



بسم الله الرحمن الرحيم

كلية نبتة
NAPATA COLLEGE

Medicine Program

Community Medicine Department

Assessment of Academic Stress and Its Impact on Academic
Performance among Medical Students at Napata College Sudan (2026)

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Abstract:

Background: Medical education is one of the most stressful academic programs world wide. In Sudan, ongoing civil conflict adds extra challenges for students, including displacement, limited resources, and psychological trauma. Academic stress can reduce concentration, impair learning, and lower academic performance.

Objective: This study aimed to assess academic stress and its impact on academic performance among undergraduate medical students at Napata College, Sudan, in 2026.

Methods: A cross-sectional, descriptive, and analytical design was used. A total of 203 students completed a self-administered online questionnaire covering socio-demographic data, academic performance (GPA, attendance), perceived stress using the PSS-10 scale, sources of stress, and coping strategies. Data were analyzed using SPSS with descriptive and inferential statistics.

Results: Most students experienced moderate stress (77.3%), while 11.8% reported high stress and 10.8% low stress. Common stressors included financial problems, competition with peers, living conditions, frequent exams, and poor internet/electricity. Higher stress levels were significantly associated with lower GPA (Spearman's $\rho = -0.170$, $p = 0.015$) and concentration difficulties (79.8%). Stress levels differed across age groups, academic years, place of residence, and perceived war impact, but not by gender or socioeconomic status. Coping strategies primarily involved social support (43.3%) and religious practices (42.4%), while leisure and avoidance strategies were less common. Despite coping efforts, stress affected students' performance and persistence in medical school.

Conclusion: Academic and conflict-related stress significantly impacts medical students' performance and well-being at Napata College. Targeted interventions such as psychological support, resilience programs, and academic accommodations are essential to help students manage stress and succeed academically in challenging environments.

Keywords: Academic stress, Medical students, GPA, Coping strategies, Sudan

مستخلص الاطروحة:

الخلفية:

تُعد الدراسة في كلية الطب من أكثر البرامج الأكاديمية إجهادًا على مستوى العالم. في السودان، يضيف الصراع الأهلي المستمر تحديات إضافية للطلاب، بما في ذلك التهجير، نقص الموارد، والصدمات النفسية. يمكن أن يؤدي الضغط الأكاديمي إلى تقليل التركيز، ضعف التعلم، وانخفاض الأداء الأكاديمي.

الهدف:

هدفت هذه الدراسة إلى تقييم الضغط الأكاديمي وتأثيره على الأداء الأكاديمي بين طلاب الطب الجامعيين في كلية نبتة، السودان، لعام 2026.

المنهجية:

تم استخدام تصميم دراسة مقطعية وصفية وتحليلية. أكمل 203 طلاب استبيانًا إلكترونيًا ذاتيًا يغطي البيانات الديموغرافية، الأداء الأكاديمي (المعدل التراكمي، الحضور)، الضغط الأكاديمي باستخدام مقياس PSS-10، مصادر الضغط، وآليات المواجهة. تم تحليل البيانات باستخدام برنامج SPSS باستخدام إحصاءات وصفية واستنتاجية.

النتائج:

أفاد معظم الطلاب بتعرضهم لمستوى متوسط من الضغط الأكاديمي (77.3%)، بينما أبلغ 11.8% عن ضغط مرتفع و10.8% عن ضغط منخفض. كانت أبرز مصادر الضغط المشاكل المالية، المنافسة بين الزملاء، ظروف المعيشة، الامتحانات المتكررة، وضعف الإنترنت/الكهرباء. ارتبطت مستويات الضغط الأعلى بانخفاض المعدل التراكمي بشكل ملحوظ ($\text{Spearman's } \rho = -0.170, p = 0.015$) وصعوبة التركيز (79.8%). اختلفت مستويات الضغط حسب الفئة العمرية، السنة الدراسية، مكان الإقامة، وتأثير الحرب المدرك، لكنها لم تختلف حسب الجنس أو الوضع الاجتماعي الاقتصادي. كانت استراتيجيات المواجهة الأكثر استخدامًا هي الدعم الاجتماعي (43.3%) والممارسات الدينية (42.4%)، بينما كانت استراتيجيات الترفيه والتجنب أقل شيوعًا. بالرغم من جهود المواجهة، أثر الضغط على أداء الطلاب واستمرارهم في دراسة الطب.

الخلاصة:

يؤثر الضغط الأكاديمي والمرتبط بالحرب بشكل كبير على أداء ورعاية طلاب الطب في كلية نبتة. تُعد التدخلات المستهدفة مثل الدعم النفسي، برامج بناء الصلابة النفسية، والتسهيلات الأكاديمية ضرورية لمساعدة الطلاب على إدارة الضغط والنجاح أكاديميًا في بيئات صعبة.

الكلمات المفتاحية: الضغط الأكاديمي، طلاب الطب، المعدل التراكمي، استراتيجيات المواجهة، السودان

الكلمات المفتاحية

الضغط الأكاديمي، طلاب الطب، المعدل التراكمي، استراتيجيات التكيف، السودان

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Abbreviations	Full term
PSS-10	Percevied stress scale (10 items)
GPA	Grade Point Average

Chapter One

1.1 Background

1.2 Problem statement

1.3 Justification

1.4 Research question

1.5 Objectives

1.1. Background

Medical education is universally acknowledged as one of the most intellectually demanding and emotionally taxing academic pursuits. The inherent rigor of the curriculum, the constant pressure of high-stakes examinations, and the early exposure to significant clinical responsibilities collectively impose immense psychological burdens on students [1]. Academic stress, in this context, is defined as the physiological and psychological response of an individual to academic-related demands that are perceived to exceed their adaptive capabilities [2]. While a moderate level of stress, often referred to as “eustress,” can serve as a powerful motivator, enhancing cognitive alertness and driving performance, prolonged or excessive stress (distress) frequently culminates in detrimental outcomes. These include heightened anxiety, clinical depression, burnout, and a measurable decline in academic performance [3, 4].

The socio-political landscape of Sudan has been dramatically reshaped by the ongoing civil conflict, which intensified significantly in 2023. This protracted conflict has resulted in widespread internal displacement, extensive destruction of critical infrastructure, and severe disruptions across all sectors, including the national educational system [5]. For medical students enrolled at institutions like Napata College, the pre-existing, inherent stressors of medical school are now compounded by an array of external pressures. These include pervasive environmental instability, severe economic deterioration, and the profound psychological trauma associated with living through a protracted war [6]. Recent epidemiological studies conducted among Sudanese medical students have consistently indicated a high prevalence of perceived stress, with reports suggesting that over 50% of participants experienced significant stress levels during the conflict period [7]. This situation underscores an urgent need for targeted interventions. The interplay between academic stress and academic performance is intricate and multifaceted. Stress has been scientifically proven to impair crucial cognitive functions such as memory consolidation, attentional focus, and effective decision-making—all of which are indispensable for aspiring medical professionals [8]. In the unique and challenging context of a conflict zone, these adverse effects are likely to be exacerbated. Factors contributing to this intensification include the severe scarcity of educational resources, inconsistent and unreliable internet access essential for online learning modalities, and the overwhelming psychological burden imposed by the national crisis [9]. A comprehensive understanding of these complex dynamics is not merely academic; it is fundamentally essential for the development and implementation of effective, supportive interventions aimed at

safeguarding the mental well-being and academic trajectory of future medical professionals in Sudan.

1.2. Problem Statement

Despite the extensive global research documenting the pervasive nature of academic stress within medical education, there remains a critical paucity of empirical data specifically examining how this stress interacts with the unparalleled challenges posed by a conflict zone in Sudan, particularly within the unique institutional setting of Napata College. The ongoing war has not only led to the physical displacement of numerous students but has also severely disrupted both their clinical training opportunities and theoretical learning pathways. While there is a strong theoretical hypothesis that these adverse conditions significantly exacerbate academic stress and consequently impair academic performance, no formal, systematic assessment has been conducted at Napata College to quantitatively measure these impacts as of 2026. This glaring absence of localized, evidencebased data critically impedes the ability of the college administration, faculty, and mental health professionals to develop and implement targeted, effective, and evidence-based support systems that are precisely tailored to address the urgent and evolving needs of their medical student population during this crisis

1.3 Justification

This proposed study is of paramount importance and is justified by several compelling reasons, each addressing a critical need within the current Sudanese context:

1. **Enhancing Student Well-being:** The primary justification for this research lies in its potential to directly contribute to the mental health and overall well-being of medical students. By systematically identifying the precise levels, primary sources, and specific manifestations of academic stress, this study was provide the foundational data necessary for developing and implementing essential mental health support services. These services are crucial for students who are navigating not only the inherent pressures of medical education but also the unprecedented challenges of a protracted conflict.
2. **Ensuring Academic Continuity and Quality:** A thorough understanding of how stress impacts academic performance was enable Napata College to critically evaluate and, if necessary, adapt its existing teaching methodologies, curriculum delivery, and assessment strategies. Such adaptations can help mitigate the negative effects of stress, thereby fostering a more conducive learning environment and ensuring the continuity and quality of medical education even amidst adversity.
3. **Informing Evidence-based Policy and Intervention Development:** The findings generated

from this research was provide robust empirical evidence. This evidence is indispensable for Napata College, and potentially other Sudanese higher education institutions operating in similar challenging environments, to formulate and implement data-driven policies. These policies could include the development of resilience-building programs, the provision of academic accommodations, and the establishment of comprehensive psychological support services tailored to the specific needs of students affected by conflict.

4. Contributing to Global Academic Literature: This research was make a significant and timely contribution to the international academic literature. It was specifically enrich the understanding of medical education in emergency situations and conflict-affected regions—a field that remains critically under-researched, particularly within the Sudanese context. The insights gained was be valuable for educators, policymakers, and humanitarian organizations globally.

5. Long-term Societal Impact: By supporting the mental health and academic success of its medical students, Napata College is directly investing in the future healthcare workforce of Sudan. Ensuring that these students can complete their education and become competent medical professionals is vital for the long-term recovery and stability of the nation's healthcare system.

1.4 Objectives

1.4.1 General Objective

- To comprehensively assess the prevalence and levels of academic stress and to determine its specific impact on the acacadem performance of undergraduate medical students enrolled at Napata College, Sudan, during the academic year 2025-2026

1.4.2 Specific Objectives

1. To determine the prevalence of academic stress) among medical student
2. To identify the main academic and non-academic stressors experienced by students
3. To evaluate the relationship between academic stress levels and academic performance (GPA, attendance, and self .
4. To meticulously examine the relationship between key socio-demographic factors (e.g., gender, academic year of study, current displacement status, socioeconomic background) and the observed levels of academic stress and academic performance.

5. To explore the coping mechanisms employed by medical students at Napata College to manage academic and conflictrelated stress.

