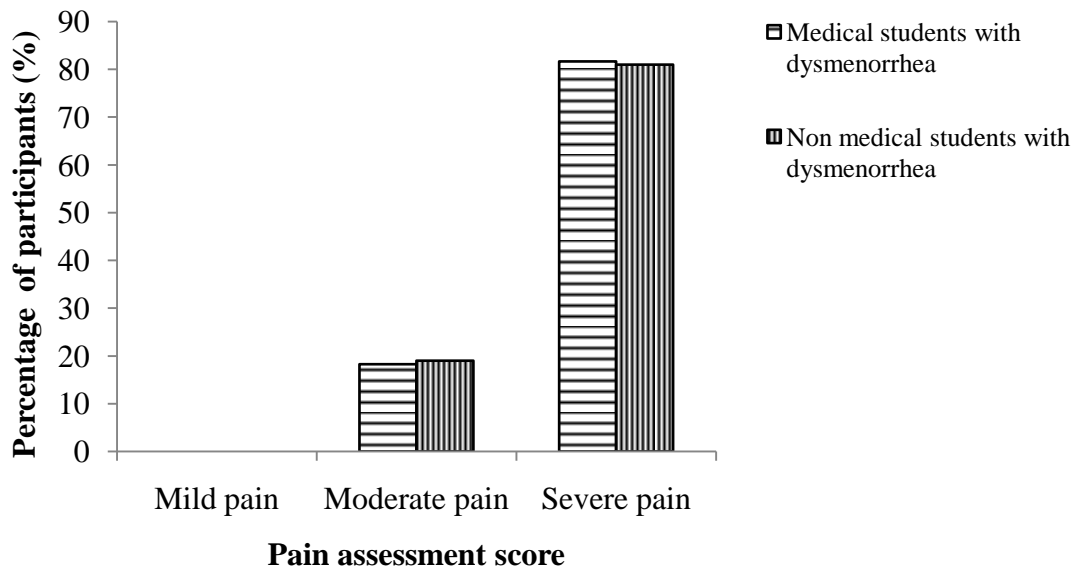


Fig no: 40 Pain assessment score

Table no: 34 Area of pain due to dysmenorrhea

S.No	Area of pain	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	Upper abdomen	363 (63.02)	147 (65.63)	216 (61.36)
2	Lower abdomen	536 (93.05)	218 (97.32)	318 (90.34)
3	Leg pain	276 (47.92)	116 (57.79)	160 (45.45)
4	Back pain	458 (79.51)	185(82.59)	273(77.56)

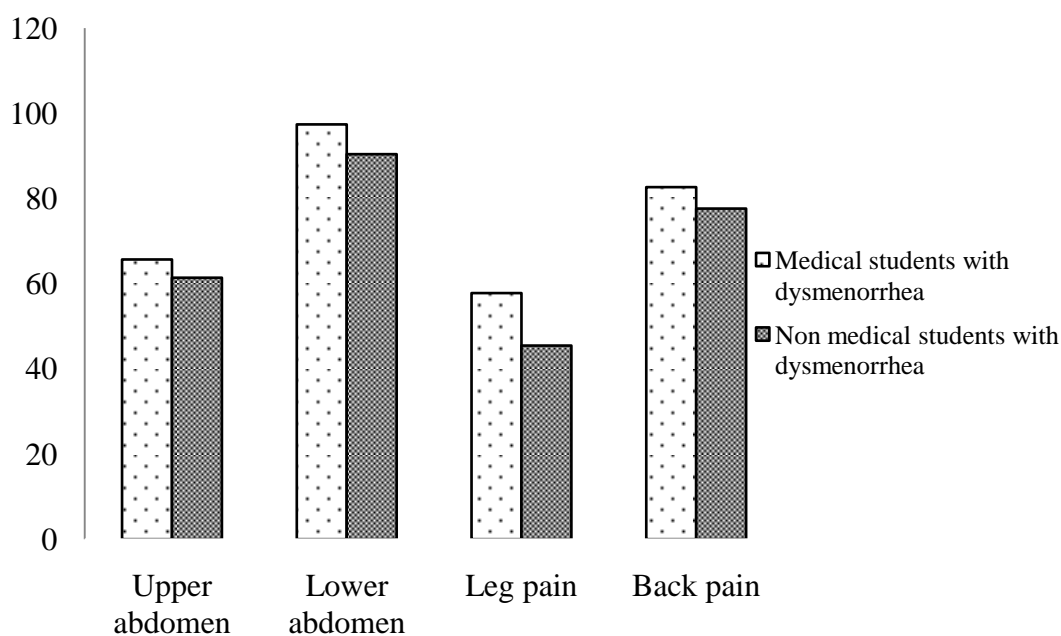


Fig no: 41 Area of pain due to dysmenorrhea

Table No: 35 Number of spotting days during menstruation

S.No	No of spotting days	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	< 3 days	44 (7.64)	18 (8.04)	26 (7.39)
2	≤ 5 days	427 (74.13)	168 (75)	259 (73.58)
3	> 7 days	105 (18.23)	38 (16.97)	67 (19.03)

