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Effects of a 14-Week Structured Physical Activity Programme on Stress Management, Anxiety, and Mood Among Physical Education University Students in Western Fiji

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Abstract: On a psychological level, students in the university can suffer from stress, anxiety and mood disorders that can hinder their performance and wellbeing. While exercise has been shown to be an effective tool for mental health promotion, there is relatively little empirical work that has investigated the psychological advantages of exercise in Fiji in universities. The aim of this study was to examine the impact of a 14-week structured physical activity programme on stress, anxiety and mood amongst University of Fiji undergraduate Physical Education students. The research design used was quantitative pre-test and post-test intervention with 50 undergraduate Physical Education students who were purposefully selected. A 20-item questionnaire assessed on a 5-point Likert scale was used and showed high internal consistency (Cronbach's $\alpha = .87$). The participants answered the questionnaire before and after they took part in a physical activity programme based on athletics, rugby, volleyball, Zumba, aerobic activity and other fitness activities. Changes in psychological wellbeing were analysed by descriptive statistics, independent-samples t-tests, one-sample t-tests, and Pearson's correlation analyses. After reanalysis, the descriptions of the statistical tests should be updated. It was evident that after the intervention subjects' psychological well-being scores significantly improved. Post-test scores showed that stress and anxiety were also reduced and that there was an improvement in mood when compared with pre-test scores ($p < .001$). Other gender and ethnic differences were also noted for the psychological variables. In addition, Pearson's correlation analyses identified significant positive relationships between stress management and mood; and between anxiety management and mood; suggesting that enhancements in stress management score were predictive of enhancements in mood score and enhancements in anxiety management score were predictive of enhancements in mood score. The findings of the study indicate that structured physical activity can be seen as an effective intervention to improve psychological well-being of university students. These results reinforce the need for incorporating physical activity into the curriculum in universities to ensure students' mental health and to generate evidence for further strengthening of student well-being initiatives at the University and policy level in Fiji.

Keywords: Physical activity; psychological well-being; stress management; anxiety; mood; university students; Fiji.

INTRODUCTION

Physical activity is a key component of physical and mental well-being. Physical activity has also been consistently linked to greater emotional well-being, a lower sense of stress, improved mood and psychological resilience (Reed & Buck, 2009) as well as an increase in cardiovascular fitness, muscular strength, and physical functioning. These psychological advantages are significant in the context of higher education where students often face academic stress, financial considerations, social adaptation issues, and increased care responsibilities, all of which can have a detrimental effect on their mental health (Bamber & Kraenzle Schneider, 2020). As a result, it is increasingly recognized that encouraging physical activity in the school environment is crucial to helping students thrive in school and in their psychological health. The prevalence of mental health problems among university students has been increasing in recent years to become a public health problem globally. Stress, anxiety and emotional distress are consistently reported as occurring frequently within the tertiary education environment, and are associated with reduced academic outcomes, decreased engagement and motivation to learn, and diminished quality of life (Paluska & Schwenk, 2000; Rebar *et al.*, 2015; Schuch *et al.*, 2016).

To address these concerns, physical activity has become a practical, cost-effective, and viable intervention that has the potential to impact psychological health and to enhance the quality of life, in a sustainable manner. The benefits of physical activity for mental health have been well documented in a variety

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of populations including athletes, university students and adolescents. Frequent exercise is associated with less stress, anxiety and depression as well as improved self-esteem, emotional regulation, cognitive function and psychological resilience (Dishman *et al.*, 2006; Cooney *et al.*, 2013; Rebar *et al.*, 2015). Numerous physiological and psychological mechanisms explain these benefits. Physical activity releases the chemicals, namely serotonin, dopamine and endorphins, that play a beneficial role in mood and emotional control. Also, engaging in organised physical activity fosters good social skills, teamworking, self-confidence and self-achievement, which all aid in good psychological health. Encouraging physical activity also supports the United Nations Sustainable Development Goal 3 (SDG 3): Ensure healthy lives and promote wellbeing for all at every age. In University environments, organised physical activity programs are a practical and evidence-based strategy that can be implemented to attend to the mental health of students and promote healthy lifestyles for a lifetime.

