

ORIGINAL RESEARCH

Determinants of self-medication and other self-care practices for dysmenorrhea among students of health sciences: implications for education and safety

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ABSTRACT

Background: Understanding the determinants of self-care practices for dysmenorrhea is essential to enhance healthcare education and safety. **Methods:** This questionnaire-based, cross-sectional study involved students of health sciences at the Christian Medical College & Hospital Ludhiana, Punjab, India. **Results:** Of the 695 enrolled female students, 564 (81%) participated. Dysmenorrhea was prevalent (86%), with tiredness (68%) the most associated symptom. Students missed academic (81%) and social (45%) activities. Self-medication was practiced by 98% students. Self-medication with drugs (69%) increased with clinical pharmacology and medical training, seniority, dysmenorrhea severity and frequency, and consultation. The most preferred interventions were heat therapy (71%) and non-steroidal anti-inflammatory drugs (69%). The most used drugs were paracetamol (55%) and mefenamic acid (48%). Adverse drug reactions were reported by 4% of students. Knowledge about drug safety was limited. Unsafe practices were identified, such as the use of injections, prescription-only medications, hormones, drug duplication, not consulting experts, and unreliable information sources (family, websites, and friends). Despite knowledge gaps, most students felt knowledgeable and confident. Time saving (50%) and adverse drug reactions (46%) were the main advantage and disadvantage, respectively. Most students expressed interest in education on the topic. **Conclusions:** Self-care practices for dysmenorrhea were common and safety concerns were identified. Considering the influence of education on self-medication, interest in education on this topic, and the high participation rate, the ground for educational interventions is fertile. Educational institutions and healthcare providers can play pivotal roles in shaping students' behaviours and attitudes in ways that enhance their well-being and safety.

Keywords: dysmenorrhea, self-care, self-medication, health science students, clinical pharmacology, medical training, medication errors

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INTRODUCTION

Dysmenorrhea, commonly referred to as period pain or menstrual cramps, affects up to 90% of women, with 20% enduring severe pain that adversely impacts their lives.¹⁻³ University students exhibit a high prevalence of dysmenorrhea.⁴ This recurring issue necessitates effective and safe self-care interventions. The World Health Organization (WHO) defines self-care as the capacity of individuals, families, and communities to promote and sustain health, prevent illness, and manage sickness and disability, with or without the involvement of healthcare professionals. Self-care encompasses hygiene, nutrition, lifestyle,

environmental factors, socioeconomic aspects, and self-medication (SM).⁵

SM is the selection and utilization of medications (including complementary and alternative medicine (CAM) remedies) by individuals for self-recognized illnesses or symptoms, or the intermittent or continuous use of medications prescribed by a physician for chronic or recurring conditions.^{5,6} SM, or prescribing for self, represents a prevalent practice among the general population⁷ and is particularly facilitated among students of health sciences by the ready availability of drugs and information.^{8,9} It can be influenced by their educational program.¹⁰ Self-care

interventions may be associated with medication errors, adverse drug reactions (ADRs) and interactions, warranting evaluation.⁶

Despite the abundance of studies on dysmenorrhea, there exists a paucity of research on self-care interventions for dysmenorrhea among young women.¹¹ To promote rational drug use, minimize medication errors, and enhance individual safety, understanding the factors for such interventions is imperative. The primary objective of this study was to investigate the determinants of self-care interventions for dysmenorrhea among students of health sciences.

METHODS

Study design and setting

This investigation was undertaken in May and June of 2023 with the approval of the Institutional Research and Ethics Committees. Employing convenience sampling, this cross-sectional study targeted the entire female student population, from year 1 (admission year 2022) to year 4 (admission year 2019), enrolled in undergraduate health science programs (HSPs) at the Christian Medical College & Hospital Ludhiana, Punjab, India (CMCH): Allied Health Sciences (AHS), Bachelor of Dental Surgery (BDS), Bachelor of Physiotherapy (BPT), Bachelor of Science in Nursing (BSC), General Nursing and Midwifery (GNM), and Bachelor of Medicine and Bachelor of Surgery (MBBS).

Data collection

A questionnaire was developed, validated by external experts, and pilot tested in a representative sample of students. In the classroom students were briefed regarding the study, their anonymous and voluntary participation, and strict data privacy and confidentiality. A Microsoft Forms link to the informed consent form and the questionnaire was disseminated through students' WhatsApp groups. To ensure consistency, the principal investigator personally conducted all briefings and remained present in the classroom until all participants submitted the questionnaire.

Data analysis

Data management and analysis were performed using Microsoft Excel. Additionally, the Real Statistics Resource Pack software (Release 8.9.1), credited to Charles Zaiontz (2013 – 2023),¹² was utilized for data analysis.

Descriptive statistics used were medians (mdn), quartiles (Q), counts and percentages. Inferential statistics, used to calculate point estimates along with 95% confidence interval, were Chi-squared test, Fisher's exact test, Kruskal-Wallis (KW) test, Dunn test (D test), and Mann-Whitney (MW) test. When multi-group comparison yielded a significant p-value with $\alpha = 0.05$, a post hoc analysis was performed using the Holm-Bonferroni method.