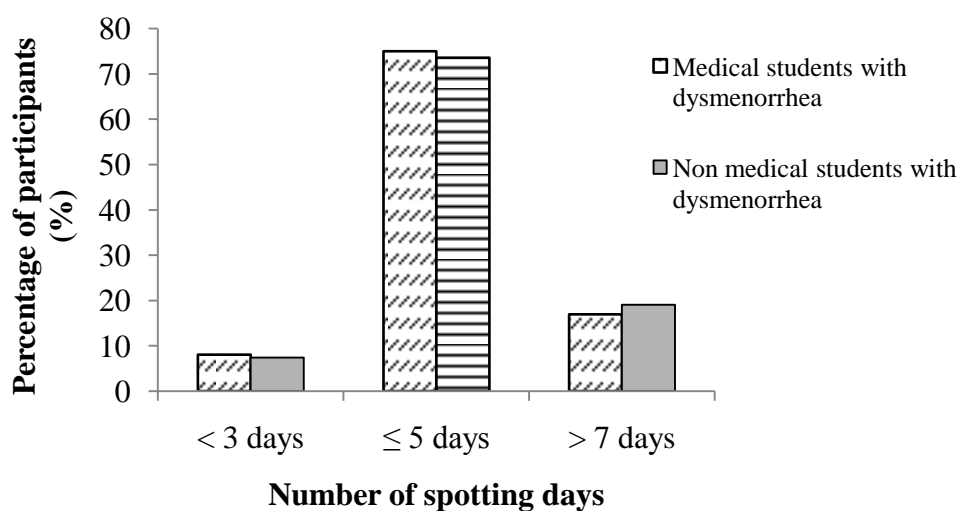


Fig no: 42 Number of spotting days during menstruation

Table no: 36 Sufferings due to dysmenorrheal pain

S. No	Sufferings due to dysmenorrhea	No of students with dysmenorrhea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352 (%)
1	Lack of interest	509 (88.36)	217 (96.88)	292 (82.95)
2	Lost concentration in studies	478 (82.89)	201 (89.73)	277 (78.69)
3	Affects relationship	195 (33.85)	99 (44.19)	96 (27.27)
4	Affects Mental health	170 (29.51)	65 (29.0)	105 (29.83)

