

Behavioural and Motivational Determinants Related to Health in Sports Sciences: The Case of Indonesia and Burundi

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ABSTRACT: The purpose of this study is to compare motivation, physical activity and self-reported lifestyle-related items between sport science students in two countries, Indonesia and Burundi. This study used a cross-sectional comparative study design with a total of 338 university students (Indonesian students, n=169; Burundian students, n=169). Motivation was measured using the Sport Motivation Scale II (SMS-II), while physical activity and self-reported lifestyle-related items (diet, sleep, alcohol, smoking) were assessed by self-report questionnaires. Independent samples t-tests were used to compare between the groups, with the Bonferroni correction applied to control for multiple comparisons. Effect size was calculated using Cohen's d, while Pearson correlation coefficients were used to determine the relationships among the variables. ANCOVA was used to control differences in demographics. The results showed that Indonesian students scored significantly higher on all motivation subscales, including intrinsic motivation (d=2.70) and amotivation (d=1.10) compared to Burundian students. However, current physical activity levels were reported by the Burundian students as being higher than those reported by Indonesian students at that same time point (0.66), while pre-university rates were reported as being higher for Indonesian students (2.77). Differences in lifestyle demonstrated that Indonesian students report greater diet quality than Burundian students (1.33) but report a higher rate of smoking than Burundian Students (0.42) and poorer sleep quality (0.87). Burundian students reported a higher quality of sleep than Indonesian students, had a higher level of water consumption than Indonesian students (0.32), and were more likely to use alcohol than Indonesian students (1.39). Overall, motivational processes and lifestyle behaviors are influenced by socioeconomic factors, availability of institutionally provided resources, and cultural context; thus, the relationship between motivation and behavior is context specific. To effectively implement health promotion strategies for university students, it is crucial to consider the varying realities in which students from these two countries find themselves, thus emphasizing the need to utilize a context-specific approach.

KEYWORDS: Motivation, Physical activity, lifestyle, Burundi, Indonesia and Cross-cultural comparison

I. INTRODUCTION

The time from being an adolescent to being a young adult is an important period of development in which behaviors related to health are established and also subsequently increasingly difficult to change (Keating et al., 2013). The transition from being an adolescent to a young adult is also marked by students in universities facing new academic, social, and environmental challenges which affect their physical activity (PA), dietary practices, sleep quality, and substance use. Understanding the determinants of these behaviors is particularly relevant within the field of sport sciences, because students in the field will be future health professionals and will be role models for the larger populations (Kartiko et al., 2023).

Physical activity is generally associated with good health outcomes (reducing cardiovascular risk, improving mental health, and enhancing cognitive ability) (Bauman et al., 2012). However, there is no consistency in participation in PA across populations; rather, the activity they engage in is shaped by the complex interaction of psychological factors (individual motivation), social influences (peer "norms"), and the physical environment (access to PA facilities). University students participating regularly in PA will indicate a greater sense of purpose in life, better emotional regulation, and better sleep than students who are sedentary (Romero-Ramos et al., 2023; Vestergaard et al., 2024).

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Although health behaviour research has grown significantly, most studies have looked at factors like motivation, physical activity and lifestyle as separate constructs and have been conducted with examples that tend to be from cultures that share similarities in income and other factors. As a result, there is little quantifiable evidence on how these variables are related and interact across different socioeconomic and institutional contexts - especially in under-researched areas such as Sub-Saharan Africa and Southeast Asia. The lack of evidence to inform this area is important because theoretical models created in Western countries may not be able to account for the structural and cultural determinants of health behaviors in low-income countries.

This manuscript seeks to address this gap by examining the countries of Indonesia and Burundi as a true contrast to each other in terms of sport infrastructure to develop the economy, and differences in cultural norms. For example, whereas Indonesia is a wealthier Southeast Asian democracy with well-established sport infrastructure (i.e., universities with organized sport programs), Burundi is a low-income Sub-Saharan democracy with a lack of available resources, thus relying on functional movements, such as walking and manual labor, for physical activity (Bauman et al., 2012). These contextual differences will influence the level of physical activity and the processes of motivation used to support healthier behaviors.

II. LITERATURE REVIEW

A. Theoretical Basis for Health-Related Behavior

According to the World Health Organization (1946) health is defined as a state (or condition) of optimum and complete physical, mental and social well-being; in other words, health relates not only to the absence of a disease but also to all aspects of physical, mental and emotional wellness. In terms of the university student population, health includes many interconnected lifestyle behaviors such as eating nutritious food, engaging in regular physical activity, obtaining sufficient sleep (7-9 hours of sleep nightly), managing stress effectively, and avoiding the use of harmful substances (González Moreno & Molero Jurado, 2024). Understanding how these eat, exercise, and sleep behaviors are established is important during a college/university student's life because they often develop and carry those behaviors into adulthood, which will ultimately impact long-term health (García-laguna et al., 2024).

Research studies show that university students who participate in regular physical activity demonstrate greater academic productivity, have more stable moods, increased mental acuity, and improved quality of sleep than their non-active counterparts (Vestergaard et al., 2024). Implementing health promotion/education interventions in the university setting has been shown effective in increasing student participation in physical activity, further validating the necessity of institutional support for programming (García-laguna et al., 2024). There is also a strong relationship between participating in physical activity and psychological well-being; students who are physically active also report feeling a greater sense of purpose and have better emotional regulation skills (Romero-Ramos et al., 2023).

B. Student Motivations Through Self-Determination Theory (SDT)

The Self-Determination Theory was first proposed by Ryan and Deci in 2000 as a framework that explains the way we are motivated to engage in health-promoting behaviors through self-determination (Ryan & Deci, 2000). Those who engage in healthpromoting behaviors because they find them to be enjoyable or interesting (intrinsically motivated) do so because they have satisfied all three of the following fundamental human needs as described by SDT (Ryan & Deci, 2017): the need to have control over their own lives (autonomy), the need to feel effective in the activities they perform (competence), and the need to feel a sense of connection with others (relatedness).

There is a continuum of motivation to participate in health-promoting physical activities that ranges from lack of motivation (amotivation) through the various forms of external motivation or extrinsic regulation for example: amotivated, external, introjected, identified, and integrated motivation to ultimately intrinsic motivation. Researchers have demonstrated that students' physical self-concepts mediate the association between their motivation for health-promoting behaviors and the resulting behavioral choices (Estrada-Araoz et al., 2024). Additionally, students' physical self-concept is a significant predictor of their motivation for participating in other health-related behaviors, such as nutrition and substance use (Yana-salluca et al., 2025). This suggests that students can have a motivation profile that influences multiple areas of lifestyle at the same time and therefore supports the rationale for developing comprehensive health promotion interventions.

Across different cultures, there are several distinct ways in which one's psychological needs may be met through cross-cultural applications of SDT. For example, León-Reyes et al. (2025) determined that among 1412 university students in Ecuador, 3 primary motivators exist to engage individuals in PA (or to motivate participation in PA as follows; health (with the greatest strength); social affiliation; and skill development. However, this research also illustrated that the relative importance of each of these motivators differs by gender, demonstrating the extent to which demographic and cultural variables can influence motivational profiles among different demographic groups (León-reyes et al., 2025). Additionally, if comparative analyses were conducted

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between students living in two significantly different socio-economic countries such as Indonesia and Burundi; the degree of satisfaction one derives from having their basic psychological needs satisfied may differ vastly due to resources available to them, cultural beliefs and values associated with person-centered care, as well as, the nature and availability of institutional supports for individuals wishing to have their basic psychological needs fulfilled.

C. Lifestyle Contextual Factors among Sports science students

A variety of external factors can influence university students' physical activity levels including social and economic status, cultural and social norms, and the educational environment. During the COVID-19 pandemic, university students who continued to be physically showed significantly greater levels of positive life purpose and significantly less deterioration of mental health than did university students who were not physically active. This suggests that PA may provide an important protective effect against psychological distress (Romero-Ramos et al., 2023).

