Association between the level of stress and severity of pain, and factors associated with stress, and perceived knowledge on stress management among university students in Phnom Penh, Cambodia

Keopanha Pen[1], Visessakseth So[2], Huykhim Ung[3], Sokunvary Oeung[4], Philip Poul[1], Narin Oudom[1], Chanraksmey Long[1], Vottey Nara[1], Mengkhim Heim[1], Sin Chea[1]*

[1]Faculty of Pharmacy, University of Puthisastra, Cambodia
[2]Division of Pharmacognosy, Faculty of Pharmacy, University of Puthisastra, Cambodia
[3]Division of Basic of Pharmaceutical Sciences, Faculty of Pharmacy, University of Puthisastra, Cambodia
[4]Division of Basic of Toxicology, Faculty of Pharmacy, University of Puthisastra, Cambodia

*Corresponding author: Sin Chea, csin1@puthisastra.edu.kh

ABSTRACT

Background: Stress negatively impacts mental and physical health, often leading to anxiety and hypertension. By identifying key factors, we can better understand the challenges faced by university students in Cambodia and develop targeted solutions to support their mental health and well-being.

Objectives: This study seeks to determine the prevalence of stress and pain among university students in Phnom Penh, and also investigating associated factors with stress levels, determining stress-pain association, and gathering insights into pain management strategies.

Methods: A cross-sectional study was conducted at five universities in Phnom Penh, Cambodia, from September to November 2023. A total of 320 students were selected through simple random sampling, and data was collected using a structured questionnaire administered via face-to-face interviews. Descriptive data were analysed using Excel and SPSS. Univariate analysis was conducted to screen for potential factors associated with high stress, using a chi-squared test. The final multiple logistic regression model retained only factors that are significantly associated with stress (P<0.05).

Results: Findings revealed that stress levels were significantly higher in female students (63.6%) compared to males (42.7%), and gender was strongly associated with high stress levels (P<0.001). Students who said something negatively to themselves were 3.51 times more likely to experience high stress (95% CI: 2.14- 5.75, P<0.001) and students with insufficient sleep had a 2.82 times higher risk of high stress (95% CI: 1.78- 4.45, P<0.001). Acute pain was the most prevalence among participants, and we found that all type of pain were associated with high stress (P<0.05).

Conclusion: This study demonstrates significant stress levels among university students in Phnom Penh, driven by both internal and external factors. Universities should implement comprehensive support programs to mitigate stress and pain management to improve student well-being. Also, the impact of pain management by self-medication with analgesic.

Keyword: Stress, Severity of pain, Factor association, Perceived knowledge, Stress and pain management

1. Introduction

Stress, characterized by worry and mental tension, serves as a mechanism to confront challenges and threats in their lives [1]. Numerous factors contribute to stress, including psychological, academic, biological, lifestyle, social, and financial elements [2]. These widespread prevalence of stress particularly among university undergraduates, affecting students in both developed and developing countries [3]. The negative effects of stress on both physical and mental health are well-documented, with stress intolerance characterized by heightened sensitivity to stress being particularly pronounced in individuals with chronic pain [4]. Pain, defined as an unpleasant sensory or emotional experience related to actual or potential tissue injury, can manifest in various forms such as acute, chronic, or recurrent [5]. It showed a significant correlation between stress levels and pain severity across these different forms [6]. Specifically, studies have shown that higher stress levels are linked to increased pain severity [7]. In India, 61.3% of students experiencing stress were found to be suffered from headaches [8]. Similarly, the occurrence of musculoskeletal disorders among students in virtual classrooms was correlated with

stress, with statistical significance ($P<0.05$) observed at both one week and one month [9]. Another study reported that 356 patients with severe stress experienced chest pain [10].

Psychological issues such as stress can originated from a variety of internal and external sources affecting both physical and mental well-being [11]. Internally generated stressors, such as unrealistic expectations, negative self-talk, and perfectionism, place significant pressure on individuals by influencing their emotions, thoughts, and outlook [12]. Externally derived stressors, including environmental, interpersonal, and academic factors, also play a critical role in inducing stress. Academic deadlines, workload pressures, and interpersonal conflicts can lead to mental disorders, financial strain, and relationship discord [13]. Additionally, external stressors like economic downturns can amplify financial and relational stress, further compounding the overall burden [14]. Cambodia is a developing country among Southeast Asia, also the increasing number of Cambodian university students with psychological stress has been a growing concern compared to those in other countries [15].