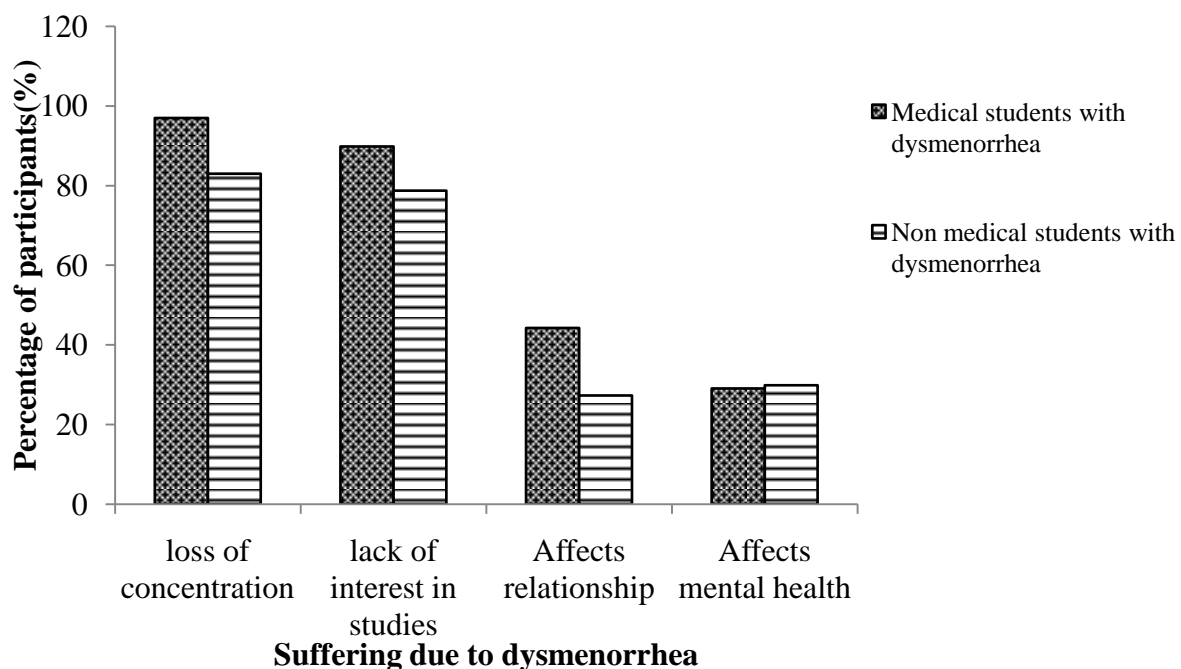


Fig no: 43 Suffering due to dysmenorrheal pain

Table no: 37 Symptoms during menstrual days

S · N o	Symptoms during menstrual days	No of students with dysmenorrhoea n=576(%)	No of Medical students	No of Non medical students
			Dysmenorhea n=224 (%)	Dysmenorhea n=352(%)
1	Diarrhoea	155 (26.91%)	52 (23.21%)	103 (29.26%)
2	Constipation	93 (16.15%)	32 (14.29%)	61 (17.33%)
3	Vomiting	278 (48.28%)	98 (43.75%)	180 (51.14%)
4	Nausea	216 (38.02%)	72 (32.14%)	144 (40.91%)
5	Change in appetite	360 (62.5%)	192 (85.71%)	168 (47.73%)
6	Palpitation	136 (23.61%)	32 (14.29%)	104 (29.55%)
7	Headache	172 (29.86%)	44 (19.64%)	128 (36.36%)
8	Breast tenderness	99 (17.19%)	22 (9.82%)	77 (21.88%)