The longitudinal data illustrates that intrinsic motivation is a critical factor in maintaining ongoing engagement in PA, as is access to institutional sport programs (Plúas, 2025). Providing students with structured environments (including scheduled exercise times, available facilities and social support) is an essential component of providing students with the ability to engage in regular physical activity, even if they have moderate levels of intrinsic motivation upon initiation.

Nutritional Habits Are Essential Elements Within Lifestyle Health. Active individuals require balanced macronutrient ratios in their diet to maintain optimal health (complex carbohydrates 55–65%, high quality protein 12–20%, and healthy fats 20–30%). By leading a nutritious lifestyle, active individuals can achieve improved memory, cognitive focus, muscle recovery, and endurance (Zhang, 2025). It has been recently shown that individuals who have greater motivation for physical activity are highly likely to have other healthy behaviors, such as maintaining healthy eating patterns. Therefore, health professionals can use this information to create holistic interventions that positively affect both physical activity and healthy eating behaviors (Yana-salluca et al., 2025).

Gender can also impact motivation in various ways. In an examination of body appreciation and PA motivation, women were found to have a much stronger link between a positive body image and intrinsic motivation than males. Based on these findings, gender-sensitive approaches for health promotion should be considered in designing effective programs for both genders (Yanasalluca et al., 2025).

D. Cross-cultural perspectives on Physical Activity

Culturally multidisciplinary studies on people's physical self-esteem and their relationship with physical motivation are based on a large number of expectations developed over time from various background experiences (Estrada-Araoz et al., 2024). Students often respond differently to information they receive from others regarding the abilities of their bodies, and as a result, the health programs developed in the university must take into consideration these characteristics of motivation within the audiences they are targeting. Culturally competent health promotion programs have been shown to be more successful in increasing participants' levels of physical activity, and in improving their lifestyles, than traditional or generic health programs (García-laguna et al., 2024).

León-Reyes et al. (2025) illustrated differences between samples of physical activity in cross-cultural studies (León-reyes et al., 2025). Differences exist in the motivational characteristics of physical activity between cultural and gender groups. Enhanced intrinsic motivation through perceived autonomy-supportive learning environments (e.g., physical education instructors who provide students with reasonable choices/enhanced motivation and enhanced physical activity; associated with better psychological well-being) vary from one culture to another; however, across many cultures, the connection between physical activity and overall well-being is still strongly correlated. The types of activities that create this relationship (i.e., sports, dance, and exercise), as well as the motivations for participation, are determined in large part by culture and/or access to available resources (Romero-Ramos et al., 2023).

The amount of research looking at how different cultures compare culturally has been growing, thus indicating a desire to do more cross-cultural comparative research to identify ways to implement effective interventions for different cultural contexts (Kartiko et al., 2023). Plúas Rodríguez (2025) claims that having sufficient institutional support and adequate access to sporting facilities are predictive of PA sustainability for university students. Therefore, the environment is very important in helping maintain a healthy behavior within all cultures (Plúas, 2025).

E. Indonesia and Burundi: A Comparative Perspective

There is growing acknowledgement of the need to conduct cross-cultural health research. However, to date, very few have carried out systematic comparisons of motivation, PA patterns, and lifestyle characteristics of university students in Southeast Asia versus those of Sub-Saharan Africa. Indonesia and Burundi provide a very informative comparison case study; where Indonesia

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has invested heavily in the development of (1) sporting facilities/venues and (2) dedicated athletics programs at universities vs. (1) Burundi being severely limited by resources and (2) thus sports participation is primarily functional movement that is not centrally organized.

There are several plausible explanations for why motivations and behaviors are likely different between these two countries. For example, students studying in Indonesia may have developed significantly higher intrinsic motivation than Burundian students, who will have benefitted from well-defined sporting structures that provide opportunities to develop both their skills and to receive social recognition for their achievements. In contrast, although Burundian students may have had significantly lower levels of organized sport and formalized opportunities to develop their physical skills, they have likely reached higher levels of total PA than their Indonesian counterparts currently, due to the environmental demands on their daily PA (e.g. using walking for transportation and working in manual labor). Additionally, this study is the first to provide quantitative data to examine these differences in motivation using validated measures of motivation to contribute to the limited literature regarding sports science students in the underrepresented areas.

Based on theoretical and empirical, the following hypothesis were developed to compare Indonesian and Burundian sports science students:

H1: The differences between Indonesian and Burundian students in terms of motivation level, physical activity, and lifestyle-related items.

H1a (Motivation): It is hypothesized that Indonesian sports science students will score significantly higher than Burundian students on all sub-scales.

H1b (Physical Activity): Students from Burundi will report significantly higher levels of current physical activity (frequency, duration, and intensity) than students from Indonesia.

H1c (Lifestyle-related Items): Lifestyle-related items report substantial differences by cultural groups.

Diet Quality: Indonesian students will report better diets for a greater number of diet quality items.

Hydration: Burundians will report to consume more water daily.

Sleep: Burundians will report to sleep better, and more regularly than do Indonesians.

Smoking: Indonesians will report the greatest amount of smoking, based on self-report.

Alcohol: Burundians will report the greatest amount of alcohol use, based on self-report.

H2: Relationships Between Intrinsic Motivation and Physical Activity

H2a (Indonesian sample): Significant positive relationships between the intrinsic motivation subscales and identified regulation among Indonesian students and their current frequency, duration, and intensity of physical activity will support the predictions of Self-Determination Theory.

H2b (Burundian sample): The correlations between the intrinsic motivation subscales and current physical activity among Burundian students will be non-significant, indicating that environmental constraints for functional movement may take precedence over motivational factors in resource-poor contexts.

H3: Lifestyle items and Relationship to Physical Activity

H3a (Sleep and Eating Habits – Both countries): For both populations, there will be significant positive relationships with how much someone is physically active as a result of sleep quality as well as eating habits.

H3b (Cigarette Use): There will be differences in the relationship between smoking cigarettes and being physically active by country;

H3c (Alcohol Use – for each Country): There will be differences in the relationship between alcohol consumption and being physically active for the two countries.

III. METHOD

A. Research Design

This research utilized a quantitative, cross-cultural comparative design to examine differences in the health and motivational related factors among sports science students from two distinct cultural contexts: Indonesia and Burundi.

B. Participants

There were 338 undergraduate sport science students participated in the study, with 169 students recruited from each institution: Universitas Negeri Yogyakarta (Indonesia) and the *Institut d'Education Physique et des Sports* (Burundi) Participants were selected using convenience sampling-based accessibility within the institution.

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All participants were enrolled in sport science programs and voluntarily agreed to participate in the study. No individual matching the procedure was applied.

C. Instruments

- Motivation was evaluated using the Sport Motivation Scale II (SMS II; Pelletier et al., 2013) which is based on the theory of self-determination. The questionnaire has different types of motivation: intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. All responses were recorded on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).
- The Physical Activity Self-Report Questionnaire utilized for assessment was adapted from The International Physical Activity Questionnaire (IPAQ) and measured four dimensions - frequency, duration, intensity of physical activity PA before and during university.

The standard scoring protocol used to calculate MET score in the IPAQ was modified to a Likert-type scale (1-5) for two reasons: First, to create consistency in responses from all survey instruments in order to minimize participant's burden of providing responses. Second, since the overall aim of the analysis was to compare the relative amounts of PA between groups instead of calculating absolute MET minutes per week, the use of a Likert-type response format allowed for preserving the order of the remaining amounts of PA participants engaged in at both time points. However, this change in the scoring system does not allow for a direct comparison between studies that have used standard IPAQ MET scoring so therefore readers need to consider the results of this study as representing a ranking of PA levels for each sample of participants rather than absolute levels of PA.

- Self-Reported Lifestyle-Related Items: A structured questionnaire based on the World Health Organization (WHO) standards and prior research was used to assess lifestyle-related items such as diet, water intake, alcohol use, use of tobacco products, and sleep. The content validity of the instrument was established through expert review, and a pilot test was conducted to ensure clarity.

