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RESEARCH ARTICLE
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OVER-THE-COUNTER MEDICATION USAGE DURING MENSTRUAL PERIODS BY MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Menstruation is a natural physiological process that can be accompanied by various discomforts, including cramps, headaches, fatigue and mood swings. To manage these symptoms, many medical students turn to over the counter (OTC) medication for relief.

Aim and Objective: To study the prevalence of over-the-counter medication usage during menstrual periods by medical students.

Methodology: This was a cross-sectional analytical study carried out in Rama Medical College, Kanpur. A total of 188 students of age group 18-26 years from 1[st] year to 4[th] year were included by simple random sampling. Self-administered online google form was used to collect data.

Keywords: Over the counter, Medicine, Students, Menstruation, Google form.

INTRODUCTION

Medicines for self-medication are often called ‘nonprescription’ or ‘over the counter’ (OTC) and are available without a doctor’s prescription through pharmacies. In some countries OTC products are also available in supermarkets and other outlets. Medicines that require a doctor’s prescription are called prescription products (Rx products).**(1)** Studies revealed that there is an increase in trends of self-medication particularly among the youth.

A normal female undergoes a myriad of changes in her body from puberty and thereafter. Puberty is a period of extreme stress and strain due to various physiological and psychological changes that occur. One of the major pubertal changes in girls is the onset of menstruation. Every mature female menstruates on an average of 3-5 days each month until menopause. Sometimes this cycle is

associated with painful uterine contractions and discomfort known as dysmenorrhea (**2).** The prevalence of dysmenorrhoea in India is 62%, and it varies greatly across different populations and ethnic groups.
This can be attributed to socio-economic factors, life style, ready access to drugs, the increased potential to manage certain illnesses through self-care, and greater availability of medicinal products, socio-demographic, epidemiological, availability of healthcare and health professional, law, society and exposure to advertisement; high level of education and professional status (Alano et al., 2009).Moreover, knowledge of drugs and their use are the main causes of self-medication especially among pharmacists and physicians (Al Khaja et al, 2006). Analgesics remain the most common method of treatment especially for the relief of pain such as headaches, fever, toothache, musculoskeletal injuries and menstrual cramps. Aspirin, paracetamol and ibuprofen and their combinations are available in pharmacies as over the counter (OTC) drugs.(**2)**

MATERIAL AND METHODS

This was a cross sectional analytical study carried out in Rama Medical College, Kanpur. A total of 188 students of age group 18-26 years from 1st year to 4th year were included by simple random sampling .Self administered online google form was used to collect data.

Aim and objectives:

1. To determine the prevalence of over-the-counter medication usage among medical students during menstrual periods.
2. To identify and analyse the factors influencing the usage of OTC medication during menstrual periods.
3. To determine the association between over-the-counter medication usage and menstrual features.

Study design- Cross-sectional analyticalstudy.
Study Setting- Rama Medical College Hospital and Research Centre, Kanpur.
Study population –Female Medical students from 1st year till 4th year.
Study duration-2ndApril 2024 to 2ndJuly 2024(4 months)
Sampling method- Simple Random Sampling.
Sample Size- According to a study done by kumar singh R etal,proportion of OTC medication usage among girls in medical college was 81%.**(3)**applying formula for one proportion $N=4PQ/D^2$
Where P=81
Q=100-81=19
D=Absolute precision is taken as 6%
$N=4X81X19/6^2=171$,Adding 10% non response,it came out to be 188.

Inclusion Criteria- students who gave consent
Exclusion Criteria- students who did not give consent.
Data Collection Method- A semi-structured online questionnaire in the form of google forms was used to collect data regarding OTC Medication during menstrual periods with other associated information.

Data analysis. Data collected was entered into Microsoft Excel. Data analysis was done by using software Jamovi(2.4.8)The prevalence of over the counter medication usage was presented in the form of frequencies and percentages.Most of the variables in this study were categorical so statistical significance was tested using Chi-square test and pvalue (pvalue≤0.05is statistically significant, and>0.05not significant)

Ethical consideration- Ethical clearance for the study and permission to conduct the study in study setting was obtained from the Institution's ethics committee RMCHRC/Ethics/2024/3371-C Dated 5/3/2024 .

Consent:Written informed consent was taken from the students included in the google form. Confidentiality of the information was maintained.

