Perceived Stress as a Predictor of Sleep Quality in Undergraduates: A Cross-Sectional Study

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ABSTRACT

Research spanning several years has explored the topic of perceived stress among university students. Globally, investigations consistently highlight that undergraduates encounter escalated levels of perceived stress during their academic journey, often attributed to the intricate interplay between their physical, social, and emotional well-being. The transition to an unfamiliar lifestyle, coupled with the demands of academia and evolving familial dynamics, contributes substantially to heightened stress levels. Sleep disruptions and compromised sleep quality emerge as prevalent issues for a considerable number of undergraduates. Recent studies conducted in Sri Lanka underscore a noteworthy upswing in perceived stress among local undergraduates within the last decade. This study undertakes an exploration into the intricate connection between perceived stress and sleep quality within the context of a non-state Sri Lankan university. Employing quantitative research methods, data was gathered from a cohort of 125 participants, (83 female, 39 male,3 LGBTQ) from the Humanities and Sciences faculty. The perceived stress scale, K10 and the Pittsburgh sleep quality index were used to collect the data. According to the results, participant's gender has no influence on perceived stress levels, but does affect sleep quality in undergraduates (U = 103.0,

p = .033), with males reporting lower sleep quality than females. This finding highlights the need for targeted interventions to reduce stress and improve sleep quality among undergraduates.

1. INTRODUCTION

Research into perceived stress among university students has persisted over time. Studies reveal that undergraduates often experience elevated stress due to unestablished links between physical, social, and emotional well-being (Varghese, 2015). Previous research shows perceived stress reflects individual interpretations of present situations (Evans et al., 2018; Varghese, 2015). Study findings highlight perceived stress as a product of intertwined variables, not singular construction.

Although stress is a universal experience, individual responses vary based on personal perception and coping strategies. Stress's impact on performance can be positive or negative. WHO defines stress as strain from various changes necessitating attention or action (World Health Organization, 2021). Identifying stress isn't straightforward. Dr. Hans Selye defines it as a physiological reaction to stimuli (Viner, 1999), while Lazarus & Folkman (1984) counter that stress arises when personal and social expectations exceed a person's perceived capability.

Stress triggers the body's "Fight or Flight" reaction to perceived threats. The autonomic nervous system comprises the sympathetic (SNS) and parasympathetic (PNS) branches. SNS activates the "fight or flight" response, mobilized by the hypothalamus in danger situations. Adrenal glands release hormones to prepare the body for defence. Yet, prolonged stress leads to adverse psychological and physiological effects, undermining well-being.

Stress negatively affects mental well-being. Recent research links stress to neuro degenerative diseases like Alzheimer's and Multiple Sclerosis (Habib et al., 2001; McEwen & Sapolsky, 1995; Mizoguchi et al., 1992). prolonged stress relates to mental disorders: anxiety, depression, PTSD, and schizophrenia (Harvey & Bryant, 1998; Kim et al., 2006; Lupien et al., 2000; Meyer et al., 2001). Stress impairs cognitive function, potentially causing memory loss, concentration difficulties, suicide, and burnout among university students (Marin et al., 2011). Adolescent obesity is positively linked to perceived stress (Sparrenberger et al., 2008). Perceived stress diminishes students' quality of life and negatively impacts academics (Evans et al., 2018).

Recent data highlights notable surges in depression and anxiety disorders among global undergraduate students (El Ansari et al., 2014; Evans et al., 2018b; Gao et al., 2020; Moore & Cunningham, 2012). In India, 17.87% sought treatment for depression, and 12.91% for anxiety (Asher BlackDeer et al., 2021). Malaysian undergraduates recorded 45% with anxiety and 14% with depression (Fauzi et al., 2021). Sri Lankan undergraduates saw 9.3% identified with major depression and 13.5% with other anxiety-related disorders (Amarasuriya et al., 2015).

Adlaf et al. (2001) studied 7800 Canadian undergraduates across 16 universities, noting a notable 30% stress prevalence. A Sri Lankan study (Kuruppuarachchi et al., 2014) with 350 participants from five universities unveiled higher psychological distress in male students, particularly rural entrants (65.4%). Transitioning to university, especially for rural entrants, led to stress due to unfamiliarity with non-agrarian environments. Adaptation to new academic-social landscapes during university led to distress. Sleep issues were common, linked to perceived stress and demanding academic routines, impinging on sleep quality. Academic and extracurricular engagements often encroached on sleep due to rigorous schedules.

Sleep significantly impacts health and life quality (Buysse, 2014). Low sleep quality increases mental health risks among undergraduates,

directly affecting academics. University students struggle with sleep due to social distractions, late-night academic work, and irregular patterns (Foulkes et al., 2019). In Taiwan, irregular sleep patterns correlate with poor sleep quality (Kang & Chen, 2009). Numerous studies explored the link between perceived stress and sleep quality, showing a correlation. A cross-sectional study in Bolivia and the US found sleep hygiene and global perspective influence sleep quality, with perceived stress varying significantly between countries (Doolin et al., 2018).