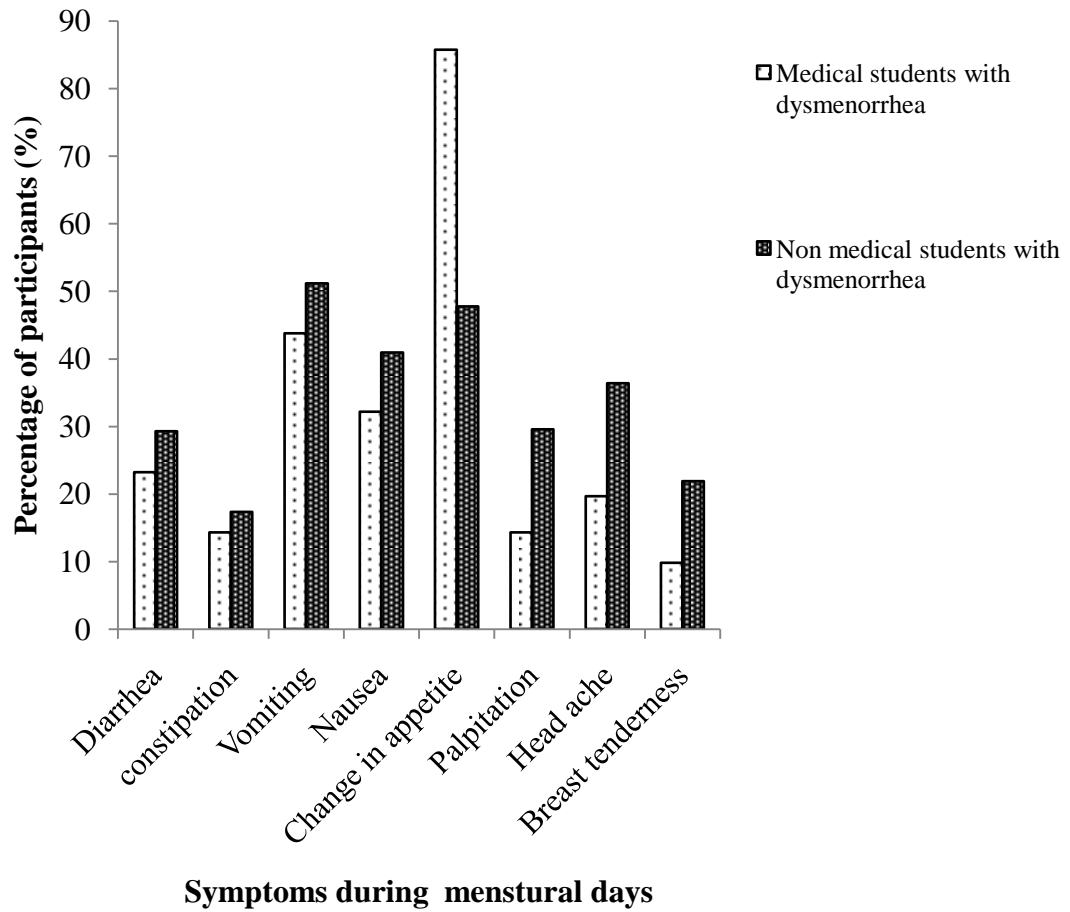


Fig no: 44 Symptoms during menstrual days

8. DISCUSSION

Table no.1 shows the prevalence of dysmenorrhea in women. It was found that 73% of the participants suffer from dysmenorrhea. This is in correlation with the recent large Australian study on senior high school girls by Parker MA *et al.*, (2010)⁷² which found that a high proportion, (93%)of teenagers reported menstrual pain.

Table no.2 shows categorization of study participants according to the course of the study. It was found that 70.2% were medical students and 74.89% were Non medical students.

Table no.3 shows the age of menarche in study population. It was found that 68.23% of the participants with dysmenorrhea menarche between 13-15 years, followed by 27% of the participants attain menarche at ≤ 6 years and 27.1% at above 15 years were have dysmenorrhea. The age group of 13-15 years was highly affected with dysmenorrhoeal pain. This result is concurrent with the study performed by Mulunehet *al.*,(2002)¹⁶ in which 49.7% of the study participants underwent the process of menarche in the age of 13-14 years.

Table no.4 shows the family history of dysmenorrhea in the study population. It was found that 80.03% of the study participants with dysmenorrhea had family history of dysmenorrhea. This result is in accordance with the findings of Rafiqueet *al.*,(2010)⁷² which showed that 85.7% of study participants had family history of dysmenorrhea. In other study suggest that genetic factors also contributing to the development of dysmenorrhea by Parveen *et al.*,(2009)⁷⁴.

Table no.5 shows the amount of water intake by participants.It was found that 48.78% of the study participants with dysmenorrhea were observed to take 1-2 liters of water every day. This result was concurrent with the study performed by Fernandez EMet *al.*,(2009)⁶⁶;in which 75.6% had an intake of 1-2 liters of water per day.

Table no.6 shows the frequency of physical exercise, it was found that 74.83% of the participants with dysmenorrhea never participated in any physical exercise. This result was similar to the study conducted by Fernandez EMet *al.*,(2006)⁶⁶ in which, 77.7% of the participants affected with dysmenorrhea did not participate in

any physical activity. It was hypothesized that exercise works by improving blood flow at the pelvic level as well as stimulating the release of endomorphins, which act as non-specific analgesics.

Table no.7 shows the categories of cooking oil used by the study participants .It was found that 53.99% of the study participants with dysmenorrhea use sunflower oil and 41.32% of the participants use Ground nut oil, followed by 17.88% of the participants who use coconut oil and only 3.82% using palm oil for cooking

Table no.8 shows the frequency of consumption of fish.It was found that among participants with dysmenorrhea, 76.39% consumed fish occasionally, followed by 18.05% who never consumed fish and 5.56% consumed fish on a regular basis. This result is in accordance with the previous study conducted by Geneen L J *et al.*,(2011)⁷⁵ which showed that 74.9% of the participants with dysmenorrhea consumed fish occasionally. This may be due to the presence of omega 3 fatty acid in fish which have anti-inflammatory properties and suppress the production of prostaglandins.

Table no.9 shows the frequency of meat intake by the participants. It was found that 41.67% of the participants with dysmenorrhea consume meat more than 2 times a week. This result was accordance with study performed by Ju Het *al.*,(2014)¹² which showed that excess intake of meat are being high risk factors for dysmenorrhea.

Table no.10 shows the habit of eating fruits. It was found that 94.79% of the participants with dysmenorrhea do not take fruits regularly. The vegetarian diets /consumption of fruits and vegetables related to the decrease of estrogen activity and therefore decrease of the frequency of dysmenorrhea Bagala Z *et al.*,(2007)⁷⁶.