According to the United Nations' Sustainable Development Goals (SDGs) a global blueprint for creating a better world for people and the planet by 2030 mental wellness is primarily addressed under social development goal 3 (SDG 3) entitled "Good Health and Well-being" [16]. So far there is limited evidence on factors associated with stress and the level of stress associated with pain in Cambodia, especially among university students.

Therefore, this study aimed to determine the prevalence of stress among university students in Phnom Penh, Cambodia, explore the factors associated with stress, assess the prevalence and severity of pain, examine the relationship between stress levels and pain severity, explore varying levels of perceived knowledge on stress management, and gather information on analgesics used for pain treatment.

2. Methods

2.1 Study Area

This study was conducted in five different universities in Phnom Penh, Cambodia, from September to November 2023, including two medical universities and three non-medical universities.

2.2 Study Design

A cross-sectional study was conducted among university students.

2.3 Sample size and sampling

In our study, we used a simple random sampling method to select universities, with the total number of participants determined based on data of total students from each institution's official website. The goal was to obtain a sample size that would enable us to estimate the prevalence of the target phenomenon with a specified level of accuracy and confidence. To ensure the precision of our prevalence estimates, we aimed for a margin of error of 2.5% within a 95% confidence interval (CI) [17]. Assuming an infinite population, the required sample size was calculated to be 381 using the formula $n = (Z^2 \times P(1-P))/e^2$, where Z is the value from the standard normal distribution corresponding to the desired confidence level [18].

Out of 10 universities, we selected five, including two public universities and three private institutions. This resulted in the following distribution of participants: 139 students from the Royal University of Phnom Penh, 65 students from the University of Health Sciences, 18 students from the

University of Puthisastra, 139 students from the Royal University of Law and Economics, and 21 students from CamEd Business School. The study complied simple random sampling to select the students who were readily accessible and willing to participate, and above eighteen and was the students in those universities. The data collection was carried out using a structured questionnaire and face to face interview.

2.4 Data Collection

Structured questionnaires were used in in-person interviews and spent around 15 to 20 minutes for interviewing. The final questionnaire consisted of five sections with a total of 52 questions. The first section gathered demographic information, including gender, age, marital status, major, academic year, and monthly income. The second section explored the factors contributing to stress, focusing on psychological, environmental, and academic influences. The third section utilized the perceived stress scale (PSS-10), where participants rated their stress-related experiences on a scale from $0 =$ never, $1 =$ almost never, $2 =$ sometimes, $3 =$ often, and $4 =$ very often. Four items of the PSS required for scoring reverse. Stress levels were classified as low (score 0-13), moderate (score 14-26), and high (score 27-40) [19]. The fourth section assessed pain severity through questions about pain location and intensity, using the facial expression pain scale [20], and types of pain such as acute, chronic and recurrent within the last three months [21]. Notably, students who got no pain were excluded to assess severity and location of pain. Perceived knowledge question regarding to stress management have been adapted and modified from World Health Organization (WHO) guidelines for stress management [22]. It has divided into two levels based on the total score. Students who got below 60 percent out of a hundred percent of total knowledge questions indicate the poor knowledge and those who got equal or more than 60 percent, they were classified into good knowledge [23]. The fifth section evaluated pain management by gathering information on the types of analgesics used by participants. A pilot study with 35 university students in Phnom Penh, Cambodia, was conducted to determine the questionnaire's reliability using Cronbach's alpha (α) and KR-20, where items scoring less than 0.5 were deemed acceptable, scores between 0.5 and 0.6 indicated poor reliability, and scoring more than 0.6 were acceptable.

2.5 Data Analysis

Descriptive data were analysed using statistical package for social sciences (SPSS) version 25. Bivariate analysis was conducted to screen for potential factors associated with high stress, using a chi-squared test. The significant level was set at 0.25. Any factors associate with stress (P<0.25) were submitted for multiple logistic regression. The final multiple logistic regression model retained only factors that were statistically significantly associated with stress (P<0.05). Stepwise method was used to extract significant factors.