This study incorporated characteristics related to menarche and the menstrual cycle from Munro et al.,¹³ and the scale for assessing dysmenorrhea severity from Andersch B and Milsom I.¹⁴

RESULTS

Participants

Out of a total of 695 female students enrolled in various HSPs (Table 1), 564 (81%) consented and participated. Their median age (Q1, Q3) was 20 (19, 21) years, with lowest in AHS and highest in GNM. Their median age at menarche was 13 (12, 14) years, with highest in AHS and lowest in MBBS.

Dysmenorrhea was reported by 483 (86%) participants, with highest in BDS and lowest in GNM. Their median age of 20 (19, 21) years was similar to that of participants without dysmenorrhea, with lowest in AHS. Their median age at menarche of 13 (12, 14) years was similar to that of participants without dysmenorrhea, with highest in AHS and lowest in MBBS.

SM was practiced by 471 (98%) participants, all HSPs being statistically similar. Self-medication with drugs (SMD) was practiced by 333 (69%) participants, with lowest in AHS and highest in BDS and MBBS (Table 1, Figure 1). Their median age of 20 (19, 21) years was similar to that of participants who did not practice SMD, with lowest in AHS. The median age at menarche of 13 (12, 14) years was similar to that of participants who did not practice SMD, with highest in AHS and lowest in MBBS. From first year to final year, the prevalence of SMD increased, even though the prevalence of dysmenorrhea did not increase (Figure 2).

SMD and menstruation characteristics

Most participants (Table 2) had a normal onset of menarche (81%), normal period frequency (85%), normal period duration (99%), and regular menstrual cycles (93%). The prevalence of SMD was higher in those with early menarche, infrequent periods, and irregular cycles. SMD was consistently high across all categories.

SMD and dysmenorrhea characteristics

Most participants (Table 3) reported dysmenorrhea onset on the first day (68%) and relief upon period cessation (96%). The majority experienced Grade 2 severity (51%) followed by Grade 1 (38%). The prevalence of SMD was significantly higher in those with Grades 3 (87%) and 2 (80%) dysmenorrhea, and in those with dysmenorrhea in most (76%) and every (75%) cycle. Extreme fatigue was the most reported associated symptom (68%). SMD was consistently high across categories related to dysmenorrhea onset, offset, and associated symptoms.

Drugs and CAM remedies used for self-care

Heat therapy (71%) was the most preferred self-care intervention (Figure 3). Non-steroidal anti-

inflammatory drugs (NSAIDs) were the most preferred drugs (69%). Paracetamol (55%) and mefenamic acid (48%) were the most used drugs. One participant (0.3%) correctly mentioned the adult maximum daily safe dose of paracetamol as 4 g.

Table 4 presents the use of injections (2%), hormones (1.8%) and fixed-dose combinations (FDCs, 2.1%). Out of 5 who used injections, 2 had severe Grade 3 dysmenorrhea, although 4 experienced dysmenorrhea in every cycle. One student injected butorphanol. Two students were unsure about the injected drug. Out of 6 students who used hormones, 2 had severe Grade 3 dysmenorrhea, and 1 experienced dysmenorrhea in every cycle. Out of 7 who used FDCs, 2 had severe dysmenorrhea, and 1 had dysmenorrhea in every cycle. In 2 cases there was duplication of paracetamol and mefenamic acid. Notably, the use of injections, hormones, prescription-only drugs, and drug duplication was not observed in students of MBBS and BDS programs. ADRs were reported by 4% of SMD students.

Knowledge, attitudes, and self-care practices

Participants (Table 5) missed academic (81%) and social (45%) activities. Most CAM users also practiced

SMD. The majority did not seek consultation (86%), and of those who did, the prevalence of SMD (91%) was higher. Family (75%), websites (48%) and friends (45%) were the main information sources. Most participants felt moderately knowledgeable (51%) and very comfortable (51%) discussing the issue with others. A majority (69%) expressed interest in educational sessions on dysmenorrhea. SMD was consistently high across most categories.

Perceived advantages and disadvantages of SMD

The most reported advantage was that it saves time (50%). Other advantages were ease of use, convenience, inducing calmness, happiness, relaxation, suitable for introverts, privacy, knowledge enhancement through experience, independence, and empowerment. Some (5%) saw no advantages. The most reported disadvantage was ADRs (46%), followed by addiction (16%), and incorrect dosage (9%). Other disadvantages were inadequate knowledge, incorrect diagnosis or drug, ineffectiveness, drug resistance, delay in seeking help, drug interactions, and non-adherence. Some (21%) perceived no disadvantages.