Table no.11 shows the excess salt intake, it was found that 8.16%, of the participants with dysmenorrhea took excess salt followed by 91.84% are not taking excess salt. This result was inconsistent with the study performed by Nastaran Net *al.*,(2011)⁷⁷ found that higher prevalence of dysmenorrhea in women with moderate or excessive intake of salt compared with those with a minimal intake.

Table no.12 shows whole grains /Cereals intake by participants. It was found that 53.82% of the students were with dysmenorrhea doing not take whole grains. The

study was similar to the study performed by Banikarim *et al.*,(2011)⁷⁸ who found that 76.6% of the participants with dysmenorrhea were avoiding whole grains and cereals.

Table no.13 shows sweet product intake by participants. It was found that 54.34% of the participants with dysmenorrhea take excess sugar. This result is consistent with the previous study performed by Ozerdogan N *et al.*,(2007)⁷⁹ which found that increase in the sugar product intake will increase the risk of dysmenorrhea. This may due to the fact that sugar levels in the body fluctuate during the time of the menses. So consuming too much sugar when on period's messes with already messed up sugar levels sugar causes inflammation and tends to intensify cramping.

Table no.14 shows the frequency of drinking tea. It was found that (50.87%) of the participants with dysmenorrhea drinking tea occasionally. This result is in accordance with study conducted by Faramarzi *et al.*,(2010)⁸⁰ which showed significant association between tea consumption and dysmenorrhea. Caffeine present in the tea is a vasoconstrictor; it makes the blood vessels to constrict. This can cause the vessels that feed uterus to tighten, make period cramps even more painful.

Table no.15 shows the frequency of drinking Coffee. It was found that 58.33% of the participants with dysmenorrhea were drinking coffee occasionally. This result was concurrent with the study conducted by Mahmoud AZ *et al.*,(2012)⁸¹ found that there is positive association between coffee and menstrual pain.

Table no.16 shows the frequency of drinking soft drinks. It was found that 73.44% of the participants with dysmenorrhea were drinking soft drinks frequently. This result was similar with the study conducted by Fernandez EMe *et al.*,(2000)⁶⁶ found that 80.2% of the participants with dysmenorrhea were drinks soft drinks frequently. This may be due to artificial sweetener, which causes blood vessels to constrict and decrease blood flow to your uterus. This lack of blood flow to uterus can increase menstrual cramps.

Table no.17 shows frequency of eating chocolate. It was found that 64.41% of the participants with dysmenorrhea ate chocolate occasionally .This results is in contrast to the study conducted by Fernandez EMe *et al.*,(2002)⁶⁶ which found that 80.2% of the participants with dysmenorrhea ate excess chocolate. This may due to

cocoa in chocolate is loaded with excess sugar, butter and also double the calories, which can worsen bloating and intensify the menstrual pain. In contrast, dark chocolate contain high amount of magnesium, iron and potassium which can relax the muscles and lighten the cramps. But in our study area students are more prone to consume milk based chocolate.

Table no.18 shows the frequency of eating Ice-cream by participants. It was found that 90.27% of the participants with dysmenorrhea ate ice cream occasionally. This may increases the risk of dysmenorrhea because dairy products like milk, cheese, and ice cream contain arachidonic acid which may increase inflammation and can intensify period pain.

Table no.19 shows the frequency of eating junk/fast food by participants; it was found that 90.97% of the participants with dysmenorrhea were occasionally had junk/fast foods. This result is concurrent with study conducted by Negi *Pet al.*,(2014)⁸² in 2009 which found that high intake of fast and junk food leads to dysmenorrhea

Table no.20 shows the frequency of eating breakfast by participants, it was found that (61.1%) of the participants with dysmenorrhea do not take breakfast regularly. This study was consistent with study performed by KazamaM *et al.*,(2011)⁸³ which described that skipping of breakfast has been increasing trends over last decade and its growing health problem in adolescent. While the mechanism under skipping of meal are not clear, but this due to low intake of certain polyunsaturated fatty acids, which have anti-inflammatory effects.

Table no.21 shows the hours of sleep by participants; it was found that 55.88% of the participants sleep for only ≤ 6 hours. This result was similar to the study conducted by Bakers *et al.*,(1999)⁸⁴ which found that most of the participants with dysmenorrhea have poor sleep quality. This may due to relationship between sleep and pain is interactive and bidirectional, such pain disrupts sleep and disturbances in sleep modify pain perception.