RESULTS

The study includes 188 students, all aged between 18 and 26 years. The sample is fairly evenly distributed across all four years of study. The majority of participants identify as Hindu (94.7%), followed by Muslims (4.3%), with a small percentage belonging to other religions (1.1%). Most students (94.7%) reside in hostels, while a small percentage live as paying guests (3.2%) or with their families (2.1%).

Regarding dietary habits, a majority of participants (61.2%) follow a mixed diet that includes both vegetarian and non-vegetarian foods, while 38.8% are vegetarians. These dietary choices may be influenced by cultural or religious beliefs **(table1).**

Table 1: Demographic profile of study participants(n=188)

Variable	category	Number	Percentage (%)
Age	18-26 years	188	100
Year of study	1st year	52	27.7
	2nd year	51	27.1
	3rd year	48	25.5
	4th year	37	19.7
Religion	Hindu	178	94.7
	Muslim	8	4.3
	Other	2	1.1
Residence	Hostel	178	94.7
	Paying guest	6	3.2
	With family	4	2.1
Diet	Vegetarian	73	38.8
	Mixed	115	61.2

In terms of menarche, most individuals (75%) experienced it between the ages of 11 and 14 years. A small percentage (3.2%) had early menarche, occurring between the ages of 7 and 10 years, while 21.8% experienced it after the age of 14 years. A rare 1.6% reported menarche occurring after 18 years, which may indicate underlying health conditions or delayed puberty.

The typical duration of menstrual periods for participants is 4-5 days (69.7%), which is considered normal. Additionally, 12.8% report shorter periods (1-3 days), while 17% experience longer durations (6-7 days). A small percentage (0.5%) have periods lasting more than 7 days, which may suggest a medical concern such as menorrhagia.

Table 2: Menstural characterstics of study participants(n=188)

Variable	Category	Number	Percentage
Age at menarche	7-10 years	6	3.2
	11-14 years	141	75.0
	15-18 years	38	
	>18 years	3	1.6
Average duration of menstrual periods	1-3 days	24	12.8
	4-5 days	131	69.7
	6-7 days	32	17.0
	more	1	0.5
Menstrual flow	Heavy	20	10.6
	moderate	163	86.7
	light	5	2.7
Pattern of cycles	regular	144	76.6
	irregular	26	13.8
	varies	18	9.6
Dysmenorrhea	yes	59	31.4
	no	104	55.3
	sometimes	25	13.3
Hirsuitism	yes	6	3.2
	no	181	96.8

Most participants (86.7%) report having a moderate flow, which is typical, while 10.6% experience heavy flow, potentially due to hormonal imbalances, fibroids, or other health issues. A minority (2.7%) report light flow, which could be normal for them. Regarding the regularity of menstrual cycles, 76.6% have regular cycles, indicating a healthy reproductive system. However, 13.8% report irregular cycles, which may be attributed to stress, hormonal imbalances (e.g., PCOS), or other medical conditions. Additionally, 9.6% experience varying cycle patterns, which could be either normal or indicative of underlying health issues,31.4% of individuals experience severe menstrual pain, which can significantly impact their daily activities and may be indicative of conditions such as endometriosis or primary dysmenorrhea,13.3% of individuals experience pain occasionally, while 55.3% do not experience significant period pain. Additionally, 3.2% report hirsutism, which may suggest hormonal imbalances such as Polycystic Ovary Syndrome (PCOS) or other endocrine disorders. Conversely, 96.8% do not experience excessive hair growth, indicating that hirsutism is not a widespread issue in this group**.(table 2)**

3.1% of individuals use over-the-counter (OTC) medication for menstrual symptoms, while 56.9% do not. This indicates that while self-medication is relatively common, it is not universal. Approximately 27.1% use OTC medication 1-2 times per cycle, which suggests they experience mild to moderate pain relief needs. In contrast, 15.2% take OTC medication 3-4 times per cycle, which may signify more severe menstrual pain or discomfort. A small percentage, 1.1%, use it more than four times per

cycle, which could be concerning as frequent use may indicate underlying conditions such as dysmenorrhea or endometriosis.Regarding the duration of usage, 39.6% of OTC users have been taking medication for at least one year, with varying durations among different individuals. A small group (3.2%) has relied on OTC medication for 7-8 years, suggesting long-term dependence.When it comes to obtaining recommendations, 20.2% rely on friends or family, which may lead to improper medication use. In a safer approach, 13.3% consult healthcare professionals, while 9.6% turn to pharmacists for general advice. Regarding the effectiveness of OTC medications, 53.2% agree that they are effective for managing menstrual symptoms. Meanwhile, 41.0% remain neutral, indicating mixed experiences or minimal symptom relief, and 5.9% disagree, suggesting that OTC medications may not work for everyone. In terms of medication safety, 40.9% always read the instructions, reflecting responsible use. However, 24.5% sometimes read them, while 17.6% never do, posing a risk of incorrect usage or side effects. Additionally, 17.0% rarely check the instructions, highlighting the need for greater awareness about self-medication safety (**table 3).**

