

Exploring the Positive Feeling of Physical and Mental Energy among Struggling Preclinical Medical Students in Nigeria: A pilot Observational Study

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ABSTRACT

Objective: The pursuit of medical education is reputed to be demanding and research has increasingly shown that successful completion of medical studies entails fostering the mental well-being of medical students. However, medical students' subjective vitality which is a critical component of their mental well-being is grossly underexplored. This study aimed to estimate the positive feeling of physical and mental energy among struggling medical students in Nigeria.

Methods: Academic performance was evaluated through continuous assessment test (CAT) scores in basic physiology. Struggling medical students, defined as those with CAT scores less than 45%, were compared with control counterparts, whose CAT scores were $\geq 50\%$. The impact on physical and mental energy was assessed using the Subjective Vitality Scale (SVS) validated questionnaire. The study was conducted at Nnamdi Azikiwe University, Awka, Nigeria. Statistical comparisons between groups were conducted using the Wilcoxon test. Data were analyzed utilizing SPSS version 26, with a two-sided p-value < 0.05 considered statistically significant.

Results: The study recruited 144 participants, with 19 (18.0%) identified as struggling students and 125 (82.0%) non-struggling students. The mean rank for subjective vitality scale (SVS) among struggling students was 63.13, compared to 73.92 among non-struggling students ($p=0.293$). Struggling students reported significantly lower scores specifically in the domain of feeling alive and vital at the moment compared to their counterparts with higher CAT scores ($P = 0.011$), suggesting diminished vitality. No significant differences occurred in the other six SVS items of struggling medical students when compared to their non-struggling counterparts. Only age of the students significantly predicted their subjective vitality ($\beta = -0.172, t = -2.004, p = 0.047$).

Conclusion: Struggling students reported significantly lower scores on the SVS domain of feeling alive and vital at the moment compared to their counterparts with higher CAT scores. This pilot study underscores the importance of understanding the relationship between academic struggles and the subjective experience of physical and mental energy among preclinical medical students in Nigeria. Further research with larger samples across multiple time points can help explain observed connections between educational challenges and vitality. Supportive interventions for students should be developed using this information.

Keywords: Continuous assessment, Energy, Engagement, Medical students, Subjective vitality

INTRODUCTION

The pursuit of a medical education is renowned for its demanding nature, requiring not only intellectual prowess but also physical and emotional stamina [1]. It is a rigorous journey that demands dedication, resilience, and compassion [1, 2]. In this demanding academic environment, the subjective vitality of medical students emerges as an essential yet under-examined factor. Subjective vitality refers to the positive sense of experiencing both physical and mental energy, acting as a driving force for purposeful actions and optimal performance [2]. It demonstrates having extremely high energy, stamina, physical or mental vigour

[3]. Researchers have noted that vitality is a critical component of the essence of flourishing in life [4]. For example researchers have found that subjective vitality is positively related to life skills, self-efficacy, university adjustment, life satisfaction, happiness, academic performance and psychological well-being [5-8].

Another recent study has demonstrated how students' subjective vitality is positively related to nursing students' self-esteem [9]. Evidence has shown that students with low self-esteem have low subjective vitality [10]. On the other hand, factors that influence students' subjective well-being have been highlighted in the literature. Whereas stress has significant negative association with subjective vitality, adaptability and quality peer relationships have been demonstrated to positively relate to students' subjective vitality [11]. The perceived fulfillment of basic psychological needs enhances students' subjective vitality [12]. Additionally, prosocial traits like gratitude and resilience play a key role in subjective vitality and are recognized as essential factors for sustaining it [13]. Despite its significance in fostering student well-being and academic performance, the subjective vitality of struggling medical students in Nigeria remains a relatively uncharted territory.

Nigeria, like many other countries, grapples with the complexities of medical education, compounded by resource constraints, societal expectations, and systemic challenges. Within this context, medical students navigating academic difficulties may encounter unique barriers to maintaining subjective vitality [13]. The experience of struggling in medical school can precipitate emotional distress, cognitive overload, and physical exhaustion, all of which can undermine subjective vitality and hinder adaptive coping mechanisms [14]. This can be variously assessed using a number of instruments [15-17].

Vitality refers to a sense of aliveness, energy, and motivation [18]. Understanding the combined positive feeling of experiencing physical and mental energy among struggling medical students is paramount for several reasons. Firstly, subjective vitality is intricately linked to motivation, resilience, and academic engagement, making it a critical determinant of student success and well-being. Secondly, by elucidating the factors that contribute to subjective vitality, educators and policymakers can design targeted interventions to support struggling students and cultivate a conducive learning environment [19]. Additionally, although university students consider psychosocial and social sustainability in particular core factors of subjective well-being, research regarding this topic is scarce. Fostering the subjective vitality of medical students is not just about their individual well-being; it is a strategic investment in the quality of care provided to patients, the health of the clinicians, the efficiency of healthcare systems, and the broader societal good.

Vitality plays a key role in thriving and overall well-being, encompassing the physical and mental energy necessary for life. It is linked to motivation and resilience, which drive individuals to pursue goals and overcome obstacles [20, 21]. Subjective vitality, reflecting one's perception of energy and liveliness, is a crucial measure of emotional health [15, 22]. The Subjective Vitality Scale (SVS), originally developed by Ryan and Frederick [15], has been widely used to measure vitality across various populations. Adaptations, such as six-item version [23] and five-item version [17], address item-specific concerns, and a six-item version has been validated for Spanish adolescents [24].

Medical students, particularly in Nigeria, face significant stress and mental health challenges. They experience stressors such as academic pressure, insecurity, and financial hardship, with rates of perceived stress, depression, and psychoactive substance use reaching 60.5%, 33.5%, and 44.2%, respectively [26]. These findings highlight the importance of subjective vitality in promoting resilience among these students. Additionally, age impacts academic performance, with older students performing better due to the "relative age effect" [27]. To support students, faculty mentorship, structured evaluation systems, and career programmes [28], as well as diagnostic assessments with feedback [29], are proposed to improve both academic performance and well-being.

Against this backdrop, this observational, analytical preliminary study sought to estimate the combined positive feeling of experiencing physical and mental energy among struggling medical students in Nigeria.

There is need to promote the wellness of struggling medical students. Through this exploration, we aimed to shed light on the factors that promote or inhibit subjective vitality among struggling medical students, thereby informing evidence-based interventions and fostering student resilience.

METHODS

Study design

A pilot cross-sectional analytical study. The pilot nature of this study allowed the researchers to assess the feasibility of conducting a larger study [30]. It enabled the researchers to test and refine the research methods.

Study site

This study was carried out at the department of physiology, Nnamdi Azikiwe University, Okofia Campus, Nnewi, Nigeria.

Study population

The population of interest in the study was the 266 preclinical students of medicine and surgery class (MBBS class) who are being taught physiology at the department of physiology, Nnamdi Azikiwe University, Okofia Campus, Nnewi, Nigeria. These sets of students are newly exposed to physiology, hence the target of choice. Anecdotal reports revealed that physiology appears to be an area the students struggle most.

Study procedure

In this pilot observational study, all the preclinical medical students that enrolled in the physiology class between November 2023 and April 2024 were invited to participate. After obtaining informed consent, eligible participants were screened based on academic performance and subjective vitality. To assess positive feelings and mental energy, the Subjective Vitality Scale (SVS), a validated self-reported questionnaire, was administered [15-17]. The SVS measures the students' perceived vitality, which reflects their sense of physical and mental energy. Academic performance was evaluated using the first Continuous Assessment Test (CAT) scores in medical physiology. Students who scored below 45% in the CAT were categorized as "struggling medical students," while those who scored 50% or higher were designated as the control group. This classification allowed a comparison of the impact of positive feelings and mental energy between struggling students and their peers with stronger academic performance.

Inclusion and exclusion criteria

Inclusion criteria

Year Two medical students at the College of Health Sciences, Nnamdi Azikiwe University, Okofia, Nnewi Campus, Nigeria, who are newly introduced to physiology, and have given their consent were recruited into the study.

Exclusion criteria

Medical Students who were not in year two, and year two medical students who did not consent were excluded.

Sample size determination

The minimum sample size was calculated using the formula by Fisher [31]: $N = \frac{Z^2 PQ}{d^2}$; where N = sample size; Z = standard normal deviation at 95% confidence interval which is 1.96; d degree of precision set at

0.05; P = proportion of the target population, and a power of 80%. In this instance, 26.8% of graduates reported retaking more than one examination during their studies, as previously documented in Nigeria [32] ($P = 0.268$). The alternate proportion (Q) is calculated as $1 - P$, resulting in a study size of 302 subjects, which applies to populations exceeding 10,000. However, for populations smaller than 10,000, the desired sample size (N_f) was calculated using the formula $N_f = N \div [1 + (N / n)]$, where N_f was the desired sample size for populations under 10,000, N was the desired sample size for populations over 10,000, and n was the estimated study population (266) in this case, which resulted in a sample size of which gave 143.8, which was approximately 144 students.

Ethical consideration

Ethical approval was obtained from Nnamdi Azikiwe University Teaching Hospital, Nnewi Research Ethics Committee: with registration number: (NAUTH/CS/66/VOL.15/VER.3/337/2023/93).

Statistical analysis

The mean, standard deviation or median and interquartile range statistic were adopted for the quantitative data. We used Student's t -tests and Mann-Whitney U tests, where appropriate to determine the SVS, and statistical comparisons between groups were conducted using the Wilcoxon test. The Mann-Whitney U test is a non-parametric alternative to the t -test, which does not assume a normal distribution, and by ranking the data, the Mann-Whitney U test provided a robust comparison of the central tendencies between groups without being affected by outliers [33]. Like the Mann-Whitney U test, the Wilcoxon test did not require normality, making it a robust option for non-parametric data, and so it was an ideal for handling paired data with non-normal distributions and provided insights into the median differences between related groups. Bivariate correlation and logistic regression analyses were used to investigate factors associated academic performance and SVS. All analyses were performed using SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA), with a two-sided p -value <0.05 considered statistically significant.

RESULTS

Socio-demographic Profiles

A total of 144 participants were included in these analyses, of which the struggling medical students constitute 13.2% (19/144) and students that are not struggling with their academics group constituted 86.8% (125/144) of the study group. The socio-demographic profiles of the participants are summarized in Table 1. Most of them were males ($N = 79$, 54.9%), with a majority between 18 and 20 years ($N = 100$, 69.4%). All the participants were single, and majority lives off- campus ($N = 88$, 61.1%). Less than 70% ($N = 98$, 68.0%). of the participants have their parents/ sponsors' monthly income being below 150, 000 naira.

Physical and Mental Energy Impact:

Table 2 shows the comparison of subjective vitality scale (SVS) between struggling students and controls. The Subjective Vitality Scale (SVS) scores, indicative of the subjective experience of physical and mental energy, were significantly lower among struggling medical students compared to the control group. Struggling students reported significantly lower scores on the SVS domain of feeling alive and vital at the moment compared to their counterparts with higher CAT scores ($P = 0.011$), indicative of reduced vitality.

Table 3 and Figure 1 show a correlations between students' performance (score) and SVS score.

Table 4 shows the relationship between Subjective Vitality Scale (SVS) and CAT Scores of the Students. The SVS mean rank for the struggling students was 63.13, whereas the non-struggling group exhibited a mean rank SVS score of 73.92 ($p=0.293$). This finding suggests a disparity in the positive feeling of vitality and energy between the two groups.

Correlation Analysis:

A correlation analysis was conducted to explore the relationship between physical and mental energy (SVS scores) and academic performance (CAT scores) among struggling medical students. A non-significant positive correlation was observed ($r = 0.020$, $p=0.812$), indicating that higher vitality and resilience was not associated with higher academic performance in this group.

Table 5 revealed a significant joint predict powers of students' socio-demographic characteristics on their subjective vitality $F(7, 143) = 2.118$; $p < 0.05$. This explains a total variance of 9.8% in the explanation of the variances accounted for by the predictor variables on the outcome variable. Furthermore, only age of the students significantly predicted their subjective vitality, ($\beta = -0.172$, $t = -2.004$, $p = 0.047$). This explains 17.2% contribution to the variances observed in students' subjective vitality. Other variables did not make significant contributions to the variances as indicated in table 5.

Table 1: Socio-demographic characteristics of the study participants

Socio-demographic Variables n=144		Frequency	Percent
Age Categories	18-20 Years	100	69.4
	21-25 Years	38	26.4
	26-30 Years	6	4.2
Gender	Male	79	54.9
	Female	65	45.1
Marital Status	Single	144	100.0
Course Retake	Yes	4	2.8
	No	140	97.2
Present Course	Medicine and Surgery	144	100.0
Place of Residence	Urban	72	50.0
	Rural	33	22.9
	Semi-Urban	39	27.1
Type of Residence	Lives Off-Campus	88	61.1
	Lives on Campus	56	38.9
Average Guardian/Sponsor Income Monthly	20,000-49,999	31	21.5
	50,000-99,999	29	20.1
	100,000-149,999	38	26.4
	150,000-199,999	6	4.2
	200,000-499,999	10	6.9
	500,000-999,999	17	11.8
	1 million and above	13	9.0

Table 2: Comparison of subjective vitality scale (SVS) between struggling students and controls

SVS	Struggling Students (<50 CAT) n=19	Others (50 and above) n=125	t value	p value
At this moment, I feel alive and vital	3.79±2.299	4.96±1.775	-2.57	0.011
*I don't feel very energetic right now	4.47±1.926	5.21±1.733	-1.695	0.092
Currently, I feel so alive I just want to burst	2.26±1.368	2.59±1.746	-0.784	0.434
At this time, I have energy and spirit	3.79±1.619	4.33±1.891	-1.176	0.241

I am looking forward to each new day	5.37±2.033	5.34±1.651	0.077	0.939
At this moment, I feel alert and awake	4.95±1.929	4.98±1.838	-0.063	0.950
I feel energetic right now	4.42±2.194	4.47±1.974	-0.103	0.918

*data was scored positively; Abbreviations: CAT=Continuous assessment test

Table 3: Correlations between students' performance (score) and SVS score

Variables	Mean	Std. Dev.	N	Pearson Correlation (r)	P value
Score	61.354	10.5476	144	0.020	0.812
SVS	31.50	9.751	144		

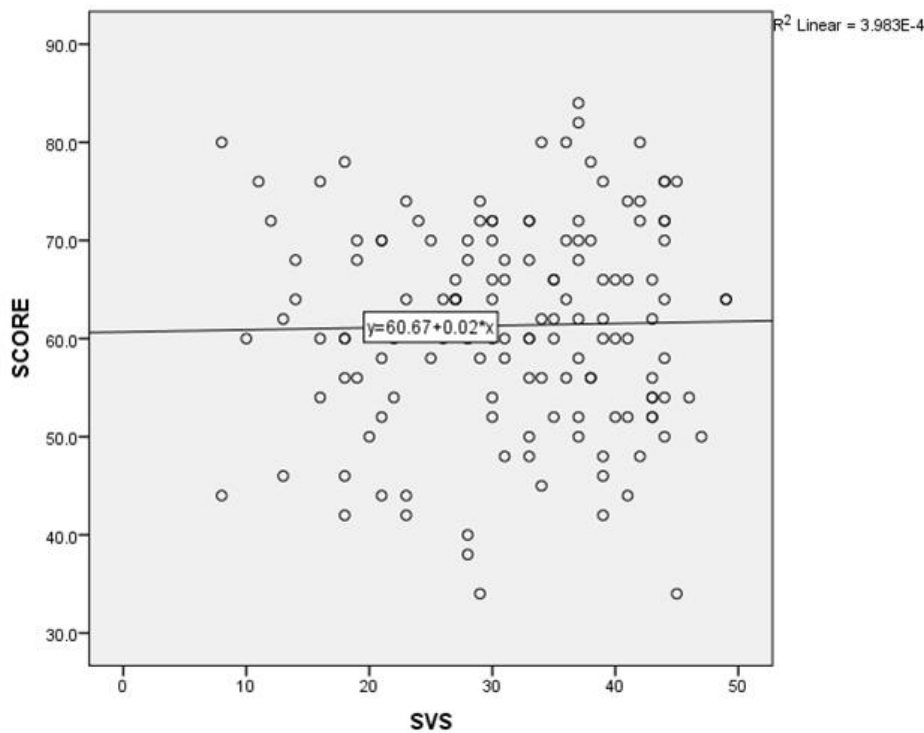


Figure 1: Correlation graph showing the association with SVS and performance in CAT scores.

Table 4: Relationship between Subjective Vitality Scale (SVS) and CAT Scores of the Students

Descriptive Statistics

	N	Mean	Std. Deviation	Percentiles		
				25 th	50 th (Median)	75 th
SVS	144	31.50	9.751	24.25	33.00	39.00
ScoreCat	144	1.87	.340	2.00	2.00	2.00

Mann-Whitney Test

Ranks				
	ScoreCat	N	Mean Rank	Sum of Ranks
SVS	Struggling Students (<45% CAT)	19	63.13	1199.50
	Others (50 and above)	125	73.92	9240.50
	Total	144		

Test Statistics^a

	SVS
Mann-Whitney U	1009.500
Wilcoxon W	1199.500
Z	-1.052
Asymp. Sig. (2-tailed)	.293

a. Grouping Variable: ScoreCat

Table 5: Regression Analysis Showing the Impact of Sociodemographic Characteristics on Subjective Vitality Scale (SVS) Scores

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant) $R = .314^a$, $R^2 = .098$, $p = \mathbf{0.046}^b$	43.603	15.431		2.826	.005
Age	-3.358	1.675	-.172	-2.004	.047
Gender	-1.453	4.935	-.025	-.294	.769
1 Class level	-3.113	4.899	-.053	-.635	.526
Have you repeated any course in the university before?	-.633	.981	-.055	-.645	.520
Place of residence	-1.731	1.697	-.087	-1.020	.309
Type of residence	.133	.429	.027	.309	.758

a. Dependent Variable: SVS

DISCUSSION

The motivation for the present study was that subjective vitality is a critical aspect of medical education in Nigeria, where struggling students may face unique challenges that affect their well-being and academic performance. The principal findings of the study indicated that struggling students had significantly lower scores, especially in the aspect of feeling alive and vibrant at present, compared to peers with higher CAT scores, reflecting lower subjective vitality. However, no significant differences were found in the other six items of the SVS between struggling medical students and their non-struggling counterparts. These items included feelings of low energy at the moment, a strong sense of vitality, having energy and enthusiasm, anticipation for each new day, feeling alert and awake, and a sense of current energetic state. Regression analysis suggested that age was a factor influencing this difference.

This research uncovered that students facing difficulties reported notably lower scores in the SVS category reflecting their current sense of aliveness and vigor compared to those with higher CAT scores, suggesting diminished vitality. This result could be explained from the fact that better academic performance is associated with higher subjective vitality [17]. Students who feel energized and connected to what they are doing are likely to develop interest and put more efforts in their studies. On the other hand, students who are not doing well not their studies are likely to feel sapped of every energy they have resulting to low self-esteem and dissatisfaction with life. Previous studies, including those involving Spanish students, have suggested that reduced subjective vitality may lead to diminished self-esteem [16, 21-24].

In this study, struggling medical students did not show any significant variance in the other six SVS areas when compared to normal controls. These domains include not feeling very energetic right now, feeling intensely alive and bursting with energy, having current energy and spirit, eagerly anticipating each new day, feeling presently alert and awake, and feeling energetic overall. This outcome aligns with earlier research

which suggests that energy levels, or "vitality," may serve as distinct indicators of mental and physical well-being not fully captured by other self-reported health and well-being inquiries [18]. Specifically, individuals scoring high on measures of physical and social well-being may still report low energy levels, while those facing physical and emotional challenges might exhibit high energy and vitality. Notably, in one of the largest vitality studies to date (involving 10,000 participants), researchers observed that many individuals anticipated to have high vitality levels (based on their youth and lack of health issues) actually reported low vitality [20]. The authors suggested that this demonstrates "the ability to live with health, vigour, and vitality is diverse and individualized" [20]. Based on the evidence presented, we contend that vitality is a key component of flourishing in life. In health sciences, vitality is described not only as physical and mental energy but also as "motivation" and "resilience"—the drive to achieve goals and the ability to overcome challenges, respectively [21, 22].

This study found that age is the sole determinant influencing students' SVS performance. This discovery aligns with prior research indicating that older students tend to exhibit better academic performance due to their accumulated experiences and maturation, known as the relative age effect [27]. This effect becomes more pronounced among younger students [27]. These findings suggest potential adjustments in the age requirements for compulsory schooling to accommodate differences in student readiness. Younger students within a school year may encounter greater challenges compared to their relatively older peers [27]. Other studies focusing on academic performance suggested the implementation of faculty mentorship, activity evaluation systems, and career association programs [28] or introduction of diagnostic tests with feedback and remediation in all curriculums [29].

Subjective vitality, which denotes one's conscious perception of energy and liveliness, is utilized to gauge the positive emotional aspect of one's well-being [15, 22]. The SVS was devised to evaluate this concept and has been widely applied across various cultural settings and demographic groups, including university students [5, 22]. Although in the present study, we utilised the seven-item version of SVS, several versions of the SVS have been utilized for assessing subjective vitality: the original seven-item scale developed [27], followed by a six-item model [23] after removing item two, and a five-item model [17] after removing items two and five. Subsequently, the SVS was modified and validated for Spanish adolescents, confirming that the six-item version (excluding item 2) demonstrated the best fit for the Spanish population [24].

This research carries significant clinical implications. Students facing academic challenges reported diminished vitality and resilience compared to those with higher CAT scores, indicating potential implications for their well-being and academic achievement. These findings emphasize the need for targeted interventions aimed at bolstering the vitality and resilience of struggling medical students, ultimately improving their overall academic performance and well-being. Medical students encounter substantial demands, stressors, and pressure to excel, often with limited resources, placing them at elevated risk for mental strain and burnout [25]. Medical training is arduous, compounded by external factors such as insecurity, social issues, and financial hardship, often without adequate university support [26]. A systematic review disclosed alarming rates of perceived stress, depression, and psychoactive substance use among medical students in Nigeria, reaching as high as 60.5%, 33.5%, and 44.2%, respectively [26]. Overall, vitality among medical students is closely tied to their subjective experiences of physical and mental energy, overall well-being, and resilience to stress. Cultivating a sense of vitality can enhance students' ability to navigate the rigors of medical education, promote academic success, and support their overall health and professional development.

Our study has further clinical implications. First, medical education is physically demanding, requiring long hours of studying, attending classes, and participating in clinical rotations. Students with high vitality levels are more likely to possess the physical stamina needed to sustain this demanding schedule. They may feel less fatigued, more alert, and better able to engage in academic and clinical activities without experiencing burnout or exhaustion. Second, vitality extends beyond physical and mental energy to encompass overall well-being. Medical students who feel vital are more likely to experience a sense of fulfilment, purpose, and satisfaction in their academic and personal lives. They may be better able to balance the demands of medical

school with self-care activities, social relationships, and other interests, contributing to a more holistic sense of wellness. Third, medical training can be inherently stressful, with students facing academic challenges, high stakes examinations, and exposure to emotionally taxing preclinical experiences. Students with a strong sense of vitality are better equipped to cope with these stressors. They may exhibit greater resilience, adaptive coping strategies, and a capacity to bounce back from setbacks, reducing their vulnerability to stress-related mental health issues such as anxiety and depression.

This study's strength lies in being the first in Nigeria to compare the collective sense of physical and mental energy among struggling medical students with their high-performing peers. However, there are several limitations worth noting. Firstly, the sample was drawn from a single Nigerian university, potentially introducing bias. Additionally, the struggling medical student group did not have a sufficient number of participants to allow for individual comparisons with each non-struggling counterpart. The generalizability of these findings to other medical and nursing student populations is limited due to the homogeneity of the sample in terms of culture, language, working climate, and organizational structures within one medical campus and university. The participants shared similar sociodemographic and academic contexts, which may have led to a less diverse sample. However, while the concept of subjective vitality is universally relevant, its application and impact on medical students' experiences can vary across cultural contexts. Understanding these cultural differences is crucial for developing effective strategies to support the well-being of medical students globally. Furthermore, the study employed the seven-item version of the SVS without prior testing in the Nigerian population, although research with Spanish university students showed that the six-item version exhibited a better fit than the original seven-item model. Overall, the primary justification for conducting the current pilot cross-sectional analytical study is to lay the groundwork for future research endeavours by assessing feasibility, refining methodologies, and exploring preliminary outcomes, ultimately enhancing the validity and reliability of subsequent studies. Finally, in the current study, the Wilcoxon test and its variation (rank-sum test) were preferred over t-tests because such tests were needed when dealing with non-normally distributed data, ordinal data, or when robustness to outliers and small sample sizes is required.

CONCLUSION

Struggling students exhibited notably lower scores on the SVS domain pertaining to feeling alive and vital in the moment in contrast to their peers with higher CAT scores. However, between-group comparisons showed significantly lower SV scores in the domain of feeling alive and vital, but not in other domains of SVS assessed by the tool used in the study to determine status. This preliminary investigation highlights the critical need to comprehend the connection between academic challenges and the subjective perception of physical and mental energy among medical students in Nigeria. The impact of academic difficulties on the subjective experience of vitality among medical students in Nigeria was found to be significant. The relative age effect, particularly concerning schooling age, may be pertinent, especially for students who have previously underperformed, such as in preschool, or those facing sociocultural disadvantages. Further research employing larger sample sizes and longitudinal designs is warranted to uncover the causal mechanisms and potential interventions aimed at bolstering the vitality and resilience of struggling medical students. While the present study did not test specific interventions, it underscores the need for targeted support to enhance struggling medical students' subjective vitality. Potential interventions include mental health support, peer networks, curriculum adjustments, physical health initiatives, and institutional resources. Future research should evaluate these strategies' effectiveness across cultures. This study addresses a literature gap by examining Nigerian medical students' vitality, aiming to contribute to comprehensive support mechanisms that empower all medical students to thrive.

AUTHORS' CONTRIBUTIONS

GU Eleje, DC Ikwuka, KC Nwosu, LI Eleje, N Sani, JP Niyoyita, KB Okesina, OI Ikwuka, UK Nwanna, VB Archibong, E Twizeyimana, NS Divekar, SI Ogenyi, OM Ochayi, M Bushaku, EJ Ani and EO Nwobodo

were involved in the overall conceptual design and implementation of the project, and overall revision of the manuscript. KC Nwaogu, O Onaadepo, IM Sule, EC Nwangwu, CA Nri-Ezedi, CU Onubogu, AA Onwuegbuna, TO Okonoboh, OM Ogelle, JE Mamah, and DH Wondimu, and U Dimkpa were involved in the writing of this manuscript and overall revision. All the authors were involved in the revision of the manuscript. The authors read and approved the final manuscript.

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Availability of data and materials

Data is provided within the manuscript or supplementary information files.

Ethics approval and consent to participate

An ethical approval was obtained from Nnamdi Azikiwe University Teaching Hospital, Nnewi Research Ethics Committee (**NAUTH/CS/66/VOL.15/VER.3/337/2023/93**). In addition, permissions were obtained from the Provost of the college of Health Sciences. A written informed consent was obtained from each study participant prior to the involvement in the study. The collected data were kept confidential and accessed only by the research team member.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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