2.6 Ethical Clearance

The study was approved by the National Ethics Committee for Health Research Cambodia. Document No. 367 NECHR on December 05, 2023. Prior to the interview, the participants had read the information sheet and signed an informed consent form to join this study.

3. Results

Characteristics of the students

Out of the initial sample size of 381, only 320 university students were included in the research study due to missing and uncollectable data. Most students were female (n=217, 67.8%) with a mean age of 20.48 ± 0.12 years old. Most students reported a monthly income of 360,000 to 450,000 riels (n=121, 37.8%), and a significant portion were in their senior years of study (3rd to 7th years) (n=166, 51.8%). The student field of study were categorized into health sciences and non-health sciences. Among non-health science students, the most common majors were accounting and finance (n=51, 15.9%), law (n=21, 6.6%), and public administration (n=20, 6.3%). Health science students were primarily majoring in pharmacy (n=45, 14.1%), dentistry (n=36, 11.3%), and medicine (n=8, 2.5%) (Table 1).

Table 1: General characteristics of social demographic among university students (n=320)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	103	32.2
Female	217	67.8
Income		
<100,000 riels	11	3.4
100,000 to 250,000 riels	47	14.7
260,000 to 350,000 riels	53	16.6
360,000 to 450,000 riels	121	37.8
>450,000 riels	88	27.5
Year of Study		

Variable	Frequency (n)	Percentage (%)
Junior Year (1st-2nd)	154	48.2
Senior Year (3rd-7th)	166	51.8
Field of Study		
Bachelor's degree of Accounting and Finance	51	15.9
Bachelor's degree of Law	21	6.6
Bachelor's degree of public administration	20	6.3
Bachelor's degree of Mathematic	19	5.9
Bachelor's degree of Biochemistry	18	5.6
Bachelor's degree of Tourism	17	5.3
Bachelor's degree of Khmer literature	14	4.4
Bachelor's degree of Environment	12	3.8
Bachelor's degree of Chemistry	10	3.1
Bachelor's degree of Physic	9	2.8
Bachelor's degree of Bioengineering	8	2.5
Bachelor's degree of Pharmacy	45	14.1
Bachelor's degree of Dentistry	36	11.3
Bachelor's degree of Medicine	8	2.5
Others	25	9.9

Prevalence of stress and factors association with the level of stress.

Most of the female were high stress level (n=138, 63.6%) compared to male (n=44, 42.7%) (Figure 1). Therefore, male student experienced in moderate stress (n=59, 57.3%) compared to female. Based on the univariable analysis showed that gender greatly associated with high stress (P<0.001) (Table 2). Most of items significantly affect with stress among university students (P<0.05) (Table 2).
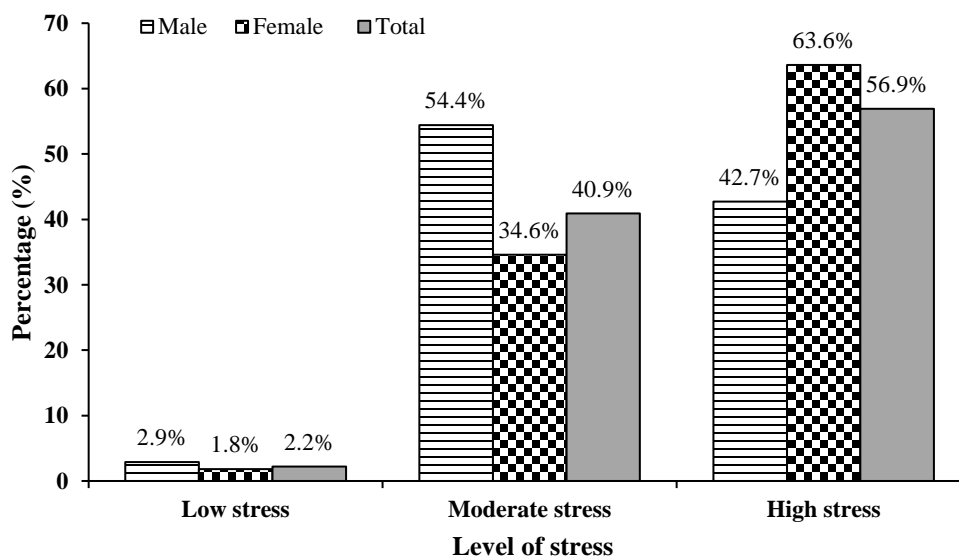