Table 3: Over the counter medication usage (n=188):

Variable	category	Number	Percentage
OTC Drug usage	yes	81	43.1
	no	107	56.9
Frequency of OTC medication	1-2 times per cycle	51	27.1
	3-4 times per cycle	28	15.2
	More than 4 times per cycle	2	1.1
	n/a	107	
Duration of OTC Usage	1-2 years	25	13.3
	2-3 years	22	11.7
	3-4 years	14	7.4
	4-5 years	14	7.4
	5-6 years	0	0
	6-7 years	0	0
	7-8 years	6	3.2
	>8 years	0	0
	N/A	107	56.9
Who recommended OTC?	Friend/family	38	20.2
	Healthcare professionals	25	13.3
	self	18	9.6
	N/A	107	56.9
OTC is effective in managing menstrual cycles	agree	100	53.2
	disagree	11	5.9
	neutral	77	41.0
do you read the instructions before taking OTC medicine?	always	65	40.9
	never	28	17.6
	rarely	27	17.0
	sometimes	39	24.5
Type of OTC Medicine used	Meftal spas	58	30.9
	ibuprofen	5	2.7
	paracetamol	18	9.6
	Home remedies	9	4.8
	N/A	98	52.1

The usage of over-the-counter (OTC) medications is notably linked to a range of menstrual challenges. These include heavy menstrual flow, which can lead to excessive bleeding, and dysmenorrhea, characterized by severe menstrual cramps that disrupt daily life. Additionally, many individuals experience menorrhagia, a form of prolonged or heavy menstruation that can significantly impact their well-being. The consequences of these menstrual issues often extend to missed classes and reduced academic performance, as the physical and emotional symptoms can hinder concentration and focus on studies. Overall, the interplay between OTC drug usage and menstrual symptoms reveals a profound influence on both daily activities and academic pursuits**(table4).**

Table 4: Association of over the counter medication usage and Menstrual cycle (N=188):

Variable	category	OTC usage		Chi square value	P value
		no	yes		
Pattern of menstrual cycles	Regular	82	62	3.99	0.136
	irregular	18	8		
	varies	7	11		
Duration of menstrual cycles	1-3 days	19	5	6.44	0.092
	4-5 days	70	61		
	6-7 days	17	15		
	more	1	0		
Menstrual flow	heavy	5	15	10.2	0.006
	light	2	3		
	moderate	100	63		
dysmenorrhea	May be	9	16	22.0	**<0.001**
	no	75	29		
	yes	23	36		
Severity of menstrual pain	mild	27	10	14.6	**<0.001**
	moderate	30	34		
	severe	8	22		
menorrhagia	May be	11	15	6.44	**0.040**
	no	77	45		
	yes	17	21		
Do you miss classes during menstruation	frequently	5	17	25.2	**<0.001**
	never	23	4		
	ocassionally	35	39		
	rarely	44	21		
Menstrual pain affects academic performance	moderately	33	31	13.0	**0.005**
	Not at all	10	1		
	Severely	6	14		
	slightly	58	35		

How much menstrual pain affects daily life activities	moderately	33	41	21.9	**<0.001**
	Not at all	6	1		
	severely	6	15		
	Slightly	62	24		
Able to concentrate on studies	no	55	58	7.85	**0.005**
	yes	52	23		

The analysis shows a strong association between OTC medicine usage and its frequency, duration, and source of recommendation ($P < 0.001$). Those who take OTC medicine frequently or occasionally are significantly more likely to continue using it over time, with many relying on it for 1-8 years. The majority receive recommendations from friends and family (32 users), followed by pharmacies (17) and healthcare professionals (21). This highlights a potential risk of misuse or lack of medical guidance**(table 5).**

Table 5: Association of over the counter medication usage and its related factors (N=188):