Table 1: Demographics of study participants (n=564)

	AHS	BDS	BPT	BSC	GNM	MBBS	TOTAL
Girls in HSP	68	121	58	184	65	199	695
All participants n (%)	61 (90)	89 (74)	55 (95)	151 (82)	45 (69)	163 (82)	564 (81)
Age-all ¹ (y) Mdn (Q1, Q3)	19 (19, 21)	20 (19, 21)	20 (20, 21)	20 (19, 21)	21 (20, 22)	20 (19, 21)	20 (19, 21)
Menarche-all ² (y) Mdn (Q1, Q3)	14 (13, 15)	13 (12, 14)	13 (13, 14)	13 (12, 14)	13 (12, 15)	12 (12, 13)	13 (12, 14)
Dysmenorrhea ³ n (%)	52 (85)	82 (92)	49 (89)	131 (87)	31 (69)	138 (85)	483 (86)
No Dysmenorrhea n (%)	9 (15)	7 (8)	6 (11)	20 (13)	14 (31)	25 (15)	81 (14)
Age-D ⁴ (y) Mdn (Q1, Q3)	19 (19, 20)	21 (19, 21)	20 (20, 21)	20 (19, 21)	21 (20, 23)	20 (19, 21)	20 (19, 21)
Age-ND (y) Mdn (Q1, Q3)	21 (20, 21)	20 (20, 22)	19 (19, 20)	21 (19, 21)	21 (20, 22)	21 (20, 21)	21 (19, 21)
Menarche-D ⁵ (y) Mdn (Q1, Q3)	14 (13, 15)	13 (12, 14)	13 (13, 14)	13 (12, 14)	13 (12, 15)	12 (12, 13)	13 (12, 14)
Menarche-ND (y) Mdn (Q1, Q3)	14 (13, 15)	15 (14, 16)	14 (13, 15)	13 (12, 14)	13 (12, 14)	13 (12, 13)	13 (12, 14)
SM ⁶ n (%)	48 (92)	82 (100)	49 (100)	126 (96)	31 (100)	135 (98)	471 (98)
NSM n (%)	4 (8)	0 (0)	0 (0)	5 (4)	0 (0)	3 (2)	12 (2)
SMD ⁷ n (%)	27 (52)	65 (79)	34 (69)	81 (62)	19 (61)	107 (78)	333 (69)
NSMD n (%)	25 (48)	17 (21)	15 (31)	50 (38)	12 (39)	31 (22)	150 (31)
Age-SMD ⁸ (y) Mdn (Q1, Q3)	19 (19, 21)	20 (19, 21)	21 (20, 21)	20 (19, 21)	21 (20, 22)	21 (20, 21)	20 (19, 21)
Age-NSMD (y) Mdn (Q1, Q3)	19 (19, 20)	21 (19, 22)	20 (19, 20)	20 (19, 21)	21 (19, 23)	20 (19, 22)	20 (19, 21)
Menarche-SMD ⁹ (y) Mdn (Q1, Q3)	14 (13, 15)	13 (12, 13)	13 (13, 14)	13 (12, 14)	13 (12, 15)	12 (12, 13)	13 (12, 14)
Menarche-NSMD (y) Mdn (Q1, Q3)	14 (13, 15)	13 (12, 14)	13 (13, 14)	13 (12, 14)	13 (12, 15)	13 (12, 13)	13 (12, 14)

¹Age-all: Inter-HSP KW p-value 0.0016. Post hoc Dunn: AHS < GNM, MBBS, BDS.

²Menarche-all: Inter-HSP KW p-value 0.0000. Post hoc Dunn: AHS > MBBS, BDS, BSC. MBBS < BPT, BSC, GNM.

³Dysmenorrhea: Inter-HSP Chi-square p-value 0.0148. Post hoc Fisher's exact BDS > GNM.

⁴Age-D vs. Age-ND (Total): MW p-value 0.2457

⁴Age-D inter-HSP KW p-value 0.0002. Post hoc Dunn: AHS < GNM, MBBS, BDS, BPT, BSC.

⁵Menarche-D vs. Menarche-ND (Total): MW p-value 0.1008.

⁵Menarche-D inter-HSP KW p-value 0.0000. Post hoc Dunn: AHS > MBBS, BDS, BSC. MBBS < BPT, GNM, BSC.

⁶Self-medication: Inter-HSP Chi-square p-value 0.0521.

⁷Self-medication-D: Inter-HSP Chi-square p-value 0.0013. Post hoc Fisher's exact test AHS < BDS, MBBS.

⁸Age-SMD vs. Age-NSMD (Total): MW p-value 0.0636

⁸Age-SMD inter-HSP KW p-value 0.0087. Post hoc Dunn: AHS < GNM, BPT, MBBS.

⁹Menarche-SMD vs. Menarche-NSMD (Total): MW p-value 0.0508

⁹Menarche-SMD inter-HSP KW p-value 0.0000. Post hoc Dunn: AHS > MBBS, BDS, BSC. MBBS < BPT, BSC, GNM.

AHS, Allied Health Sciences; BDS, Bachelor of Dental Surgery; BPT, Bachelor of Physiotherapy; BSC, Bachelor of Science (Nursing); D, dysmenorrhea; GNM, General Nursing and Midwifery; HSP, Health Science Program; KW, Kruskal-Wallis test; MBBS, Bachelor of Medicine and Bachelor of Surgery; Mdn, median; MW, Mann-Whitney test; ND, no dysmenorrhea; NSM, no self-medication; NSMD, no self-medication with drugs; Q, quartile; SM, self-medication; SMD, self-medication with drugs.

