ORIGINAL ARTICLE

Physical Exercise as a Stress-Coping Mechanism Among Physiotherapy Students at the University of Zambia

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ABSTRACT

Background: Mental health is a major public health concern affecting many populations worldwide, including university students. There has been mounting evidence of various coping mechanisms which are being utilised by the university student population and various studies have shown their effects on mental health. Physiotherapy students undergo health personnel training which is attributed to high levels of stress due to the high clinical demands, academic pressure and practical skills that must be developed to deliver hands-on expertise. Although various studies on stress levels and coping mechanisms have been documented internationally, stress levels and stress-coping mechanisms have not been studied extensively in the university setting locally, among physiotherapy students, and not much has been seen about the use of physical exercise (PE) as an effective and healthy stress-coping mechanism.

Objective: To investigate the role of PE as a stress-coping mechanism amongst physiotherapy students at the University of Zambia (UNZA), Ridgeway campus.

Methodology: A qualitative descriptive method was used in this study. A quota sampling method was used to get a representation of the entire full-time, undergraduate physiotherapy student population. Focus group discussions were used to collect data. Four focus groups were formed with each class having 7, 10, 10, and 8 participants, respectively. Audio-recorded data was transcribed and reported verbatim, and deductive thematic analysis was employed as the focus group discussion guide was based on predetermined themes from the objectives of the study.

Results: The study showed that student stress levels differed significantly with the year of study, with senior students (fourth and fifth years) reporting to feel more stressed. On the other hand, for the junior students, while second years found their course load to be manageable, most third years described their course load to be stressful. Stress-coping mechanisms differed among students. Most females were seen to use emotion-focused and avoidant coping mechanisms such as sleeping, talking to people, listening to music, watching movies, and

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stress-eating. While most males were seen to use problem-focused coping such as jogging, running, and taking walks. Students also showed awareness of the physiological effects exercise has in improving a person's mood.

Conclusion: The physical benefits of physical exercise are well known and documented, but its use in mental health promotion amongst students is not known. The findings showed that despite most of the participants being aware of the role of physical exercise in stress-coping, very few intentionally utilise it to cope with stress. This finding shows that more efforts should be channelled into health promotion and collaborations with university management to promote mental health and incorporate PE and its importance in mental health and overall well-being.

INTRODUCTION

Mental health is a major public health concern affecting many populations worldwide, including university students. University students face a wide variety of demands, both academic and non-academic, that could affect their well-being[1]. This predisposes them to several mental health problems and disorders like stress. Stress is anything that poses a challenge or threat to our well-being[2]. It is a common experience to be stressed out at different points in life, and a good amount of stress is said to push someone to perform better. On the other hand, excessive or high levels of stress are said to be detrimental to individuals' physical and mental well-being and have many negative outcomes.

University students are at a higher risk for stress as they are in a stage of transition from adolescence into adulthood[3]. Transitioning into adulthood comes with many stressors as individuals move out from the comfort of their parents or guardians' homes into an environment where they must make their own decisions and live on their own for the first time, and this makes the population vulnerable to mental health problems. A survey from three universities in Sialkot, Pakistan, found the frequency of depression, anxiety, and stress among university students was 75%, 88.4%, and 84.4% respectively[4]. These high rates of stress, other mental issues, and the many challenges university students face are a threat to the attainment of their education. Stress has a major impact on students' academic performance, mental and physical wellbeing, and many students find it hard to cope and battle with substance abuse and suicidal ideations.