Table no.22 shows the hours of pain experienced due to dysmenorrhea, it was found that 69.97% of the participants with dysmenorrhea experienced 48-72hrs of pain and 30.03% of participants experienced >72 hours pain.

Table no.23 shows the students answer to the question: Did you know about dysmenorrhea before? It was found that 86.81% of the participants with dysmenorrhea were not known about the term dysmenorrhea before.

Table no.24 shows the usage of Pain killer for management of dysmenorrhea. It was found that 20.49% of the participants with dysmenorrhea were using the painkiller for the management of dysmenorrheal pain. This result was consistent with the study performed by Omidvar *Set al.*, (2016)⁶⁷ which described only a small proportion of girls took pharmacological management (25.5%). NSAIDS are commonly recommended for the relief of mild dysmenorrhea. When given prophylactically, there is evidence that aspirin has a moderate action for severe dysmenorrhea. Only 1% of the girls knew about the mefenamic acid could be taken as prophylactically this result found in study conducted by Thirza IJ *et al.*, (2005)⁸⁵.

Table no.25 shows the menstrual cycle duration of participants. It was found that 78.64% of the participants with dysmenorrhea experienced periods between 22 to 28 days .This results was consistent to the study conducted by KazamaM *et al.*, (2009)⁸³ which found that 48.2% of the participants with dysmenorrhea experienced menstrual cycle between 25-38days. There is correlation between the menstrual cycle duration and risk of dysmenorrhea.

Table no.26 shows the first experience of menstrual pain. It was found that 65.97% of the participants with dysmenorrhea were experienced pain during 1st puberty time. This result was inconsistent with the study conducted by ChoLW *et al.*, (2008)⁸⁶ which found that 37.6% of the participants experienced menstrual pain after 6 months to a year after menarche.

Table no.27 shows the nature of Menstrual flow. It was found that 68.05% of the participants with dysmenorrhea were reported moderate flow, followed by 28.99% of the participants reported heavy flow and only 2.95% of the participants with light flow. This result was accordance with study conducted by Ortiz MI *et al.*, (2013)⁸⁷ in

2009 which found that 75.4% of the participants with dysmenorrhea experienced moderate flow and 10.8% of the participants with heavy flow. There is significant correlation between the presence of dysmenorrhea and the amount of flow.

Table no.28 shows the pain character during periods. It was found that 48.78% of the participants with dysmenorrhea experienced mix pain and followed by 27.95% of the participants with stinging pain and 23.61% of the participants experienced sharp pain. This results was not similar with study conducted by Omidvar *Set al.*, (2016)⁶⁷ in 2016 was found that 18.2% of the participants with dysmenorrhea experienced sharp pain followed by 11.8% of the participants with dysmenorrhea have stinging pain and but no one experienced mix pain.

Table no.29 shows the mood during periods. It was found that 94.62% of the participant with dysmenorrhea were depressed and followed by 65.97% of the participants with dysmenorrhea were have anger and Tendency to fight with the people around them was 48.26%. This may due to during menstruation the female may be psychologically affected.

Table no.30 shows the help seeker for menstrual pain. It was found that 84.38% of the participants with dysmenorrhea was discuss the menstrual pain with mother and followed by 78.82% of the participants with dysmenorrhea discussed the pain with friends and 77.08% of the participants to the sister. This results was accordance with study conducted by Alsaleem *et al.*, (2004)⁶³ which found that 57.4% of the participants gives preference to their family members for consulting about the pain.

Table no.31 shows limitation of daily activities due dysmenorrheal pain by participants. It was found that 44.79% of the participants with dysmenorrhea were severely affected. This result was accordance with the study conducted by Gilany EL *et al.*, (2006)⁸⁸ 98.6% of women with severe menstrual pain, affects the daily activities and social lives of women.

Table no.32 shows home remedies for dysmenorrhea pain. It was found that 93.75% of the participants with dysmenorrhea were lay on be and followed by 78.47% of the participants were their divert mind. This result was accordance with

the study conducted by Jones M *et al.*, (2007)⁸⁹ that 67.87% of the participants with dysmenorrhea were laid on bed.

Table no.33 shows the pain assessment score. It was found that 81.25% of the participants with dysmenorrhea experienced severe pain and followed by 18.17% of the participants experienced the moderate pain by using Visual Analysis Scale. Most of the students experienced severe dysmenorrheal pain. This result was inconsistent with the study conducted by Potur D *et al.*, (2013)¹¹ which found that 30.4% of the participants with dysmenorrhea experienced severe pain, followed by 49.8% of the participants with dysmenorrhea have moderate pain.