Chapter Two

Literature Review

2.1 General review

2.2 Focus review

2.3 Previous studies

2.1 Academic Stress in Medical Education: A Global Perspective

Medical education is universally recognized as one of the most intellectually demanding and emotionally taxing academic paths. Globally, medical students consistently report higher levels of psychological distress, including anxiety, depression, and burnout, compared to their peers in other disciplines [10]. A landmark meta-analysis by Rotenstein et al. (2016), which synthesized data from 195 studies involving over 129,000 medical students across 47 countries, found the overall prevalence of depression or depressive symptoms to be 27.2%, while the prevalence of suicidal ideation was 11.1% [11]. These figures highlight a pervasive issue that transcends geographical and cultural boundaries, indicating that the inherent structure and demands of medical training contribute significantly to student distress [11]. The origins of this stress are multifaceted, stemming from an overwhelming volume of information, a culture of perfectionism, and the high-stakes nature of clinical competency assessments [12]. The constant pressure to excel, coupled with rigorous examination schedules and the fear of making mistakes, creates an environment ripe for chronic stress [13]. Further studies have corroborated these findings across different cultural contexts. A study in Saudi Arabia by Al Dabal et al. (2010) found a stress prevalence of 63.5% among medical students, with academic pressures being the most cited stressor, including heavy workload, competitive environment, and fear of failure [27]. Similarly, a study in Pakistan by Shah et al. (2010) reported that over 70% of medical students experienced anxiety and stress, directly linking it to academic demands, such as frequent examinations, vast curriculum, and fear of not meeting expectations [28]. The transition from preclinical to clinical years introduces unique stressors, such as the emotional toll of patient suffering, ethical dilemmas in care, and the pressure to perform in real-world medical environments [12]. This phase, often termed “clinical shock,” has been shown to significantly increase rates of burnout and cynicism among students, as they confront the realities of illness and death [29]. Research in Western contexts has highlighted that while some stress (eustress) can enhance focus and motivation, chronic distress leads to cognitive impairment, reduced empathy, and a significant decline in professional identity formation, ultimately impacting patient care [13]. These global trends underscore the baseline vulnerability of medical students to stress, a vulnerability that is profoundly exacerbated in conflict settings.

2.2 Theoretical Frameworks: The Interplay of Stress and Cognitive Performance

The relationship between academic stress and performance is frequently analyzed through the Yerkes-Dodson Law, which suggests an inverted U-shaped relationship where performance peaks at moderate levels of arousal but deteriorates as stress becomes excessive [14]. This law

implies that a certain level of stress can be beneficial, enhancing alertness and focus, but beyond an optimal point, it becomes counterproductive. In medical education, however, the constant barrage of exams, clinical responsibilities, and the pressure to absorb vast amounts of information often pushes students into the “distress” zone, where cognitive functions are compromised. This is further supported by the Transactional Model of Stress and Coping proposed by Lazarus and Folkman (1984), which posits that stress is not merely an environmental stimulus but a result of an individual’s appraisal of an event as threatening or challenging, and their perceived ability to cope with it [20]. This model emphasizes the subjective nature of stress and the importance of coping strategies, suggesting that interventions should focus on both reducing stressors and enhancing coping resources.

Neurobiological studies have provided a concrete basis for these theories, illustrating the physiological mechanisms through which stress impact cognitive function. Chronic stress leads to the sustained elevation of glucocorticoids, particularly cortisol, released by the adrenal glands. High levels of cortisol are known to cause structural changes in the hippocampus, the brain region essential for memory consolidation and spatial learning, leading to atrophy and reduced neurogenesis [16]. For medical students, this means that the very stress intended to drive them toward excellence may actually impair their ability to retain complex anatomical or pharmacological information, making learning less efficient and more difficult. Additionally, stress impacts the prefrontal cortex, hindering executive functions such as decision-making, emotional regulation, and attentional control—skills that are non-negotiable for future physicians [17]. The prolonged activation of the hypothalamic-pituitary-adrenal (HPA) axis due to chronic stress can also lead to systemic inflammation, further impacting overall health and cognitive resilience, and contributing to conditions like anxiety and depression [17]. This physiological burden, combined with the psychological demands, creates a vicious cycle where stress impairs performance, leading to more stress and further decline in academic outcomes, a cycle that is particularly difficult to break in high-stress environments like medical school in a conflict zone.

2.3 Medical Education Under Siege: The Sudanese Crisis (2023 –2026)

The Sudanese civil conflict that erupted in April 2023 has transformed the educational landscape into a zone of survival. For medical students, the inherent pressures of their curriculum are now compounded by external “mega-stressors” directly related to the conflict. A pivotal cross-sectional study by Alfadul et al. (2025), which surveyed 4,185 Sudanese medical students amid the conflict, documented a catastrophic rise in mental health disorders. The study reported staggering rates of anxiety (61.98%), depression (65.5%), and Post-

Traumatic Stress Disorder (PTSD) (36.7%) [19]. These figures are significantly higher than global averages for medical students, underscoring the profound and devastating impact of the conflict on the psychological well-being of future healthcare professionals. The study further identified displacement, loss of family members, and exposure to violence as significant predictors of these mental health outcomes, highlighting the multi-layered trauma experienced by these students [19]. The conflict has not only imposed psychological trauma but has also systematically dismantled the infrastructure of learning. A study by Mohamed et al. (2025) described medical education in Sudan as being “under siege,” highlighting that displacement has forced thousands of students to flee to safer states or neighboring countries, often losing access to their primary learning materials, clinical sites, and even their academic records [18]. The abrupt and often poorly supported shift to “emergency remote teaching” in Sudan has been plagued by the “digital divide,” where frequent power outages, unreliable internet connectivity, and lack of access to appropriate devices in conflict-affected areas prevent students from attending virtual lectures or accessing online repositories [18]. This “siege” on education creates a state of perpetual uncertainty regarding graduation timelines, professional licensing, and future career prospects, further exacerbating the psychological burden. The destruction of homes, loss of family members, and constant threat of violence contribute to a pervasive sense of insecurity that makes focused study nearly impossible, leading to a significant decline in academic engagement and performance [30]. The cumulative effect of these stressors creates an environment where learning becomes a secondary concern to survival, severely compromising the quality of medical education.

2.4 Lessons from Other Conflict Zones: A Comparative Perspective

The challenges facing Sudanese medical students are not unique in the history of conflict, and examining experiences from other war-torn regions can provide valuable insights into potential long-term consequences and effective interventions. A study on Syrian medical students during the civil war by Moustafa et al. (2017) found similarly high rates of PTSD (44.6%) and depression (35.1%). The study identified witnessing violence, personal injury, and the loss of loved ones as major predictors of mental health issues, which in turn severely impacted academic performance and career aspirations [31]. The Syrian experience demonstrated that the disruption of clinical rotations, the targeting of healthcare facilities, and the emigration of faculty created a generation of doctors with significant gaps in their practical training and a diminished capacity to serve their communities effectively, leading to a long-term crisis in healthcare provision [32]. In Yemen, a study by Al-Kaf et al. (2019) on university students during the ongoing conflict revealed that academic life was severely hampered by pervasive

insecurity, economic collapse, and the breakdown of university services. Students reported a significant decline in their academic motivation and performance, with many being forced to abandon their studies altogether due to financial hardship or direct threats to their safety [3 3]. Similarly, research from Iraq post-2003 invasion highlighted the long-term psychological sequelae on students, including chronic anxiety, depression, and a pervasive sense of hopelessness, which continued to affect their academic and professional lives years after the initial conflict subsided [3 4]. These studies from other conflict zones provide a grim but valuable roadmap, highlighting the urgent need for early, sustained, and contextually appropriate interventions to mitigate the long-term damage to both the students' mental health and the future healthcare system of the affected nation. They underscore the importance of addressing not only academic needs but also the holistic well-being of students in such crises, emphasizing the need for comprehensive support systems that extend beyond the classroom.

2.5 The Impact of War on Academic Performance and Continuity

Empirical evidence from Sudan indicates that the war has directly and profoundly compromised academic performance and continuity. A 2026 study by Alslawy et al. at the University of Khartoum found that displacement and the loss of family income were the strongest predictors of academic decline, leading to lower GPAs and increased rates of course failure [3 0]. Students reported that the inability to focus due to constant safety concerns, the grief of losing colleagues or family members, and the sheer struggle for survival made traditional studying nearly impossible. The psychological toll of witnessing violence, experiencing displacement, and living in a state of chronic uncertainty manifests as impaired concentration, severe memory deficits, and reduced motivation, all of which directly hinder academic progress and engagement [3 5]. This is further compounded by the physiological effects of chronic stress, which as discussed in Section 2.2 , directly impair cognitive functions essential for learning. Moreover, the disruption of clinical training—the backbone of medical education—has led to a severe “competency crisis.” Many hospitals that served as teaching centers were either destroyed, damaged, or converted into military outposts, leaving senior students without the hands-on experience required for their final years and crucial clinical rotations [3 6]. This gap in training not only affects current GPA and exam scores but also raises profound long-term concerns about the quality and competence of the future healthcare workforce in a post-war Sudan. The lack of access to essential resources such as laboratories, well-stocked libraries, and even basic study materials further compounds the challenges, forcing students to rely on inadequate resources or forgo essential learning experiences, thereby compromising their foundational knowledge and practical skills [1 8]. The inability to

complete practical requirements also delays graduation, creating a backlog of students and further straining an already fragile educational system, potentially leading to a shortage of qualified medical professionals in the future.

2.6 Coping Mechanisms and Resilience in a Conflict Zone

In the face of such overwhelming adversity, Sudanese medical students have demonstrated remarkable resilience through various coping strategies. Unlike Western models that often emphasize individualistic self-care and professional psychological interventions, Sudanese students rely heavily on collective and spiritual coping mechanisms, deeply rooted in their cultural and religious contexts. A study by Abdalbagi et al. (2024) on Sudanese university students found that religious coping (e.g., prayer, finding meaning in faith, seeking divine intervention) was the most frequently used and effective strategy for mitigating psychological distress during the conflict, providing a sense of hope and control in uncontrollable circumstances [37]. This highlights the importance of culturally sensitive approaches to mental health support. Social support networks, both physical and virtual, play a crucial role in fostering resilience. Peer-led study groups, informal support networks, and “resilience circles” have emerged as vital spaces for emotional venting, sharing experiences, and academic collaboration, providing a sense of community and shared struggle [20]. Family support also remains a cornerstone, with many students finding strength and motivation in their familial bonds despite displacement and economic hardship. However, there is also evidence of maladaptive coping, such as avoidant behavior, social withdrawal, and substance abuse, particularly among those experiencing severe PTSD symptoms or prolonged exposure to trauma. A study on coping among medical students in conflict zones found that while problem-focused coping (e.g., active problem-solving, seeking information) was associated with better outcomes, emotion-focused and avoidant coping were linked to higher levels of depression and anxiety [21]. Understanding these diverse coping profiles is essential for institutions like Napata College to design support programs that resonate with the students’ cultural and situational realities, promoting adaptive strategies while addressing and mitigating maladaptive ones, thereby fostering a more holistic approach to student well-being.