Much research has shown that university students are at higher risk and experience moderate to high levels of stress. A study at Sultan Qaboos University in Oman, encompassing 667 students from Agricultural and Marine Sciences, Art and Social Sciences, Economics and Political Science, Education, Engineering, Law, Nursing, Medicine and Health Sciences and Science, reported that almost three quarters (75.1%) of the students suffered from moderate stress, 13.5% were severely stressed and only 11.4% were mildly stressed[5]. Healthcare personnel training and its high demands, particularly, has been associated with high levels of stress. A study at Minia University in Egypt, among a sample of 314 medical and 291 non-medical students reported that the prevalence of perceived stress was slightly higher (88.9%), among medical students than among non-medical students (83.5%)[6]. Another study amongst 267 undergraduate physiotherapy students from various institutes in Pakistan, 142 (53.2%) students reported to be mildly 47 (17%), moderately 66 (25%), severely 24 (9%), and very severely 5 (2%) stressed[7]. Along with the reports of high prevalence of stress, there has been mounting evidence of various coping mechanisms, both healthy and unhealthy, which are being utilised by the student population. When stress goes unchecked and is not managed well amongst the university student population, it can lead students to resort to many unhealthy ways of coping such as substance abuse, alcoholism, risky sexual behaviour and suicidal thoughts. Elevated stress with limited healthy coping capabilities may result in students turning to such external resources to cope[8].

Over the years, scientific research has proven that physical exercise (PE) is a healthy and effective way of coping with stress. It can be utilised as a preventative or non-pharmacological method for dealing with stress in different populations. PE can cause physiological (enhanced adrenal activity) and psychological (regulation of emotions and change of state of mind) effects in alleviating psychological stress, thereby, improving an individual's ability to control psychological stress in different situations and atmospheres and enhancing an individual's social adaptation to cope with psychological stress[9]. It has also been seen to reduce the adverse effects of psychological stress and improve cognitive function when handling daily problems, thereby, acting as a coping strategy. Among university students it can greatly reduce the burden of mental health issues, improve academic performance, reduce costly pharmacological interventions, and enhance overall well-being and quality of life.

Various studies in student populations have shown the perceived levels of stress and various coping mechanisms internationally, but not much research with a focus on PE as a stress-coping mechanism has been done in African student populations. A study done at the University of Zambia, School of Medicine, among 132 students from third to seventh year as participants revealed that the prevalence of stress of all categories was 71.21% and of severe stress was 20.45% and that the frequency of using jogging and active sport was 40.90% and 25.76% respectively among other coping mechanisms[10]. It brought out the use of PE and other coping mechanisms among students, but still, there has been a lack of extensive research specifically on PE and more so in the physiotherapy student population in Zambia. In addition, much research has been conducted using quantitative methods. Therefore, there was a need for a more detailed understanding of how PE contributes as an effective stress-coping mechanism by qualitative methods.

This study, therefore, aimed to investigate the role of PE as a stress-coping mechanism amongst physiotherapy students. Evaluating this data, specifically, focusing on PE as a stress-coping mechanism provided valuable insight on how PE can be used as a healthy stress-coping mechanism to reinforce health promotion and promote mental health amongst university students in Africa.

METHODOLOGY

Study design and Population: A qualitative descriptive method was used to find in-depth information regarding physical exercise being utilised as a stress-coping mechanism amongst physiotherapy students at the University of Zambia (UNZA), Ridgeway campus. This was ideal considering the under-exploration and limited existing literature on the topic, despite its limitations such as lack of generalizability and subjectivity due to potential bias, which were acknowledged in this study. The study population included full-time, male and female, undergraduate physiotherapy students from the second to fifth year of study.

Sample size: According to the Department of Physiotherapy register for the 2023/2024 academic year, there were 110 second-year, 74 third-year, 22 fourth year and 21 fifth year undergraduate physiotherapy students at Ridgeway campus. Quota sampling was employed to get a representation of the entire physiotherapy student population by dividing it into 4 quotas according to the years of study (second to fifth year). The sample size, based on a similar study, was 7-10, male and female undergraduate physiotherapy students from each year of study[11].

Data collection tools: Focus group discussions were used to collect data using predetermined themes based on the objectives of the study. Four focus groups were formed, each having 7-10 participants. The participants were assigned codes such as Male 1 and Female 1 to ensure anonymity and confidentiality. Two moderators conducted the discussions. The researcher took the lead in asking questions and a co-moderator took notes to determine the characteristics of the groups, observed the non-verbal communication or behaviour of the participants and coordinated the audio recording.