Table 2: Self-medication with drugs and menstruation characteristics of participants with dysmenorrhea (n = 483)

CATEGORIES	SMD	NSMD	TOTAL
Dysmenorrhea n (%)	333 (69)	150 (31)	483
Age (y) Mdn (Q1, Q3) (MW p-value 0.0636)	20 (19, 21)	20 (19, 21)	20 (19, 21)
Menarche (y) Mdn (Q1, Q3) (MW p-value 0.0408)	13 (12, 14)	13 (12, 13)	13 (12, 14)
Menarche onset n (%) (Fisher's exact p-value 0.2702)			
Early (≤ 10 y)	18 (75)	6 (25)	24 (5)
Normal (11 y TO 14 y)	273 (70)	117 (30)	390 (81)
Delayed (≥ 15 y)	42 (61)	27 (39)	69 (14)
Period frequency n (%) (Fisher's exact p-value 0.3223)			
Amenorrhoea	0 (0)	0 (0)	0 (0)
Infrequent (>38 d)	20 (83)	4 (17)	24 (5)
Normal (24 to 38 d)	280 (68)	132 (32)	412 (85)
Frequent (<24 d)	17 (71)	7 (29)	24 (5)
Data not available	16 (70)	7 (30)	23 (5)
Period duration n (%) (Fisher's exact p-value 1.0000)			
Normal (≤ 8 d)	331 (69)	149 (31)	480 (99)
Prolonged (>8 d)	2 (67)	1 (33)	3 (1)
Cycle variation n (%) (Fisher's exact p-value 0.5151)			
Normal (≤ 9 d)	308 (69)	141 (31)	449 (93)
Irregular (≥ 10 d)	9 (82)	2 (18)	11 (2)
Data not available	16 (70)	7 (30)	23 (5)

MW, Mann-Whitney test; NSMD, no self-medication with drugs; SMD, self-medication with drugs.

Characteristics related to menarche and the menstrual cycle were adapted from Munro et al.¹³

Table 3. Self-medication with drugs and dysmenorrhea characteristics of participants (n = 483)

CATEGORIES n (%)	SMD	NSMD	TOTAL
Dysmenorrhea	333 (69)	150 (31)	483
Dysmenorrhea onset (Fisher's exact p-value 0.2905)			
Few days before	111 (73)	42 (27)	153 (32)
On 1 st day	222 (67)	108 (33)	330 (68)
Dysmenorrhea offset when period ends (Fisher's exact p-value 0.0504)			
No	10 (48)	11 (52)	21 (4)
Yes	323 (70)	139 (30)	462 (96)
Dysmenorrhea severity ^a (Fisher's exact p-value 0.0000)			
Grade 1	91 (49)	93 (51)	184 (38)
Grade 2	194 (80)	50 (20)	244 (51)
Grade 3	48 (87)	7 (13)	55 (11)

Dysmenorrhea frequency ^b (Fisher's exact p-value 0.0005)			
Every cycle	137 (75)	45 (25)	182 (38)
Most cycles	90 (76)	29 (24)	119 (25)
Some cycles	106 (58)	76 (42)	182 (38)
Associated symptoms (Chi-square p-value 0.0776)			
Extreme tiredness	244 (74)	86 (26)	330 (68)
Nausea and vomiting	209 (83)	43 (17)	252 (52)
Bloating	194 (78)	55 (22)	249 (52)
Headache	129 (79)	35 (21)	164 (34)
Diarrhoea	107 (77)	32 (23)	139 (29)
Dizziness	117 (84)	22 (16)	139 (29)

NSMD, no self-medication with drugs; SMD, self-medication with drugs.

^aThe scale for assessing dysmenorrhea severity was adapted from Andersch B and Milsom I.¹⁴

^aSeverity: Post hoc Grade 1 was different from Grade 2 & 3

^bFrequency: Post hoc 'some cycles' was different from 'every' & 'most cycles'

Table 4: Use of injections, hormones, and fixed-dose combinations for self-medication with drugs

HSP	YEAR	GRADE	FREQUENCY	INJECTIONS	OTHER DRUGS
AHS	2	3	Every	Don't know	Mefenamic acid
AHS	2	2	Every	Butorphanol	Paracetamol, Aspirin
BPT	2	2	Every	Don't know	Paracetamol
BSC	4	1	Most	Dicyclomine	Mefenamic acid
GNM	1	3	Every	Dicyclomine	Mefenamic acid
HORMONES					
AHS	1	3	Some	Combined contraceptive pills	-
AHS	1	3	Every	Combined contraceptive pills	-
AHS	1	2	Most	Combined contraceptive pills	-
BSC	2	1	Some	Combined contraceptive pills	Paracetamol, Aspirin
BSC	4	1	Some	Combined contraceptive pills	-
GNM	1	2	Most	Combined contraceptive pills	Aspirin
FIXED-DOSE COMBINATIONS (mg)					
BDS	1	1	Some	Dicyclomine (10)+Mefenamic (250)	-
BPT	1	1	Some	Ibuprofen (400)+Paracetamol (325)	-
BSC	1	3	Every	Dicyclomine (10)+Mefenamic (250); Drotaverin (80)+Diclofenac(50)	Mefenamic acid, Paracetamol
BSC	2	2	Some	Chlorzoxazone (250)+Paracetamol (500)	Paracetamol
BSC	2	3	Most	Aceclofenac (100)+Paracetamol (325)+Serratiopeptidase (15)	-
MBBS	1	2	Most	Dicyclomine (20)+Paracetamol (500)	-
MBBS	3	1	Some	Ibuprofen (400)+Paracetamol (325)	-

AHS, Allied Health Sciences; BDS, Bachelor of Dental Surgery; BPT, Bachelor of Physiotherapy; BSC, Bachelor of Science (Nursing); Frequency, dysmenorrhea in every, most or some cycles; Grade, severity of dysmenorrhea; GNM, General Nursing and Midwifery; HSP, health science program; MBBS, Bachelor of Medicine and Bachelor of Surgery.

