

RESEARCH ARTICLE

Navigating the power outages: Impact and coping strategies of students in a South African university during loadshedding

Ukuphila ngaphansi kwezikhawu zokucishwa kukagesi: Umthelela kanye nezindlela zokuphila zabafundi basenyuvesi yaseNingizimu Afrika ngesikhathi sohlelo lokucishakonga

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ABSTRACT

Loadshedding, the scheduled power outage implemented in South Africa, has significantly affected various sectors, including higher education institutions. This article explores the impact of loadshedding on students in a South African university, focusing on the difficulties they face, and the coping strategies employed. The study adopts a mixed methods approach, combining quantitative data from a structured survey and qualitative insights from discussion interviews. The findings highlight the disruptions caused by loadshedding, including missed lectures, limited access to resources, and challenges in submitting assignments. Power outages also negatively affect students' mental health, leading to increased stress, anxiety, and feelings of isolation. The study emphasises the need for support measures to address the mental health needs of students during loadshedding. Various coping strategies are identified, such as time management, alternative power sources, offline study materials, group study sessions, and self-care practices. Understanding and analysing these coping strategies is essential in mitigating the impact of loadshedding on students' academic progress and well-being. The study contributes to the understanding of loadshedding's multifaceted impact on students, providing insights for developing support measures and creating a conducive learning environment. These findings can inform discussions in institutions, among policymakers and stakeholders to support students and address the challenges posed by loadshedding.

KEYWORDS

Loadshedding, academic performance, students, mental health, coping strategies

ISIFINYEZO

Ukucishakonga, okuwuhlelo lokucishwa kukagesi izikhawu okwethulwe eNingizimu Afrika, sekube nomthelela omkhulu ezimbonini ezihlukene okubandakanya nezikhungo zemfundo ephakeme. Lolucwaningo luzohlola umthelela odalwe ukucishakonga kubafundi kwenye yamanyuvesi aseNingizimu Afrika, lugxile kakhulu ezinkingeni ababhekane nazo kanye nezindlela abazisebenzisile ukulwisana nalenkinga. Lolucwaningo lusebenzisa izindlela ezixubene zokucwaninga, ezibandakanya idatha eyikhwantithethivu evela kusaveyi kanye neyikhwalthethivu evela ezingxoxweni ezibe khona ezibanjiwe. Ulwazi olutholakele luveza ukuthi kukhona ukuphazamiseka okuqhamuka nokucishakonga, okubandakanya amakilasi okungafikekanga kuwo, izinga elincane lezinsizakusebenza, kanye nezingqinamba zokuthumela imisebenzi eyenziwe. Ukuhamba kukagesi kunomthelela ongemuhle esimweni sengqondo sabafundi, lokho okuholela ekutheni baphazamiseke

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emqondweni, ukucindezeleka, ukukhathazeka kanye nemizwa yokuzwa ngathi babodwana. Ucwangingo lugcizelela isizathu sezindlela zokulekelela okumele zenziwe ukulwisana nezidingo zomqondo zabafundi ngesikhathi sohlelo lokucishakonga. Zikhona izindlela zokuphila kulesisimo ezitholakele, lezi zibandakanya ukulawulwa ngendlela kwesikhathi, ezinye izindlela zokuthola ugesi, izinsizakufunda ezingadingi ukuxhuma kwi-inthanethi, izikhathi ezihleliwe zokufunda ngamaqoqo kanye nezindlela zokuzinakekela. Ukuqonda kanye nokuhlaziya lezizindlela zokuphila kulesisimo kubalulekile emizamweni yokuqhamuka nezindlela zokulekelela kumthelela onezigaba eziningi odalwa ukucishakonga kubafundi, ngokuthi kuqhanyukwe nemibono engasetshenziswa ukuthuthukisa izindlela ezingalandelwa kanye nokwenza indawo yokufunda okuphileka kalula kuyo. Lolulwazi olutholakele lugquguzela izinkulumo okumele zibe khona maphakathi nezikhungo, abaqambi bamapholisi, kanye nezinye izinhlaka ezikhona ukulekelela abafundi kanye nokulwisana nezinkinga ezidalwe uhlelo lokucishakonga.