Students studying Physical Education represent a particular student body of the university as physical activity is part of their educational programme. Physical Education students are not as free as other university students to participate in exercise; participation in practical lessons, sport-specific training and fitness-based activities are regular occurrences and students are managing the academic content of their courses, assessments and expectations within the professional realm. The academic programmes that they are studying are very much embedded within a physical component, but the students still face significant academic and psychological pressures relating to performance expectations, workload and balancing the demands of both theoretical and practical learning. Although there is significant international evidence for the psychological benefits of being physically active, there is a dearth of understanding of these relationships within Pacific Island countries including Fiji. Much of the literature that is available has been done in North America, Europe and Australia, where education and culture are greatly different from Pacific communities and health behaviours and lifestyle patterns are also different. As a result, educators, university leaders and policy makers in Fiji do not have much evidence that has been produced in Fiji to inform the design of interventions to support student mental health in the context of a structured physical activity. This Pacific –only evidence is a significant omission in the literature. Fiji, like other Pacific Island Nations, is in a process of fast social, educational and lifestyle transformation; this has impacted physical activity levels and mental health among young adults.

Concurrently, mental health is also a growing priority for public health in the region, which calls for contextually relevant research that can inform educational policies and health promotion efforts (Finau *et al.*, 2018; Waqa *et al.*, 2013). Thus, the study of the relationship between structured physical activity and psychological well-being of university students in Fiji is important to be able to design appropriate intervention based on evidence that pertain to local educational and cultural aspects. In this study, two complementary theories are used: the Biopsychosocial Model and the Self-Determination Theory. According to the Biopsychosocial Model (Engel, 1977), health outcomes are the product of dynamic interaction between biological, psychological, and social factors. Among physical activity, the positive change in psychological health could occur due to physiological adaptations, emotional regulation, and better social connectedness. Self-Determination Theory (Deci & Ryan, 1985) also proposes that psychological health is positively affected when people feel they are autonomous, competent and related. Students are able to develop physical competence and exercise personal choice through the opportunity to take part in activities including athletics, rugby, volleyball, aerobic exercise and Zumba, whilst encouraging them to be active and to participate in a co-operative fashion, developing their interpersonal skills and relationships along the way. These theories are complementary and offer a strong base for the understanding of the mechanisms by which physical activity can improve the psychological well-being of university students. While there has been long-standing evidence of a connection between physical activity and psychological well-being, there are relatively few intervention-based studies looking at the relationships between physical activity and psychological well-being in the context of university students in Fiji.

Additionally, there has been little research that has studied physical education students specifically, as they have a unique educational context and are continuously involved in physical activity. It is critical to work on this gap as it will enhance the implementation of the curriculum to university plans, support for university students and policies on psychological health through regular physical activity. This study therefore looked at the impact of a 14-week structured physical activity programme on stress, anxiety and mood of undergraduate Physical Education students in a University in Fiji. To specifically explore if participation in structured physical activity over time has an impact on psychological wellbeing and to give evidence to support future health promotion activities in higher education institutions in Fiji.

The following research questions were used to guide the study:

- Does a 14-week structured physical activity programme have a positive impact on stress, anxiety and mood in undergraduate Physical Education students?
- How does frequent engagement with planned physical activity enhance the psychological health of undergraduates taking Physical Education classes?

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- How can the findings contribute to the creation of physical activity programme for mental wellbeing of the students in the University of Fiji?

METHODOLOGY

To investigate the impact of a structured physical activity programme on stress and mood among Physical Education, students at a University in Fiji, this study implemented a quantitative pre-test and post-test intervention research design. A quantitative approach was deemed suitable due to its ability to objectively measure psychological variables and facilitate the statistical analysis of changes that occur because of an intervention. The study implemented a single-group pre-test and post-test design, in which participants completed the same questionnaire prior to the intervention's commencement and promptly following the completion of the 14-week physical activity programme. This design enabled the researchers to ascertain the modifications in the tension and mood levels of participants because of their consistent engagement in structured physical activities. The questionnaire that was developed by the researchers resulted from literature review regarding the objectives of the study on physical activity and psychological well-being. The instrument was pretested before the main study and had good internal consistency (Cronbach's $\alpha = .87$).

The intervention was a 14-week structured physical activity programme that was conducted for two hours on a weekly basis from 10:00 a.m. to 12:00 p.m. A diverse array of moderate- to vigorous-intensity activities, such as aerobic exercises, fitness-based activities, Zumba, volleyball, rugby, and athletics, comprised the programme. The activities were intended to improve students' psychological well-being by promoting physical fitness through regular participation in socially engaging and pleasant exercise sessions.

Participants
Demographic Information

Table 1

		Frequency	Percentage
Gender	Female	18	36
	Male	32	64
Ethnic group	iTaukei	26	52
	Fijian of Indian Descent	24	48

A total of fifty undergraduate Physical Education students enrolled at a university campus in Fiji participated in this study. Participants were selected using purposive sampling based on their enrolment in the Physical Education programme and their active participation in the structured physical activity intervention. Students who were unable to participate consistently throughout the 14-week programme were excluded from the study. Participation was voluntary, and informed consent was obtained from all participants prior to data collection.