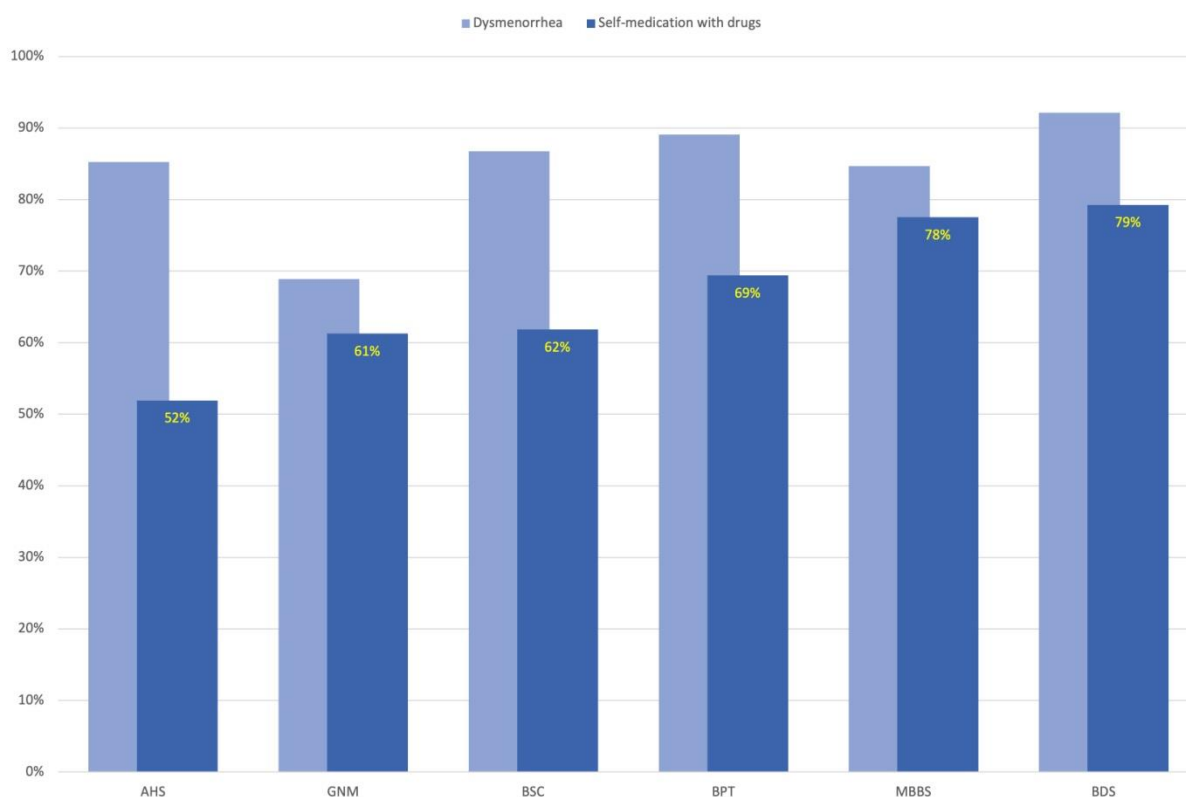
Table 5: Knowledge, attitudes, and self-care practices of students with dysmenorrhea (n = 483)

CATEGORIES n (%)	SMD	NSMD	TOTAL
Dysmenorrhea	333 (69)	150 (31)	483
Missed activities (Fisher's exact p-value 0.1541)			
Academics	323 (82)	70 (18)	393 (81)
Social activities	166 (76)	53 (24)	219 (45)
Work	78 (82)	17 (18)	95 (20)
Nothing	28 (36)	49 (64)	77 (16)
CAM remedies (Fisher's exact p-value 0.3719)			
Heat	250 (72)	95 (28)	345 (71)
Relaxation	126 (67)	62 (33)	188 (39)
Exercise	42 (76)	13 (24)	55 (11)
Herbal	35 (66)	18 (34)	53 (11)