2.7 Socio-Demographic Variations in Stress Experience

The experience of stress is not uniform across the student population, with various socio-demographic factors significantly modulating its perception and impact. Gender remains a significant factor, with female students in Sudan reporting higher levels of anxiety and a greater impact of displacement on their perceived safety and academic continuity [23]. This is consistent with findings from other conflict zones, where women and girls often face increased

risks, heightened societal pressures, and specific forms of gender-based violence, further exacerbating their psychological distress and hindering their access to education [3 1]. Academic year also modulates the stress experience; final-year students face the unique “anxiety of the unknown,” as their transition to internship and professional life is stalled by the national crisis, leading to profound uncertainty about their future careers. Conversely, first-year students struggle with the loss of a traditional university experience, the overwhelming demands of medical school, and the chaos of the conflict, often feeling isolated and unsupported, which can lead to early attrition [2 5]. Socioeconomic status has also emerged as a critical moderator of stress and academic outcomes. A 2026 study by Ahmed et al. found that students from families whose livelihoods were destroyed by the war face the dual burden of academic pressure and the urgent need to seek employment to support their displaced families. This financial strain often forces students to deprioritize their studies, leading to a direct drop in academic engagement, attendance, and performance [3 5]. Furthermore, students from rural areas or those with limited access to technology may experience exacerbated stress due to the challenges of remote learning, communication breakdowns, and lack of access to essential digital resources during the conflict [1 8]. These disparities highlight the need for targeted interventions that consider the diverse backgrounds and vulnerabilities within the student population, ensuring equitable access to support and educational opportunities.

2.8 Institutional Response and Adaptive Strategies

The role of medical colleges during the conflict has shifted dramatically from purely academic institutions to critical humanitarian and supportive entities. A 2025 study documented the adaptive strategies employed by the University of Gezira, which included flexible exam scheduling, hybrid learning models combining online and limited in-person sessions, and the establishment of psychological counseling units to address the burgeoning mental health crisis [3 8]. However, the effectiveness of these interventions is often limited by a severe lack of funding, a scarcity of trained mental health professionals, and the sheer scale and complexity of the crisis, making comprehensive and sustained support challenging to deliver. The need for external aid and international collaboration becomes paramount in such circumstances. Global literature on “Education in Emergencies” (EiE) suggests that for medical education to survive and thrive in conflict zones, institutions must move beyond traditional curricula and integrate trauma-informed pedagogy [2 6]. This involves acknowledging the students’ lived experiences of war within the classroom, creating safe spaces for discussion, and providing academic accommodations that reflect the reality of their lives, rather than imposing unrealistic expectations. A comprehensive review by Mendenhall et al. (2017) emphasizes that such

approaches should include offering psychosocial support, developing resilience-building programs, ensuring access to basic necessities like food and shelter where possible, and fostering a supportive institutional culture that prioritizes student well-being alongside academic achievement [2 6]. The current study at Napata College aims to fill the data gap necessary to refine these institutional responses and ensure they are tailored to the specific needs of their student population, ultimately contributing to the development of more robust and resilient medical education systems in conflict-affected regions. This includes advocating for policies that protect educational institutions and students during conflict, and establishing partnerships with humanitarian organizations to provide comprehensive support.

2.9 Summary and Research Gap

While global literature provides a robust foundation for understanding academic stress in medical education, and recent Sudanese studies have powerfully highlighted the mental health crisis among students during the ongoing conflict, there remains a critical lack of integrated research that specifically connects these heightened stress levels to quantitative academic performance (GPA) within private medical colleges like Napata College during the 2025-2026 period. Most existing studies tend to focus on public universities or provide general assessments of mental health without the granular focus on how specific stressors (e.g., inconsistent internet access, physical displacement, economic hardship) differentially impact concrete academic outcomes such as GPA, attendance, and progression rates. This study addresses this crucial gap by providing a localized, evidence-based assessment of the Napata College cohort, aiming to inform targeted interventions and policy adjustments that are critically needed to support medical students in conflict-affected regions. The unique context of Napata College, as a private institution operating within a conflict zone, offers a distinct perspective that can enrich the broader understanding of medical education resilience and adaptation during crises, providing actionable insights for both local and international stakeholders. This research will contribute significantly to the literature by offering a detailed analysis of the interplay between conflict-related stressors, coping mechanisms, and academic performance in a specific, underresearched setting, thereby guiding future policy and intervention development.

Chapter Three

Methodology

3.1 Study Design

This research was a cross-sectional, descriptive, and analytical study design. This methodological approach is particularly well-suited for assessing the prevalence of academic stress and investigating its correlational relationship with academic performance among a defined population at a specific point in time (academic year 2025-2026). The cross-sectional nature allows for the collection of data from a large sample efficiently, providing a snapshot of the current situation without requiring long-term follow-up.

3.2 Study Setting and Duration

The study was primarily conducted at Napata College, located in Khartoum, Sudan. Given the prevailing security situation and logistical challenges imposed by the ongoing conflict, data collection was predominantly facilitated through secure online platforms. This approach ensures the safety of both researchers and participants and maximizes reach. The entire study, from ethical approval to final report submission, is projected to span a period of approximately six months, commencing in January 2026 and concluding in June 2026. The data collection phase itself was concentrated over a period of four to six weeks within this timeframe.

3.3 Study Population

The target population for this research comprises all undergraduate medical students (from Year 1 to Year 6) who are officially enrolled and actively pursuing their medical degrees at Napata College during the academic year 2025-2026. This specific population has been selected due to the inherent academic rigor of their program, their frequent exposure to high-stakes assessments, and their heightened vulnerability to elevated stress levels exacerbated by the ongoing conflict.

3.4 Inclusion and Exclusion Criteria

To ensure the homogeneity and relevance of the study sample, the following criteria was applied:

Inclusion Criteria: All undergraduate medical students currently enrolled at Napata College for the academic year 2005-2026, who are aged 18 years or older, are able to understand and respond to the questionnaire in Arabic or English, and who provide informed consent to participate in the study.

Exclusion Criteria: Students who are currently on an official leave of absence (e.g., academic,

medical, or personal), those who explicitly decline to participate, and those who provide incomplete or inconsistent responses to the questionnaire, rendering their data unusable for analysis.

3.5 Sampling Method and Sample Size

A non-probability convenience sampling method was be utilized for participant recruitment. This approach is necessitated by the significant logistical and security challenges presented by the conflict situation, which preclude the feasibility of random sampling. Invitations to participate was be disseminated through official university communication channels, including the college’s learning management system, official student email lists, and designated student WhatsApp groups, with the assistance of class representatives.

The sample size was calculated using Cochran’s formula with a 95% confidence level and 5% margin of error, followed by finite population correction. Proportional allocation was used to distribute the sample across academic years.

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

Where:

n = required sample size

Z = Z value at 95% confidence level (1.96)

p = estimated proportion of adequate knowledge (50% used due to lack of local data)

d = margin of error (5%)

Using this formula:

$$n = \frac{1.96^2 0.5 (1 - 0.5)}{0.05^2} = \frac{3.8416 \times 0.5 \times 0.5}{0.0025} = \frac{0.9604}{0.0025} \approx 384$$

Then using finite population correction

$$n = (N \times n_0) / (n_0 + N - 1)$$

n = sample size after correction

n₀ = initial sample size (for infinite population)

N = total population size

$$n = (429 \times 384) / (384 + 429 - 1) = 164736 / 812 \approx 203$$

The calculated sample size is **203** participants.

3.6 Data Collection Tools

Data was collected using a meticulously structured, self-administered electronic questionnaire, primarily hosted on Google Forms or a similar secure online survey platform. The questionnaire was designed in both Arabic and English to accommodate the linguistic diversity of the student body and was comprised of the following key sections:

1. **Socio-demographic Data:** This section was gathered essential demographic information, including age, gender, current academic year, marital status, current living situation (e.g., living with family, displaced, on-campus housing), and self-reported internet accessibility and reliability.
2. **Perceived Stress Scale (PSS-10):** This is a widely validated and frequently used 10-item psychometric instrument designed to measure the degree to which situations in one's life are appraised as stressful [26]. Participants were asked to rate each item on a 5-point Likert scale (0 = never to 4 = very often), with higher cumulative scores indicating a greater perception of stress. The PSS-10 has demonstrated good reliability and validity in diverse populations, including those in conflict-affected regions.
3. **Sources of Stress:** This section included a series of open-ended and closed-ended questions designed to identify specific academic, environmental, and conflict-related stressors. Closed-ended questions were used with a Likert scale to assess the perceived intensity of various stressors (e.g., examination pressure, workload, financial difficulties, security concerns, displacement). Open-ended questions allowed students to articulate additional unique stressors they face.
4. **Coping Mechanisms:** Adapted items from the Brief COPE Inventory [27] were used to assess the various coping strategies employed by students. This section explored both adaptive (e.g., active coping, planning, seeking social support, positive reframing) and maladaptive (e.g., self-blame, denial, behavioral disengagement) coping strategies.
5. **Academic Performance:** Participants were asked to self-report their Grade Point Average (GPA) from the most recently completed semester. Additionally, questions assessed their perceived impact of stress on study hours, concentration during lectures, preparation for examinations, and overall academic engagement. Prior to full deployment, the questionnaire underwent a pilot test with a small sample of 15-20 medical students (not included in the main study sample) to assess its clarity, comprehensibility, cultural appropriateness, reliability, and technical functionality. Minor revisions were made based on the feedback received from the pilot study.

3.7 Data Analysis

All collected data were entered, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 26.0.

Descriptive statistics were used to summarize the data. Categorical variables were presented as frequencies and percentages. Ordinal and non-normally distributed continuous variables, including the total PSS-10 score, were summarized using the median and interquartile range (IQR).

The normality of data distribution was assessed using graphical methods, including histograms and Q–Q plots. As most variables were not normally distributed and the GPA variable was treated as ordinal, non-parametric tests were applied.

For inferential analysis, the Mann–Whitney U test was used to compare differences between two independent groups, while the Kruskal–Wallis test was used for comparisons across more than two groups. Spearman’s rank correlation coefficient (ρ) was used to assess the relationship between total PSS-10 scores and academic performance (GPA).

A p-value of less than 0.05 was considered statistically significant.

3.8 Ethical Considerations

Rigorous ethical protocols was be strictly adhered to throughout all phases of this research. Formal ethical approval was be diligently sought and obtained from the Research Ethics Committee of Napata College prior to any data collection activities.