Figure 1: Prevalence of level stress by total university students and by gender

Table 2: Bivariate analysis of factors associated with stress among university students in Phnom Penh (n=320)

Factors	Frequency (%)		$OR_c{}^a$	95% CI^b for OR_c	P-value^c
	High stress	Low to Moderate stress			
Gender					
Male	44 (42.7)	59 (57.3)	1		
Female	138 (63.6)	79 (36.4)	2.34	1.45-3.78	<0.001
Year of study					
Senior	91 (54.8)	75 (45.2)	1		
Junior	91 (59.1)	63 (40.9)	1.19	0.76-1.86	0.441
Field of Study					
Non-Health Science	126 (56.5)	97 (43.5)	1		
Health Science	56 (57.7)	41 (42.3)	1.05	0.65-1.70	0.838
Being a person who easily getting upset all the time					
No	122 (54.0)	104 (46.0)	1		
Yes	60 (63.8)	34 (36.2)	1.50	0.92-2.47	0.105
Lose your confident					
No	90 (47.6)	99 (52.4)	1		
Yes	92 (70.2)	39 (29.8)	2.60	1.62-4.16	<0.001
Getting an irritable most of the time					
No	105 (53.3)	92 (46.7)	1		
Yes	77 (62.6)	46 (37.4)	1.47	0.93-2.32	0.102
Being a person who over thinking					
No	29 (45.3)	35 (54.7)	1		
Yes	153 (59.8)	103 (40.2)	1.79	1.03-3.11	<0.05
Saying something negatively to yourself					
No	36 (36.0)	64 (64.0)	1		
Yes	146 (66.4)	74 (33.6)	3.51	2.14-5.75	<0.001
Ignoring achievements					
No	55 (47.8)	60 (52.2)	1		
Yes	127 (62.0)	78 (38.0)	1.78	1.12-2.82	<0.05
Feeling useless when cannot success on something					
No	114 (52.1)	105 (47.9)	1		
Yes	68 (67.3)	33 (32.7)	1.90	1.16-3.11	<0.05
Being a person who focusing on negative point					
No	85 (47.0)	96 (53.0)	1		
Yes	97 (69.8)	42 (30.2)	2.61	1.64-4.15	<0.001
Feeling nervous during assessments or exam periods					
No	32 (45.1)	39 (54.9)	1		
Yes	150 (60.1)	99 (39.8)	1.85	1.10-3.14	<0.05
Being a person who overfocusing during your class					
No	85 (47.0)	96 (53.0)	1		
Yes	97 (69.8)	42 (30.2)	2.61	1.64-4.15	<0.001
Having enough sleep					
Yes	66 (43.7)	85 (56.3)	1		
No	116 (68.6)	53 (31.4)	2.82	1.78-4.45	<0.001
Having vacation					
Yes	82 (48.8)	86 (51.2)	1		

Factors	Frequency (%)		OR$_c$[a]	95% CI[b] for OR$_c$	P-value[c]
	High stress	Low to Moderate stress			
No	100 (65.8)	52 (34.2)	2.02	1.30-3.17	<0.05
Consuming alcohol for releasing stress					
Yes	101 (50.0)	101 (50.0)	1		
No	81 (68.6)	37 (31.4)	2.20	1.36-3.53	<0.05
Smoking cigarette for releasing stress					
Yes	20 (55.6)	16 (44.4)	1		
No	162 (57.0)	122 (43.0)	1.06	0.53-2.14	0.865
Having communication with lecturer					
Yes	69 (46.9)	78 (53.1)	1		
No	113 (65.3)	60 (34.7)	2.13	1.36-3.34	<0.05
Overloading of schoolwork making stress					
No	143 (61.1)	91 (38.9)	1		
Yes	39 (45.3)	47 (54.7)	1.89	1.15-3.12	<0.05

[a]Odd Ratio, [b]95% Confidence Interval, [c]Pearson Chi-Square, significant: P-value < 0.25

After conducting a multivariable analysis using multiple logistic regression, the adjusted odds ratios showed similar trends for the same variables, with some increasing and others decreasing in effect. The strongest predictor of high stress was pessimism: individuals who frequently engaged in negative self-talk had a 3.51 times greater likelihood of experiencing high stress compared to those who did not (Table 3).