Table no.34 shows area of pain due to dysmenorrhea. It was found that 93.05% of the participants with dysmenorrhea have lower abdomen pain, followed by 79.51% have back pain and 63.02% of the participants with dysmenorrhea have upper abdomen pain. This result was similar with study conducted by Rafique Net *al.*, (2013)⁷³ which found that pain in the subjects can be due to uterine contraction as a result of increased prostaglandin production in the menstruating uterus.

Table no.35 shows number of spotting days during menstruation. It was found that 74.13% of the participants with dysmenorrhea have ≤ 5 days of spotting. This result was consistent with the study conducted by Kazama M *et al.*, (2011)⁸³ which found that 46.05% of the participants with dysmenorrhea were have ≤ 5 days of spotting. Therefore increase the spotting days can cause risk of dysmenorrhea.

Table no.36 shows suffering due to dysmenorrheal pain. It was found that 88.36% of the participants with dysmenorrhea were have loss of concentration followed by 82.89% of the participants were lost their interest in studies and 33.85% of Sthe participants with dysmenorrhea, has affects their relationship and 29.51% of the participants with dysmenorrhea, mental health was affected. This result was accordance with the study conducted by Banikarin *et al.*, (2015)⁹⁰ found that dysmenorrhea has negative impact on education and affects the socialization with peers and relationship with friends and family.

Table no.37 shows the symptoms during menstrual days. It was found that 62.5% of the participants with dysmenorrhea have change in appetite. Somatic symptoms

involved diarrhea (26.91%), constipation (16.15%), vomiting (48.26%), nausea (38.02%) of the participants with dysmenorrhea were affected. This result was accordance with study conducted by Davis et al., (2014)⁷⁹ which found that 76.4% of the participants with dysmenorrhea were more prone to change in appetite. Somatic symptoms are due to production of prostaglandins and the high intensity of pain.

9. CONCLUSION

- The prevalence of dysmenorrhea was 73% among the 17-25 year students in the present study.
- Dysmenorrhea often associated with limitation in daily activities, and the affected students expressed poor satisfaction with their academic performance during the periods when they exhibited the symptoms.
- Researchers and health care providers should consider about the primary dysmenorrhea as a highly prevalent gynaecological complaint and intervention studies give due attention to the factors to reduce the intensity of pain.
- It would also seem that if mothers family history significantly affects the intensity of primary dysmenorrhea, certain amount of reassurance on the part of the mothers can go a long way in helping their daughters cope with the discomforts that accompany primary dysmenorrhea.
- The short sleeping hours, skipping breakfast and may associated life style factors are the risk factors for dysmenorrhea.
- Therefore, strategies should be designed for early detection of the problems and management through change in students life style like promoting regular physical exercise reduced negative effect of the primary dysmenorrhea. It is concluded that developing educational programs for effective dysmenorrhea management to decrease symptoms would be beneficial for female students and may improve their study performance and social relationship.

10. LIMITATIONS

- The study was conducted in a small group. Because menstruation-related problems are considered as 'taboo' in our study population. This results of which were evaluated according to the students self reports.
- Therefore, the results of the study cannot be generalized. However it is thought that it will be source for prospective studies associated with dysmenorrhea.
- We also could not discriminate between primary and secondary dysmenorrhea, so pain related to periods was considered as a whole.
- Women were randomly selected, but some did not complete the questionnaire. This may have had an impact on the reported prevalence of the diseases.

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ETHICAL CLEARANCE CERTIFICATE

TO WHOM IT MAY CONCERN

Certificate Reference No.: JKKNCP/ETHICS_PRACTICE/019PDS03, Date: 10.01.2019

Project title: A prevalence of dysmenorrhea and its correlating lifestyle factors among female students in private educational institutions

Nature of Project: M.Pharm

Principle Researcher: Deepika.V

Supervisor: Dr. N. Venkateswaramurthy

This study was placed before the J.K.K Nattraja Institutional Ethics committee. The Institutional Ethics committee has reviewed and discussed your application to conduct the study in the Department of Pharmacy Practice. After discussion and review of your project, the committee approves the project to be conducted in the present form. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above. The J.K.K Nattraja Institutional Ethics committee retains the right to withdraw or amend this Ethical Clearance Certificate if

- ❖ Any unethical principal or practices are revealed or suspected
- ❖ Relevant information has been withheld or misrepresented

(Dr. A. Sivakumar)
Chairman

J.K.K Nattraja Institutional Ethical Committee

INFORMED CONSENT

TITLE OF STUDY

Prevalence of dysmenorrhea and its correlating life style among female students in private educational institutions.