These items have not received full psychometric validation (e.g., confirmatory factor analysis or test-retest reliability), so the use of this instrument should be considered an exploratory study; results obtained regarding lifestyle items should be interpreted cautiously.

D. Questionnaire Translation Process

Forward-backward translation was utilized in the translation of the questionnaire from English into Bahasa Indonesia (for UNY participants) and into French (for IEPS participants). The forward translations were done by two independent bilingual translators for each language from English into the target language. The research team reviewed the translated questionnaire, and a final version identical in English was determined by the research team for each translated language. Then, two different bilingual translators, who were blinded to the original English version, and who were separate from the forward-translators performed backtranslations of each target language questionnaire to the original English version. To verify that the back-translated questionnaire was conceptually equivalent to the original English questionnaire, the translated questionnaire was reviewed, and discrepancies were discussed and resolved by both the research team and the translators. The translated questionnaires were pilot tested with 15 students at both institutions to verify the clarity and cultural appropriateness of the questionnaires; the feedback from the pilot testing was used to make minor changes to the wording of the questionnaires.

E. Data Collection Method

In November 2025, data was gathered through posting in departmental WhatsApp groups to attract participants to the study. All data was collected via Google Forms; links to the forms were sent to both eligible participants, and informed consent was provided electronically via Google Forms when participants clicked on an "I Agree to Participate" button prior to beginning the questionnaire. The informed consent included a description of the study, voluntariness of participation, and confidentiality of data.

F. Data analysis

Using SPSS v.26, we performed analyses including descriptive statistics for all variables, t-tests, comparing Indonesian and Burundian students for motivation, physical activity, and lifestyle-related items. Bonferroni-corrected p-values were calculated due to the number of t-tests performed respectively. Furthermore, we calculated effect sizes (Cohen's d) and used Pearson correlation coefficients (r) to determine associations between motivation, physical activity, and lifestyle-related items. To account for demographic differences between groups, ANCOVA was used.

G. Post-hoc power analysis

A post-hoc power analysis was carried out using G*Power, developed by Faul et al. (2009), to determine the statistical power of the sample sizes obtained. The post-hoc power analysis used the assumption of a medium effect size (Cohen's $d = 0.31$), based on existing cross-cultural studies in sport psychology. Table 1 shows all the details

Table 1. Post-hoc Power analysis for independent sample t-test

Parameter	Value
Test family	t-tests
Statistical test	Means: Difference between two independent means (two groups)
Type of power analysis	Post-hoc
Effect size (Cohen's d)	0.31 (medium)
α error probability	0.05
Sample size (n_1)	169
Sample size (n_2)	169
Total sample size (N)	338
Power ($1-\beta$ error probability)	0.82

H. Validity and Reliability of Instruments

Expert review, pilot testing, and internal consistency analysis were used to determine the validity and reliability of the instruments. A group of experts from Indonesia and Burundi assessed the content validity for cultural appropriateness and clarity of the questionnaire's items. The Cronbach's alpha coefficients across all the main scales (> 0.70) demonstrated acceptable reliability; thus, all the instruments were determined to have adequate internal consistency.

IV. FINDINGS**A. Preliminary analyses**

Prior to analyzing the data through the primary comparative analysis, the normality and homogeneous variance of the study variables were examined. The Shapiro-Wilk test demonstrated significant deviations from normality across all variables in each country, as indicated by $p < .001$ (see Table 2).

Table 2. Normality test

Normality Tests												
	Indonesia						Burundi					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk			Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.	Statistic	df	Sig.	Statistic	df	Sig.
Motivasi_In trinsik1	.334	169	.000	.743	169	.000	.294	169	.000	.695	169	.000
Motivasi_In trinsik2	.307	169	.000	.759	169	.000	.244	169	.000	.781	169	.000
Motivasi_In trinsik3	.321	169	.000	.753	169	.000	.270	169	.000	.813	169	.000

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Peraturan_yang_Diidentifikasi1	.333	169	.000	.733	169	.000	.266	169	.000	.758	169	.000
Peraturan_yang_Diidentifikasi2	.345	169	.000	.738	169	.000	.316	169	.000	.777	169	.000
Peraturan_yang_Diidentifikasi3	.347	169	.000	.728	169	.000	.304	169	.000	.813	169	.000
Regulasi_introjeksi1	.265	169	.000	.806	169	.000	.283	169	.000	.810	169	.000
Regulasi_introjeksi2	.361	169	.000	.709	169	.000	.281	169	.000	.813	169	.000
Regulasi_introjeksi3	.285	169	.000	.794	169	.000	.296	169	.000	.803	169	.000
Peraturan_Eksternal1	.243	169	.000	.820	169	.000	.274	169	.000	.807	169	.000
Peraturan_Eksternal2	.231	169	.000	.836	169	.000	.316	169	.000	.707	169	.000
Peraturan_Eksternal3	.208	169	.000	.877	169	.000	.319	169	.000	.736	169	.000
Amotivasi1	.183	169	.000	.896	169	.000	.271	169	.000	.757	169	.000

Amotivasi2	.168	169	.000	.895	169	.000	.345	169	.000	.746	169	.000
Kegiatan_PraUniversitas1	.278	169	.000	.781	169	.000	.348	169	.000	.628	169	.000
Kegiatan_PraUniversitas2	.225	169	.000	.832	169	.000	.262	169	.000	.759	169	.000
Aktivitas_Fisik_Saat_Ini_Universitas1	.206	169	.000	.851	169	.000	.313	169	.000	.676	169	.000

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Aktivitas_Fisik_Saat_Ini_Universitas2	.223	169	.000	.834	169	.000	.309	169	.000	.672	169	.000
Aktivitas_Fisik_Saat_Ini_Universitas3	.193	169	.000	.877	169	.000	.312	169	.000	.703	169	.000
Aktivitas_Fisik_Saat_Ini_Universitas4	.215	169	.000	.852	169	.000	.287	169	.000	.645	169	.000
Aktivitas_Fisik_Saat_Ini_Universitas5	.326	169	.000	.746	169	.000	.351	169	.000	.580	169	.000
Kebiasaan_Makan1	.207	169	.000	.869	169	.000	.236	169	.000	.807	169	.000
Kebiasaan_Makan2	.202	169	.000	.900	169	.000	.322	169	.000	.735	169	.000
Kebiasaan_Makan3	.195	169	.000	.903	169	.000	.236	169	.000	.834	169	.000
Kebiasaan_Makan4	.200	169	.000	.870	169	.000	.184	169	.000	.909	169	.000
Kebiasaan_Makan5	.202	169	.000	.886	169	.000	.191	169	.000	.910	169	.000
Kebiasaan_Makan6	.192	169	.000	.907	169	.000	.211	169	.000	.891	169	.000
Zat_Konsumsi_Hidrasi1	.246	169	.000	.818	169	.000	.423	169	.000	.529	169	.000
Zat_Konsumsi_Hidrasi2	.363	169	.000	.707	169	.000	.381	169	.000	.587	169	.000
Zat_Konsumsi_Hidrasi3	.453	169	.000	.551	169	.000	.251	169	.000	.817	169	.000

Keseimbangan_Tidur1	.230	169	.000	.884	169	.000	.392	169	.000	.552	169	.000
Keseimbangan_Tidur2	.216	169	.000	.845	169	.000	.322	169	.000	.659	169	.000
a. Lilliefors Significance Correction							a. Lilliefors Significance Correction					

As stated in the Central Limit Theorem, if the sample sizes are large enough (e.g., $n > 30$ for both groups), the mean sampling distribution approaches a normal distribution, no matter the underlying distribution (Lumley et al., 2002). With 169 participants in each group in this present study, it is concluded that the independent-samples t- tests are robust to violations of normality.

To further mitigate any issues arising from the assumptions upon which the t-test is based (normality and homogeneity), Mann-Whitney U tests, which are non-parametric tests, were used to confirm the results of all the significant comparisons also found in the t-tests. The Mann-Whitney U tests produced very similar results across all the variables for which significance was found in the t-tests (all $p < .001$), thereby providing further evidence that the t-test results are valid.

Levene's test for variance equality found that most of the measures had evidence of heterogeneity including items pertaining to, intrinsic motivation scale (Motivasi_Intrinsik_1, $F=15.65$, $p<.001$), identified regulation scale identified (Peraturan_yang_Diidentifikasi1, $F=96.12$, $p<.001$), alcohol consumption (Zat_Konsumsi_Hidrasi3, $F=32.31$, $p<.001$) and sleep balance (Keseimbangan_Tidur1, $F=3.25$, $p=.072$, Keseimbangan_Tidur2, $F=0.03$, $p=.874$). Thus, all the t-tests that have been reported used Welch's adjustment.

B. Demographic Characteristics

Table 3. Participant demographic characteristics

Description	Indonesia(n=169)	Burundi(n=169)	Total(n=338)
Gender			
Male	88(52.07%)	82(48.52%)	170(50.3%)
Female	81(47.93%)	87(51.48%)	168(49.7%)
Age			
16-20	71(39.7%)	46(27.22%)	117(34.61%)
21-25	96(53.5%)	93(55.03%)	189(55.92%)
26-above	2(6.8%)	30(17.75%)	32(9.47%)
Academic year			
First Year	32(18.93%)	33(19.53%)	65(19.23%)
Second Year	45(26.63%)	48(28.40%)	93(27.51%)
Third Year	53(31.36%)	83(49.11%)	136(40.24%)
Fourth Year	39(23.08%)	5(2.96%)	44(13.02%)
Socioeconomic status			
Low	18(10.65%)	89(52.7%)	107(31.66%)
Medium	114(67.46%)	74(43.8%)	188(55.62%)
High	37(21.89%)	6(3.5%)	43(12.72%)

C. Comparison: Indonesian Vs Burundian students

The independent samples t-tests conducted showed that Indonesian and Burundian students had significant differences between each other in a variety of areas. Table 4 provides all the results for all variables that had a statistically significant difference between groups.

Table 4. Independent Samples t-Tests: Comparison of Differences Between Indonesian and Burundian Students

Variable	Indonesia Mean (SD)	Burundi Mean (SD)	t	df	p	d	95% CI
Motivation							
Intrinsic Motivation 1	4.43 (0.70)	1.81 (1.17)	24.81*	278.45	<.001	2.7	[2.41, 2.83]
Intrinsic Motivation 2	4.37 (0.69)	3.11 (1.71)	8.93*	222.45	<.001	0.97	[0.98, 1.54]
Intrinsic Motivation 3	4.40 (0.69)	3.18 (1.59)	9.23*	226.78	<.001	1	[0.96, 1.48]
Identified Regulation 1	4.45 (0.64)	2.18 (1.45)	18.87*	224.56	<.001	2.05	[2.03, 2.51]
Identified Regulation 2	4.39 (0.78)	3.27 (1.60)	8.14*	240.12	<.001	0.89	[0.85, 1.39]
Identified Regulation 3	4.46 (0.68)	3.34 (1.50)	8.89*	230.45	<.001	0.97	[0.87, 1.37]
Introjected Regulation 1	4.20 (0.85)	3.08 (1.58)	8.14*	250.67	<.001	0.89	[0.85, 1.39]
Introjected Regulation 2	4.49 (0.69)	3.28 (1.56)	9.29*	226.89	<.001	1.01	[0.95, 1.47]
Introjected Regulation 3	4.22 (0.86)	3.30 (1.56)	6.74*	250.34	<.001	0.73	[0.65, 1.19]
External Regulation 1	4.15 (0.81)	3.24 (1.59)	6.69*	242.78	<.001	0.73	[0.64, 1.18]
External Regulation 2	4.01 (1.00)	1.89 (1.17)	18.1	336	<.001	1.97	[1.89, 2.35]
External Regulation 3	3.78 (1.00)	1.90 (1.03)	17.12	336	<.001	1.86	[1.67, 2.09]
Amotivation 1	3.36 (1.23)	2.00 (1.26)	10.1	336	<.001	1.1	[1.09, 1.63]
Amotivation 2	2.86 (1.36)	2.05 (1.14)	5.99	336	<.001	0.65	[0.54, 1.08]
Physical Activity							
Pre-University Activities 1	4.18 (0.97)	1.57 (0.94)	25.46	336	<.001	2.77	[2.41, 2.81]
Pre-University Activities 2	4.04 (0.96)	3.48 (1.67)	3.79*	265.34	<.001	0.41	[0.27, 0.85]
Current PA 1	3.95 (0.91)	4.23 (0.93)	-2.83	336	0.005	0.31	[-0.48, -0.08]
Current PA 2	3.75 (1.30)	4.26 (0.95)	-4.07*	308.67	<.001	0.44	[-0.76, -0.26]
Current PA 3	3.36 (1.38)	4.17 (1.04)	-6.04*	314.23	<.001	0.66	[-1.07, -0.55]
Current PA 4	3.92 (0.98)	4.31 (1.02)	-3.63	336	<.001	0.39	[-0.60, -0.18]
Current PA 5	4.38 (0.78)	4.44 (0.99)	-0.62	336	0.535	0.07	[-0.25, 0.13]
Lifestyle Factors							
Diet Quality 1	3.56 (1.25)	2.01 (1.09)	12.25	336	<.001	1.33	[1.30, 1.80]
Diet Quality 2	3.28 (1.14)	3.59 (1.67)	-2.01*	294.56	0.045	0.22	[-0.61, -0.01]
Diet Quality 3	3.46 (1.05)	2.14 (1.09)	11.44	336	<.001	1.24	[1.09, 1.55]
Diet Quality 4	3.72 (1.13)	2.94 (1.12)	6.45	336	<.001	0.7	[0.54, 1.02]
Diet Quality 5	3.57 (1.10)	2.70 (1.14)	7.22	336	<.001	0.78	[0.63, 1.11]
Diet Quality 6	3.16 (1.19)	2.96 (1.21)	1.55	336	0.123	0.17	[-0.05, 0.45]
Water Consumption	4.16 (0.81)	4.47 (1.12)	-2.91*	307.45	0.004	0.32	[-0.52, -0.10]

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Use (Drugs) (Cigarette) Consumption	2.00 (1.42)	1.50 (0.91)	3.89*	289.34	<.001	0.42	[0.25, 0.76]
Alcohol	1.59 (1.18)	3.47 (1.52)	-12.75*	317.56	<.001	1.39	[-2.17, -1.59]
Sleep balance	3.55 (1.03)	4.46 (1.07)	-7.99*	335.23	<.001	0.87	[-1.13, -0.69]
Sleep Balance	3.98 (0.92)	4.36 (0.99)	-3.7	336	<.001	0.4	[-0.58, -0.18]

D. Correlation analysis

Table 5. complete summary of the correlations between the key variables in each group.

Variable Pair	Indonesia (n=169)	Burundi (n=169)
Motivation & Physical Activity		
Intrinsic Motivation and Current Physical Activity	.23**	0.09
Intrinsic Motivation and Pre-University Physical Activity	.32**	0.13
Identified Regulation and Current Physical Activity	.39**	0.11
External Regulation and Current Physical Activity	.28**	-0.04
Amotivation and Current Physical Activity	0.09	-0.11
Motivation & Self-reported lifestyle-related items		
Intrinsic Motivation and Sleep Quality	.18*	0.06
Intrinsic Motivation and Diet Quality	.22**	.36**
Intrinsic Motivation and Alcohol Consumption	-0.05	-0.11
Intrinsic Motivation and Smoking	0.1	0.09
Physical Activity & Self-reported lifestyle-related items		
Current Physical Activity and Sleep Quality	.21**	.29**
Current Physical Activity and Diet Quality	.25**	.20*
Current Physical Activity and Alcohol Consumption	-0.08	.26**
Current Physical Activity and Smoking	0.06	-.20*
Self-reported lifestyle-related items Intercorrelations		
Sleep Quality and Diet Quality	.36**	.51**
Sleep Quality and Alcohol Consumption	-.15*	.34**
Diet Quality and Alcohol Consumption	-0.1	.20*

Note: *p < .05; **p < .01 (two-tailed)

E. Interpretation of the findings

1. Characteristics of Participants

Participants included 338 participants with 169 from Indonesia (UNY) and 169 from Burundi (IEPS) as shown in Table 8. The two groups differed significantly on age distribution, academic year, and socioeconomic status.

In terms of age distribution, 17.75% of Burundian respondents were aged 26 and older compared to only 6.80% for Indonesia respondents. For academic year of study, most Burundian respondents were in their third year of university (49.11%) compared to 31.36% of Indonesian respondents; and finally, for socioeconomic status, 52.70% of Burundian respondents reported low SES, while only 10.65% of Indonesian respondents reported so. For Indonesia, 67.46% of respondents indicated they were at medium SES and 21.89% at high SES compared to 43.80% and 3.50%, respectively, at those same SES levels for Burundi respondents.

2. Differences

2.1. Motivation between Groups

Significant differences between motivation dimensions were observed through independent sample t-tests conducted on the two different groups, Indonesian and Burundian students. Significant statistical differences were found on all five subscales of the SMS-II (see Table 4).

Indonesian students showed significantly higher scores on the five different motivational dimensions (intrinsic, identified, introjected, extrinsic, and amotivation) than Burundian students. For example, on the "Intrinsic Motivation 1" test (Table 4), the mean (M) score for Indonesian students ($M = 4.43$, $SD = 0.70$) was substantially higher than the mean score for Burundian students ($M = 1.81$, $SD = 1.17$), with a very large effect ($t = 24.81$, $p < .001$, $d = 2.70$). The same was true for the "Identified Regulation 1" test, where Indonesian students had substantially higher scores than Burundian students (Indonesian students: $M = 4.45$, $SD = 0.64$; Burundian students: $M = 2.18$, $SD = 1.45$; $t = 18.87$, $p < .001$, $d = 2.05$) as well.

That Indonesian students obtained higher amotivation scores than Burundian students is also a noteworthy finding (Indonesian students: $M = 3.36$, $SD = 1.23$; Burundian students: $M = 2.0$, $SD = 1.26$; $t = 10.10$, $p < .001$, $d = 1.10$). Therefore, the assumption that greater motivation means lower amotivation is not accurate since Indonesian students had both greater intrinsic motivation and was more highly amotivated than Burundian students. This may be called "motivational complexity," as Indonesian students live in an environment that has high academic competition, but obtain satisfaction from playing sports while under pressure to perform academically, compete against peers, and be uncertain about careers.

All differences reported remain statistically significant after performing Bonferroni adjustments for multiple comparisons (all $p < .001$).

2.2. Physical Activity between Groups

In Table 4, the results show a considerable reversal in physical activity.

Indonesian students had been participating in significantly more organized sports pre-university than Burundians, as evidenced by Pre-University Activities 1, which showed that Indonesian students had a mean of 4.18 ($SD = 0.97$), compared to Burundian students' mean of 1.57 ($SD = 0.94$), with a very large effect size ($t = 25.46$; $p < .001$; $d = 2.77$), likely due to more exposure to organized sports through access to organized sport clubs/facilities and competition during secondary school in Indonesia.

Burundian students reported having a lot more chances to be physically active while attending university than Indonesian students. For instance, Current Physical Activity 3 (length of time), mean = 4.17 ($SD = 1.04$), was substantially greater for Burundian students than Indonesian students who had a mean of 3.36 ($SD = 1.38$), with an intermediate effect size ($t = -6.04$; $p < .001$; $d = 0.66$). Likewise, Current Physical Activity 2 (frequency), (4.26, $SD = 0.95$, respectively) for Burundian students was much higher than Indonesian students (3.75, $SD = 1.30$) and had a small-to-medium effect size ($t = -4.07$; $p < .001$; $d = 0.44$).

The university environment at IEPS in Burundi appears to act as a catalyst for increased physical activity and assisting students with little previous experience in formal sporting activities (e.g. Physical education classes or organised sports) to engage in a higher level of physical activity. In comparison, while Indonesian students' pre-university sporting histories were considerably more positive than that of Burundian students, there was little change or a decrease in the level of physical activity for Indonesian students at university. This lack of physical activity at university may be attributable to academic commitments, lifestyle changes, and reduced opportunities for organised sport opportunities.

All comparisons made were corrected using Bonferroni correction to account for the multiple comparisons made.

2.3. Self-reported lifestyle-related items

Table 4 provides a comparison of lifestyle-related aspects of both groups which appears to contain many different types of complex and sometimes conflicting patterns.

Diet Quality: In terms of diet quality, H1c was supported in that Indonesian students had significantly greater diets on almost all measures as compared to Burundian students. For example, in Table 4, Diet Quality 1 was rated significantly higher for Indonesian Students ($M = 3.56$, $SD = 1.25$) compared to Burundian students ($M = 2.01$, $SD = 1.09$) with a very large effect size ($t = 12.25$, $p < .001$, $d = 1.33$). In addition, Diet Quality 3 was rated significantly higher for the Indonesian students ($M = 3.46$, $SD = 1.05$) compared to Burundian Students ($M = 2.14$, $SD = 1.09$) at a very large effect size ($t = 11.44$, $p < .001$, $d = 1.24$). These differences are most likely attributable to the food security, variety and knowledge of nutrition that exists in Indonesia, as compared to Burundi.

Hydration: H1c was also supported by Burundian Students consuming more daily water compared to Indonesian Students. As outlined in Table 4, Water Consumption was significantly higher for Burundian Students ($M = 4.47$, $SD = 1.12$) compared to Indonesian Students ($M = 4.16$, $SD = 0.81$) with a small effect size ($t = -2.91$, $p = 0.004$, $d = 0.32$).

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Sleep Quality: In comparison with Indonesian students, Burundian students demonstrated higher sleep quality and greater sleep balance across the two groups. The mean Sleep Quality for Burundian students were significantly higher ($M = 4.46$, $SD = 1.07$) than Indonesian students ($M = 3.55$, $SD = 1.03$), with a large effect size ($t = -7.99$, $p < .001$, $d = 0.87$). The mean Sleep Balance for Burundian students ($M = 4.36$, $SD = 0.99$) was also significantly higher than Indonesian students ($M = 3.98$, $SD = 0.92$), but with a small-to-medium effect size ($t = -3.70$, $p < .001$, $d = 0.40$).

Substance Use: As predicted in Hypothesis 1c, Indonesian students reported higher cigarette consumption, while Burundian students reported higher alcohol consumption than the other group, specifically as follows: Cigarette Consumption for Indonesian students ($M = 2.00$, $SD = 1.42$) was significantly higher than the cigarette consumption of Burundian students ($M = 1.50$; $SD = 0.91$) with a small-to-medium effect size ($t = 3.89$, $p < .001$, $d = 0.42$); whereas, Alcohol Consumption was significantly greater among Burundian students ($M = 3.47$, $SD = 1.52$) than Indonesian students ($M = 1.59$, $SD = 1.18$), with a large effect size ($t = -12.75$, $p < .001$, $d = 1.39$).

The findings from this study suggest that neither Burundian nor Indonesian students were uniformly "healthier." Both types of students exhibited unique protective and risk behaviors, resulting from numerous cultural, economic and environmental influences on their health.

3. Correlation Analysis

3.1. Indonesian Students

Table 5 provides results of correlation analyses conducted on Indonesian students and found to show a consistent and integrated pattern which supports predictions made by Self Determination Theory.

Motivation and Physical Activity: From the results presented in Table 5, it was found that intrinsic motivation is highly correlated with current physical activity ($r = .23$; $p < .01$) and with physical activity prior to entering university ($r = .32$; $p < .01$). A very strong positive correlation ($r = .39$; $p < .01$) between identified regulation and current physical activity also exists. Finally, there was also a statistically significant positive correlation ($r = .28$; $p < .01$) between current physical activity and external regulations.