Key ethical considerations include:

Informed Consent: All prospective participants was receive a detailed information sheet outlining the study’s purpose, procedures, potential risks and benefits, and their rights. Digital informed consent was be obtained from each participant before they commence the questionnaire, clearly stating their voluntary participation and right to withdraw at any time without penalty.

Confidentiality and Anonymity: Participant responses was be treated with the utmost confidentiality. Data was be collected anonymously, ensuring that no personally identifiable information is linked to their responses. All data was be stored on secure, password-protected servers accessible only to the research team.

Beneficence and Non-maleficence: The study is designed to minimize any potential harm to participants. Given the sensitive nature of discussing stress in a conflict zone, participants was be provided with contact information for mental health support services available at Napata College or through local NGOs, should they experience distress during or after completing the

survey.

Data Security: All electronic data was be encrypted and stored in compliance with relevant data protection regulations. Physical copies, if any, was be stored in locked cabinets.

Transparency: The research findings was be disseminated transparently, ensuring that the college administration and students benefit from the insights gained.

Chapter Four

Result

Table No (1): Demographic characters of medical students at Napata College in 2026
(N=203)

Demographic characteristics		N (%)
Age		
	Less than 20	19 (9.4%)
	20–22	55 (27.1%)
	23–25	101 (49.8%)
	More than 25	28 (13.8%)
	Total	203 (100%)
Gender		
	Male	102 (50.2%)
	Female	101 (49.8%)
	Total	203 (100%)
Academic year		
	First	25 (12.3%)
	Second	24 (11.8%)
	Third	51 (25.1%)
	Fourth	30 (14.8%)
	Fifth	73 (36.0%)
	Total	203 (100%)
Marital status		
	Single	170 (83.7%)

Married	33 (16.3%)
Total	203 (100%)

Place of Residence

With family	131 (64.5%)
Alone	23 (11.3%)
With friends	49 (24.1%)
Total	203 (100%)

Socioeconomic Status

Low	24 (11.8%)
Moderate	157 (77.3%)
High	22 (10.8%)
Total	203 (100%)

Are you financially responsible

Yes	120 (59.1%)
No	83 (40.9%)
Total	203 (100%)

A total of 203 medical students participated in the study. The majority were aged 23–25 years (101, 49.8%), followed by 20–22 years (55, 27.1%), more than 25 years (28, 13.8%), and less than 20 years (19, 9.4%). Male and female students were nearly equally represented (102, 50.2% vs 101, 49.8%). Regarding academic year, most students were in the fifth year (73, 36.0%), followed by the third year (51, 25.1%), fourth year (30, 14.8%), first year (25, 12.3%), and second year (24, 11.8%). The majority were single (170, 83.7%) and lived with family (131, 64.5%). Most students reported a moderate socioeconomic status (157, 77.3%) and 120 (59.1%) were financially responsible for their education.

Table No (2): Academic performance among medical students at Napata College in 2026
(N=203)

Academic performance		N (%)
Current GPA		
	Less than 2.5	21 (10.3%)
	2.5 – 3.0	98 (48.3%)
	3.1 – 3.5	58 (28.6%)
	Above 3.5	26 (12.8%)
	Total	203 (100%)

academic performance

Poor	22 (10.8%)
Average	74 (36.5%)
Good	76 (37.4%)
Excellent	31 (15.3%)
Total	203 (100%)

Attendance		
	Regular (>80%)	10 (4.9%)
	Moderate (50–80%)	71 (35.0%)
	Poor (<50%)	122 (60.1%)
	Total	203 (100%)

satisfied with your academic
performance?

Yes	125 (61.6%)
No	78 (38.4%)
Total	203 (100%)

Regarding academic performance, 98 students (48.3%) had a GPA between 2.5–3.0, 58 (28.6%) had a GPA of 3.1–3.5, 26 (12.8%) had a GPA above 3.5, and 21 (10.3%) had a GPA below 2.5. Self-rated academic performance was reported as good by 76 students (37.4%), average by 74 (36.5%), excellent by 31 (15.3%), and poor by 22 (10.8%). Most students had poor attendance (122, 60.1%), while 71 (35.0%) reported moderate attendance and only 10 (4.9%) had regular attendance. A majority were satisfied with their academic performance (125, 61.6%).

Table No (3): Stress level among medical students at Napata College in 2026 (N=203)

	Very Often N (%)	Fairly Often N (%)	Sometimes N (%)	Almost Never N (%)	Never N (%)	Total N (%)
Felt upset because of something that happened unexpectedly	29 (14.3%)	31 (15.3%)	62 (30.5%)	40 (19.7%)	41 (20.2%)	203 (100%)
Felt unable to control the important things in your life	37 (18.2%)	37 (18.2%)	52 (25.6%)	42 (20.6%)	35 (17.2%)	203 (100%)
Felt nervous and stressed	24 (11.8%)	33 (16.3%)	52 (26.5%)	43 (21.2%)	51 (25.1%)	203 (100%)
Felt confident about your ability to handle personal problems	50 (24.6%)	52 (25.6%)	45 (22.2%)	33 (16.3%)	23 (11.3%)	203 (100%)
Felt that things were going your way	23 (11.3%)	35 (17.2%)	67 (33.0%)	29 (14.3%)	49 (24.1%)	203 (100%)
Found that you could not cope with all the things that you had to do	48 (23.6%)	39 (19.2%)	46 (22.7%)	37 (18.2%)	33 (16.3%)	203 (100%)
Been able to control irritations in your life	39 (19.2%)	38 (18.7%)	52 (25.6%)	35 (17.2%)	39 (19.2%)	203 (100%)
Felt that you were on top of things	33 (16.3%)	42 (20.7%)	52 (25.6%)	40 (19.7%)	36 (17.7%)	203 (100%)
Been angered because of things that were outside of your control	36 (17.7%)	34 (16.7%)	51 (25.1%)	41 (20.2%)	41 (20.2%)	203 (100%)
Felt difficulties were piling up so high that you could not overcome them	36 (17.7%)	33 (16.3%)	49 (24.1%)	46 (22.7%)	39 (19.2%)	203 (100%)

Stress was commonly reported among the students. About 62 students (30.5%) sometimes felt upset due to unexpected events, while 29 (14.3%) felt very often, and 41 (20.2%) never

experienced this. Feeling unable to control important things was reported very often by 37 students (18.2%) and sometimes by 52 (25.6%). Nervousness and stress were sometimes experienced by 52 students (26.5%), very often by 24 (11.8%), and never by 51 (25.1%). Confidence in handling personal problems was very often reported by 50 students (24.6%), and almost never by 33 (16.3%). About 67 students (33.0%) sometimes felt that things were going their way, while 49 (24.1%) never felt this. Not being able to cope with responsibilities was very often reported by 48 students (23.6%), and never by 33 (16.3%). Students' ability to control irritations varied, with 52 (25.6%) sometimes able and 39 (19.2%) never able. Feeling on top of things was sometimes reported by 52 students (25.6%) and never by 36 (17.7%). Being angered by external factors was very often reported by 36 students (17.7%), and 41 (20.2%) never felt this. Lastly, difficulties piling up beyond their ability to cope were sometimes experienced by 49 students (24.1%) and very often by 36 (17.7%).

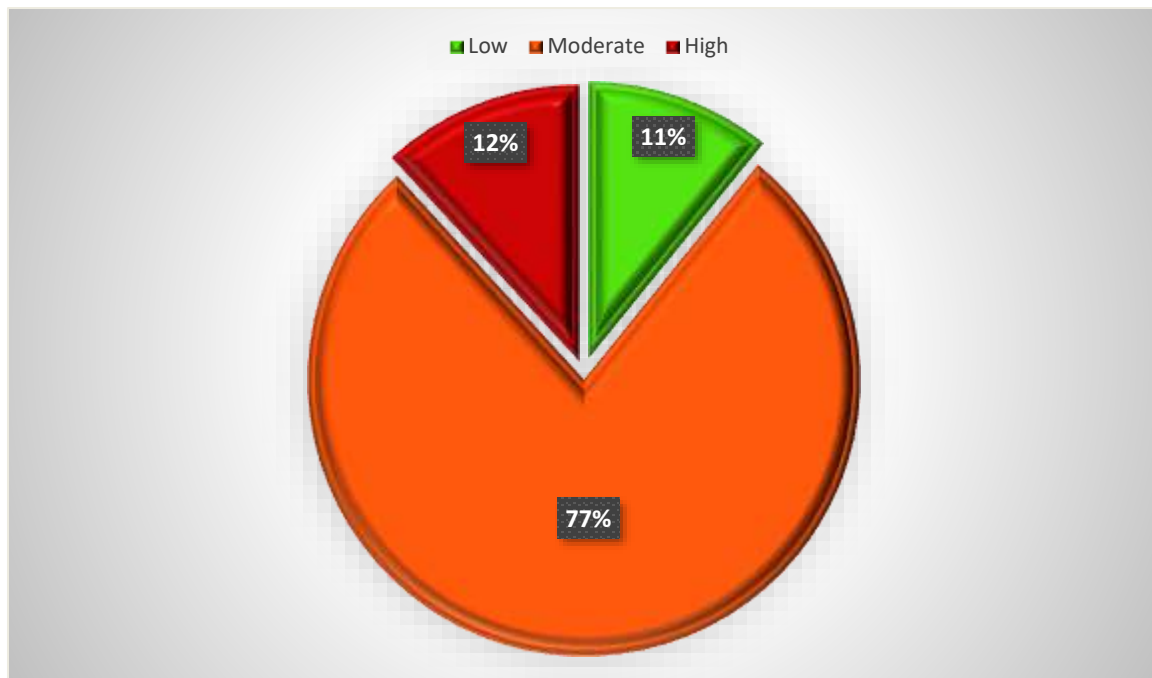


Figure No (1): Level of stress among medical students at Napata College in 2026 (N=203)

The majority of students reported moderate stress (level 2), with 157 students (77.3%). Low stress (level 1) was reported by 22 students (10.8%), while high stress (level 3) was reported by 24 students (11.8%). Overall, most students experienced moderate levels of stress.