Female students were 2.34 times more likely to experience high stress than male students, possibly due to differences in stress responses. Students with insufficient sleep had a 2.82 times higher risk of high stress compared to those who slept adequately. Additionally, students who focused on others' negative traits faced a 2.61 times greater chance of high stress.

Table 3: Multiple logistic regression analysis of association between psychological factor and stress among university students in Phnom Penh (n=320)

Factors	OR$_c$[a]	95% CI[c] for OR$_c$	OR$_{adj}$[b]	95% CI[d] for OR$_{adj}$	P-value[e]
Gender, female	2.34	1.45-3.78	2.20	1.23-3.93	<0.05
Losing confidence, yes	2.60	1.62-4.16	1.89	1.10-3.25	<0.05
Becoming irritable, yes	1.47	0.93-2.32	1.82	1.07-3.10	<0.05
Saying something negatively to ourselves, yes	3.51	2.14-5.75	2.31	1.30-4.11	<0.05
Feeling useless when not successful, yes	1.90	1.16-3.11	2.02	1.14-3.60	<0.05
Focusing on negative point of other, yes	2.61	1.64-4.15	2.24	1.32-3.80	<0.05
Getting enough sleep, no	2.82	1.78-4.45	2.54	1.51-4.28	<0.001
Consuming alcohol, no	2.20	1.36-3.53	2.52	1.45-4.38	<0.05

[a]Crude Odd Ratio, [b]Adjusted Odd Ratio, [c]95% Confidence Interval of crude odd ratio, [d]95% Confidence Interval of adjusted odd ratio, [e]Pearson Chi-Square

The prevalence and severity of pain

In our results, we found 90.3% (n=289) of students having pain, and 9.7% of students (n=31) having no pain. They usually have acute pain (n=205, 64.1%), recurrent pain (n=50, 15.6%), and chronic pain (n=34, 10.6%). Those types of pain were classified into moderate pain (n=189, 59.1%), mild pain (n=86, 26.9%), severe pain (n=14, 4.4%). It is reported to have pain on head (n=223, 42.31%), gastrointestinal (n=142, 26.94), and spinal spine (n=123, 24.2%) (Table 4).

Table 4: The prevalence and severity of pain stress among university students in Phnom Penh

Variables	Frequency (n)	Percentage (%)
Prevalence of pain[a]		
No pain	31	9.7
Acute pain	205	64.1
Chronic pain	34	10.6
Recurrent pain	50	15.6
Severity of pain[b]		
Mild pain	86	26.9
Moderate pain	189	59.1
Severe pain	14	4.0
Location of pain[b]		
Head[*]	223	42.3
Gastrointestinal	142	26.4
Spinal spine	123	24.2
Upper limbs	18	5.6
Lower limbs	17	5.3
Chest	3	0.9
Muscle	1	0.3

[a]n=320, [b]n=289, [*]Head pain combined between migraine and tension headache

The association between level of stress and severity of pain

Based on the types of pain, we found that all three types were reported in students who got high stress. Students with recurrent pain (n=50) reported experiencing high stress (28.3 ± 5.5) compared to those who got moderate stress (P<0.05) (Figure 2). Those who got the acute pain (n=205) were significantly different from those who have no pain (P<0.05). Therefore, there was significant association between the level of stress and severity of pain (P<0.05) (Table 5). This suggested a significant association between the duration of pain and the intensity of stress, with those suffering acute pain being particularly prone to higher stress levels.