As presented in Table 1, the study sample comprised thirty-two male students (64%) and eighteen female students (36%), indicating a higher proportion of male participants. In terms of ethnicity, twenty-six participants (52%) identified as iTaukei, while twenty-four participants (48%) were Fijians of Indian Descent. The demographic profile reflects representation from Fiji's two major ethnic groups and provides a balanced sample for examining the effects of structured physical activity on stress levels and mood among undergraduate Physical Education students.

A structured self-administered questionnaire consisted of 20 items that were evaluated on a five-point Likert scale, with values ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Data were collected using this instrument. The questionnaire evaluated the psychological health of participants in relation to their participation in physical activity, including their perceptions of stress reduction, mood enhancement, anxiety, relaxation, emotional well-being, concentration, motivation, sleep quality, and overall health. The instrument was administered twice: once during the first week of the programme (pre-test) and again promptly following the completion of the 14-week intervention (post-test). This procedure facilitated the comparison of the psychological status of participants prior to and following the intervention.

Process of Data Collection

The questionnaire was explained distributed to the students to answer in the first week of the program and they were told that they would do a similar application after fourteen weeks. Thus, learners were made aware beforehand and this discussion prepared them to consider their expectations of the program. After a total of fourteen weeks of physical activity, the survey questionnaire was given out, and students were allowed to answer it subjectively based on their experience.

Analysis of Data

The data that was collected were analysed using the Statistical Package for the Social Sciences (SPSS) version 30. Descriptive statistics, such as frequencies, percentages, means, and standard deviations, were employed to summarise the demographic characteristics of the participants and their responses to each questionnaire item. To investigate discrepancies between the pre-test and post-test scores, inferential statistical analyses were implemented. To ascertain whether the 14-week physical activity programme resulted in statistically significant improvements in anxiety, mood, and tension levels, paired-sample t-tests were implemented. Psychological outcomes were compared based on gender and ethnicity using independent-

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samples t-tests. The relationships among tension, mood, and anxiety were also investigated using Pearson's correlation analysis. The threshold for statistical significance was set at $p < .05$.

Pilot Study

Prior to the main study, a pilot study was conducted to evaluate the reliability, relevance, and clarity of the research instrument. The pilot participants possessed characteristics like those of the target population but were excluded from the final study sample. Feedback obtained during the pilot study was used to refine the wording, sequencing, and clarity of the questionnaire items, thereby improving the overall quality and comprehensibility of the instrument.

The final questionnaire, entitled *The Effects of Physical Activity on Stress Levels and Mood among Physical Education Students in Lautoka, Fiji*, consisted of 20 items measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument was designed to assess students' perceptions of the effects of regular physical activity on stress levels, mood, and overall psychological well-being.

The internal consistency reliability of the instrument was assessed using Cronbach's alpha coefficient. The analysis yielded a Cronbach's alpha value of **0.87**, indicating high internal consistency and excellent reliability. According to established guidelines in social science research, a Cronbach's alpha coefficient of 0.70 or above is considered acceptable, while values exceeding 0.80 indicate good reliability. Therefore, the obtained reliability coefficient confirms that the questionnaire consistently measured the intended constructs and was suitable for use in the main study and subsequent statistical analyses.

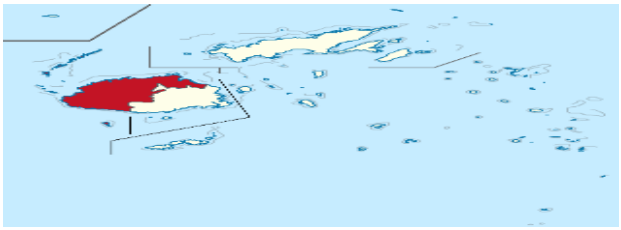
Ethical Approval

The investigation was conducted in accordance with ethical principles. Prior to commencing data collection, the appropriate research ethics authority at Fiji National University granted ethical sanction. The investigation among PE students was also conducted with the approval of the relevant academic unit. An information sheet was distributed to all participants, which delineated the purpose of the research, study procedures, prospective benefits, and their rights as research participants. Prior to participation, written informed consent was obtained.

The study was conducted solely on a voluntary basis, and participants were advised that they could withdraw at any point without incurring any academic penalties or repercussions. By designating identification codes to questionnaires and guaranteeing that no personally identifiable information was disclosed, confidentiality and anonymity were preserved. In accordance with institutional ethical guidelines and data protection requirements, all data that was collected was securely stored and utilised exclusively for research purposes.

Research Site

The study comprised of 50 Physical Education participants (32 males and 18 females) across Western division of Fiji.