Nothing	2 (13)	14 (88)	16 (3)
Other	14 (45)	17 (55)	31 (6)
Consultation (Fisher's exact p-value 0.0000)			
No	270 (65)	144 (35)	414 (86)
Yes	63 (91)	6 (9)	69 (14)
Sources of information (Fisher's exact p-value 0.6891)			
Family	261 (72)	103 (28)	364 (75)
Websites	166 (72)	66 (28)	232 (48)
Friends	163 (76)	52 (24)	215 (45)
Textbooks	83 (72)	33 (28)	116 (24)
Drug insert	18 (82)	4 (18)	22 (5)
Knowledgeable about topic (Fisher's exact p-value 0.2617)			
Little	96 (65)	52 (35)	148 (31)
Moderate	179 (72)	69 (28)	248 (51)
Very	58 (67)	29 (33)	87 (18)
Comfortable discussing (Fisher's exact p-value 0.0932)			
Little	48 (61)	31 (39)	79 (16)
Moderate	106 (67)	53 (33)	159 (33)
Very	179 (73)	66 (27)	245 (51)
Interest in educational sessions (Fisher's exact p-value 0.2862)			
No	22 (65)	12 (35)	34 (7)
Maybe	74 (64)	42 (36)	116 (24)
Yes	237 (71)	96 (29)	333 (69)

CAM, complementary and alternative medicine; NSMD, no self-medication with drugs; SMD, self-medication with drugs.

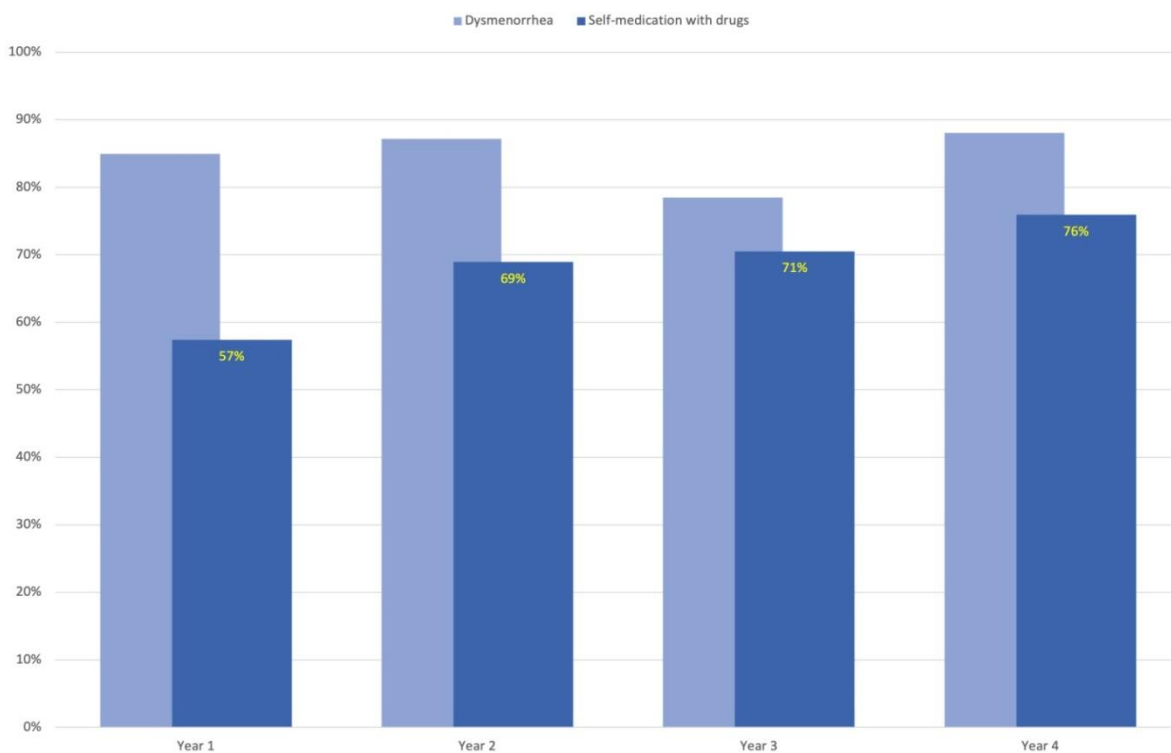
Figure 1: Health science program and self-medication with drugs. Self-medication with drugs is associated with education.



Ascending order of exposure to clinical pharmacology and medical training: AHS<GNM<BSC <BPT<BDS<MBBS.