The discussions which lasted 15-25 minutes were recorded using Sound Recorder application (Android Version 3.0.2.113) and were later transcribed by SoundType AI transcriber application (Android Version 1.7.5), manually checked and reported verbatim.

Bias minimisation: The importance of honest responses, diverse perspectives and participation were emphasized before the focus group discussions in efforts to reduce social desirability, dominance and group-thinking biases. Sampling bias was also avoided by using quotas to ensure representation. Although the moderators were not trained and experienced moderators, they were aware of potential biases including their own and open-ended questions were formulated to reduce interviewer effect.

Data analysis: Thematic analysis can be used to analyse qualitative data by formulating and coding themes as data is being analysed and given meaning[12]. After transcription, data with similar content and meaning is categorized into groups and themes are formulated. In this study, deductive thematic analysis was employed as the focus group discussion guide was based on predetermined themes from the objectives of the study, which were;

i. To assess the perceived levels of stress and coping mechanisms.
ii. To assess the use of PE as a stress-coping mechanism.
iii. To evaluate the awareness of PE as a stress-coping mechanism.
iv. To identify what PEs are being used to cope with stress.

Trustworthiness: Credibility, transferability, dependability and confirmability were used to ensure trustworthiness of the study. To ensure credibility, all the results of the study were reported verbatim. Clear and detailed documentation was used to ensure transferability so that study findings may apply to studies in similar settings or individuals. An in-depth description of the methodology and design was also used to enable further studies to be done and ensure dependability. Lastly, the researcher checked and analysed the data thoroughly, throughout data collection, and analysis, and clear documentation of the themes was done to ensure confirmability.

Ethical consideration: Permission to carry out the research was sought from the University of Zambia Health Sciences Research Ethics Committee (UNZAHSREC). Permission was also obtained from the School of Health Sciences and the Department of Physiotherapy. Signed consent was obtained from the participants of the study. The participants were given information about what the research involved and were fully informed that there were no perceived hazards associated with the study, that no financial rewards would be given, and signed confidentiality agreements that information discussed during the focus group discussion was not to be disclosed. They were also informed that they were at liberty to withdraw at any point. To ensure the participants' confidentiality, a coding system and not names were used to protect their identity. The information was collected, stored, and securely transcribed on a smartphone and cloud with access only by the researcher to avoid risks of breach of confidentiality.

RESULTS

Description of participants

A total of 35 participants took part in four focus group discussions at the UNZA, physiotherapy classes. The participant's ages varied from 20-23 years in the first and second focus groups (second and third years), and 22-28 in the third and fourth focus groups (fourth and fifth years). The total number of females was 20 (57%) and the total number of males was 15 (43%). Only 1 male participant from the fifth year was an in-service student. Figure 1 illustrates the description of participants.

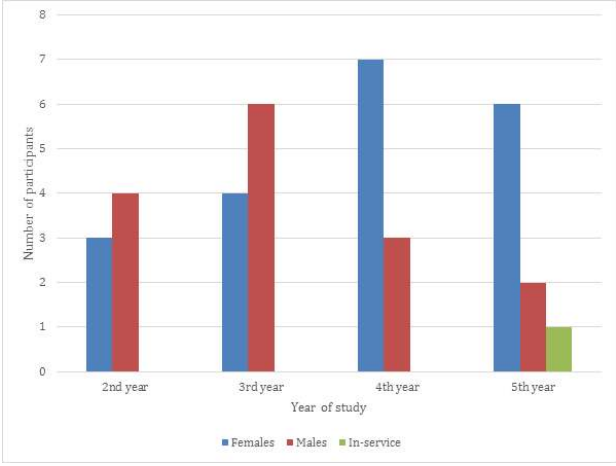

Figure 1: Demographic characteristics of participants

Presentation of data

The findings of the study were presented under five main predetermined themes from the objectives of the study. Table 1 illustrates the deduction of themes and Figure 2 illustrates the summary of the themes and quotes.