Table 5: The association of the level of stress and the severity of pain by R×C Chi-square test (n=320)

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.32[a]	4	<0.05
Likelihood Ratio	10.67	4	<0.05
Linear-by-Linear Association	7.79	1	<0.05

[a]3 cells (33.3%) has expected count less than 5. The minimum expected count is .39.
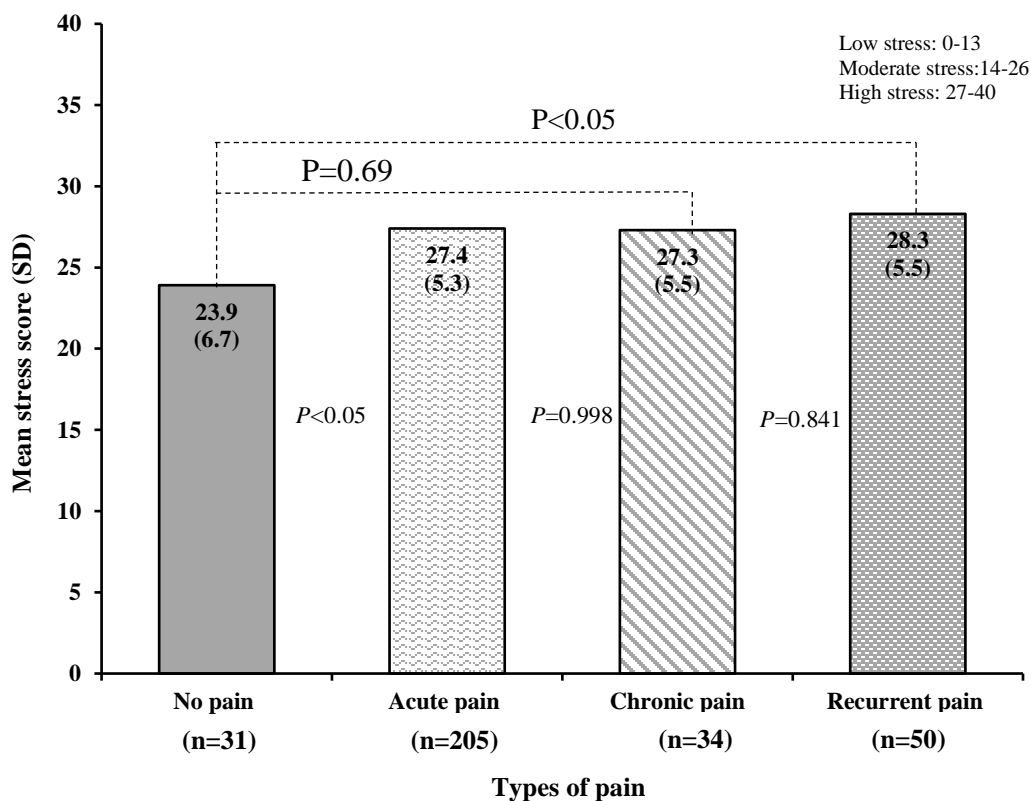
Figure 2: The prevalence of different level of stress with the different severity of pain among university students (n=320). ANOVA post-hoc analysis with Turkey test was used at a significantly level P<0.05

Perceived knowledge on stress managements

Most of the students showed good perceived knowledge (n=297, 92.8%) and poor (n=23, 7.2%) toward stress management as shown in (Table 6). Many of them understood that regularly exercise (n=296, 92.5%) and spending time with their family (n=295, 92.2%) can reduce stress (Table 7).

Table 6: The level of perceived knowledge stress among university students in Phnom Penh (n=320)

Level of Perceived Knowledge	Frequency (n)	Percentage (%)
Poor	23	7.2
Good	297	92.8

Table 7: The prevalence perceived knowledge of stress management among university students in Phnom Penh (n=320)

Items	Correct n (%)	Incorrect n (%)
Lack of communication cause stress	268 (83.8)	52 (16.2)

Items	Correct n (%)	Incorrect n (%)
Keep your daily routines can help you avoid stress	233 (72.8)	87 (27.2)
Get plenty of sleep will reduce your stress	262 (81.9)	58 (18.1)
Consume healthy diet can help you reduce stress	290 (90.6)	30 (9.4)
Spending time with family reduces stress	295 (92.2)	25 (7.8)
Regularly exercising reduces stress	296 (92.5)	24 (7.5)

The information of pain management

Most university students turned to take analgesic drugs for managing the pain, particularly from the NSAID group and paracetamol. Majority, paracetamol was significantly associated with acute pain (42%), chronic pain (35.3%), and recurrent pain (22.4%) explaining as $\chi^2=8.97$, P<0.05 (Figure 3). Therefore, some students used paracetamol + caffeine and ibuprofen. Beyond painkillers, some students also took medications tailored to specific symptoms, like heartburn or stomach discomfort, and used calcium supplements as part of their pain management strategy.
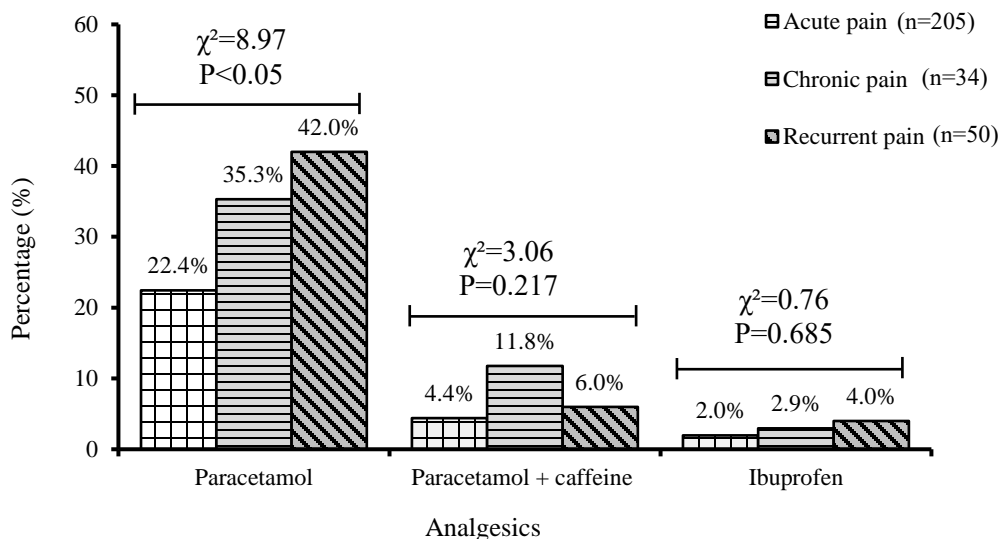

Figure 3:   The prevalence of analgesic intake within each type of pain among university students (n=289)

4. Discussion

Gender also plays a crucial role in the experience of stress. Our study revealed that a significant proportion of female students either non-health or health field of study experienced high level of stress (n=138, 63.6%) compared to male (n=44, 42.7%) (P<0.001) with 57.3% reporting moderate stress compared to female students. A study reported that female had higher stress might

be attributed to social pressure, academic expectations, and possibly different coping mechanism compared to males [24]. Research conducted in Saudi Arabia, where a study involving 465 undergraduates found that approximately 38% of participants experienced stress [25]. Notably, another study in Saudi Arabia also included a balanced mix of health (49.68%) and non-health (50.32%) students [26]. Furthermore, research conducted in Malaysia also indicated a substantial prevalence of stress among university students, with around 44.6% of students reporting stress. These findings collectively highlighted a widespread issue of stress among students across different regions [27]. Additionally, a history of psychological conditions increased the likelihood of experiencing stress. Students often fear not performing well academically, which diminishes their confidence in achieving good grades [28].

Psychological factors play a significant role in inducing stress among students. A lack of confidence and negative self-perception have been found to be statistically significant contributors to stress levels such as family conflicts, academic stress and psychology well-being had significant relationship with level of stress, anxiety, and depression in

students [29]. Students experiencing higher levels of stress are more likely to suffer from pain, including acute, chronic and recurrent pain [30]. A study emphasized the interplay between psychological stress and pain, suggesting that stress can heighten pain sensitivity and contribute to the development of chronic pain conditions included stress hormone and central nervous system [31].

In our study, after conducting a multivariable analysis using multiple logistic regression, the adjusted odds ratios showed similar trends for the same variables, with some increasing and others decreasing in effect. The strongest predictor of high stress was pessimism: individuals who frequently engaged in negative self-talk had a 3.51 times greater likelihood of experiencing high stress compared to those who did not. Encouraging positive self-perceptions in this group was crucial. Female students were 2.34 times more likely to experience high stress than male students, possibly due to differences in stress responses. Universities could benefit from closely monitoring female students and providing support throughout their studies and beyond. Students with insufficient sleep had a 2.82 times higher risk of high stress compared to those who slept adequately. Additionally, students who focused on others'

negative traits faced a 2.61 times greater chance of high stress. Universities should offer training to foster positive attitudes environment and respect toward others. Students who often lack of confidence had a 2.60 times higher likelihood of high stress. Feelings of unimportance after failure and irritability also emerged as significant stress factors. Interestingly, students who abstained from alcohol had a 2.20 times higher likelihood of experiencing high stress, suggesting a need for relaxation or recreational activities. However, given the potential negative consequences of alcohol, they should be encouraged to explore other healthy stress-relief methods, such as exercise.

The statistics also revealed that an increasing level of stress leads to increase the severity of pain ($P<0.05$). Most students reported experiencing pain in the head (n=223, 42.3%) and gastrointestinal region (n=142, 26.9%). A study conducted in Spain identified sleep difficulties and task overload as two significant factors associated with increased stress ($P<0.001$) [30]. Both issues were found to have a strong correlation with higher stress levels, highlighting their critical role in contributing to overall stress. Addressing these factors could be crucial in developing effective stress management strategies and interventions to improve individuals' well-being and reduce the negative impact of stress.

The participant perceived understanding of stress management is strong, according to our finding. The majority, who clearly understood the benefits of these measures, correctly recognized regular exercise (n=296, 92.5%) and family time (n=295, 92.2%) as two ways to relieve stress. Furthermore, a significant majority agreed that getting enough sleep (n=262, 81.9%) and maintaining a good diet (n=290, 90.6%) are important for stress management. Fewer people (n=233, 72.8%) grasped the significance of sticking to regular routines, even though the majority (n=268, 83.8%) acknowledged the value of communication in reducing stress. Overall, the data suggested respondents' knowledge of practical techniques for stress reduction being rather good, however they might do a better job of appreciating the influence of daily routines. A study conducted in Nigeria found that 67% of students thought medical school was stressful while some students identified other issues (such as time, economics, self, family, and environment) to be stresses, the majority

of students (52.8%) viewed academics to be the main source of stress [32].

Stress management and pain self-management often involve a combination of non-drug therapies and medications. Most participants in recent studies reported that utilizing non-drug therapies, such as adequate sleep, listening to music, exercising, and engaging in activities like yoga and meditation to manage stress effectively [33]. These strategies are known for their ability to enhance emotional regulation and reduce stress levels without the need for pharmacological interventions [34]. When it comes to pain management, university students typically resort to NSAIDs and paracetamol or panadol when non-drug methods fall short [35]. Paracetamol was significantly associated with acute pain (42%), chronic pain (35.3%), and recurrent pain (22.4%) explaining as χ^2=8.97, P<0.05, which in line a study conduct in South Korea reported that 45% of students were used paracetamol for pain relievers [36]. Furthermore, our research reported that 4.4% of students who have acute pain were taking paracetamol with caffeine which are similar to a study in University of Medical Sciences, Poznan, Poland found that 5.5% were used paracetamol combined with opioids while

they have pain [37]. This pattern underscored the importance of integrating both non-drug and drug therapies to address stress and pain effectively while emphasizing the role of personalized care in improving overall well-being.

Based on the study, there were some limitations and preventive measures such as in sampling bias which is a smaller number of students from certain universities which may affect the generalizability of the results. The bivariate analysis at P-value threshold of 0.25, potentially introducing confounders that may skew the final analysis. Therefore, conduct a multivariate analysis to control for confounders, ensuring only variables that remain significant after adjusting for other factors are included in the model.

5. Conclusion

This study highlighted the significant levels of stress experienced by university students in Phnom Penh, with a substantial portion of students experiencing moderate to high levels of stress and identified both internal and external factors contributing to this stress. This research study also showed increasing levels of stress leads to an increase in the severity of pain. In this context, universities should consider introducing comprehensive

support programs that include stress management education, mental health resources, and academic workload management to enhance student well-being and reduce the negative impacts of stress to all students. Future research should explore the long-term effects of stress on academic performance and health outcomes, as well as the effectiveness of different intervention strategies in reducing stress and improving student health outcome.

Acknowledgement

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