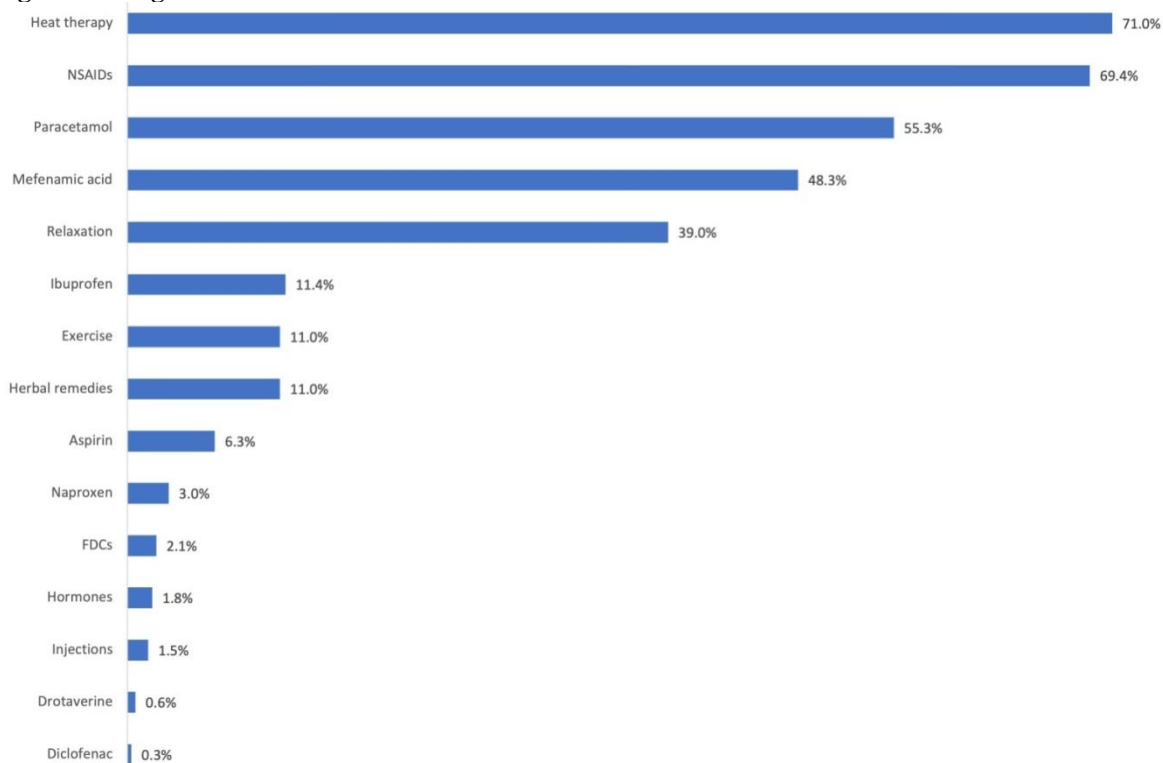
AHS, Allied Health Sciences; BDS, Bachelor of Dental Surgery; BPT, Bachelor of Physiotherapy; BSC, Bachelor of Science (nursing); GNM, General Nursing and Midwifery; MBBS, Bachelor of Medicine and Bachelor of Surgery.

Figure 2: Academic seniority of students and self-medication with drugs.



Self-medication with drugs is associated with increasing education and experience.

Figure 3: Drugs and CAM remedies used for self-care.



CAM, complementary and alternative medicine; Injections: butorphanol, dicyclomine and unknown; FDCs, fixed-dose combinations; NSAIDs, non-steroidal anti-inflammatory drugs.

DISCUSSION

For a nuanced discussion of the study's results, background of the participants is important. Students enrolled in HSPs at CMCH have varying levels of exposure to clinical pharmacology and medical training. Medicine (MBBS) and dentistry (BDS) students, training to become doctors, have the highest and most comprehensive exposure. Pharmacology is a most relevant basic science in medical and dental practice; almost every patient gets drugs.¹⁵ Students of other HSPs in this study will not prescribe drugs in their practice, hence their exposure to such education is less: physiotherapy (BPT), nursing (BSC and GNM), with allied health sciences (AHS) students having the least exposure.

Menstrual cycle, dysmenorrhea and SMD

The prevalence of dysmenorrhea (86%) aligns with studies indicating its widespread occurrence,¹ and falls within the reported values of 45% to 95%.¹⁶ The prevalence of SMD is higher among those with early menarche, infrequent periods, and irregular cycles.¹⁷ Studies have suggested a correlation between dysmenorrhea and SM with a lower age at menarche.¹⁷ As expected, SMD was less in those with mild Grade 1 dysmenorrhea and those experiencing dysmenorrhea intermittently. The associated symptoms align with the known spectrum of manifestations associated with dysmenorrhea, contributing to the overall burden experienced by individuals.^{18,19} Dysmenorrhea has a significant negative impact on academic performance both at school and during higher education, and is associated with increased absenteeism and poorer workability.^{2,3,11} Severe dysmenorrhea can significantly disrupt academic and other activities.²⁰

HSPs and SMD

Most students with dysmenorrhea (98%) practiced some form of SM. The prevalence of SMD (69%) is in line with a recent systematic review involving 60,938 university students²¹ reporting a similar prevalence (70%). Some studies have reported higher rates.²² The different prevalence of SMD across HSPs indicates that the nature of students' training program and education significantly influences their practices related to dysmenorrhea.¹⁰ Though age and SMD appeared directly proportional, this can be attributed to the baseline differences in age between the HSPs.

Seniority and SMD

In line with previous studies,^{10,23} prevalence of SMD increased from the first year to the final year. With seniority students gain more knowledge and experience. However, academic progression also comes with the confounder of increasing age. Studies have reported that SM tends to begin during adolescence and increases with age.¹¹

Self-care practices

Up to 95% of students frequently resort to over-the-counter (OTC) medications to address various health concerns.²⁴ The use of NSAIDs and CAM remedies aligns with evidence-based practices for alleviating menstrual pain and are widely recognized as effective means of alleviating menstrual pain.^{1,25} NSAIDs are a first-line treatment for dysmenorrhea.¹⁹ Many studies have consistently reported that 58% to 70% of girls self-medicate with NSAIDs and analgesics for dysmenorrhea.¹⁶ These OTC drugs are common choices for pain relief and are easily accessible to students. While SMD and the use of OTC medications can improve health, inappropriate use can pose substantial risks.²⁶ In this study, the reporting of ADRs was very low. It is quite possible that study participants may be under-dosing due to ignorance or fear. ADRs are known to be common with SMD, particularly when NSAIDs are used.^{6,27} The perceived advantages and disadvantages have been reported earlier.^{8,10}