RESULTS AND FINDINGS

Stress Management and Psychological Well-being

The findings indicate that regular participation in the 14-week structured physical activity programme had a substantial positive effect on students' psychological well-being. Most participants agreed that engaging in physical activity helped them feel more relaxed, reduced their stress management levels, enabled them to manage academic stress more effectively, decreased feelings of being overwhelmed by academic demands, and improved their ability to cope with stressful situations. Participants also reported greater confidence in handling stressful situations after regularly engaging in physical activity.

Collectively, these findings suggest that structured physical activity serves as an effective strategy for stress management and psychological resilience among university students. The results are consistent.

Salmon (2001), who reported that physical activity reduces stress through physiological mechanisms including endorphin release, and with Biddle and Asare (2011), who found that exercise contributes to lower cortisol levels and improved stress regulation. Similarly, Kimball and Freysinger (2003) concluded that physical activity provides an effective coping mechanism for academic-related stress among university students.

Mood, Emotional Health, and Overall Well-being

Participants consistently reported improvements in their emotional health following regular physical activity. Most respondents indicated that exercise improved their mood, increased happiness, reduced anxiety, enhanced their overall emotional state, promoted calmness, reduced irritability, stabilised mood throughout the week, and contributed positively to their overall well-being. In addition, participants reported feeling more energetic after engaging in physical activity, suggesting that the programme enhanced both psychological and physical vitality. These findings

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demonstrate that structured physical activity contributes to multiple dimensions of psychological well-being by promoting positive emotions while reducing negative emotional states. The results support previous research by Dishman (1997), who found that exercise stimulates the release of neurotransmitters such as serotonin and dopamine that regulate mood. Likewise, Craft and Landers (1998) reported that regular physical activity contributes to emotional stability, while Conn (2010) demonstrated that exercise reduces symptoms of anxiety through physiological relaxation responses. The findings also support Biddle and Mutrie (2001), who concluded that regular exercise promotes emotional regulation and improved mental health.

Academic Performance and Personal Development

The results further revealed that participants perceived physical activity as contributing positively to their academic functioning and personal development. Most students agreed that regular exercise improved their concentration during study, enhanced their academic performance, increased motivation, and encouraged a more positive outlook towards learning. These findings suggest that the psychological benefits of physical activity extend beyond emotional well-being to include cognitive functioning, self-efficacy, and academic engagement. Improved concentration and motivation may enable students to manage academic responsibilities more effectively while maintaining better mental health. These findings are consistent with Hillman *et al.* (2008), who demonstrated that physical activity improves cognitive functioning, attention, and academic achievement. Furthermore, Bandura's (1997) theory of self-efficacy suggests that successful participation in physical activities strengthens confidence, motivation, and persistence when facing academic challenges.

Healthy Lifestyle and Social Well-being

Regular participation in physical activity also contributed to healthier lifestyle behaviours and improved social well-being. Participants reported better sleep quality following exercise and believed that physical activity positively influenced their interactions with peers. Although perceptions regarding social interaction showed greater variation than other aspects of the study, the overall responses indicate that structured physical activities promote teamwork, communication, and supportive peer relationships while encouraging healthy lifestyle habits. Improved sleep quality and stronger social connections contribute to overall psychological well-being and reinforce the broader benefits of regular physical activity. These findings support Passos *et al.* (2010), who found that regular exercise improves sleep quality, and Bailey (2006), who argued that participation in physical education and sport enhances interpersonal relationships, social connectedness, and holistic student development.

Table 2: Independent sample t test comparing Gender.

Gender		N	Mean	F	Sig.
Stress	Female	18	4.1036	2.9542	0.04
	Male	32	4.5032		
Mood	Female	18	4.4500	3.9652	0.03
	Male	32	4.8200		
Anxiety	Female	18	3.8900	0.9601	0.00
	Male	32	4.7500		

An independent samples *t*-test was conducted to determine whether significant gender differences existed in stress, mood, and anxiety following participation in the 14-week structured physical activity programme. As shown in Table 2, male students reported higher mean scores than female students across all three psychological variables. Specifically, males demonstrated higher levels of stress management (M = 4.50) compared with females (M = 4.10), with the difference being statistically significant (p = .04). Similarly, male students recorded significantly higher mood scores (M = 4.82) than female students (M = 4.45; p = .03). Significant differences were also observed for anxiety management, where males reported higher mean scores (M = 4.75) than females (M = 3.89; $p < .001$).

Table 3: Independent sample t test comparing ethnic groups.