In Sri Lanka, university admission and education have grown increasingly challenging due to limited government institutions. Certain students pursue non-state universities while others go abroad. Mohanraj's recent study (2020) indicated higher perceived stress among first-year students in private universities compared to state universities, yet non-state students noted lower academic stress. Despite this, research on perceived stress and sleep quality in Sri Lankan private university undergraduates remains limited, with little comparison between government and non-state students. Predominant research targets medical students, not the overall Sri Lankan university populace. Thakshila and Suraweera (2021) found first-year undergraduates exhibit a positive connection between stress and sleep quality, with 57.6% experiencing both. Sleep issues and perceived stress are common among university students.

The present study aims to explore the relationship between perceived stress and sleep quality in a non-state university in Sri Lanka. Despite the potential influence of stress on this student population, there is a scarcity of research in this area. Solutions for stress-related sleep problems remain limited. Comprehensive studies are essential to address student well-being holistically. This research could significantly enhance our comprehension of psychological well-being among private university students. Additionally, we envisage that it will prompt academics and policymakers to implement preventive measures against burnout among the university students, thereby nurturing a supportive academic environment.

The researchers hypothesized that 1) There is a relationship between perceived stress and quality of sleep among undergraduates; 2) There is a relationship between gender and perceived stress among undergraduates; 3) The sleep quality will differ between males and females.

2. METHODS

This study adopted a cross-sectional approach involving 135 undergraduate participants from a non-state higher educational institute. The participants were recruited using convenience sampling. All participants aged between 18 to 30 years.

2.1 Measures

The Perceived Stress Scale (PSS), a self-reported questionnaire, gauged stress perception through ten questions assessing life's unexpectedness, manageability, and burden (Cohen et al., 1983). Psychological distress was measured by the Kessler Psychological Distress Scale (K10), a 10-item self-report tool evaluating anxiety and depression symptoms over the past month, capturing current status (Kessler et al., 2002). The Pittsburgh Sleep Quality Index (PSQI) employed 19 self-rated and five partner/roommate-based queries to assess sleep quality and patterns in adults (Buysse et al., 1989).

2.2 Procedure

The survey was distributed via the humanities and sciences faculty's social media platforms amongst students. The initial survey page provided an info sheet outlining the topic, eligibility, anonymity, and voluntary participation. Eligible students (18 and above) accessed the questionnaire upon consenting to participate. The survey's conclusion contained a debrief with research objectives

and contact details for inquiries or information withdrawal.

2.3 Ethical Concerns

This is an online survey that was shared through social media platforms among undergraduates. The study received ethical approval from the psychology ethical review committee at SLIIT as per the guidelines for LJMU undergraduate research projects.

3. RESULTS

The study consisted of 135 participants. Among them, 83 were female (67%), 39 male (31%), and 3 identified as LGBT (2%). Response rates varied across semesters: 1st year 1st semester had 7.4%, 1st year 2nd semester 4.4%, 2nd year 1st semester 11.9%, and 2nd year 2nd semester 20%. For 3rd year, 1st semester had 4.4%, and 2nd semester 46.7%. Lastly, 4th year 1st semester and 2nd semester had 0.7% and 4.4% responses respectively.

The perceived stress of the selected sample was measured by the perceived stress scale (N= 135). Male (M 23.24, SD 4.65525), female (M 22.60, SD 3.9622). The sample data did not significantly differ from the normal population (male (0.770) > 0.05, female (0.801) > 0.05), confirming normal distribution.

Hypothesis 1 was tested using Pearson correlation coefficient. the results indicated that is a positive correlation between perceived stress and sleep quality ($r = .199$, $p < .05$, $N = 120$). This means that people who report higher levels of perceived stress also tend to report lower levels of sleep quality.

Hypothesis 2 predicted that there is a relationship between gender and perceived stress among undergraduates. An independent-samples t-test revealed no significant gender differences in perceived stress ($t(118) = 0.770$, $p = .443$), suggesting that gender does not influence perceived stress. Additionally, a one-way ANOVA showed no significant differences in perceived stress among degree programs ($F(6, 113) = 2.051$, $p = .065$), indicating consistent response means across groups. Similarly, a one-way ANOVA indicated no significant differences in perceived stress among academic years ($F(3, 116) = 0.657$, $p = .580$), suggesting that academic year does not affect perceived stress.

The Kessler Psychological Distress Scale (K10) was used to assess psychological distress in 135 undergraduate students. Normality tests revealed that the data were normally distributed for both males ($M = 32.1333$, $SD = 7.5441$) and females ($M = 30.44$, $SD = 7.7827$). An independent-samples t-test was conducted to examine gender differences in stress, revealing no significant difference ($t(118) = 1.174$, $p = .243$). Therefore, gender does not significantly impact stress levels in this undergraduate population.

Hypothesis 3 predicated that there is a gender that has an impact on the sleep quality. As the data set dot meet the parametric assumption of normality, independent samples Mann-Whiteney U test was used for the analysis. The independent samples Mann–Whitney U test revealed a significant effect of gender on sleep quality ($U = 103.0$, $p = .033$). This indicates that the two groups (males and females) have different distributions of sleep quality scores, with males experiencing more impact on their sleep quality than females. The mean rank for males was 65.73, while the mean rank for females was 51.78.