Potential for harm: medication errors

A medication error is a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient. Various types of errors can happen, including irrational prescribing, inappropriate prescribing, overprescribing and underprescribing.²⁸ Medication errors represent one of the most prevalent preventable causes of undesired adverse events in medication practice and constitute a significant public health challenge.²⁹ In this study several errors in self-prescribing with potential to cause harm were identified, and these were more common in HSPs with less exposure to clinical pharmacology.

Being unaware of the maximum daily safe dose of paracetamol for an adult as 4 g³⁰ carries the risk of underdosing or overdosing, since paracetamol is a common cause of drug-induced liver injury.^{31,32} The use of CAM remedies and food supplements is particularly frequent among women and in those with chronic conditions. Many consider them "natural" and, thus, "less harmful" and having no, or fewer, side effects. Concomitant use of drugs and CAM remedies carries the risk of interactions.^{33,34} NSAIDs and paracetamol are known to interact with herbal products leading to toxicity.³⁵ Hormones for at least three menstrual cycles could be administered to women whose dysmenorrhea is severe and frequent, and not manageable by NSAIDs.¹⁹ Whether these students had tried NSAIDs is not known. The severity and frequency of dysmenorrhea do not justify the use of hormones in this group. Injections may be necessary when pain is severe or when oral medication is not feasible. In other situations, the use of injections is irrational, unnecessary, and potentially dangerous. The reported use of butorphanol injections, a prescription-only drug, can be dangerous and habit-forming. This likely reflects poor knowledge and overconfidence. While FDCs have

some advantages, they are not without disadvantages.³⁶ In two cases, drug duplication was observed with paracetamol and mefenamic acid, which carries the risk of unintended overdose. It is noteworthy that the use of hormones, injections, prescription-only drugs, and drug duplication were not reported by MBBS and BDS students.

Unreliable information sources

Friends and mothers are the most important sources to whom girls turn for answers regarding dysmenorrhea, but they typically do not seek medical advice for dysmenorrhea, a pattern supported by previous studies.^{11,16} The utilization of reputable sources, such as textbooks and package inserts, was minimal; this contrasts with some studies where the majority of students referred to package inserts.^{8,10} Ensuring that students have access to accurate and credible information from reliable sources is crucial for informed decision-making regarding their health.³⁷ The use of the internet to disseminate misinformation and disinformation is not new and was highlighted during the COVID-19 pandemic.³⁸

According to the WHO, seeking hospital or specialist care when necessary is part of self-care.⁵ Not doing so can be dangerous, leading to a delay in proper diagnosis. Despite the frequency and severity of dysmenorrhea, most adolescents do not seek medical advice or treatment or consult healthcare professionals. They consider painful periods a normal condition that they can manage using different self-care methods.¹¹ This behaviour is known among students of health sciences and may be due to advantages of SM cited by the students. Alternatively, it may be due to overconfidence in self-diagnosis.^{39,40} Overconfidence among students of health sciences has been reported to affect various aspects of the decision-making process.^{39,40} Nevertheless, those who consulted also practiced more SMD; this point of contact should be utilised for imparting education. Simultaneously, most students indicated interest in attending educational sessions about dysmenorrhea. This finding, along with the high participation rate in the study underscores the topic's importance and relevance among female students of health sciences.

LIMITATIONS

The study, confined to a specific institution, may limit the generalizability of findings. Additionally, the study relies on self-reported data, which may introduce bias or inaccuracies.

CONCLUSIONS

This study illuminates crucial aspects of self-care interventions for dysmenorrhea among students of health sciences. The prevalence of dysmenorrhea, its impact on students' personal and academic lives, and SMD was high. Education emerges as a significant modifiable factor for SMD: students with greater

exposure to clinical pharmacology and medical training exhibiting higher prevalence of SMD and fewer unsafe practices. Tailored educational interventions can be key in fostering responsible self-care practices and overall well-being. The evident interest shown in this topic suggests a fertile ground for educational interventions aimed at promoting rational and safe self-care practices.

ABBREVIATIONS

ADRs, adverse drug reactions
AHS, Allied Health Sciences
BDS, Bachelor of Dental Surgery
BPT, Bachelor of Physiotherapy
BSC, Bachelor of Science (Nursing)
CMCH, Christian Medical College & Hospital Ludhiana
FDCs, fixed-dose combinations
GNM, General Nursing and Midwifery
HSP, Health Science Program
KW, Kruskal-Wallis test
MBBS, Bachelor of Medicine and Bachelor of Surgery
Mdn, median
MW, Mann-Whitney test
NSAIDs, non-steroidal anti-inflammatory drugs
NSM, no self-medication
NSMD, no self-medication with drugs
OTC, over-the-counter
Q, quartile
SM, self-medication
SMD, self-medication with drugs
WHO, World Health Organization

DECLARATIONS

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