AMAGAMA ASEMQOKA

Ukucishakonga, ukuphumelela kwezemfundo, abafundi, isimo sokuphila komqondo, izindlela zokulwisana nezimo

Impact of loadshedding on higher education

Loadshedding, stemming from insufficient generation capacity, maintenance issues, and other factors, has led to unpredictable power outages across the country (Laher et al., 2019). However, this challenge is not unique to South Africa; governments of countries like Nigeria (Faley, 2021), Pakistan (Kazmi et al., 2019), Nepal (Shrestha, 2010), Ghana (Ibrahim et al., 2016), and Bangladesh (Meah, 2010) also face a similar electricity crisis. In fact, Agba (2015) asserted that the current supply of electricity can best be described as epileptic, impacting the work performance of academic staff in Nigerian public universities. Additionally, in Japan, energy poverty is common among college students living independently (Nazarahari et al., 2015). Matsheta and Sefoka (2023) study the impact of loadshedding on education in South Africa, focusing on the 'Section 29 Inquiry'. They highlight how power outages threaten students' access to education, disrupting learning opportunities guaranteed by South Africa's Constitution. The Organisation for Economic Co-operation and Development's (OECD) *Education at a Glance 2019* report showed that only 7% of adults aged 25 to 34 in South Africa had completed university level education, with a projected increase to 15% by 2020 (OECD, 2019). Loadshedding exacerbates educational challenges, potentially discouraging enrolment and harming academic performance.

Challenges faced by students

For students in higher education, these outages disrupt their academic routines, impede their access to resources, and create added stress and anxiety (Malik et al., 2022). Findings from a study in Honduras concluded that unreliable access to electricity reduces educational attainment (Squires, 2015). When electrical supply is interrupted, it leads to students missing lectures, limited study time, difficulties in accessing online learning platforms and research databases, and challenges in submitting assignments (Malik et al., 2022). Such disruptions not only affect student academic progress but also contribute to heightened pressure and a sense of uncertainty.

Curriculum delivery impacts

Loadshedding in South Africa significantly affects students and universities in several ways (Mhandu et al., 2021). It disrupts classes and lectures, leading to missed content and curriculum difficulties. Limited access to online resources hampers studying, research, and assignment completion (Ginsburg, 2010). To illustrate, the incessant electric power interruption destroys and causes malfunction of ICT instructional materials and equipment (Ogbu, 2013). Power outages also interrupt research activities, causing delays and compromising outcomes (Tollefson, 2019). Difficulties arise in submitting assignments on time, and students face limited study time and productivity due to power disruptions (Phiri et al., 2021). Examination schedules are often disrupted, causing additional stress. Power outages, as noted by Jianjun et al. (2018), notably also affect students, particularly during exam preparation. While some invest in alternative power sources, unequal access is an issue. Loadshedding disrupts activities and causes students to lose their work (Khan et al., 2022). Top of Form Loadshedding negatively impacts student's mental health due to uncertainty, stress, and pressure to meet deadlines (Altaf et al., 2013; Phiri et al., 2021).

Additional impacts on curriculum delivery

Loadshedding poses various additional impacts on curriculum delivery in higher education (Mapudzi et al., 2021). Apart from the aforementioned challenges, it can disrupt practical sessions that require specific equipment or laboratory facilities, impeding students' first-hand learning experiences (Bukar, 2016). Furthermore, the limited access to digital learning resources during power outages hampers students' engagement with e-books, online libraries, and multimedia materials, hindering self-study and research (Malik et al., 2022). Power outages pose various additional impacts on curriculum delivery in higher education and hamper the move to educational technologies and media embedding into education systems (Williamson, 2019). University students find online collaborative work tools useful (Oliveira & Terra., 2021). Collaborative work among students may also suffer due to loadshedding, as group projects and virtual meetings heavily reliant on digital communication tools are affected by loadshedding, leading to delays and inefficiencies (Faleye, 2021). Moreover, inconsistent assessment and grading may occur as online examinations or assignments requiring uninterrupted power supply may need to be rescheduled, impacting timely evaluation and feedback (Cahapay, 2021).