	Ethnic group	N	Mean	F	Sig.
Stress	iTaukei	26	4.0275	0.009	0.014
	Fijian of Indian Descent	24	4.4524		
Mood	iTaukei	26	4.3692	3.351	0.023
	Fijian of Indian Descent	24	4.5583		
Anxiety	iTaukei	26	3.8654	0.244	0.003
	Fijian of Indian Descent	24	4.3854		

An independent samples *t*-test was conducted to examine whether there were significant differences in stress, mood, and anxiety between iTaukei students and Fijians of Indian Descent following participation in the structured physical activity programme. As presented in Table 3, statistically significant differences were

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observed across all three psychological variables. Fijians of Indian Descent reported higher mean scores for stress management (M = 4.45) than iTaukei students (M = 4.03), and this difference was statistically significant (p = .014). Similarly, Fijians of Indian Descent demonstrated significantly higher mood scores (M = 4.56) than iTaukei students (M = 4.37; p = .023). Significant differences were also found for anxiety management, with Fijians of Indian Descent reporting higher mean scores (M = 4.39) than iTaukei students (M = 3.87; p = .003).

Table 4: One-Sample Test for comparing the pretest and post test results for stress.

Variable	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Stress (post-test)	48.290	49	0.000	4.23143	4.0553	4.4075
stress (pretest)	20.444	49	0.000	1.98000	1.7854	2.1746

A one-sample t-test was conducted to compare participants' stress scores before and after the 14-week structured physical activity programme. As shown in Table 4, the post-test results revealed a statistically significant improvement in stress management compared with the pre-test scores. The post-test mean score (M = 4.23) was higher than the pre-test means score (M = 1.98), indicating that participants experienced lower levels of perceived stress following regular participation in the physical activity programme. The difference was statistically significant for both the pre-test (t = 20.44, p < .001) and post-test (t = 48.29, p < .001), confirming that the observed improvement was unlikely to have occurred by chance.

Table 5: One-Sample Test for comparing the pretest and post test results for mood.

Variable	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Mood (post-test)	65.672	49	0.000	4.46000	4.3235	4.5965
Mood (pretest)	14.145	49	0.000	1.88000	1.6129	2.1471

A one-sample t-test was conducted to compare participants' mood scores before and after the 14-week structured physical activity programme. As presented in Table 5, there was a statistically significant improvement in participants' mood following the intervention. The post-test mean score (M = 4.46) was higher than the pre-test mean score (M = 1.88), indicating that participants experienced a marked enhancement in their overall mood after regularly engaging in the structured physical activity programme. The differences were statistically significant for both the pre-test (t = 14.15, p < .001) and the post-test (t = 65.67, p < .001), demonstrating that the improvement in mood was highly significant and unlikely to have occurred by chance.

Table 6: One-Sample Test for comparing the pretest and post test results for Anxiety.

Variable	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Anxiety (post-test)	45.233	49	0.000	4.11500	3.9322	4.2978
Anxiety (pretest)	18.198	49	0.000	1.68000	1.4945	1.8655

A one-sample t-test was conducted to compare participants' anxiety scores before and after the 14-week structured physical activity programme. As shown in Table 6, a statistically significant difference was observed between the pre-test and post-test anxiety scores. The post-test mean score (M = 4.12) was higher than the pre-test mean score (M = 1.68), indicating a substantial improvement in participants' ability to manage anxiety following the intervention. The post-test results were highly significant (t(49) = 45.23, p < .001), while the pre-test scores also demonstrated statistical significance (t(49) = 18.20, p < .001). The 95% confidence intervals further confirmed that the observed differences were statistically dependable.

Table 7: Illustrating the correlation between stress and the mood.

Correlations		Stress	Mood
Stress	Pearson Correlation	1	.626**
	Sig. (2-tailed)		0.000
	N	50	50
Mood	Pearson Correlation	.626**	1
	Sig. (2-tailed)	0.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

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Pearson's correlation analysis was conducted to examine the relationship between stress and mood among the Physical Education students. As presented in Table 7, there was a statistically significant, moderate positive correlation between stress and mood ($r = .626$, $p < .001$). The positive correlation indicates that improvements in stress management were associated with corresponding improvements in students' mood following participation in the 14-week structured physical activity programme.

Table 8: Illustrating the correlation between stress and the anxiety.

Correlations		Stress	Anxiety
Stress	Pearson Correlation	1	.696**
	Sig. (2-tailed)		0.000
	N	50	50
Anxiety	Pearson Correlation	.696**	1
	Sig. (2-tailed)	0.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson's correlation analysis was performed to examine the relationship between stress and anxiety among the Physical Education students. As presented in Table 8, there was a statistically significant, strong positive correlation between stress and anxiety ($r = .696$, $p < .001$). This finding indicates that stress and anxiety were strongly associated, with higher levels of stress corresponding to higher levels of anxiety among the participants.