Variable	Category	OTC Medicine usage		Chi square value	P value
		no	yes		
Frequency of OTC medicine	frequently	0	2	135	**<0.001**
	n/a	100	7		
	ocassionally	3	25		
	rarely	4	47		
Duration of OTC Medicine	1-2 years	4	21	130	**<0.001**
	2-3 years	3	19		
	3-4 years	1	13		
	4-5 years	0	14		
	7-8 years	0	6		
	n/a				
Who recommended OTCmedicine	Friend/family	6	32	110	**<0.001**
	Healthcare professionals	4	21		
	n/a	96	11		
	pharmacy	1	17		

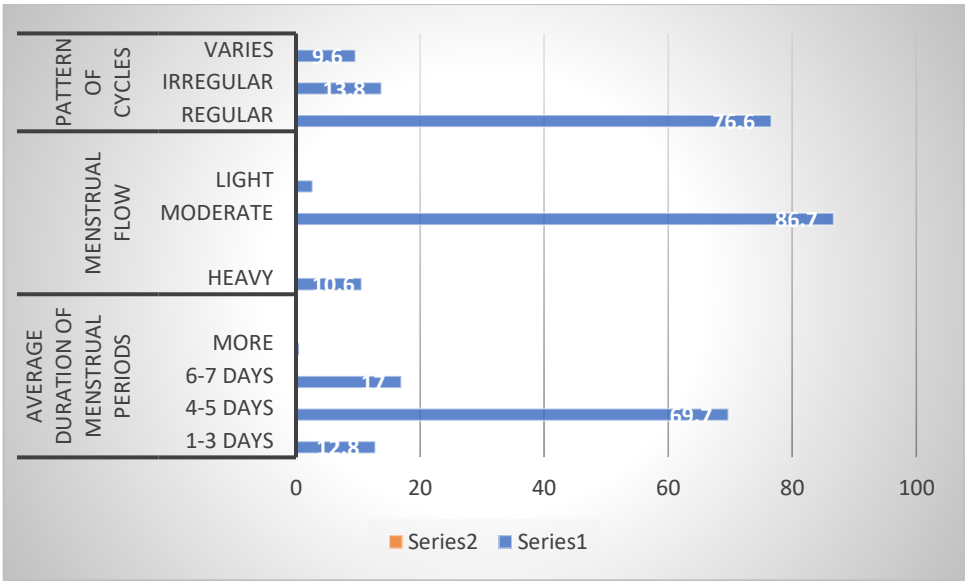

Fig 1: Characterstics of menstrual cycles of study participants(n=188)

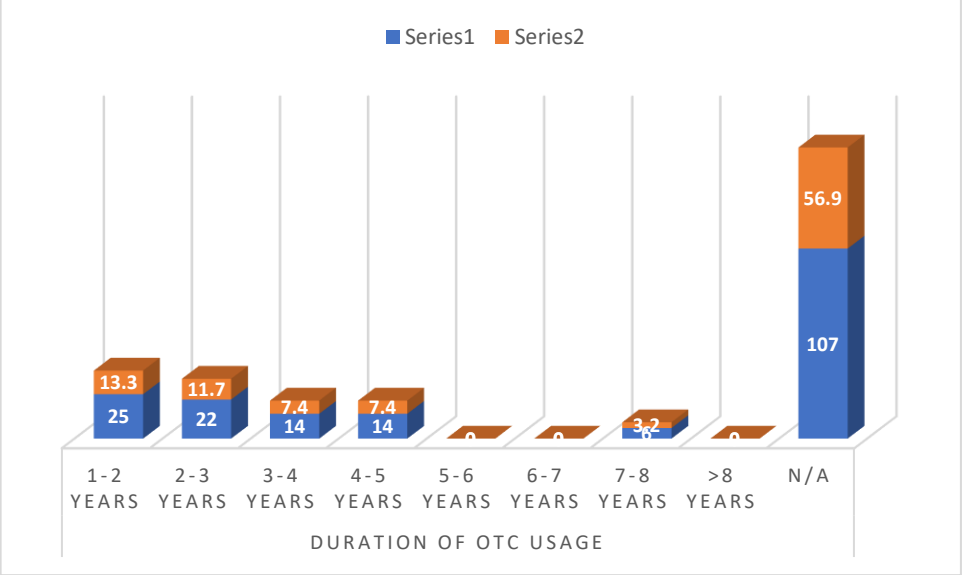

Fig 2: Duration of OTC usage (N=188)