Mental health implications

The consequences of loadshedding extend beyond academic implications, impacting the mental health and well-being of students (Malik et al., 2022). The constant worries about power outages, missed deadlines, and the need to catch up on missed course work can result in increased stress and anxiety levels (Ibrahim et al., 2016). A study conducted in Zambia reported that students experienced anxiety due to loadshedding (Kombe & Mtonga, 2021). The disruption of study routines and limited access to resources may further exacerbate these issues, leading to reduced motivation,

productivity, and feelings of isolation among students (Malik et al., 2022). In contrast, a cross-sectional study among university students in Ghana reported that erratic power supply does not suggest any clinical confirmation of the student's anxiety disorders (Ibrahim et al., 2016). There is limited information on the impact of loadshedding and coping strategies of students during loadshedding. However, loadshedding in South Africa has negative effects on both the economy and mental well-being. A survey on the general population by the South African Depression and Anxiety Group (SADAG) found that people experience anxiety, stress, and depression during power outages. The lack of power leads to isolation, reduced family time, and difficulty staying connected. Loadshedding has increased calls for mental health support and worsened existing conditions. Disrupted schedules and sleep patterns further impact wellness (South African Depression and Anxiety Group, 2023).

Coping strategies and mental health support

The impact of loadshedding on the mental health of students in South African higher education institutions is still not well documented, and it is unclear whether students have implemented different coping mechanisms to deal with the challenges it presents. According to Ibrahim et al. (2016), the frequency of power outages increased anxiety levels among university students in Ghana. It remains unknown whether the uncertainty and unpredictability of power outages increase stress and anxiety levels of South African university students as they worry about the impact on their studies. Disruption of study routines, limited access to resources, and academic pressure contribute to heightened stress. Reduced motivation and productivity result from studying under suboptimal conditions. Loadshedding, as reported by SADAG (2023), also leads to social isolation, disturbed sleep patterns, and limitations on coping mechanisms, further impacting students' mental health. Recognising these effects is crucial in implementing support measures to address the mental health needs of students during loadshedding. The coping strategies provided in the literature include time management and planning, utilising alternative power sources, relying on offline study materials, engaging in group study sessions, utilising public spaces with electricity, prioritising essential tasks, practising self-care, and adapting to the changing circumstances (Malik et al., 2022). An earlier study indicated that the high prevalence of depression, anxiety, and stress symptoms among university students is alarming (Bayram & Bilgel, 2008). Understanding and analysing these coping strategies is crucial to uncovering effective approaches that can mitigate the impact of loadshedding on students' academic progress and mental well-being. Therefore, the objective of the study reported on in the current article was to investigate the impact of loadshedding on the academic performance, mental well-being and coping strategies of university students in South Africa. Specifically, the study aimed to explore how power outages affected students' access to education, including disruptions to lectures, research activities and online learning, as well as the associated stress and anxiety. Additionally, the study sought to identify and analyse the coping strategies employed by students to manage these challenges and assess the need for mental health support in response to the impacts of loadshedding.

Research design

The study adopted a mixed methods approach to gather both quantitative and qualitative data, supplying a comprehensive understanding of the topic. This included a structured survey and discussion interviews that did not exceed ninety minutes. The data were obtained from a focus group interview and questionnaire of fifteen students.

Sampling

A table has been included below to provide a clear overview of the data sources, their purposes, target populations, and samples:

Table 1: Sampling overview

Data source	Purpose	Target population	Sample
Focus group interview	Gather qualitative insight	Registered students	15 students
Survey questionnaire	Gather quantitative data	Registered students	15 students

Additionally, further background on the profile of the respondents has been provided to give context to the participants' experiences and how they mitigate loadshedding. The focus group comprised students from different academic levels, and living arrangements, ensuring a diverse representation to capture a variety of experiences. All registered students were eligible to participate, promoting gender inclusivity, with an age range of 18 to 30 years to include individuals at various stages of young adulthood. This comprehensive approach helps to paint a clearer picture of the participants' demographics and their relevance to the study's objectives.

Data collection methods

A semi-structured questionnaire was employed to assess the specific difficulties faced by students during loadshedding, their coping strategies, and the impact on their academic progress and mental well-being. The questionnaire incorporated standardised scales for measuring stress and anxiety, including the Generalized Anxiety Disorder 2 (GAD-2), a self-report questionnaire that evaluates the severity of generalised anxiety disorder symptoms. However, as noted in the relevant literature, establishing a causal link between loadshedding and mental health outcomes can be methodologically challenging (Bantjes & Swartz, 2023). The lack of empirical data to support such a link, and the tendency to conflate psychological distress with psychopathology, require caution in interpreting the results (Bantjes & Swartz, 2023). This study aimed to address these concerns by carefully exploring how the effects of loadshedding manifest in students' mental well-being, while considering the potential biases and limitations inherent in the research design.