PRINCIPAL INVESTIGATOR

Deepika.V

2nd year Master of pharmacy

Department of pharmacy practice

J.K.K.Nattraja College of Pharmacy

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PURPOSE OF STUDY

The purpose of study is to determine the prevalence of dysmenorrhea and its correlating life style among female students in private educational institution.

STUDY PROCEDURES

The collected data regarding the study will be analysed statistically to estimate prevalence of dysmenorrhea and correlate the life style factors with prevalence of dysmenorrhea.

BENEFIT

This study helps to estimate the prevalence of dysmenorrhea in educational institutions located in study area and also used to provide education regarding dysmenorrhea to the students.

CONFIDENTIALITY

Your responses to this questionnaire will be anonymous. Please do not write any identifying information in the questionnaire. Every effort will be made by the researcher to preserve your confidentiality.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

KOMARAPALAYAM

Data entry form

**Title of the research work :Prevalance of Dysmenorrhea and its Correlating Life style
among female student in Private Institutions**

part 1:Sociodemographic Details

1. Age of the student :
2. Educational qualification :
3. Marital status : Single Married
4. Fathers education : Primaryschool High school
 Degree Nil
5. Mothers education : Primary school High school
 Degree Nil
6. Living area : Village Town City
7. Family size : ≤4 ≤5-8 >8
8. Residence : Home Hostel
9. Height :
- 10.Weight :
- 11.Family income per annum approximately :
- 12.Family history of menstrual pain :Yes/ No
- 13.Regularity ofmenstrual cycle : Regular Irregular
- 14.Age of first menses : ≤ 12 yrs 13-15yrs >15 yrs

Part2: Life Style And Food Habbits

1. Tick yes /no if you having the habit of consuming these following products regularly:

S.No	Question	Yes/Occasionally(or) Regularly	No
1	Tea		
2	Coffee		
3	Cola drinks		
4	Chocolate		
5	Fast food/junk food		
6	Icecream		
7	Tobacco		
8	Alcohol		

2. Daily water intake : Less than 1 liter 1 to 2 liter
 Greater than 2 litre
3. Cooking oil used : Sunflower oil Groundnut oil
 Coconut oil Palm oil
4. Fish in take : Regularly Occasionally
5. Meat in take : Weekly once More than 2 times a week
6. Hours of sleep : Less than or equal to 6hr From7 to 8 hr .
 More than 9 hr
7. Exercise : Never Occasionally Regularly
8. Breakfast : Eat everyday regularly Eat some days only
 Do not eat
9. Eats fruits (minimum 3 pieces) daily : Yes/ No
10. Whole grains/cereals intake (Minimum 1 type per week): Yes / No
11. Sweet product intake : Do not take Eat some days Eat every day
12. Excess salt intake : Yes / No
13. Have you experienced heavy painful periods for past 3 months regularly : Yes /No
14. How many hours you experience the pain: 24-48hrs 48-72hrs >72hrs
15. Did you consult the doctor for any other gynaecological problem: Yes / No
- If your answer is [Yes] for 13,14 questions .Please answer for the 3rd part of the question which involve the menstrual characteristics of female student.

Part3: Menstrual Characteristics

1. Cycle regularity : Regular Irregular
2. Cycle duration : ≤ 21 days 22 to 28days > 29 days
3. Number of days spots : ≤ 5 days > 7 days
4. Onset of pain : Day before cycle 1st day 2nd day
5. End of pain : 1st Day 2nd day 3rd day
6. First experience of menstrualpain: During first puberty time
 1 to 2 yr after puberty
7. Area of pain : Upper abdomen Lower abdomen
 Leg pain Back pain
8. Common symptoms related to menstrual pain:

sno	Symptoms	yes	no
1.	Nausea		
2	Diarrhea		
3.	Constipation		
4	Change in appetite		
5	Heart burn		
6	Vomiting		
7	Headache		
8	Anger		
9	Depressed mood		
10	Palpitation		
11	Breasttenderness		
12	Swelling of lower limbs		
13	Fatigue		

9. Limitation of daily activities due to menstrual pain:
 None Slightly affected
 Moderately affected Severely affected
10. Absence of classes due to pain(per semester): 3days > 3 days
11. Did you attend/receive any menstrual education: Yes/No