Table No (4): Causes of stress among medical students at Napata College in 2026 (N=203)

	Median (IQR)	Very Often N (%)	Fairly Often N (%)	Sometimes N (%)	Almost Never N (%)	Never N (%)	Total N (%)
Heavy study load	3 (2-4)	23 (11.3%)	32 (15.8%)	56 (27.6%)	44 (21.7%)	48 (23.6%)	203 (100%)
Frequent exams	3(2-4)	43 (21.2%)	33 (16.3%)	63 (31.0%)	30 (14.8%)	34 (16.7%)	203 (100%)
Lack of time	3(3-5)	20 (9.9%)	30 (14.8%)	69 (34.0%)	33 (16.3%)	51 (25.1%)	203 (100%)
Fear of failure	3(2-5)	26 (12.8%)	37 (18.2%)	50 (24.6%)	25 (12.3%)	65 (32.0%)	203 (100%)
Competition with peers	3(1-4)	53 (26.1%)	37 (18.2%)	51 (25.1%)	35 (17.2%)	27 (13.3%)	203 (100%)
Financial problems	3(1-4)	62 (30.5%)	37 (18.2%)	50 (24.6%)	34 (16.7%)	20 (9.9%)	203 (100%)
Family expectations	3(2-4)	29 (14.3%)	37 (18.2%)	47 (23.2%)	40 (19.7%)	50 (24.6%)	203 (100%)
Poor internet / electricity	3(2-4)	45 (22.2%)	30 (14.8%)	49 (24.1%)	38 (18.7%)	41 (20.2%)	203 (100%)
Living conditions	3 (1-4)	51 (25.1%)	28 (13.8%)	65 (32.0%)	32 (15.8%)	27 (13.3%)	203 (100%)

The most commonly reported stressors were financial problems (median = 3, IQR 1–4), with 30.5% of students experiencing them “very often,” and competition with peers (median = 3, IQR 1–4), with 26.1% reporting “very often.” Other frequent stressors included living conditions (25.1%), frequent exams (21.2%), and poor internet/electricity (22.2%). Academic-related stressors such as heavy study load, lack of time, and fear of failure had median scores of 3 with varying frequencies, indicating moderate to high prevalence. Stress from family expectations showed slightly lower frequency, with only 14.3% reporting “very often.” Overall, the results indicate that both academic and non-academic factors contribute substantially to stress among medical students, with financial issues and peer competition being the most prominent.

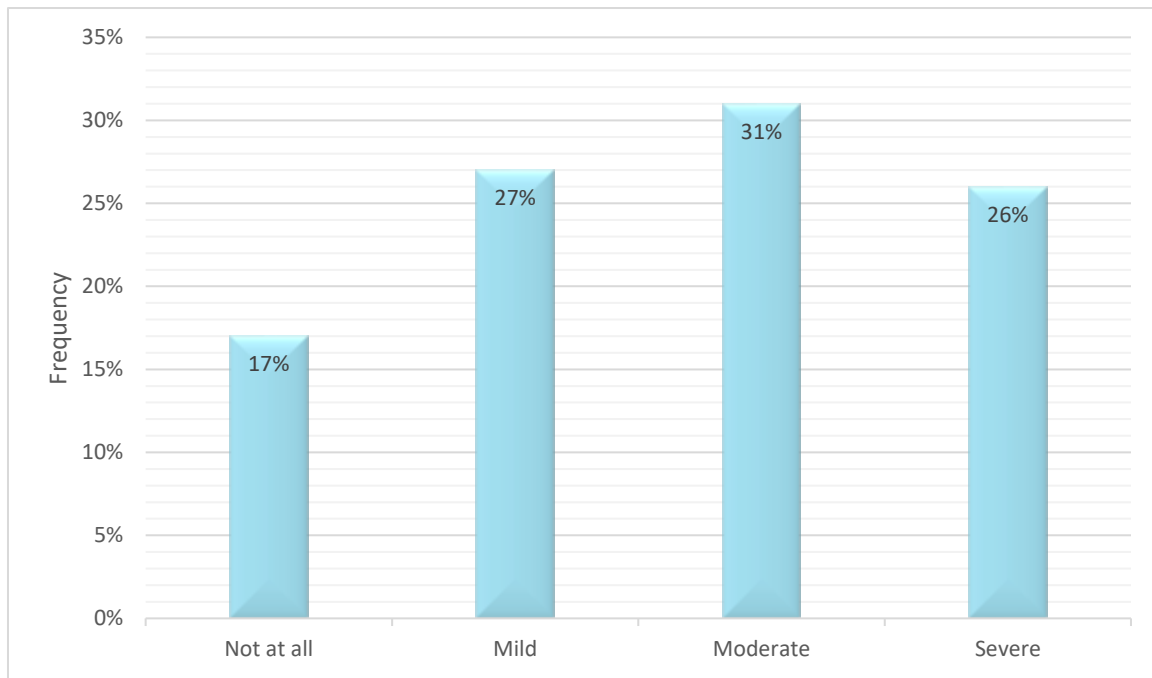


Figure No (2): The effect of war on study of medical students at Napata College in 2026 (N=203)

Among 203 medical students, 34 students (16.7%) reported no impact of war on their studies, 54 students (26.6%) reported a mild impact, 63 students (31.0%) reported a moderate impact, and 52 students (25.6%) reported a severe impact. Overall, 169 students (83.3%) experienced some level of disruption to their academic studies due to the ongoing conflict.

Table No (5): Coping strategies used by medical student an Napta colleague to deal with stress in 2026 (N=203)

	Yes N (%)	No N (%)	Total N (%)
Exercise	61 (30%)	142 (70%)	203 (100%)
Social support (friends/family)	88 (43.3%)	115 (56.7%)	203 (100%)
Religious practices	86 (42.4%)	117 (57.6%)	203 (100%)
Entertainment (movies, music)	27 (13.3%)	176 (86.7%)	203 (100%)
Sleep	54 (26.6%)	149 (73.4%)	203 (100%)
Avoidance	44 (21.7%)	159 (78.3%)	203 (100%)

Among 203 students, the most commonly reported coping strategies were social support (88 students, 43.3%) and religious practices (86 students, 42.4%). Exercise was used by 61 students (30%), and sleep by 54 students (26.6%). Less frequently reported strategies included avoidance (44 students, 21.7%) and entertainment such as movies or music (27 students, 13.3%). These findings indicate that students primarily rely on social and religious coping mechanisms, while leisure and avoidance strategies are less common.

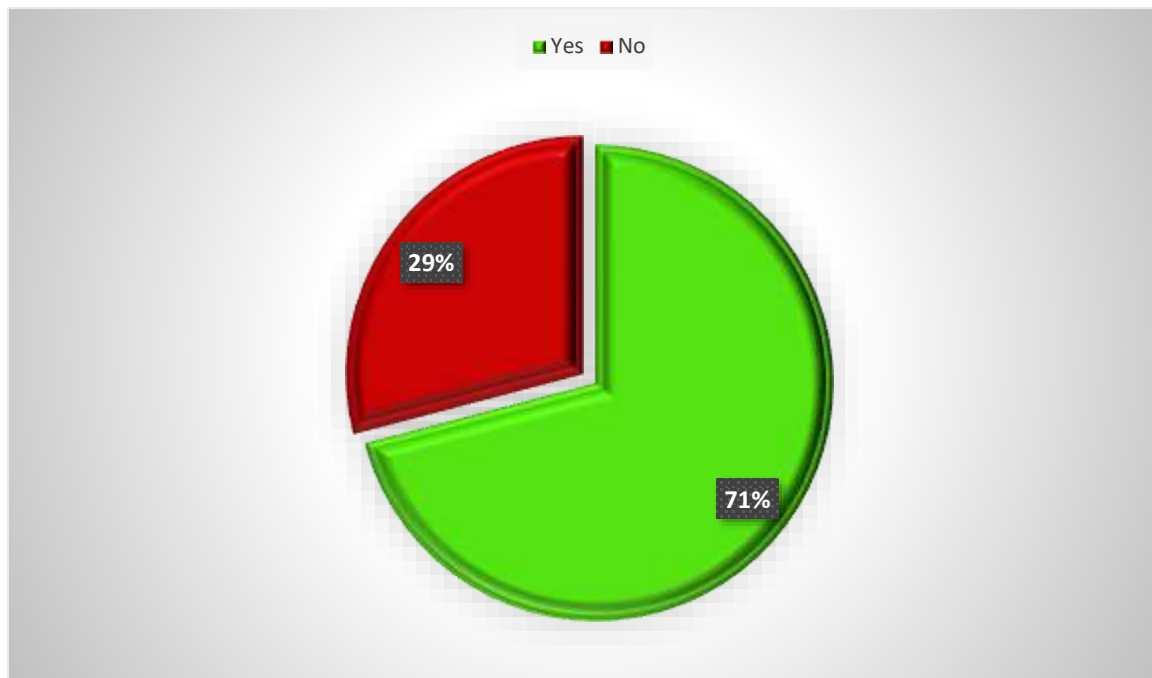


Figure No (3): The effectiveness of coping strategies among medical students at Napata College in 2026 (N=203)

Among 203 medical students, 162 students (79.8%) reported that stress affects their concentration, while 41 students (20.2%) reported no effect. This indicates that a large majority of students experience concentration difficulties due to stress despite their coping strategies.

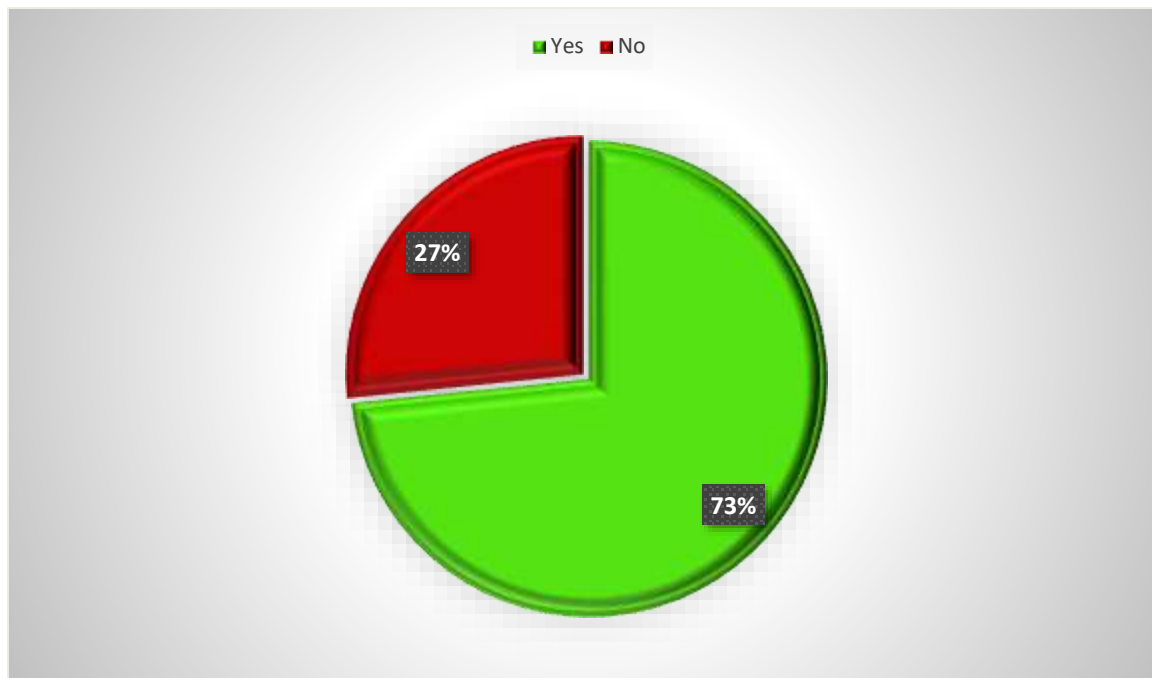


Figure No (4): the impact of stress on academic performance among medical students at Napata College in 2026 (N=203)

Among 203 medical students, 149 students (73.4%) reported that stress affects their academic performance, while 54 students (26.6%) reported no effect. This indicates that stress has a substantial impact on the academic performance of the majority of students.