Table 9: Illustrating the correlation between Mood and the anxiety.

Correlations		Anxiety	Mood
Anxiety	Pearson Correlation	1	.618**
	Sig. (2-tailed)		0.000
	N	50	50
Mood	Pearson Correlation	.618**	1
	Sig. (2-tailed)	0.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson's correlation analysis was conducted to examine the relationship between mood and anxiety among the Physical Education students. As shown in Table 9, there was a statistically significant, moderate positive correlation between mood and anxiety ($r = .618$, $p < .001$). This finding indicates that improvements in mood were significantly associated with improvements in anxiety management following participation in the 14-week structured physical activity programme.

DISCUSSION

This study investigated the impact of a 14-week structured physical activity programme on stress management, anxiety management and mood of undergraduate Physical Education students in Western, Fiji. The results overall suggest that structured physical activity had a positive effect on the psychological well-being of the participants. Most participants indicated that their stress management, mood, emotional balance and motivation improved after the intervention, and this has been confirmed by previous research that physical activity is an effective intervention for mental health in university students. The results are significant in the context of higher education in Fiji given that there is limited empirical evidence exploring the link between physical activity and psychological well-being. The results of the current study are in line with past studies that have shown that consistent physical activity can have a positive effect on psychological well-being by decreasing stress, improving mood, and increasing emotional resilience (Bailey, 2006; Puetz *et al.*, 2006). The overall effect of the structured physical activity was for the participants to feel more relaxed, energetic and emotionally balanced. The intervention not only offered physical health improvements, it also seemed to contribute to a better overall psychological well-being in the participants, by creating positive emotional experiences and countering the negative aspects of academic stress. The Biopsychosocial Model (Engel, 1977) suggests that biological, psychological and social factors interact in determining health, which could account for these findings. The benefits of regular physical activity could have resulted in physiological responses including the production of endorphins and other neurotransmitters which enhance positive mood, and at the same time had offered opportunities for social interaction, team working and self-actualisation. All these factors are likely to have contributed to the observed improvements in the psychological well-being of participants in this study. Likewise, the findings may be explained by Self-Determination Theory (Deci & Ryan, 1985), which proposes that psychological health is fostered by conditions of competence, autonomy and relatedness. During the intervention, participants were involved in a range of sporting and fitness activities

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which promoted skill development, personal achievement and social interaction. The experiences could have enhanced students' confidence, motivation and sense of belonging which would have led to an improvement in mood and stress management beyond the immediate benefits of physical activity. Furthermore, the results showed that there were significant improvements in mood after each person completed the structured physical activity programme. The positive mood changes are widely recognized as one of the most immediate psychological benefits of exercise and have consistently been reported across different age groups and populations (Craft & Landers, 1998; Dishman *et al.*, 2006). Instead of examining each item of the questionnaire, overall patterns indicate that frequent participation in fun physical activities was associated with higher levels of emotional stability and lower levels of irritability and positive affect. The results confirm the importance of structured physical activity as a non-drugging approach to promote psychological health in university students. It's also important to note that the reduction in perceived stress seen in participants was also significant. Students at universities are faced with several academic, financial and social obligations that can lead to high levels of stress. In the present study, structured physical activity seemed to offer a helpful way of coping with these pressures for participants. This result agrees with Salmon (2001), who stated that physical activity lowers stressors' physiological and psychological responses and allows the person to better handle everyday stress. Similarly, Bailey (2006) highlighted that being physically active is essential to all aspects of development, including physical, emotional and psychological. It is significant that this study has relevance to the Fijian context. While physical activity has been proven to have psychological advantages on an international level, there is relatively little empirical evidence in Pacific Island countries. Physically active lifestyles are especially crucial for Fiji, as the country is grappling with new public health issues relating to non-communicable diseases and mental health. The present results hence offer locally valid indications that structured physical activity programmes could offer a practical and cost-effective approach to support the well-being of students in HE institutions. The adoption of structured physical activity programs as part of a multi-faceted strategy for mental health, and academic performance enhancement in Fiji universities could offer benefits. Additionally, the results are in line with the goal of the United Nations Sustainable Development Goal 3 (SDG 3) “Ensure healthy lives and promote well-being for all.” This study shows that there is good psychological benefit from regular physical activity and therefore structured programmes of physical activity in schools can have an important role in the promotion of physical and mental health. These can make a difference not only to the health of university communities, but to the country's population health as well. In addition to stress management and mood, the results indicate that the physical activity programme with its structure positively affected students' academic functioning. After the intervention, participants described increased focus and attention and increased coping with academic challenges. The results are supported by the results of Hillman, Erickson and Kramer who showed that physical activity improves cognitive function related to attention, memory and executive functioning. Enhanced cognitive functioning might allow students to cope better with their studies and remain psychologically healthier. The results of this research could be of significant relevance in the context of higher education where students must attend lectures, take tests, engage in practical work and deal with their personal commitments. Although the benefits of physical activity are often considered in terms of physical fitness, the present findings indicate that the benefits of physical activity also include academic engagement and readiness to learn. As such, it is important to consider structured physical activity programmes as a key element of the support programmes of students and, not only, as opportunities for recreation.

The participants also reported an improvement in sleep quality after the intervention. Good sleep is a key part to emotional management, cognitive functioning, and recovery from a daily stressor. Exercise and sleep quality have been well correlated, and exercise can improve sleep quality and sleep efficiency (Passos *et al.*, 2010). Structured physical activity thus could be one way in which it improves psychological well-being by improving sleep. Improved sleep-in students allows them to recover and rest from a physically and mentally exhausting day, thus helping them meet school demands and minimizing the risk of stress and exhaustion. Another important finding relates to the social benefits associated with participation in structured physical activity. Post intervention participants found they had better social interaction, better relationships with peers and better emotional balance. These outcomes clearly demonstrate that physical activity has a wider impact than just improving the psychological outcomes of the individual but also supporting social environments. Cooperation, communication and encouragement are key concepts in Team sports like Rugby and Volleyball, and the students have opportunities to build a positive relationship or connection with each other and foster a sense of belonging. The results again align with the concepts of Self-Determination Theory (Deci & Ryan, 1985) as relatedness is one of the three basic psychological needs. Emotions and psychological wellbeing are more likely to be positive when students feel connected to their peers and are more likely to feel more motivated. Thus, in the context of university, opportunities for meaningful social interaction through organised physical activity may be a protective factor against stress, loneliness and emotional distress. The study further revealed that participants felt they were more motivated and confident on how to deal with stressful situations after they engaged in the structured physical exercise regularly. The results indicate that the intervention had a beneficial effect on the emotional

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level in the short-term and psychological resources were also established, which could help students face future challenges. Similar findings have been obtained by earlier studies, which show that individuals who engage in regular physical activity also experience a sense of self-efficacy and confidence as they reach personal accomplishments, mastery and incremental improvements (Bandura, 1997). The improvement in students' physical self-confidence can positively impact their self-confidence in other areas of their curriculum and personal life. Taken together, the results show that the advantages of physical activity organised in a structured way is a multi-dimensional phenomenon of psychological well-being. The intervention did not appear to have a direct effect on levels of stress, anxiety, or mood but rather seemed to have complimentary effects across all three of these psychological factors. This reflects the Biopsychosocial Model, which acknowledges that biological, psychological and social factors all work together to affect an individual's health and well-being (Engel, 1977). The results thus underscore the need to consider psychological wellbeing as a more holistic phenomenon than just psychological problems. The current research is a valuable addition to the sparse existing literature on physical activity and mental health in the Pacific. While there are several international studies that show similar relationships, there are very few studies which have focused on the same effects for university students in Fiji. There are significant variations in cultural values, educational contexts, sporting norms, and health values between countries, and the results of western contexts are not necessarily applicable to Pacific contexts. This study has added contextual knowledge that can help inform intervention design in culturally relevant and culturally responsive manner for Fiji and possibly other countries. The results also are of practical use to universities and other higher ed institutions. Counselling and academic support are common areas of focus for student support services, but the current results indicate that structured physical activity should also be included as an important aspect of mental health promotion. There is a possibility for universities to increase recreational sports, fitness programmes and campus-wide physical activity opportunities that promote frequent participation for sport and non-sport students. These programs can have positive impacts on students' well-being and can also help to increase academic engagement and retention. However, the results must be considered with some restrictions. It was carried out in one university and a relatively small sample of Physical Education students who were selected for the study in a purposive manner. Therefore, the results obtained are not necessarily generalizable to all students at the university in Fiji and other countries in the Pacific Islands. Furthermore, psychological well-being was measured using self-reported questionnaire responses, which could be affected by perception and response bias of the participants in the study. Future studies should involve larger and more varied sample sizes, as well as students from a variety of academic disciplines, and make a special effort to study the long-term impacts of structured physical activity programmes on psychological well-being. The results of the study generally suggest that physical activity, in a structured manner, is a viable means of achieving psychological well-being of the undergraduate students in Physical Education in Fiji. The overall psychological advantages of being physically active regularly are evident in the improvements in stress management, anxiety, mood, sleep, motivation, social connectedness and academic functioning. The results add to an expanding body of evidence that physical activity is an accessible, sustainable and cost-effective intervention to improve student well-being. What is more important is that they will supply locally relevant evidence that will help inform university policies and health promotion programs to build a healthier, more resilient student community across Fiji.

Practical Implications

The results from this study can have implications for higher education institutions, policy makers, and health practitioners who aim to enhance the well-being of students through structured physical activity. The benefits seen on the stress, anxiety management, mood, motivation, sleep quality and academic functioning indicate that physical activity should not just be seen as a recreational or sporting activity but as an integral part of a student support service. The findings demonstrate the importance of incorporating structured programmes of physical activity into university life and the wider curriculum for universities in Fiji. Physical Education pupils are expected to take part in regular exercise as part of their programme, but opportunities should also be provided for pupils in other disciplines of the curriculum to take part in organised exercise. Fitness programs, recreational sports, walking groups, aerobic workshops, and wellness campaigns are all initiatives that can be easily implemented and may help promote healthier environments on campus as well as the wellbeing and academic success of students. The research has implications for curriculum developers and educational leaders as well. University should attempt to take a holistic approach to students' development and appreciate the connection among physical, mental, and academic health. The inclusion of physical activity in institutional well-being plans can help students learn to cope with the stress of school in healthier ways and contribute to building resilience, social connection and healthy habits that last a lifetime. The national findings from this study help to reinforce efforts underway at national level to tackle mental health issues and the growing non-communicable disease burden in Fiji. Encouraging physical activity among young adults is a logical part of the United Nations Sustainable Development Goal 3 (Good Health and Well-being), and a proven approach to population health. Building on the positive examples of such partnership working between universities, government bodies and community

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organisations, there is further potential to support the delivery of health promotion campaigns which promote a more active lifestyle among the university community and the wider community.

Limitations

While this study offers important information about the structured physical activity and psychological well-being of undergraduate physical education students in Fiji, there are a few limitations that should be noted. The study was limited to fifty participants who were purposively sampled from one University. Therefore, the results cannot be generalised to all university students in Fiji or the other Pacific Island countries. Larger and more diverse samples from other institutions in different settings should be studied in the future to increase generalisability. Second, the study included only undergraduate Physical Education students, which may have different levels of habitual physical activity as compared to those other academic fields. Therefore, the results are applicable only to this population. Further studies are needed to determine if the same psychological effects can be seen in students from non-sporting academic programs. Third, self-reports measures were used for psychological well-being, which is prone to response bias and social desirability effects. The instrument showed a high internal consistency, but the answers given were personal perceptions and not a clinical measurement of mental health. Lastly, the intervention was delivered for 14 weeks. During this period there were clear gains, but this research didn't look at if these gains were sustained over a longer period. To assess the long-term effects of improvements in stress management, anxiety management, mood and psychological well-being after continued participation in structured physical activity, a follow-up study is recommended to do so. Even though there are some limitations, the study adds valuable evidence to the scarce literature on physical activity and psychological well-being in the Pacific region and will be a basis for further research in Fiji and other contexts.

CONCLUSION

The aim of this study was to find the impact of 14 weeks of structured physical activity programme on stress management, anxiety management and mood of undergraduate Physical Education students in Fiji. The results show that there was a strong correlation between frequent participation in structured physical activity and significant improvements in several aspects of psychological health such as decreased stress, increased mood, increased emotional balance, increased motivation, improved sleep quality, and increased confidence in handling academic and personal challenges. The results also support this argument that psychological wellbeing can be affected through a combination of biological, psychological and social factors, which is aligned with the Biopsychosocial Model, as well as the tenets of the Self-Determination Theory, which focus on three factors as necessary for positive mental health: competence, autonomy, and relatedness. These theoretical views together offer an important basis for comprehending the role of structured physical activity in students' well-being. The present study also fills a significant gap in the literature as it investigates the psychological effect of structured physical activity in the University setting in Fiji, where such research is not available. The results are thus not only relevant to the international knowledge base, but to the expanding body of knowledge needed to guide education and health promotion in Pacific Island countries. The findings suggest a practical approach for universities to implement structured physical activity program as an affordable, sustainable and easily accessible intervention to improve mental health in students. By providing more opportunities to include regular physical activity in the university environment, students can experience healthier learning environments, greater engagement with learning and greater resilience, while simultaneously helping the country meet national health goals and the United Nations Sustainable Development Goal 3 (Good Health and Well-being). The study overall shows that structured physical activity is more than just a component of physical fitness; it also is a significant factor in the psychological health and success of the student. Sustaining investment in evidence-based physical activity programs in higher education institutions can have long-lasting impacts to benefit students, universities, and society in general.

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