Motivation and Lifestyle: As indicated in Table 5, intrinsic motivation is positively correlated with sleep quality ($r = .18$; $p < .05$) and with diet quality ($r = .22$; $p < .01$) among Indonesian Students.

Physical Activity and Health Perceptions: As illustrated in Table 5, current physical activity is as well positively correlated with sleep quality ($r = .21$; $p < .01$) and with diet quality ($r = .25$; $p < .01$). Alcohol use does not correlate negatively with physical activity; however, this correlation is not statistically significant ($r = -.08$; ns). Smoking use was also found to not be correlated with physical activity and is not statistically significant ($r = .06$; ns).

Overall, motivation, physical activity, and healthy lifestyle behaviors for Indonesian students form an interdependent and integrated system, i.e., a student with higher levels of motivation will engage in healthier behaviors and also be more likely to perceive themselves as being healthy.

3.2 Burundian Students

Table 5 displays a clear divergence between the correlation analyses of the Burundian students and Indonesian students.

Motivation and Physical Activity: There was no statistically significant correlation between Burundian students' intrinsic motivation and their current physical activity ($r = .09$, $p > .05$), nor was there a statistically significant correlation between identified regulation and current physical activity ($r = .11$, $p > .05$) supporting hypothesis 2b that made predictions on Burundian students that they would not have any significant correlations in regard to these variables. This indicates that in a low-resource context, the environmental demands of functional movement may override motivational factors.

Motivation and Lifestyle: Among Burundian students, intrinsic motivation had a positive correlation with quality of diet ($r = .36$, $p < .01$), but no significant correlation was found with quality of sleep ($r = .06$, ns), alcohol consumption ($r = -.11$, ns) or smoking ($r = .09$, ns).

Physical Activity and Lifestyle: The current physical activity of Burundian students had a positive correlation with quality of sleep ($r = .29$, $p < .01$) and diet ($r = .20$, $p < .05$). Furthermore, a positive correlation was also found between current physical activity and alcohol consumption ($r = .26$, $p < .01$), while a negative correlation was found between current physical activity and smoking ($r = -.20$, $p < .05$).

The unexpectedly positive correlation between PA and alcohol ($r = .26$, $p < .01$) does not appear to have a health explanation but rather may reflect a link between alcohol use within the context of social integration; peer support; and socioeconomic status which also predict physical activity participation, rather than alcohol being specifically associated with an improvement in health. The negative correlation for smoking and PA ($r = -.20$, $p < 0.05$) suggests that more students who are physically active in Burundi do not smoke, thus producing a positive health outcome.

F. Discussion

This manuscript involved comparisons of motivation, physical activity, and self-reported health-related behaviours of sports science students at universities in Indonesia (UNY) versus those in Burundi (IEPS). The analysed results demonstrated that socioeconomic factors, institutional variables, and cultural context are significant influences on both motivational processes and health behaviours among university students. In this paper, we first presented an overview of the results and the methods used for hypothesis testing, before providing a discussion of the findings for each of the identified domains of research and their relationship to existing theories.

Table 5. Hypothesis Testing Summary

Hypothesis	Prediction for Indonesia	Prediction for Burundi	Actual Finding	Supported?
H1a (Motivation)	Significantly higher on all subscales	Significantly lower on all subscales	Indonesians higher on ALL subscales ($d = 0.73$ to 2.70)	Yes
H1b (Physical Activity)	Higher pre-university PA; lower current PA	Lower pre-university PA; higher current PA	Pre-university: Indonesia higher ($d = 2.77$); Current: Burundi higher ($d = 0.66$)	Yes
H1c (Diet Quality)	Higher diet quality	Lower diet quality	Indonesians higher ($d = 1.33$)	Yes
H1c (Hydration)	Lower water consumption	Higher water consumption	Burundians higher ($d = 0.32$)	Yes
H1c (Sleep)	Lower sleep quality	Higher sleep quality	Burundians higher ($d = 0.87$)	Yes
H1c (Smoking)	Higher smoking	Lower smoking	Indonesians higher ($d = 0.42$)	Yes
H1c (Alcohol)	Lower alcohol consumption	Higher alcohol consumption	Burundians higher ($d = 1.39$)	Yes
H2a (IM-PA Correlation)	Significant positive	Not applicable	$r = .23^{**}$ to $.39^{**}$	Yes
H2b (IM-PA Correlation)	Not applicable	Non-significant	$r = .09$ to $.11$ (ns)	Yes
H3a (PA-Sleep)	Positive correlation	Positive correlation	Indonesia: $r = .21$; Burundi: $r = .29$	Yes
H3a (PA-Diet)	Positive correlation	Positive correlation	Indonesia: $r = .25^{**}$; Burundi: $r = .20^*$	Yes
H3b (Smoking-PA)	Non-significant	Negative correlation	Indonesia: $r = .06$ (ns); Burundi: $r = -.20^*$	Yes
H3c (Alcohol-PA)	Non-significant	Positive correlation	Indonesia: $r = -.08$ (ns); Burundi: $r = .26^{**}$	Yes

All the hypotheses were confirmed (Table 5). Specifically, H2b was confirmed as originally predicted: that is, motivation and physical activity (PA) were not found to be significantly correlated in Burundi ($r = .09$, ns). This means that in low-resourced settings, environmental constraints for functional movement take precedence over motivational factors. The alcohol-PA correlation in Burundi ($r = .26^{**}$, $p < .01$) was unexpectedly found to be positive, and this finding provides support for crosscultural difference as originally hypothesized in H3c.

1. Motivation

Indonesian students had a statistically significant advantage over Burundian students in each of the five motivation scales of the SMS-II (see Table 4). Significant effect sizes were indicated for each of the intrinsic motivation and four types of regulation scales. For example, the intrinsic motivation scale indicated a very large effect size ($d = 2.70$; $p < .001$), and the amotivated

regulation scale also yielded a large effect size ($d = 1.10$; $p < .001$). The co-occurrence of both high intrinsic motivation and high amotivation might at first glance seem contradictory, but using a theoretical lens, this contradiction can be resolved.

Amotivation represents a lack of contingencies between one's behaviors and the outcomes of those behaviors (Ryan & Deci, 2000, 2017), according to Ryan and Deci's Self-Determination Theory (SDT). Unlike intrinsic motivation, which represents enjoyment derived from the activity engaged in, amotivation does not label an individual's enjoyment of that activity until there is a negative experience. Therefore, some individuals can derive intrinsic motivation from a given activity while amotivated by the long-term value or purpose of continuing to engage in that activity while they are experiencing amotivation. The existence of both high intrinsic motivation and high amotivation is most likely in highly competitive environments (e.g., academic learning) characterized by both high academic performance demands and occupational ambiguity (Curran & Hill, 2019).

Although students find pleasure in participating in sports, they may also be deterred from continuing to pursue their academic career paths due to the stress they feel from having to compete against other students (Gustafsson et al., 2017). Perfectionistic athletes are said to experience both enjoyment and exertion as the result of their desire to reach their performance target; they are also believed to feel amotivation when conditions for experiencing possible success in the future through either continuing to participate in their sport or continuing to pursue their education through higher education become jeopardized due to the pressures of competing against other student athletes. Intrinsic motivation may develop when an athlete feels that his or her coach is providing autonomy support and providing them with the opportunity to be successful; however, this may be undermined by perfectionistic expectations and/or outside pressures, including those created by competing against others (Ntoumanis, 2005).

On the other hand, Burundian students may be lower in overall motivation but may have greater clarity in their motivation for education (see (ABP, 2022)), because their view of education is as a clear step towards economic growth. Burundian students will typically have less internal conflict about the reason for going to school when the primary motivation for education is clearly established as the pathway to economic growth. This interpretation is consistent with research on the relationship between educational resilience in low-income contexts: individuals from disadvantaged backgrounds often develop a clear idea about their education when viewed as a rare opportunity for vertical mobility through education (Ungar, 2018; Anagnostaki et al., 2016). Another study also found that students from low-resourced backgrounds continue to be highly focused on economic security as their source of extrinsic motivation for education, which provides a clear purpose for their education even though it does not generate the highest level of intrinsic interest (Oketch, 2014).

2. Physical Activity

We see a dramatic shift in the level of activity reported by students prior to entering university (see Table 4). Indonesian participants had much greater rates of participating in organized physical activity through their student experience, due to having increased access to sport club systems, facilities and competitive opportunities while they were in high school (Rustandi et al., 2021). This finding matches existing research that shows early access to organized physical activity will lead to increased levels of participation by youth (Telama et al., 2005) and Malina, 2001). The National Sport System of the Republic of Indonesia, as written in the National Law on Sport Number 3 of 2005 has made formal provisions for youth in pursuing athletic careers by providing pathways for youth to participate in sport leading to opportunities for post-secondary education and careers in sport. It is likely that these opportunities and structures in the National Sport System of Indonesia contribute to why Indonesian youth have high rates of participation in physical activity prior to entering university (Rustandi et al., 2021).

We saw very different findings with Burundian students who had much higher rates of physical activity at their current stage versus Indonesian students who had greater last year greater than Burundian participants. This finding can be explained by using the Ecological Systems Theory of Bronfenbrenner (Bronfenbrenner, 1979). For Burundian students, their university experience (the new mesosystem) has the environment structured around the importance of recreational and competitive sport, providing support from coaches and peers while being able to participate in multiple sports does not exist in their previous chronosystem (childhood/adolescence limited opportunity to engage in recreational or competitive sport). The changes in their new mesosystem provide them with an environment to rapidly increase their level of participation in physical activity (sport or recreation), even if they have never formally participated in either sport or recreation prior to entering university.

Conversely, Indonesian students may have an "activity plateau" or "activity decline" as a result of transitioning from sport to university. The transition from sport to university typically creates competing academic obligations, potential lifestyle changes, and potential burnout for early-specialized athletes. Research showed that students drop out of organized sport through the transition to university at a rate of 30-50% (Crane & Temple, 2015 and Balish et al., 2014). In addition, Deliens and colleagues (2015) found that many students experience a decline in their physical activity involvement because of time constraints, academic pressures, and a limited number of organized sport opportunities. Deforche and colleagues (2015) confirmed that many students

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transition from high school to university experience a greater decline in their physical activity levels compared to students who were regularly active prior to transitioning to university.

The implications of this finding are significant from a theoretical perspective. The motivation-behavior relationship will depend on the context of the environment. Intrinsic motivation can predict the amount of PA engagement in high-resource contexts, but in low-resource contexts (like Burundi), the environmental demand for functional movement will determine how much an individual is physically active, supporting Hypothesis 2b of Self-Determination Theory (Ryan & Deci, 2017). The above findings support prior research from Adams and associates (Adams et al., 2019), who stated that health behavior models based on WEIRD (western-educated-industrialized-rich-democratic characteristics) populations do not transfer to low-resource population.

3. Lifestyle behavior

Those results are complex in nature (see Table 4), making it difficult to unambiguously categorize one of the groups as 'healthier'.

Diet quality: Indonesian students reported much higher overall diet quality for most items surveyed than did Burundian students. This would likely be attributed to Indonesia being much more food secure with a wider variety of food available to them and access to nutritional education (Jati et al., 2012; Keding, 2013). A researcher provided evidence that individuals who eat higher quality diets tend to perform better academically and athletically, indicating that Indonesian students may have a nutritional advantage for both academic learning and participation in athletics (Burrows et al., 2017). The majority of foods listed in the typical Indonesian diet contain a large amount of carbohydrate from rice but also higher amounts of fat from the frying of many foods, which may lead to cardiovascular health complications in the long term (Ismail et al., 2021). Comparatively, most foods listed in the typical Burundian diet consist of beans, sweet potatoes, cassava, and goat meat. The higher fiber content of the typical Burundian diet may be beneficial in providing energy for athletic performance; though, it is possible that this diet may not provide as many calories for individuals participating in athletics (Purcell, 2013).

Sleeping quality: Compared to students from Indonesia, those from Burundi reported much better sleep quality; therefore, sleep is likely one of the highest correlates of perceived health status in both locations. These results suggest that sleep acts as a protective factor for everyone (Cappuccio et al., 2010; Watson et al., 2015). Prior studies have shown that lack of adequate sleep reduces cognitive abilities, impairs the ability to regulate emotions, negatively impacts one's metabolic rate and increases the likelihood of developing chronic disease (Cappuccio et al., 2011; Vestergaard et al., 2024). Especially in low-resourced environments, where access to other forms of health resources (e.g., food and exercise) are limited; getting enough sleep may be even more crucial than in other places. Interventions promoting good sleep hygiene can provide significant positive health outcomes with little or no monetary cost in either location (Lavanya & Geetha, 2019).

Substances Use: The Indonesian students had the highest percentage of men who reported using cigarettes. Indonesia has high rates of male smokers - almost 2/3 of Indonesian men smoke daily (Triyana & White, 2017). This smoking pattern is similar to this sample of Indonesian enrolled students. Burundian students were more likely to report consuming alcoholic beverages reflecting East African cultural tradition of communally consuming alcohol. In addition, traditional beer made from sorghum or banana has always played an integral role in social life as well as during ceremonial occasions (Nsabimana et al., 2025).

An unexpected positive correlation between alcohol and physical activity (PA) was found in Burundi which may be due to ongoing health issues (Kim & Durden, 2007). Alcohol use could be a marker for social connection, peer relationships, male gender or high socioeconomic status, and all these markers are predictors for how much physical activity people participate in – this means that physical activity is not increased by alcohol use. The presence of these markers in Burundi supports the findings that moderate consumers of alcohol appear to create positive relationships with others and participate in more physical activities (Lundsberg et al., 2015). Further, it is important to interpret this data correctly in the sense of it representing the effects of alcohol on health; thus, the findings do not indicate alcohol consumption is associated with better health outcomes rather, they are linked through shared social determinants. Different cultural biases on self-reporting may be another explanation for this result where respondents in Burundi who had more positive perceptions about their health were able to give more accurate reports for alcohol consumption; conversely respondents from Indonesia (Muslim country) may report fewer alcohol use cases as there is a larger fear of being judged negatively.

4. Correlation structures: Two different models of health behaviors

One of the main findings in this study that has opened new avenues for further research is the underlying differences in correlation patterns between the two countries, as shown in Table 5.

In Indonesia, motivation, physical activity, and lifestyle choices are highly interrelated as part of an overall system. There is a strong connection between motivation (whether it's intrinsic, identified, or even through external regulation) and a person's ability to maintain healthy behaviors. People who are intrinsically motivated to engage in physical activity are also more likely to have

identified regulations when it comes to adhering to physical activity. Individuals who have higher levels of intrinsic motivation will also tend to have higher diet qualities and sleep qualities. These findings support predictions from SDT (Ryan & Deci, 2017) and reflect findings from WEIRD populations. The research investigated the link between self-determined regulation and weight control, identifying that individuals with higher degrees of autonomous motivation are also more likely to be able to sustain longterm changes in their health behaviors in high-resource contexts (Teixeira et al., 2012).

In contrast, the relationship between motivation and behavior in **Burundi** is much less clear — the motivation-behavior relationship may be missing altogether. There is no relationship between intrinsic motivation and a person's level of physical activity, nor is there a relationship between intrinsic motivation and how well a person sleeps. Rather, a person's sleep quality plays a role in determining their overall health regardless of their level of motivation. These relationships are consistent with findings from similar investigations in low-income countries, where structural factors often outweigh individual psychological factors when considering health outcomes (Marmot, 2017).

The finding holds significant implications for health behavior theory. There are numerous models of health behavior that have been developed in high income countries. For instance, the Theory of Planned Behaviour (Ajzen, 1991), the Health Belief Model and the Self Determination Theory (Ryan & Deci, 2000) all assert that an individual's attitudes and motivations are the primary drivers of behavior. However, in low resource settings, the individual's psychological factors may not always be as important or dominant as the structural determinants of their behaviors. Economically disadvantaged individuals live in conditions of insufficient food, unsafe neighborhood and lack of financial security where their basic needs are not reliably satisfied. While models of health behavior have been developed and established for decades; there has been very little research on their applicability to low-income populations or developing countries. Adams et al. (2019) conducted a review of the literature related to Western models of health behavior and determined that they were of questionable relevance to populations that are not WEIRD (Western, Educated, Industrialized, Rich and Democratic). They concluded that there is a need for more research examining how structural and cultural contexts limit individual capacity for health behaviors.

5. Institutional contexts

The health trajectories are shaped by the institutional environment, which can be seen in the different ways in which UNY and IEPS have contrasting trajectories. For example, students at UNY have access to modern facilities, organized clubs and competitive opportunities, which contribute to high levels of motivation but can also create academic stress and disrupt sleep. In contrast, while IEPS has limited access to resources, its institutional environment fosters an environment that allows students to have huge increases in physical activity and have improved perceptions of health.

This finding mirrors research concerning resiliency in educational institutions (Ungar, 2018), which shows that institutions can provide "turning points" in an individual's life trajectory, especially for students from underprivileged backgrounds. As can be seen in Table 4, students attending university in Burundi reported larger increases in both mental and physical health since they started university than students at UNY.

Research conducted by Ryan and Deci (2017) indicates that the structured programs offered by IEPS provide the necessary support of autonomy, competence, and relatedness, which can help to develop motivation; this is especially true when motivation levels are low at the beginning. Similarly, Houlihan (2005) conducted research on how training and skill acquisition can lead to creating patterns of upward movement in the sport system through sport development in low-resource settings. Additionally, research investigating first-generation university students in developing countries shows that post-secondary education can provide access to resources and opportunities that may not have been available before (Houlihan, 2005).

Therefore, it is likely that the most effective environmental interventions (e.g., increasing access to facilities, coaching and peer support) would produce a greater impact than motivation-based interventions in low-resource environments. Research by García-Laguna et al. (2024) also supports this idea by showing how some structured interventions for health promotion in university settings have been found to impact students' levels of physical activity through addressing environmental barriers.

6. Limitations

The following limitations need acknowledgment. First, because the study used a cross-sectional design, it was not possible to determine causal relationships between the variables. Longitudinal studies are necessary to determine temporal precedence between the variables and identify critical periods for intervention.

Second, all variables were measured using self-report questionnaires, which may have introduced some response bias, including social desirability and recall bias. The lifestyle-related questionnaire did not receive full psychometric validation (e.g., no confirmatory factor analyses, no test-retest reliability), and therefore the results should be interpreted as exploratory in nature.

Third, the measurement invariance of the scales was not formally assessed across the Indonesian and Burundian samples and, without evidence of configural, metric, and scalar invariance, cross-cultural comparisons may not reflect true differences in the

underlying constructs but rather reflect differential item functioning. Thus, all comparisons between groups should be made with caution.

The fourth limitation of this study refers to how the independent variable (socioeconomic status) was assessed. Socioeconomic status was assessed using a simple three-category self-report scale (low/medium/high), which does not adequately represent the complexity of household economics. Future research should use added indicators of household income, parent's level of education, household material wealth, and food security status.

The fifth limitation is that the results of this study were based on only two universities; therefore, the ability to generalize these results to other colleges/universities in Indonesia, Burundi, or throughout the world is limited. Additional studies at multiple other universities across Southeast Asia and East Africa will be required to determine whether these results reflect greater regional trends.

Finally, the difference in scores for both groups in this study may be partially the result of demographic differences between the two groups (i.e., age, academic class, and SES), even after using ANCOVA to apply statistical controls to the results. Subsequent research should consider utilizing matched samples and/or more sophisticated methods of statistical control over the results.

Practical implications: At Indonesian universities (UNY), while students generally show good dietary quality and enough motivation to stay healthy, they also report poor sleep, they have a higher percentage of smokers and decreasing physical activity levels while attending school. Interventions for Indonesian universities should focus on: (1) education programs for sleep hygiene that have been found to work in universities (2); providing cessation programs for tobacco use since Indonesia has a very high rate of smokers and (3); managing stress related to school by providing stress management programs related to academic pressure and perfectionism. Because of the high correlation of motivation to physical activity, it is possible to use students' current level of motivation to create new structured sports opportunities to help reverse the trend of decreasing physical activity while attending school.

Burundi has institutions for students (IEPS) where students are demonstrating incredible resilience, better perceptions of health (since their university entrance), and higher-quality sleep. However, they also have problems with diet quality, which is 1.33 times lower than Indonesians; and alcohol use, with 1.39 times more consumption than Indonesians. Therefore, some priorities to address these issues include a. maintaining and expanding sport programs that have been established as effective catalysts for promoting physical activity; b. culturally appropriate harm reduction for alcohol use [recognizing the social and ceremonial functions of alcohol]; and c. providing affordable nutrition education that honors Indigenous food traditions.

Due to the lack of a significant correlation between motivation and physical activity (PA) in Burundi, it is likely that environmental restructuring interventions (such as providing better access to facilities and creating structured programs) will be more effective for children in Burundi than motivation-based-programs.

Both institutions should prioritize sleep quality as a universal protective factor within their respective health promotion programs by implementing low-cost sleep interventions that can be implemented in all settings, including low-resource settings. Cross-cultural exchange programs provide opportunities for mutual intercultural learning; therefore, Indonesian and Burundian students will learn resilience and emotional balance from one another and nutritional strategies and motivational techniques, respectively.

7. Theoretical Contributions

This research provided three unique contributions to our understanding of motivation.

The first contribution is that this study confirmed a boundary to Self-Determination Theory; the relationship between motivation and behavior (intrinsic motivation → physical activity) is present in Indonesia but absent in Burundi. This suggests that the assumptions made by the theory regarding the benefits of being autonomously motivated may not be applicable in lowresource settings where basic needs such as food, safety and financial security are highly variable. This finding responds to the need for empirical studies of the applicability of SDT across the different cultural and economic contexts.

Secondly, this study revealed an additional construct of motivational complexity, characterized by the simultaneous experience of both high intrinsic motivation and high amotivation, as a representation of the competitive academic environments being investigated rather than as a paradox that needs to be resolved. This contributed to expanding the knowledge base of SDT by acknowledging that people can have genuine fun while also experiencing some form of existential questioning related to their pursuit. Additionally, the findings in this study contribute to the emerging literature about heterogeneous motivation in high-stakes educational environments.

The strongest and most common predictor for how someone thinks about their health is quality of sleep in both nations. The idea of a pyramid or hierarchy of determinants illustrated that fulfilling the basic biological needs, such as obtaining a sufficient amount of sleep, is a prerequisite to fulfilling other, higher level, biological needs i.e., obtaining a healthy diet and engaging in

physical activity; therefore, once the basic needs have been fulfilled, they become increasingly important to overall health. This creates an opportunity for establishing priority health promoters in resource-constrained settings

V. CONCLUSIONS

This research indicated that health behaviors and motivational processes do not exist independently of their socioeconomic, cultural, and institutional environments. In Indonesia, the students are receiving higher-quality resources and motivation; however, they are dealing with high levels of stress, lack of sleep, and tobacco use. While students in Burundi are subject to (extreme) levels of poverty, they are resilient depending on the university, have improved overall health and sleeping appears to be of higher quality. The Burundian students also demonstrate resiliency and improved health perception as they transitioned through college/university; however, both groups have very different issues for which solutions will need to be developed on a contextual basis.

Future research should use longitudinal designs, culturally validated instruments and formal measurement invariance testing when investigating the ways in which institutional and cultural contexts will moderate the motivation-behavior-health relationship. In short, cross-cultural health research should go beyond documenting the differences between groups and instead begin to investigate the structural and psychological factors that create these differences.

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