In summary, the results indicate that perceived stress does not differ by gender; both male and female undergraduates experience similar stress levels. However, sleep quality is influenced by gender, with male undergraduates reporting poorer sleep quality compared to their female counterparts.

4. DISCUSSION

This study aimed to explore the relationship between perceived stress and sleep quality among non-state university undergraduates, alongside examining gender differences in perceived stress and sleep quality. The findings revealed a notable connection between heightened perceived stress and lower sleep quality. Students facing greater stress reported difficulties in falling asleep and increased daytime drowsiness. These results align with prior research (Doolin et al., 2018; Lemma et al., 2012; Zunhammer et al., 2014) that has also identified correlations between perceived stress and sleep quality.

Two recent Sri Lankan studies (Mohanraj, 2020; Thakshila and Suraweera, 2021) corroborated these findings, showing a positive link between sleep quality and stress among first-year undergraduates. This suggests that higher perceived stress is linked to sleep-related issues, echoing our study's outcomes indicating elevated perceived stress and poorer sleep quality among non-state university students in Sri Lanka.

It is crucial to acknowledge that perceived stress levels differ among students, driven by individual perceptions and circumstances. Interestingly, this study's findings contradict previous research (Mohanraj, 2020; Shields, 2001), which found that private sector students experienced higher academic stress. Instead, this study reveals similar stress levels for both male and female students. Non-state university students in Sri Lanka confront numerous social and economic challenges during their academic journeys.

Societal biases against non-state universities may adversely impact these students' mental health. Additionally, these students typically bear the financial burden of tuition fees and living expenses themselves, potentially heightening their stress levels.

Students with elevated perceived stress often report issues with concentration, sleep disturbances, and interpersonal conflicts. These problems may arise from a lack of effective coping strategies or support systems. Prolonged sleep difficulties, including restlessness, early awakening, and trouble falling asleep, significantly impede cognitive abilities and academic performance (Caldwell et al., 2010).

Regarding our hypotheses, while we initially hypothesized gender-based differences in perceived stress, our findings indicate that both male and female students experience high perceived stress levels, leading to the rejection of this hypothesis. This contrasts with previous research (Brougham et al., 2009; Jones et al., 2016), which found higher stress levels among male undergraduates, as females were more likely to adopt coping strategies and reduce burnout.

Regarding the second hypothesis concerning gender differences in sleep quality, the study does reveal a significant positive correlation. Male students tend to experience poorer sleep quality than their female counterparts. This may be attributed to peer influence, as male students often reside with peers in university hostels or apartments. Late-night social activities and academic work completion can lead to disrupted sleep patterns. Noise, disturbances from peers, and different sleeping environments may all contribute to reduced sleep quality.

In conclusion, this study sheds light on the intricate relationship between perceived stress, sleep quality, and gender differences among non-state university undergraduates in Sri Lanka, contributing to our understanding of the mental health challenges faced by these students.

4.1 Limitations and Recommendations for future research

Before generalising these findings of the present study, it's important to acknowledge several

limitations. This study focused exclusively on undergraduates from a single non-state university in Sri Lanka's western province, specifically within the faculty of humanities and sciences. Consequently, the results cannot be extrapolated to encompass all non-state and state university undergraduates from all disciplines in Sri Lanka.

Additionally, this study did not account for varying stress sensitivity levels among students, as some individuals may be more stress-prone than others. Furthermore, it didn't compare perceived stress levels between non-state and state university students, limiting the broader applicability of the results.

Moreover, the findings pertain specifically to the university life period and do not extend to students' overall developmental experiences. Another limitation is that the study solely considered students' perceptions and did not incorporate objective measures.

Lastly, the study was conducted towards the end of the semester, potentially capturing a period of higher perceived stress due to impending end-of-semester exams. Stress levels among students can vary throughout the semester and do not remain constant. These limitations should be considered when interpreting and applying the study's findings.

However, this study focusses on an impot area of young people's life. Thus, future studies could contribute to the knowledge on this area by focussing on the broader applicability by including a larger and wider participation of young adults. Additionally, to improve result accuracy, subsequent administrations of the questionnaire should be scheduled at multiple points throughout the academic semester and using local languages.

5. CONCLUSIONS

This study sought to explore the connection between perceived stress and sleep quality in undergraduate students at a non-state university in Sri Lanka. Findings showed elevated perceived stress levels in both male and female undergraduates. Additionally, students faced sleep-related problems, with males experiencing more significant sleep quality difficulties than females. Thus, the study establishes a distinct association between perceived stress and sleep quality.

Inadequate sleep quality significantly harms students' lives, affecting academics and social well-being. Perceived stress amplifies mental health issues among undergraduates, worsening sleep problems. This study highlights the impact of stress on students' academic and personal lives, emphasizing society's duty to support their progress as future leaders.

Additionally, this study holds promise for informing educators and policymakers addressing university students' stress and quality of life. It foresees potential for novel strategies to tackle contemporary student stress. Ultimately, it forms a foundation for future research into perceived stress, sleep quality, and coping methods among university students.

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