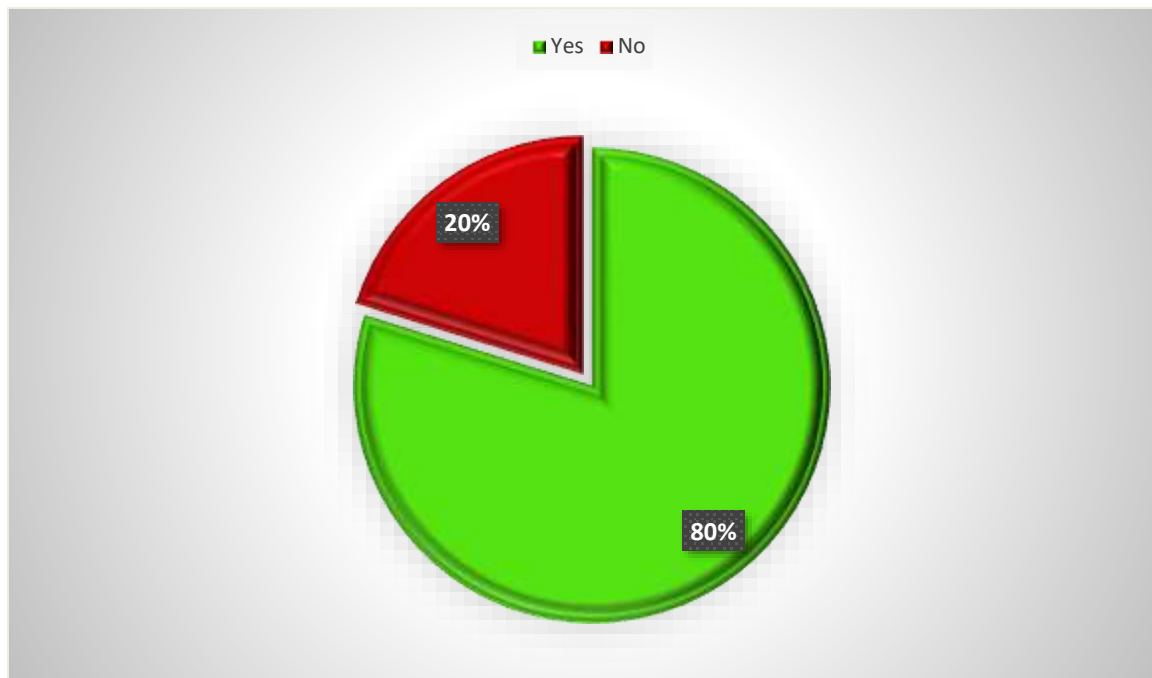


Figure No (5): the impact of stress on concentration among medical students at Napata College in 2026 (N=203)

Among 203 medical students, 162 students (79.8%) reported that stress affects their concentration, while 41 students (20.2%) reported no effect. This indicates that stress substantially interferes with students' ability to concentrate.

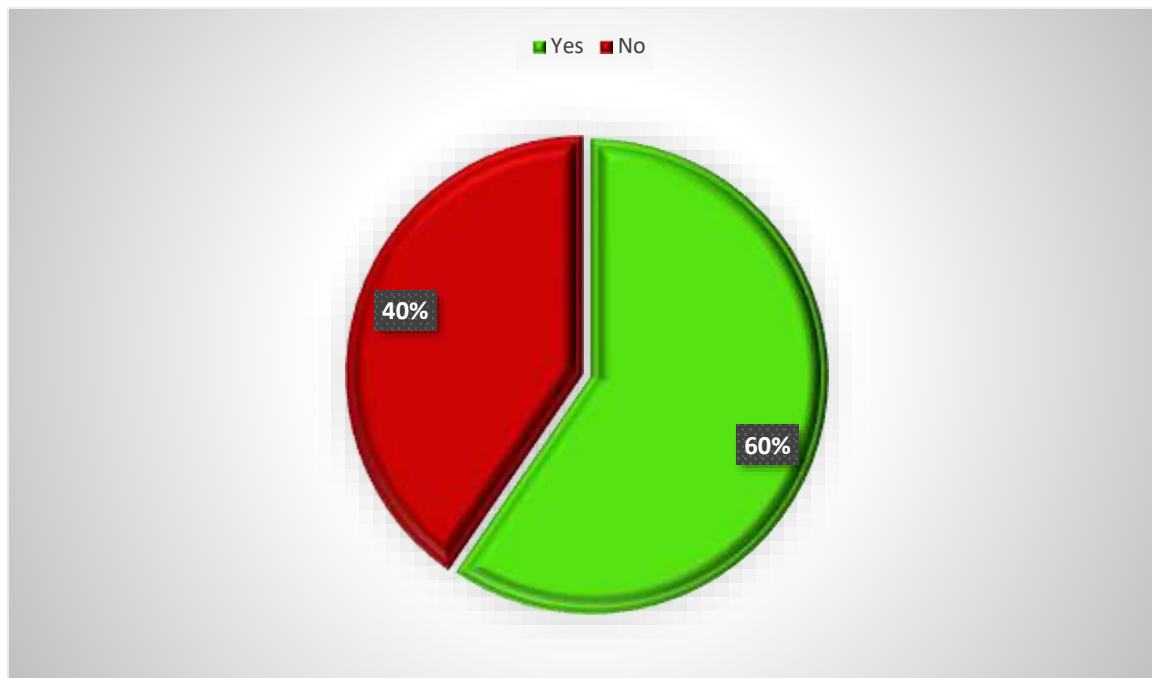


Figure No (6): the impact of stress on thinking to quitting medical school among medical students at Napata College in 2026 (N=203)

Among 203 medical students, 121 students (59.6%) reported that they have considered quitting medical school due to stress, while 82 students (40.4%) reported never having considered quitting. This shows that stress has a significant impact on students' academic persistence.

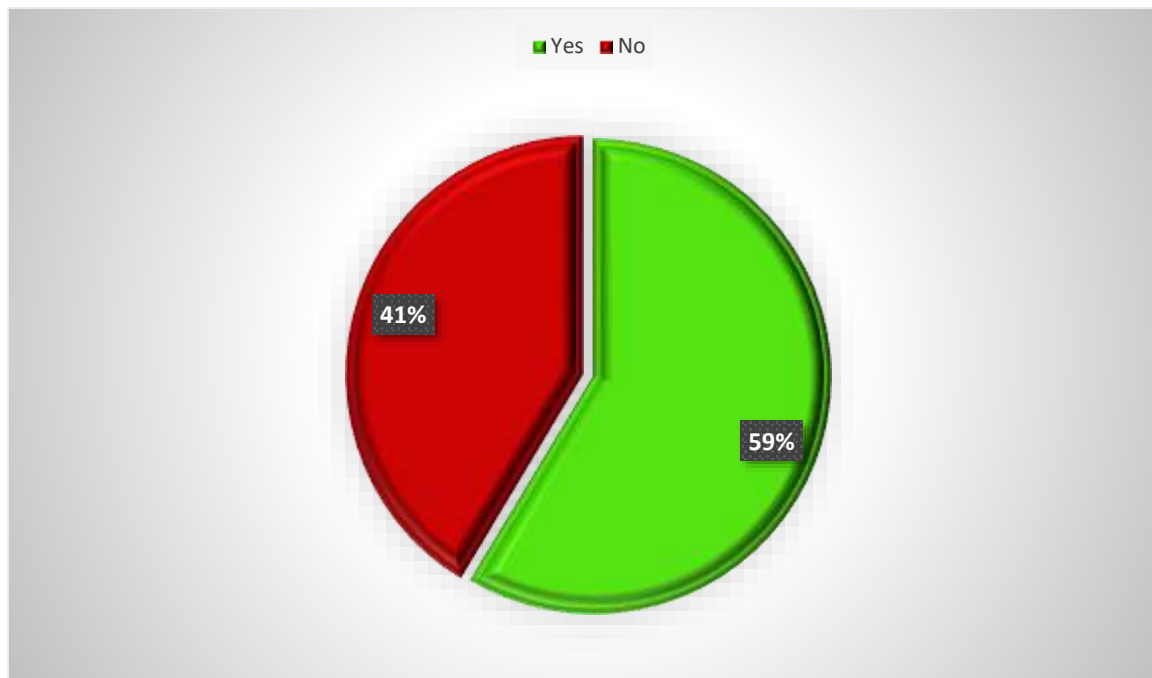


Figure No (7): The psychological support of Napata college for medical students in 2026 (N=203)

Among 203 medical students, 121 students (59.6%) reported that the college provides sufficient psychological support, while 82 students (40.4%) reported insufficient support.

Table (6): Association between stress level and academic performance (GPA) among medical students at Napata College in 2026 (N=203)

			Stress score
Spearman's rho	Current GPA	Correlation Coefficient	-0.170
		P value	0.015
		N (%)	203 (100%)

A significant negative correlation was observed between total stress score (PSS-10) and current GPA among 203 medical students (Spearman's $\rho = -0.170$, $p = 0.015$). This indicates that higher perceived stress is associated with lower academic performance

Table (7): Difference in stress level among different age groups of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Age				0.035
	Less than 20	21.00	(12.00-24.00)	
	20–22	19.00	(16.00-21.00)	
	23–25	21.00	(18.00-25.00)	
	More than 25	20.50	(17.25-23.75)	

There was a statistically significant difference in perceived stress levels (PSS-10 scores) across age groups ($p = 0.035$). Students aged 23–25 had the highest mean rank (112.36), indicating higher stress levels compared to other age groups.

Table (8): Difference in stress level among different gender of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Gender	Male	20.00	(17.00-25.00)	0.801
	Female	21.00	(17.00-23.00)	

There was no statistically significant difference in perceived stress levels (PSS-10 scores) between male and female students ($p = 0.801$). Mean ranks were comparable between males (103.03) and females (100.96), indicating similar stress levels across genders.

Table (9): Difference in stress level among different academic years of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Academic year	First	19.00	(13.50-23.00)	0.001
	Second	20.00	(17.00-22.75)	
	Third	23.00	(21.00-31.00)	
	Fourth	19.00	(15.75-21.25)	
	Fifth	20.00	(16.500-22.00)	

There was a statistically significant difference in perceived stress levels (PSS-10 scores) across academic years ($p < 0.001$). Third-year students had the highest mean rank (137.81), indicating the highest stress levels, whereas first-year (85.96) and fourth-year students (86.13) had lower stress levels.