DISCUSSION

Self-medication is termed as the use of medicines, specially designed and labeled for use without medical supervision and approved as safe and effective for such use. They are called "over the counter" drugs and are available without doctor's prescription through pharmacies. In a study by Shamshad Begum Loni etal 80.84 % (medical: 82, 38.31% and applied medical science: 132, 61.68%) confirmed that they were on self-medication. The majority of participants (42.1%) were between the ages of 20 and 21.5 years.in our study 43.1% students 18 -26 years of age were taking over-the-counter medication. In their study family members were the main source of information for self-medication (67.1%), followed by self-acquired knowledge (64.7%), social media (55.5%), and least were friends (31.2%) likewise in our study 20.2% were advised by family and friends and 9.6% were taking by self**(4)**.In a study byErgun Oksuz et al the prevalence of dysmenorrhea in female students was found to be 70.4%while in our study it is 31.4%.In their study 87.9% of cases, dysmenorrhea caused problems in daily activities in our study 71.4% students reported problems in daily activities due to menstrual pain.Also in their study Ninety percent of the students had regular menses periods (22-34 days), and the duration of the menses was less than 7 days at a rate of 74% however in our study 76.6% of individuals have regular cycles with average duration of 4-5 days at a rate of 69.7%.**(5)** In a study by Kusum Kumari et al more than 50% students were using Paracetamol as an OTC

analgesic. Fixed dose combination (FDC) drugs like combiflame, meftalspas and zerodol P were used by about 15.54% students. Nimesulide was used by very few students (1.12%) in contrast 30.9% students in our study were taking meftal spas in comparison to paracetamol(9.6%).**(6)**

This study has found that self-medication is very common among medical students, facilitated by the easy availability of drugs and information from textbooks/ seniors **(7,8).** A significant number of students are unaware of the adverse effects of the medication that they themselves take and suggest to others **(9).** This highlights the importance of creating awareness among students to consume drugs only in severe discomfort after prescription by the registered medical practitioners. Since inappropriate self-medication has the potential to cause serious harm, not only to the students themselves but also to those whom they suggest medication, potential problems of self- medication should be emphasized to the students to minimize this risk **(10).**

CONCLUSION

This study provides valuable insights into the menstrual health and OTC medication usage patterns among female students. The findings indicate that menstrual irregularities, dysmenorrhea, and heavy menstrual flow are significant factors influencing OTC medication use. While 43.1% of participants use OTC drugs, the frequency and duration of use vary, with some relying on them for several years, raising concerns about long-term dependence and self-medication risks.A notable association exists between OTC usage and menstrual challenges, including missed classes and reduced academic performance. The study also reveals that friends and family are the primary sources of OTC recommendations, rather than healthcare professionals, which may contribute to improper medication use. Although many participants find OTC medications effective (53.2%), a significant proportion (41.0%) remain neutral, suggesting mixed experiences.Given these findings, it is crucial to promote awareness about safe OTC medication use, encourage professional medical consultation, and explore alternative menstrual pain management strategies. Addressing these issues can help improve students' overall health, academic performance, and quality of life.

Recommendations

1. Promote Medical Consultation:

Encourage students to seek professional medical advice for menstrual issues rather than relying on friends, family, or pharmacies for OTC recommendations.

2. Educate on Safe OTC Medication Use:

Conduct health awareness programs to educate students on proper OTC medication use, dosage, side effects, and risks of long-term dependence.

Encourage students to always read instructions before taking OTC drugs to minimize health risks.

3. Encourage Alternative Pain Management Strategies:

Promote non-pharmacological approaches such as dietary adjustments, regular exercise, yoga, and meditation, for menstrual pain relief.

LIMITATIONS

1.The study includes only 188 students, which may not be representative of the broader female student population in different educational institutions or geographic locations.

2.The study relies on self-reported responses, which may be subject to recall bias, social desirability bias, or inaccurate reporting of menstrual health issues and OTC medication usage.

3.The study does not include clinical diagnoses of conditions like PCOS, endometriosis, or hormonal imbalances, which could provide a deeper understanding of menstrual irregularities and severe dysmenorrhea.

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Authors contribution: Conception,design,analysis, interpretation: **Dr. Lakshmi Singh**
Data collection: Shivam Rai, Abhishek Singh

Maniscript editing: Dr. Nashra Afaq,Dr.Saurabh Singh

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