Table 1: Deduction of themes

SPECIFIC OBJECTIVE	PREDETERMINED THEME(S)
To assess the perceived levels of stress and coping mechanisms.	Perceived stress Coping mechanisms
To evaluate the awareness of PE as a stress-coping mechanism.	Awareness of physical exercise as a stress coping-mechanism.
To assess the use of PE as a stress-coping mechanism.	Use of physical exercise as a stress-coping mechanism.
To identify what PEs are being used to cope with stress.	Physical exercises used.

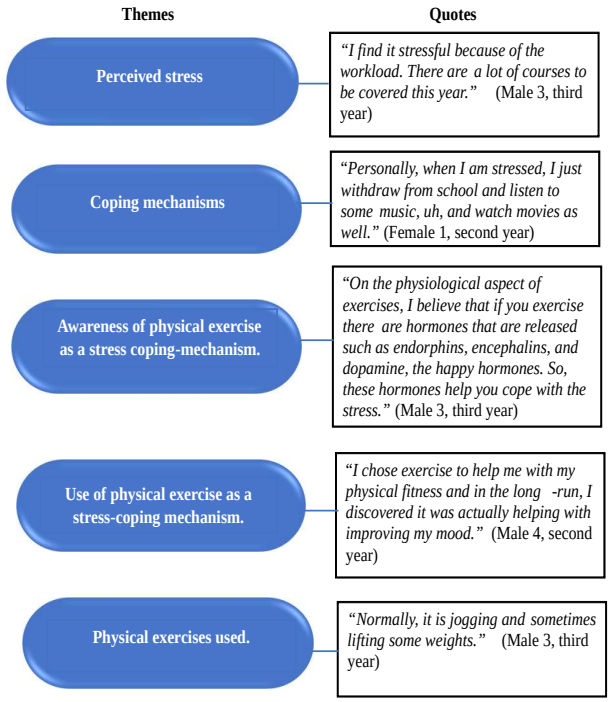

Figure 2: Summary of themes and quotes

Theme 1: Perceived stress

Second-year participants mostly reported that they did not find being a physiotherapy student stressful. A participant noted:

"Not really, I feel like it's manageable. We have got proper lecture schedules and free time during the week." (Female 1, second year)

While some third-year participants reported that they do not find being physiotherapy students stressful, others reported that it is stressful. Some of the responses noted were:

"I find it stressful because we have so many courses and little time to do them all at the same time. So, I wish if other courses were maybe in other years." (Male 2, third year)

"For me, it is a fifty-fifty thing. It can be stressful sometimes because the workload is too much. Then it is not stressful at times because I chose this program in the first place, so I have love for it." (Female 2, third year)

Most fourth year and fifth year participants, on the other hand, reported that they find being a physiotherapy student stressful. These were some of the responses:

"*Yes. So, I think just recently, because of having to cope with doing files and other things altogether. You know, when you are doing rotations every month, at the end of each rotation, you have to have a file that you have to type on each patient that you have seen. So, it is a contributing factor in a way that it takes time and everything."* (Male 1, fourth year)

"Different aspects, yes. The fact that we have to tackle the clinical work and also have classes and research as well." (Female 3, fifth year)

Theme 2: Coping mechanisms

Participants mainly reported that they sleep, watch movies, take walks, stress-eat, talk to people, and listen to music, to help cope with stress. Females mostly reported that they sleep, talk to people, stress-eat, and listen to music. These were some of the responses:

"I listen to a lot of music and talk to family members about the stress." (Female 2, third year)

"For me, I sleep, take walks, and eat. Stress-eat, yes." (Female 6, fifth year)

In contrast, most male participants reported having used some form of exercise to cope with stress, unlike female participants. Some of the responses were:

"For me, I just go to play soccer." (Male 2, fourth year)

"For me, I exercise, go for a road run, talk to people and most of the time I am in the gym." (Male 1, fifth year)

Theme 3: Awareness of physical exercise as a stress coping-mechanism

Most participants reported that they were aware of the role of physical exercise in stress-coping, and only one expressed that she was not sure. These were some of the responses:

"*On my part, I am not sure. Since I am not a physical person, I do not usually participate in physical activities. So, I have never tried that. So, I am not really sure."* (Female 3, second year)

"*It does a lot because there is just an atmosphere when you are there on the court. You just tend to forget about everything, all the schoolwork. It is just you there having fun*." (Female 3, third year)

Theme 4: Use of physical exercise as a stress-coping mechanism

Most participants reported having used physical exercise to cope with stress unknowingly, others out of influence from friends, and a few reported that they intentionally use physical exercise to cope with stress. This is one of the responses.

"*So, there was this one time, a friend of mine invited me to go for a yoga session. I was really stressed with school by then. So, I went there, tried it once, and it really worked. I found myself going there and I attended about three, four sessions, but I had to stop due to some other reasons."* (Female 3, fifth year)

Theme 5: Physical exercises used

Different physical exercises were reported to be used to cope with stress. When asked what physical exercises they had used, most participants reported they had mostly used jogging, running, aerobics, and playing football. These were some of the responses.

"I do aerobics, and I play football." (Male 4, fourth year)

"Okay, so for me, the exercises I have done at some points are aerobics and running." (Female 1, fourth year)

DISCUSSION

Many incidences of stress and its adverse outcomes amongst university students have been reported and

some studies have shown gender differences in perceived stress amongst university students. Males report lower levels of stress because they are encouraged to be more emotionally strong and not display emotional weakness, whereas females typically report higher levels of self-imposed stress and stronger physiological reactions to stress than males[12]. Perhaps this can also be attributed to how males and females handle challenges. Females would rather talk about a burning concern with trusted confidantes, while males prefer not to, but to find their solution to their problems. It shows that females tend to be more vulnerable and freer to express themselves compared to men, who in the African society are not given the space to complain about challenges as it is not seen as being manly in our culture.

This study investigated the role of PE as a stress coping mechanism amongst physiotherapy students. It did not reveal differences in perceived levels of stress between males and females, however, it showed that student stress levels differed significantly with the year of study. Senior students, that is, fourth and fifth-year students, expressed that they found being a physiotherapy student stressful. Whilst all second-year students expressed that they did not find being a physiotherapy student stressful. Most of them reported that their workload was manageable as they had manageable schedules, and that they had enough time to do other things over the weekend. The third years had mixed responses, those who found being a physiotherapy student stressful owed it to the number of courses they were having in the year of study. Senior students, that is fourth and fifth years, mainly attributed their stress to clinical rotations, which also includes typing files to document the patients and conditions they have encountered. Furthermore, fifth years also attributed working on their research projects to be a cause of stress. The study only had one in-service student, and other factors, which may influence perceived levels of stress, such as the socioeconomic backgrounds, were not explored in this study.

Stress-coping mechanisms differed among the students in this study. Problem-focused coping, emotion-focused coping, and avoidant coping are the three most investigated coping mechanisms in literature[14]. Young adults, when compared to older adults, tend to use more passive coping mechanisms such as substance abuse, avoidance, and self-blaming[15]. Several studies have found that women tend to use more emotion-focused coping mechanisms whilst men use more problem-focused coping mechanisms. Problem-focused coping can be elicited through heightened positive emotion, mental clarity, and focus, which people may often experience after performing PE[16]. Problem-focused coping, emotion-focused coping, and avoidant coping were noted. Females mostly reported using emotion-focused and avoidant coping mechanisms such as talking to people, stress-eating, sleeping it off, and listening to music. While most males reported problem-focused mechanisms such as taking walks, lifting weights, aerobics, and playing football, amongst other ball games. These differences reflect more of the dynamics of male and female thought and emotion processes. Females tend to be more expressive by venting or avoidant of facing issues head on, while males tend to be more strategic and action oriented.

This study also revealed that almost all the participants, except one, were aware of the role PE has in stress coping. This was similar to a survey which was carried out amongst undergraduate and postgraduate physiotherapy students in Gujrat, India, where more than half of the participants were found to be aware of the benefits of PE such as improvement in health, battling of diseases and stress relief amongst others[17]. Regular PE has been shown to increase the production of dopamine and endorphins, resulting in improved mood and reduced symptoms of poor mental health[18]. The students showed awareness of the physiological effects exercise has in improving a person's mood through the release of the happy hormones, dopamine and endorphins.

Despite the overwhelming evidence showing extensive health benefits of PE, a range of studies worldwide show that not so many people engage in regular PE[19]. A large Norwegian survey for higher education reported that approximately two-thirds (66% in males and 68% in females) exercised twice per week or more frequently while one in four students (27% in males and 22% in females) exercised almost every day. Only 6% and 4% of the male and female students, respectively, never exercised at all[20]. The general use of PE is seen, but there is limited research on exercise-based stress-coping in African universities. This study revealed that physiotherapy students at the University of Zambia engage in PE but very few do so intentionally or regularly. Most students reported to seek PE for leisure and recreation purposes, whilst a few others have incorporated PE as part of their lifestyles. Some participants reported that in the long run they have come to see that PE helps them cope with stress by helping them relax, take their minds off school and have fun with their friends. A cross-sectional study amongst 150 medical undergraduates in Manipal, India, had 116 students regularly performing PE in either games, sports, cycling, jogging, or gym activities amongst others[21]. In this study, although some physical exercises reported tallied with the findings of the former, the findings were inconsistent. Most participants reported using jogging, running, aerobics, and playing football. This may be due to differences in common physical and sporting activities worldwide.

Ridgeway campus, despite it being a medical campus with high academic demands, boasts of various sporting recreation activities with competitive interclass and programme tournaments. This calls to show that the lack of active engagement in PE for stress-coping is not due to the unavailability of sporting recreation facilities, but perhaps the lack of time, interest, and health promotion advocacy targeted towards PE as being an easy, inexpensive, and healthy outlet on campus. University campus management, therefore, needs to channel more efforts towards mental health programmes and encourage student participation in mental health, PE, and overall wellness through student organisations and clubs.

CONCLUSION

The physical benefits of PE are well known and documented, but its use in mental health promotion amongst students is not known. The findings showed that despite the majority of the participants being aware of the role of PE in stress-coping, very few intentionally utilise it to cope with stress. Most of the participants were seen to seek it out for leisure and recreation purposes but admitted that after performing a physical exercise they would relieve their stress unknowingly. This calls for further exploration into why it is not being actively utilised by the population despite it being a readily available outlet.

Although many participants were aware of the role of PE as a stress-coping mechanism, more advocacy needs to be done to ensure that students have a healthy outlet for stress rather than engaging in unhealthy coping mechanisms. University management should look more into mental health and PE advocacy, hand in hand with the sports and recreation facilities, student bodies and clubs on campus, to help students cope with stress in a better way. More faculty and staff involvement are also needed to further encourage and break the stigma associated with mental health among students. The findings of the study also create further exploration on the differences in preferred stress-coping mechanisms between males and females, and longitudinal studies to assess the changes in behaviour regarding PE over time.

Study limitations

The study may not be generalizable to student populations, considering only one physiotherapy population at one institution was studied, however, there is a high degree of similarity between the study context and other health disciplines. Another limitation is that the data collection method is prone to bias as other participants may have been more

outspoken and may have influenced other participants' opinions, although the interviewer did not feel like participants held back their opinions or influenced others' opinions as efforts were made to reduce them before the discussions. The moderators of the focus group discussion were not trained and experienced moderators to steer the discussions but were made aware of potential biases. Lastly, due to the predetermined themes, further exploration of emergent themes could not be done.

What is already known about the topic:

- Stress is a common public health concern amongst university students worldwide.
- Various stress-coping mechanisms are being used by students.
- Physical exercise is an effective way of coping with stress.

What this study adds:

- The perceived levels of stress amongst undergraduate physiotherapy students at the University of Zambia.
- The gender differences in the use of physical exercise to cope with stress among students at the University of Zambia.
- The physical exercises being used by students to cope with stress in the Zambian setting.

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Competing interest

The authors declare that they have no competing interests.

Authors' contributions

The manuscript was written by M.L. Chituta, while E.M. Nkandu supervised the research and made significant contributions to it.

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