Table (10): Difference in stress level among different marital status of medical students at Napata College in 2026 (N=203)

Demographic characters		Median (IQR)		P value
Marital status	Single	20.00	(17.00-24.00)	0.477
	Married	21.00	(16.00-22.00)	

There was no statistically significant difference in perceived stress levels (PSS-10 scores) between single and married students ($p = 0.477$). Single students showed slightly higher mean ranks (103.29) compared to married students (95.36), but the difference was not statistically significant.

Table (11): Difference in stress level among different place of residence among medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Place of Residence				0.001
	With family	20.00	(16.00-22.00)	
	Alone	19.00	(17.00-22.00)	
	With friends	23.00	(19.00-31.50)	

There was no statistically significant difference in perceived stress levels (PSS-10 scores) across socioeconomic status groups ($p = 0.114$). Although students with low socioeconomic status showed higher mean ranks (124.96) compared to moderate (98.25) and high (103.73), this difference was not statistically significant.

Table (12): Difference in stress level among different economic status of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)	IQR	P value
Socioeconomic Status	Low	22.50	(18.25-26.00)	0.114
	Moderate	20.00	(16.00-23.00)	
	High	21.00	(18.75-22.50)	

There was no statistically significant difference in perceived stress levels (PSS-10 scores) across socioeconomic status groups ($p = 0.114$). Although students with low socioeconomic status showed higher mean ranks (124.96) compared to moderate (98.25) and high (103.73), this difference was not statistically significant.

Table (13): Association between stress level and war effect on study among medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Effect of war on studying	Not at all	18.00	(14.00-21.25)	0.001
	Mild	20.00	(16.75-21.00)	
	Moderate	21.00	(18.00-24.00)	
	Severe	23.50	(17.25-31.75)	

There was a statistically significant difference in perceived stress levels across war impact categories ($p = 0.001$). Students who reported severe impact of war had the highest mean rank of PSS-10 scores (104.68), followed by moderate (83.02) and mild (68.35), indicating increasing stress levels with greater war impact.

Table (14): Association between Academic performance and Age of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Age	Less than 20	2.00	(1.00-3.00)	0.902
	20–22	2.00	(2.00-3.00)	
	23–25	2.00	(2.00-3.00)	
	More than 25	2.00	(2.00-3.00)	

There was no statistically significant difference in academic performance (GPA) across age groups ($p = 0.902$). Mean ranks were similar across groups, with students older than 25 showing slightly higher GPA ranks (109.09), but this difference was not significant.

Table (15): Association between Academic performance and gender of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Gender	Male	2.00	(2.00-2.00)	0.002
	Female	3.00	(2.00-3.00)	

There was a statistically significant difference in academic performance (GPA) between genders ($p = 0.002$). Female students had a higher mean rank (114.08) compared to male students (90.04), indicating better academic performance among females.

Table (16): Association between Academic performance and Academic years of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Academic year	First	2.00	(2.00-4.00)	0.12
	Second	2.00	(2.00-3.00)	
	Third	2.00	(2.00-3.00)	
	Fourth	2.00	(2.00-3.00)	
	Fifth	3.00	(2.00-3.00)	

There was a statistically significant difference in academic performance (GPA) across academic years ($p = 0.012$). Fifth-year students had the highest mean rank (116.95), followed by fourth-year (107.13) and first-year (101.56), while third-year students had the lowest mean rank (83.04), indicating variation in performance across academic levels.

Table (17): Association between Academic performance and marital status of medical students at Napata College in 2026 (N=203)

Demographic characters		Median (IQR)		P value
Marital status	Single	2.00	(2.00-3.00)	0.217
	Married	3.00	(2.00-3.00)	

There was no statistically significant difference in academic performance (GPA) between single and married students ($p = 0.217$). Although married students had a slightly higher mean rank (112.73) compared to single students (99.92), this difference was not significant.

Table (18): Association between Academic performance and place of residence of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Place of Residence				0.139
	With family	2.00	(2.00-3.00)	
	Alone	2.00	(2.00-3.00)	
	With friends	2.00	(2.00-3.00)	

There was no statistically significant difference in academic performance (GPA) across place of residence ($p = 0.319$). Students living with family had slightly higher mean ranks (106.29) compared to those living alone (94.33) and with friends (94.14), but this difference was not significant.

Table (19): Association Academic performance and Socioeconomic Status of medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Socioeconomic Status	Low	2.00	(2.00-3.00)	0.006
	Moderate	2.00	(2.00-3.00)	
	High	3.00	(2.00-4.00)	

There was a statistically significant difference in academic performance (GPA) across socioeconomic status groups ($p = 0.006$). Students with high socioeconomic status had the highest mean rank (135.98), followed by moderate (99.22) and low (89.06), indicating better academic performance among students with higher socioeconomic status.

Table (20): Association between Academic performance and war effect on study among medical students at Napata College in 2026 (N=203)

Demographic character		Median (IQR)		P value
Effect of war on studying	Not at all	3.00	(2.00-3.00)	0.583
	Mild	2.00	(2.00-3.00)	
	Moderate	2.00	(2.00-3.00)	
	Severe	2.00	(2.00-3.00)	

There was no statistically significant difference in academic performance (GPA) across different levels of war impact ($p = 0.583$). Although students reporting moderate impact showed slightly higher mean ranks (88.33) compared to mild (79.88) and severe (86.28), this difference was not significant.

Chapter Five:

Discussion

Discussion:

The current study highlights that academic stress is highly prevalent among medical students at Napata College, with the majority (77.3%) experiencing moderate stress levels. This finding is consistent with global evidence indicating that medical students experience higher stress compared to other university disciplines [10,11]. The main contributors to stress identified in this study included financial problems, peer competition, heavy study loads, frequent exams, poor internet/electricity, and the ongoing conflict in Sudan. These results align with prior literature emphasizing the multifactorial origins of stress, including academic, social, and environmental pressures [12,13,18,19]. Academic performance was significantly negatively associated with stress levels (Spearman's $\rho = -0.170$, $p = 0.015$), confirming previous evidence that elevated stress impairs cognitive functions essential for learning, such as attention, memory, and problem-solving [15-17]. Notably, third-year students experienced the highest stress, while fifth-year students demonstrated better academic performance, suggesting that stress levels fluctuate across academic years due to workload, clinical exposure, and examination demands [25]. Coping strategies were primarily social support (43.3%) and religious practices (42.4%), reflecting culturally relevant resilience mechanisms [22]. Despite these strategies, most students reported that stress negatively affected concentration (79.8%) and academic performance (73.4%), with 59.6% considering quitting medical school. These findings underscore that even adaptive coping mechanisms may not fully counteract the adverse effects of stress, particularly in conflict-affected contexts [20,22].

Demographic Influences and the War's Exacerbating Role While our demographic analyses indicated no statistically significant differences in overall stress levels based on gender ($p = 0.801$) or marital status ($p = 0.477$), a nuanced picture emerges when examining academic performance. Notably, female students demonstrated significantly higher academic performance ($p = 0.002$). This finding, while seemingly counterintuitive given that women often report higher anxiety in conflict settings [23], suggests a potential for greater resilience or more effective academic coping strategies among female medical students in this context. This aligns with global trends where female students often excel academically despite perceived higher stress [10]. Further qualitative research could explore the specific mechanisms enabling this academic resilience. Age also played a role, with students aged 23-25 reporting the highest stress levels ($p = 0.035$). This demographic often corresponds to students in their demanding clinical years, where the inherent pressures of medical training are compounded by direct exposure to patient suffering and ethical dilemmas [12]. In a conflict

zone, these clinical stressors are amplified by the breakdown of healthcare infrastructure and the emotional toll of widespread trauma, potentially explaining the heightened stress in this age group. Crucially, socioeconomic status emerged as a significant determinant of academic performance ($p = 0.006$), with higher-income students achieving better GPAs. This disparity directly underscores the profound impact of the “digital divide” and economic barriers in a conflict-affected educational landscape, as highlighted by Mohamed et al. (2025) [18]. Students from lower socioeconomic backgrounds likely face compounded challenges, including limited access to essential learning resources, stable internet, and even basic necessities, which directly impede their ability to focus on studies and maintain academic standing. This necessitates targeted institutional support to mitigate educational inequities. Finally, the study unequivocally reinforces the devastating impact of the ongoing conflict on medical education. A statistically significant relationship was found between the effect of war on studies and perceived stress levels ($p = 0.001$), with students experiencing severe disruption reporting markedly higher stress. This finding aligns with the concept of “mega-stressors” and the systematic dismantling of learning infrastructure described in the literature [18,19], emphasizing that the conflict acts as a pervasive, overarching stressor that exacerbates all other academic and personal challenges faced by these students. The cumulative effect of these conflict-related factors creates an environment where the pursuit of medical education becomes an act of profound resilience against overwhelming odds.

Chapter Six

1. Conclusion

2. Recommendation

3. Limitations

Conclusion:

Stress is a significant challenge among medical students at Napata College, affecting both academic performance and concentration. Both academic and non-academic stressors contribute to students' psychological burden, with financial problems, peer competition, and the effects of ongoing conflict being particularly prominent. While culturally relevant coping strategies such as social support and religious practices are utilized, a substantial proportion of students continue to experience academic and psychological difficulties

Limitation

1. The study was conducted at a single institution, which may limit the generalizability of findings to other medical colleges in Sudan or internationally.
2. The cross-sectional design cannot establish causality between stress and academic performance.
3. Self-reported data may be subject to recall bias or social desirability bias.
4. The study did not assess long-term psychological outcomes or clinical diagnoses of stress-related disorders.

Recommendation

Based on the findings of this study, the following recommendations are suggested:

1. Psychological Support: Establish accessible mental health services and counseling programs tailored for medical students.
2. Stress Management Training: Implement workshops on time management, problem-solving, and adaptive coping strategies.
3. Financial Assistance: Provide scholarships or financial aid programs to reduce stress related to economic challenges.
4. Academic Policy Adjustments: Consider modifying workload and examination schedules to reduce excessive academic pressure, especially for third-year students.
5. Conflict-Responsive Interventions: Develop support systems for students affected by conflict, including flexible learning options and online resources.
6. Promotion of Social and Religious Coping: Encourage culturally appropriate support networks to enhance resilience.

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Annexes

- 1. Questionnaire**
- 2. Informed consent**
- 3. Map**
- 4. Picture**

1. Study questionnaire (English version)

This questionnaire aims to assess academic stress among medical students and its effect on academic performance. Your participation is voluntary and all responses are confidential.

?