Theoretical framework

The study utilised the theory of Stress and Coping Framework to examine how students respond to power outages (loadshedding) stress and their coping methods. This framework assesses the impact of these coping strategies on mental health and

academic performance. Both the Stress and Coping Framework and GAD-2 were utilised to provide a comprehensive understanding of students' experiences.

The GAD-2 is a screening tool that quantifies anxiety symptoms, while the Stress and Coping Framework explores individual's responses to stressors and their coping mechanisms. This framework allows for the study to build on existing similar work by Malik et al (2021). Combining these approaches allowed for a nuanced analysis, providing both quantitative and qualitative insights into how students experience and manage anxiety in the face of stressors such as power outages. Additionally, open-ended questions were included in the questionnaire to allow participants to provide additional comments and insights, enriching the qualitative data collected. The data collected through the questionnaire were coded and analysed using Microsoft Excel, facilitating the organization and interpretation of the findings.

Results and discussion

Examining the spectrum of unwellness: Physical, emotional and mental impact of loadshedding

Part A: Exploring the range of effects

In this regard, according to the survey findings, participants reported various types of illnesses associated with loadshedding. Among respondents, 6.7% noted experiencing physical illness during power outages, suggesting they may encounter physical discomfort or health issues due to loadshedding. In terms of emotional well-being, 13.3% reported feeling emotionally unwell during loadshedding, indicating that power outages can affect their emotional state, potentially leading to distress, anxiety, or other negative emotions.

Part B: Self-administered questionnaire

The second part of the study was a self-administered questionnaire of the symptoms and coping strategies of students during loadshedding. The computed p-value is < .00001. The result is significant at $p < .05$.

Table 2: Self-administered questionnaire on loadshedding impacts on students

Characteristic	Yes	No
Irritation and perspiration during classes	86.66	13.34
Punctuality	93.33	6.67
Problems concentrating during lectures	93.33	6.67
Marks and general results	100	0
Disruption of study routines	100	0
Preparing for assessment and exams	100	0
Inadequate preparation for assignments and projects	93.33	6.67
Sleep disturbances	33.33	66.67

Mental and emotional stress (anxiety and frustration)	100	0
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Loadshedding has a range of adverse effects on individuals, as evident from the responses of the participants. The majority experienced irritation and perspiration during classes, problems in concentration, and disruptions to their study routine. These findings echo those of Chiner et al. (2021), who also identified significant academic and emotional challenges faced by students due to external disruptions, such as loadshedding and transition to online learning, highlighting the need for improved infrastructure and support systems in higher education. Additionally, these results are comparable to those reported in Zambia, where it was determined that power outages had a significant impact on students' daily schedules and educational pursuits. This included a reduction in study time, particularly during the evening, leading to an adverse effect on their academic performance (Phiri et al., 2021). These findings were further corroborated by those reported by Pillay et al. (2023) stating that loadshedding had previously revealed significant negative impact on the students' academic performance in higher education.

Loadshedding also had a notable impact on punctuality, with participants frequently arriving late to classes. Additionally, it affected their preparation for assessments and exams, resulting in inadequate preparation for assignments and projects. Sleep disturbances were reported by a third of the participants. Most significantly, loadshedding induced mental and emotional distress, including anxiety and frustration. These findings emphasise the widespread negative consequences of loadshedding on various aspects of students' academic experiences and well-being.

Table 3: GAD-2 (Generalized Anxiety Disorder 2-item)

Participant	Feeling nervous, anxious or on edge	Not being able to stop or control worrying	Total
1	1-Several days	3-Nearly every day	4
2	3-Nearly every day	2-More than half the days	5
3	0-Not at all	0-Not at all	0
4	3-Nearly every day	2-More than half the days	5
5	3-Nearly every day	2-More than half the days	5
6	1-Several days	1-Several days	2
7	1-Several days	2-More than half the days	3
8	1-Several days	1-Several days	2
9	1-Several days	1-Several days	2
10	1-Several days	0-Not at all	1
11	3-Nearly every day	1-Several days	4
12	3-Nearly every day	3-Nearly every day	6

13	3-Nearly every day	3-Nearly every day	6
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The study assessed the participants' (n=13) loadshedding induced anxiety levels. The interpretation of the given information is that a score of 3 points on the GAD-2 (Generalized Anxiety Disorder 2-item) questionnaire is considered the preferred cut-off for identifying possible cases of generalised anxiety disorder. If an individual scores 3 or above, further diagnostic evaluation for generalised anxiety disorder is recommended. Furthermore, using a cut-off of 3 on the GAD-2, the questionnaire demonstrates a sensitivity of 86% and specificity of 83% for diagnosing generalised anxiety disorder. This indicates that the GAD-2 has a relatively high accuracy in correctly identifying individuals who may have generalised anxiety disorder (with 86% sensitivity) and accurately ruling out individuals who do not have the disorder (with 83% specificity).

Scores on the GAD-2 range from 0 to 6, with higher scores indicating a greater likelihood of experiencing symptoms related to generalised anxiety disorder. Based on this interpretation, individuals with scores of 4 or above may have an increased likelihood of exhibiting symptoms associated with generalized anxiety disorder, while scores below 4 suggest a lower likelihood. It is important to note that a formal diagnosis of generalised anxiety disorder should be made by a qualified healthcare professional using comprehensive diagnostic criteria and additional assessment tools.

Table 4: Coping strategies

Coping strategy	Yes (%)	No (%)
Physical activity	46.66	53.34
Sleeping	66.67	33.33
Walking outside	40	60
Listening to music	86.67	13.33
Interaction with others around me	86.67	13.33
Interaction with others on social media to relieve boredom	80	20
Expressed anger	60	40
Develop offline study strategies	66.67	33.33
Take breaks and practice self-care	73.33	26.66
Collaborative study groups with friends who live in locations without loadshedding	53.33	46.66
Utilise battery-powered devices	44.44	66.66

The study examined various coping strategies employed by participants to manage the challenges of loadshedding. The most commonly reported coping strategies included sleeping, listening to music, interacting with others (both in person and through social media), taking breaks and practising self-care, and developing offline study strategies. Physical activity, walking outside, expressing anger, collaborative study groups, and

utilising battery-powered devices were also reported as coping strategies, although to a lesser extent. These findings suggest that individuals are employing a combination of approaches, focusing on both physical and psychological coping mechanisms to navigate the challenges posed by loadshedding. It is worth noting that further research and investigation may be needed to better understand the effectiveness and long-term impact of these coping strategies in managing loadshedding-related stresses. The present findings shed light on the diverse approaches' individuals adopt to navigate the challenges posed by loadshedding and provide insights into the coping mechanisms prevalent within the study population. Loadshedding remains a pervasive national issue, affecting not only higher education but also the broader economy and daily life. Memane et al. (2019) highlight that loadshedding, while a temporary measure to prevent total blackouts, requires optimised implementation to minimise its economic impact, particularly as the country faces growing energy demand.

Conclusion

Three main conclusions emerge from this study. First, loadshedding significantly disrupts university students' academic performance and mental well-being. Power outages affect study routines, exam preparation and concentration, while also contributing to increased stress and anxiety, as shown by elevated GAD-2 scores. Second, students employ various coping strategies, including physical activity, social interaction, and offline study methods. While these approaches offer some relief, they are insufficient to fully mitigate the challenges, highlighting the need for institutional support and mental health interventions. Third, addressing the impact of loadshedding requires comprehensive institutional strategies, including enhanced mental health support, access to alternative power sources, and measures to minimise academic disruptions. By attending to these challenges, universities can better support students' academic success and well-being. The foregoing study is not without limitations. These include its small sample size and focus on a single institution, which may limit the generalisability of the findings. Future research should aim to include a larger, more diverse sample from multiple institutions and explore the long-term effects of loadshedding on students' academic performance and mental health.

Ethics statement

Ethical clearance (RDI/08/2022) was obtained prior to the study. Participation was voluntary, with informed consent provided, and data were anonymised. The researcher maintained objectivity, using theory to analyse and interpret the findings.

Potential conflict of interest

The author declares no conflict of interest regarding the publication of this study.

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