◆ Section 1: Socio-demographic Data

1. Age (Multiple choice)

- Less than 20
- 20 – 22
- 23 – 25
- More than 25

2. Gender (Multiple choice)

- Male
- Female

3. Academic Year (Multiple choice)

- First
- Second
- Third
- Fourth
- Fifth / Final

4. Marital Status (Multiple choice)

- Single
- Married
- Other

5. Place of Residence (Multiple choice)

- With family
- Alone
- With friends

6. Socioeconomic Status (Multiple choice)

- Low
- Moderate
- High

7. Are you financially responsible for your education? (Multiple choice)

- Yes
- No

?

◆ Section 2: Academic Performance

8. Current GPA (Multiple choice)

- Less than 2.5
- 2.5 – 3.0
- 3.1 – 3.5
- Above 3.5

9. How would you rate your academic performance? (Multiple choice)

- Poor
- Average
- Good
- Excellent

10. Attendance (Multiple choice)

- Regular (>80%)
- Moderate (50 – 80%)
- Poor (<50%)

11. Are you satisfied with your academic performance? (Multiple choice)

- Yes
- No

?

◆ Section 3: Perceived Stress Scale (PSS-10)

(Use Linear scale: 0 = Never → 4 = Very Often)

12. Felt upset because of something unexpected
13. Unable to control important things in your life
14. Felt nervous and stressed
15. Felt confident about handling problems (Reverse)
16. Felt things were going your way (Reverse)
17. Could not cope with responsibilities
18. Able to control irritations (Reverse)
19. Felt on top of things (Reverse)
20. Angered due to things outside your control
21. Felt difficulties piling up

?

◆ Section 4: Sources of Stress

(Linear scale: Not at all → Severe)

Academic Stressors:

- 22. Heavy study load
- 23. Frequent exams
- 24. Lack of time
- 25. Fear of failure
- 26. Competition with peers

Non-Academic Stressors:

- 27. Financial problems
- 28. Family expectations
- 29. Poor internet / electricity
- 30. Living conditions

?

◆ Section 5: Conflict-related Factors

31. Have you been affected by the war? (Multiple choice)

- Yes
- No

32. Type of impact (Checkboxes)

- Displacement
- Loss of family member
- Financial hardship
- Academic disruption
- Psychological stress

33. To what extent has war affected your studies? (Multiple choice)

- Not at all
- Mild
- Moderate
- Severe

?

◆ Section 6: Coping Mechanisms

34. How do you cope with stress? (Checkboxes)

- Exercise
- Social support (friends/family)
- Religious practices
- Entertainment (movies, music)
- Sleep
- Avoidance

35. Do you feel your coping methods are effective? (Multiple choice)

- Yes
- No

?

◆ Section 7: Impact of Stress

36. Does stress affect your concentration? (Multiple choice)

- Yes
- No

37. Does stress affect your academic performance? (Multiple choice)

- Yes
- No

38. Have you ever considered quitting medical school due to stress? (Multiple choice)

- Yes
- No

?

◆ Section 8: Final Question

39. Do you think your college provides enough psychological support? (Multiple choice)

- Yes
- No

2. الإستبيان

الوصف:

تهدف هذه الاستبانة إلى تقييم مستوى الضغط الأكاديمي بين طلاب الطب وتأثيره على أدائهم الأكاديمي. مشاركتك طوعية، وجميع الإجابات سرية تمامًا.

القسم الأول: البيانات الاجتماعية والديموغرافية

العمر:

أقل من 20 سنة

20-22 سنة

23-25 سنة

أكثر من 25 سنة

النوع:

ذكر

أنثى

السنة الدراسية:

الأولى

الثانية

الثالثة

الرابعة

الخامسة / النهائية

الحالة الاجتماعية:

أعزب/عزباء

متزوج/متزوجة

أخرى

مكان السكن:

مع الأسرة

بمفردي

مع الأصدقاء

الحالة الاقتصادية:

منخفضة

متوسطة

مرتفعة

هل أنت المسؤول ماليًا عن دراستك؟

نعم

لا

القسم الثاني: الأداء الأكاديمي

المعدل التراكمي الحالي (GPA):

أقل من 2.5

3.0 – 2.5

3.5 – 3.1

أكثر من 3.5

كيف تقيم أدائك الأكاديمي؟

ضعيف

متوسط

جيد

ممتاز

الحضور:

منتظم (<80%)

متوسط (50–80%)

ضعيف (>50%)

هل أنت راضٍ عن أدائك الأكاديمي؟

نعم

لا

القسم الثالث: مقياس الضغط المدرك (PSS-10)

(0 = أبدًا → 4 = غالبًا جدًا)

شعرت بالانزعاج بسبب شيء غير متوقع
شعرت بعدم القدرة على التحكم في الأمور المهمة في حياتك
شعرت بالتوتر والضغط
شعرت بالثقة في قدرتك على التعامل مع مشاكلك (عكسي)
شعرت أن الأمور تسير كما تريد (عكسي)
لم تتمكن من التعامل مع المسؤوليات
كنت قادرًا على التحكم في انفعالاتك (عكسي)
شعرت بأنك مسيطر على الأمور (عكسي)
شعرت بالغضب بسبب أمور خارج إرادتك
شعرت بتراكم الصعوبات عليك

القسم الرابع: مصادر الضغط

(لا يوجد → شديد)

عبء دراسي كبير

الامتحانات المتكررة

ضيق الوقت

الخوف من الفشل

المنافسة مع الزملاء

مشاكل مالية

توقعات الأسرة

ضعف الإنترنت / الكهرباء

ظروف المعيشة

القسم الخامس: عوامل مرتبطة بالانزعاج

هل تأثرت بالحرب؟

نعم

لا

نوع التأثير:

النزوح

فقدان أحد أفراد الأسرة

صعوبات مالية

تعطل الدراسة

ضغط نفسي

إلى أي مدى أثرت الحرب على دراستك؟

لم تؤثر

تأثير بسيط

تأثير متوسط

تأثير شديد

القسم السادس: آليات التكيف

كيف تتعامل مع الضغط؟

ممارسة الرياضة

الدعم الاجتماعي (الأصدقاء/الأسرة)

الممارسات الدينية

الترفيه (أفلام، موسيقى)

النوم

التجنب

هل طرق التكيف فعالة؟

نعم

لا

القسم السابع: تأثير الضغط

هل يؤثر الضغط على تركيزك؟

نعم

لا

هل يؤثر الضغط على أدائك الأكاديمي؟

نعم

لا

هل فكرت في ترك دراسة الطب بسبب الضغط؟

نعم

لا

القسم الثامن: السؤال النهائي

هل توفر الكلية دعمًا نفسيًا كافيًا؟

نعم

لا

3.Written content

Participation in this research is entirely voluntary. All information provided in response to the attached questionnaire was be handled confidentially and in an organized manner to ensure participants' privacy. This includes the use of serial numbers only, without recording any direct personal identifiers such as names, phone numbers, or home addresses.

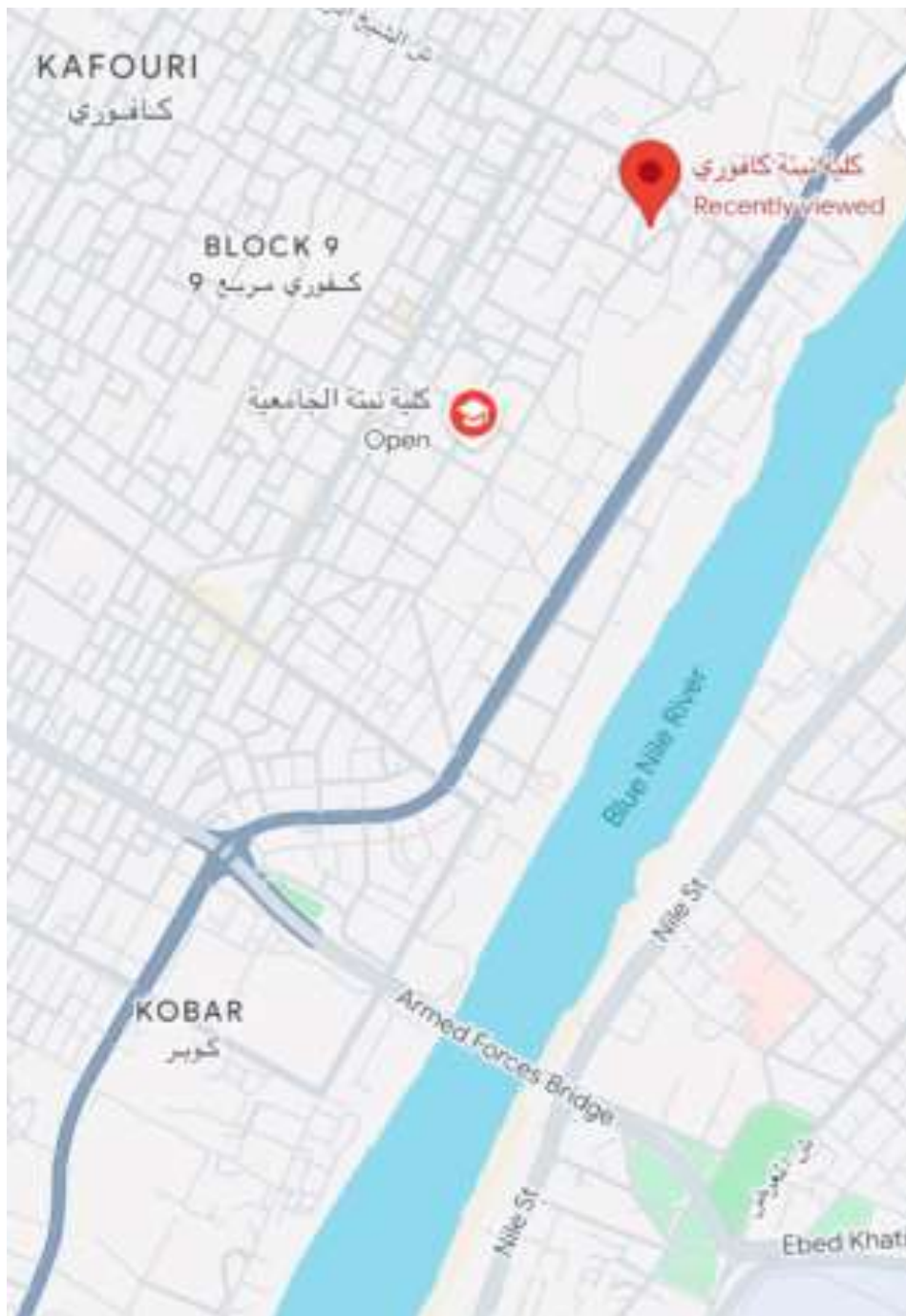
Participants have the right to be informed of the results of the study. We confirm that there are no risks to participants involved in this research after obtaining approval from the relevant authorities. There are no financial benefits associated with participation in this study.

All participants have the right to withdraw from the study at any time without providing any reason.

Thank you for your cooperation and participation.

Signature of consent: _____.

4. Maps



5. Picture:

