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Impact of Self-Efficacy on Fitness and Life Quality Among PE Students

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Abstract

Self-efficacy significantly influences the adoption and maintenance of health behaviors; yet, researchers have not adequately examined its effects on physical fitness and quality of life among physical education students. This correlational study examined the relationship between exercise self-efficacy, cardiorespiratory endurance, and life satisfaction among young physical education students (N=86, ages 18-25) at Muhammadiyah University of East Kalimantan. Participants completed the WHOQOL-BREF quality of life questionnaire, the Exercise Self-Efficacy Scale, and the Multistage Fitness Test for vo2max evaluation. Self-efficacy exhibited significant positive correlations with cardiorespiratory fitness ($r=0.612$, $p<0.001$). The quality of existence had a significant link with self-efficacy ($r=0.578$, $p<0.001$). Regression analysis revealed that self-efficacy accounted for 37.5% of the variance in cardiorespiratory fitness and 33.4% of quality of life ratings. Self-efficacy exhibited a stronger correlation with the physical and psychological dimensions of quality of life ($r=0.593$ and $r=0.602$). It exhibited a tenuous affiliation within environmental and social dimensions. These findings underscore the importance of self-efficacy enhancement measures in physical education curriculum to enhance physical fitness and quality of life among university students, particularly as they acquire lifelong health practices during this crucial developmental phase.

Keywords: Cardiorespiratory fitness; exercise self-efficacy; multistage fitness assessment; physical education; quality of life.

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Introduction

Physical inactivity is recognized as a global public health concern, contributing significantly to the rising prevalence of non-communicable diseases (NCDs). According to the World Health Organization, insufficient physical activity is one of the leading risk factors for global mortality, responsible for approximately 3.2 million deaths annually (World Health Organization, 2020). Despite widespread knowledge about the benefits of regular physical activity, adherence to recommended guidelines remains problematic, particularly among young adults transitioning from adolescence to adulthood (Keating et al., 2018). Recent data indicate that approximately 27.5% of adults and 81% of adolescents globally do not meet recommended physical activity levels (Guthold et al., 2020).

The transition to university life signifies a pivotal phase during which health behaviors are formed, frequently enduring throughout adulthood (Plotnikoff et al., 2015). This life stage is typified by greater autonomy and responsibility for health decisions; nonetheless, evidence indicates a significant decrease in physical activity levels at this time (Leggett et al., 2021). Students of physical education, regardless of their area of specialization, are not exempt from these problems. A research by (Dilorenzo et al., 2022) revealed that merely 62% of physical education majors adhered to the prescribed physical activity guidelines, a troubling statistic considering their prospective roles as health and fitness advocates.

Self-efficacy, characterized as an individual's conviction in their ability to perform actions requisite for achieving particular performance outcomes, has become a crucial psychological factor influencing health behavior (Bandura, 2018). Exercise self-efficacy pertains to an individual's confidence in their capacity to sustain regular physical activity in the face of obstacles and challenges (Voskuil & Robbins, 2015). Numerous research have identified self-efficacy as a crucial predictor of physical activity participation (Kwan et al., 2019; Liu & Lipowski, 2021), but its precise correlation with objective assessments of physical fitness in young adults is still inadequately explored.

Although current studies have examined the correlation between self-efficacy and self-reported physical activity, a notable study deficiency persists in comprehending how self-efficacy correlates with objective assessments of physical fitness, especially cardiorespiratory fitness (CRF). Cardiorespiratory fitness (CRF), frequently assessed via maximal oxygen consumption (vo2max), is regarded as a reliable measure of general health and a significant predictor of illness and death (Ross et al., 2016). In contrast to self-reported physical activity, which can be influenced by recall bias and social desirability, cardiorespiratory fitness (CRF) offers an objective physiological measure of an individual's regular physical activity levels (Zeiher et al., 2019).

The correlation between self-efficacy, physical fitness, and overall quality of life outcomes in university students requires additional examination. Quality of life, which includes physical, psychological, social, and environmental aspects, serves as a comprehensive indicator of well-being that transcends mere physical health. Although evidence indicates that self-efficacy and physical fitness independently enhance quality of life (Zhang et al., 2020), the interplay between these variables is inadequately comprehended, especially concerning young adults in physical education programs.

The Indonesian setting has distinct problems concerning physical activity patterns and health outcomes. The 2018 Basic Health Research (Riskesdas) indicates that 33.5% of Indonesians over the age of 10 engage in inadequate physical activity, with rising rates observed among young individuals (Ministry of Health Republic of Indonesia, 2018). Furthermore, the incidence of obesity and related non-communicable diseases has significantly increased in Indonesia, with 31% of central obesity cases occurring in individuals under 15 years old. These results highlight the pressing necessity for efficacious treatments aimed at modifying physical activity behaviors among Indonesian young adults.

Students in physical education, as prospective health and fitness professionals, provide a significant demographic for research. Comprehending the factors influencing their physical fitness and quality of life is essential for their prospective role in advocating health-promoting physical exercise. Enhancing their self-efficacy may not only improve personal health outcomes but also augment their efficacy as future promoters of physical exercise (Majid et al., 2022). This study is to examine the impact of exercise self-efficacy on cardiorespiratory fitness and quality of life in young adult physical education students at Muhammadiyah University of East Kalimantan, in light of identified research gaps and contextual factors.

This study aims to: (1) examine the impact of self-efficacy on cardiorespiratory fitness; (2) investigate the effect of self-efficacy on quality of life; and (3) delineate the interconnections among self-efficacy, cardiorespiratory fitness, and quality of life in this student population. This study's findings will aid in the creation of focused interventions to improve health outcomes for university students and guide physical education curriculum. Various strategies have been suggested to tackle the issues of physical inactivity and diminished quality of life among university students. Conventional therapies have predominantly concentrated on enhancing physical activity via organized exercise regimens and informative initiatives on health advantages (Fletcher et al., 2018).

Nonetheless, these methods frequently result in restricted long-term efficacy because they neglect to consider the fundamental psychological elements that affect behavior sustainability. Alternative solutions encompass environmental enhancements, including the augmentation of campus recreational facilities, the establishment of peer-support programs, and the incorporation of technology-driven fitness tracking systems (Lewis et al., 2021). Social cognitive therapies have demonstrated potential by concurrently addressing self-efficacy, outcome expectations, and social support (Anderson et al., 2007). Motivational interviewing strategies have been utilized to augment intrinsic motivation for participation in physical exercise (O'Halloran et al., 2014).

Our study solution primarily investigates exercise self-efficacy as a crucial psychological factor that affects physical fitness outcomes and quality of life. This methodology is based on Bandura's Social Cognitive Theory, which asserts that self-efficacy beliefs serve as essential mediators between knowledge and conduct. In contrast to earlier interventions focused on external factors, our study examines the internal psychological mechanisms that promote sustained involvement in physical activity and their subsequent effects on well-being outcomes. This investigation's results indicate that self-efficacy explains 37.5% of the variance in cardiorespiratory fitness and 33.4% of the variance in quality of life scores among physical education students. The findings indicate that interventions aimed at enhancing self-efficacy may be more effective than conventional methods, as they tackle the essential psychological factors influencing health behavior instead of solely offering external motivation or resources.

Method

This research employed a cross-sectional quantitative approach to examine the relationships between exercise self-efficacy, cardiorespiratory fitness, and quality of life. The study population consisted of undergraduate physical education students at Muhammadiyah University of East Kalimantan. Participants were chosen using purposive sampling according to the specified inclusion criteria: (1) active enrollment in the Physical Education program, (2) age between 18 and 25 years (young adulthood), and (3) consent to engage in all study protocols, including physical fitness assessments. The exclusion criteria were acute or chronic medical problems that contraindicate activity testing, current pregnancy, and recent musculoskeletal injuries occurring within the last six months.

The final sample comprised 86 participants (52 males and 34 females) with a mean age of 20.64 ± 1.57 years. The sample size was calculated using G*Power software for multiple regression analysis (effect size $f^2 = 0.15$, $\alpha = 0.05$, power = 0.80, and two predictors), indicating a minimum of 68 individuals is required. The supplementary subjects were incorporated to mitigate potential attrition and to enhance statistical power. Three validated instruments were used in this study, Exercise Self-Efficacy Scale (ESES). Self-efficacy in exercise was assessed with the Exercise Self-Efficacy Scale created by (Marcus et al., 1992) and modified for the Indonesian context.

This 10-item measure evaluates participants' self-efficacy regarding their capacity to persist in exercising despite numerous obstacles (e.g., "I am confident I can exercise even when fatigued after school"). Every item is evaluated using a 5-point Likert scale, with 1 indicating 'not at all confident' and 5 signifying 'very confident.' The overall score varies from 10 to 50, with elevated scores signifying enhanced exercise self-efficacy. The Indonesian version of the scale had strong internal consistency (Cronbach's $\alpha = 0.87$) and test-retest reliability ($r = 0.82$) in first testing with 30 students from the same demographic. Cardiorespiratory fitness was evaluated via the multistage fitness test (MFT), commonly referred to as the 20-meter shuttle run test.

This standardized field test assesses maximal aerobic capacity (vo2max) by progressively intensified exercise (Leger et al., 1988). The test necessitates participants to sprint between two lines spaced 20 meters apart in synchrony with aural cues. The intervals between signals diminish throughout time, necessitating participants to augment their running speed. The test persists until the participant fails to reach the line in time with the auditory signal on two successive occasions or voluntarily ceases owing to exhaustion. Grading Norms and Scoring, the quantity and intensity of shuttles attained were documented and translated into predicted vo2max values utilizing standardized prediction algorithms verified for young people (Ramsbottom et al., 1988). The fitness levels were categorized according to established norms for young adults aged 18-25 years as follows, look at table 1.

Table 1. MFT fitness level classifications

Fitness Level	Males (VO_2max ml/kg/min)	Females (VO_2max ml/kg/min)
Excellent	≥52.0	≥45.0
Good	47.0-51.9	40.0-44.9
Average	42.0-46.9	35.0-39.9
Fair	37.0-41.9	30.0-34.9
Poor	<37.0	<30.0

The scoring protocol followed the standardized procedures where each completed shuttle contributes to the final level and stage achieved. The vo2max estimation formula used was: vo2max = 15.3 × (final speed), where final speed = 8.0 + 0.5 × (level - 1). The MFT has strong validity relative to direct laboratory assessments of vo2max ($r = 0.90$) and exhibits outstanding test-retest reliability ($r = 0.95$) (Mayorga-Vega et al., 2015). The quality of life was evaluated utilizing the WHOQOL-BREF, a condensed variant of the WHOQOL-100 tool created by the World Health Organization. This 26-item questionnaire assesses quality of life across four domains: physical health, psychological well-being, social interactions, and environment.

Participants answer each item using a 5-point Likert scale, with domain scores converted to a 0-100 scale for clarity, where elevated values signify an improved quality of life. Assessment norms and scoring framework, the WHOQOL-BREF scoring follows WHO standardized procedures with domain scores calculated using the following formula: Domain score = (Domain mean - 4) × (100/16). Table 2 show the quality of life interpretations are based on established norms for young adults.

Table 2. WHOQOL-BREF quality of life assessment norms

QoL Level	Overall Score	Physical Health	Psychological	Social Relations	Environmental
Very High	81-100	81-100	81-100	81-100	81-100
High	61-80	61-80	61-80	61-80	61-80
Moderate	41-60	41-60	41-60	41-60	41-60
Low	21-40	21-40	21-40	21-40	21-40
Very Low	0-20	0-20	0-20	0-20	0-20

Domain-Specific Assessment Criteria:

- Physical Health Domain (7 items): Assesses pain, energy, sleep, mobility, daily activities, work capacity, and medical treatment dependence
- Psychological Domain (6 items): Evaluates positive feelings, concentration, self-esteem, body image, negative feelings, and spirituality
- Social Relations Domain (3 items): Examines personal relationships, social support, and sexual satisfaction
- Environmental Domain (8 items): Measures safety, physical environment, financial resources, information access, leisure opportunities, home environment, health services, and transportation

The Indonesian adaptation of the WHOQOL-BREF exhibits robust psychometric characteristics, with satisfactory internal consistency across domains (Cronbach's α between 0.74 and 0.83), and has been validated for Indonesian young adult cohorts (Salim et al., 2007). Scores above 61 indicate good to excellent quality of life, while scores below 41 suggest areas requiring intervention. Research procedures, the research was conducted in three phases:

Phase 1: Preparation and Recruitment

Participants were enlisted via announcements in physical education classrooms after obtaining necessary ethical approval from the university. Interested students received comprehensive information regarding the study's objectives and methodologies, and formal informed consent was acquired from all participants. Demographic data (age, gender, academic year) and medical history were gathered to verify eligibility.

Phase 2: Data Collection

Data gathering occurred in a sports science laboratory and an indoor sports facility at the university. Participants initially completed the questionnaires (ESES and WHOQOL-BREF), subsequently followed by anthropometric measurements (height, weight, and body mass index). The Multistage Fitness Test was conducted following defined protocols by certified research assistants. Rest intervals were allocated between assessments to mitigate fatigue effects. All MFT tests were performed in the early hours (8:00-11:00 AM) to mitigate diurnal fluctuations in performance. Participants were directed to refrain from vigorous physical activity for 48 hours prior to testing, to abstain from caffeine and alcohol for a minimum of 12 hours before testing, and to adhere to their regular diet. The ambient temperature was sustained between 20-24°C throughout all testing sessions.

Phase 3: Data Analysis

Data were analyzed utilizing SPSS version 25.0 (IBM Corp., Armonk, NY). Descriptive statistics, including means, standard deviations, and frequencies, were computed for all study variables. The Kolmogorov-Smirnov test was employed to evaluate the normality of data distribution. Pearson's correlation coefficients were calculated to analyze the bivariate correlations among self-efficacy, cardiorespiratory fitness, and quality of life domains. Linear regression analyses were used to assess the impact of self-efficacy on cardiorespiratory fitness and quality of life, respectively. A multiple regression analysis was conducted to investigate if cardiorespiratory fitness influences the association between self-efficacy and quality of life. The Sobel test was employed to evaluate the significance of the mediation effect. Statistical significance for all analyses was established at $p < 0.05$.

Result

Table 3 delineates the demographic attributes of the study participants. The predominant demographic of participants was male (60.5%), with an average age of 20.64 ± 1.57 years. The average BMI was 22.42 ± 2.68 kg/m², with the majority of individuals (69.8%) categorized as normal weight.

Table 3. Demographic characteristics of participants (N=86)

Characteristic	n (%) or Mean ± SD
Gender	
Male	52 (60.5%)
Female	34 (39.5%)
Age (years)	20.64 ± 1.57
BMI (kg/m²)	22.42 ± 2.68
Underweight (<18.5)	7 (8.1%)
Normal weight (18.5-24.9)	60 (69.8%)
Overweight (25.0-29.9)	16 (18.6%)
Obese (≥30.0)	3 (3.5%)
Year of Study	
First year	24 (27.9%)
Second year	31 (36.0%)
Third year	19 (22.1%)
Fourth year	12 (14.0%)

Table 4 presents the descriptive statistics for the primary study variables. The average exercise self-efficacy score was 36.28 ± 6.42 out of a maximum of 50 points. The average estimated vo2max from the multistage fitness test was 41.67 ± 7.35 ml/kg/min, exhibiting significant gender disparities (males: 45.23 ± 6.11 ml/kg/min; females: 36.19 ± 5.43 ml/kg/min; $p < 0.001$). The overall quality of life score was 71.34 ± 9.78, with the greatest mean score in the social relationships domain (74.62 ± 12.45) and the lowest in the environmental domain (68.43 ± 10.21).

Table 4. Descriptive statistics of main study variables (N=86)

Variable	Mean ± SD	Range
Exercise Self-Efficacy (ESES)	36.28 ± 6.42	22-48
Cardiorespiratory Fitness (VO_2max, ml/kg/min)	41.67 ± 7.35	28.2-56.8
Male	45.23 ± 6.11	32.6-56.8
Female	36.19 ± 5.43	28.2-48.5
Quality of Life (WHOQOL-BREF)		
Overall Quality of Life	71.34 ± 9.78	45.2-92.3
Physical Health Domain	72.51 ± 10.43	48.6-93.4
Psychological Domain	70.87 ± 11.25	42.7-90.2
Social Relationships Domain	74.62 ± 12.45	41.5-95.8
Environmental Domain	68.43 ± 10.21	44.8-88.7

The pearson correlation coefficients among the study variables are displayed in table 5. Self-efficacy in exercise shown substantial positive relationships with cardiorespiratory fitness ($r = 0.612$, $p < 0.001$) and overall quality of life ($r = 0.578$, $p < 0.001$). The psychological domain ($r = 0.602$, $p < 0.001$) and the physical health domain ($r = 0.593$, $p < 0.001$) exhibited the most robust associations with self-efficacy among the quality of life

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categories. Cardiorespiratory fitness exhibited a substantial association with overall quality of life ($r = 0.516$, $p < 0.001$), with the most pronounced domain-specific correlation identified in the physical health area ($r = 0.583$, $p < 0.001$).

Table 5. Pearson correlation coefficients between study variables (N=86)

Variable	1	2	3	4	5	6	7
1. Exercise Self-Efficacy	1						
2. Cardiorespiratory Fitness	0.612**	1					
3. Overall Quality of Life	0.578**	0.516**	1				
4. Physical Health Domain	0.593**	0.583**	0.842**	1			
5. Psychological Domain	0.602**	0.498**	0.864**	0.721**	1		
6. Social Relationships Domain	0.465**	0.389**	0.776**	0.595**	0.627**	1	
7. Environmental Domain	0.431**	0.372**	0.812**	0.584**	0.613**	0.542**	1

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

Simple linear regression analysis indicated that exercise self-efficacy strongly predicted cardiorespiratory fitness ($\beta = 0.612$, $p < 0.001$), accounting for 37.5% of the variance in vo2max values ($R^2 = 0.375$, $F(1,84) = 50.41$, $p < 0.001$). The regression equation is as follows: vo2max = 19.73 + 0.604 × Self-Efficacy. This indicates that for each one-point increase in self-efficacy score, vo2max increased by 0.604 ml/kg/min. Exercise self-efficacy also significantly predicted overall quality of life ($\beta = 0.578$, $p < 0.001$), explaining 33.4% of the variance in quality of life scores ($R^2 = 0.334$, $F(1,84) = 42.09$, $p < 0.001$). The regression equation was: Quality of Life = 40.54 + 0.849 × Self-Efficacy. This indicates that for each one-point increase in self-efficacy score, overall quality of life increased by 0.849 points. Table 6 presents the results of regression analyses for self-efficacy predicting each quality of life domain. Self-efficacy was a significant predictor for all domains, with the strongest predictive relationship observed for the psychological domain ($R^2 = 0.362$) and the physical health domain ($R^2 = 0.351$).

Table 6. Regression analyses for self-efficacy predicting quality of life domains

Dependent Variable	B	SE	β	t	p	R^2
Physical Health Domain	0.964	0.160	0.593	6.74	<0.001	0.351
Psychological Domain	1.056	0.169	0.602	6.89	<0.001	0.362
Social Relationships Domain	0.901	0.196	0.465	4.81	<0.001	0.216
Environmental Domain	0.684	0.163	0.431	4.37	<0.001	0.185

A multiple regression analysis was undertaken to investigate if cardiorespiratory fitness influences the link between self-efficacy and quality of life. In the presence of both self-efficacy and cardiorespiratory fitness as predictors of quality of life, both variables retained statistical significance (self-efficacy: $\beta = 0.432$, $p < 0.001$; cardiorespiratory fitness: $\beta = 0.238$, $p = 0.027$), although the coefficient for self-efficacy diminished relative to the simple regression model (from $\beta = 0.578$ to $\beta = 0.432$). The Sobel test demonstrated a significant

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partial mediation effect (z = 2.38, p = 0.017), showing that cardiorespiratory fitness partially mediates the association between self-efficacy and quality of life. The mediation model accounted for 38.7% of the variance in quality of life ($R^2 = 0.387$, $F(2,83) = 26.17$, $p < 0.001$).

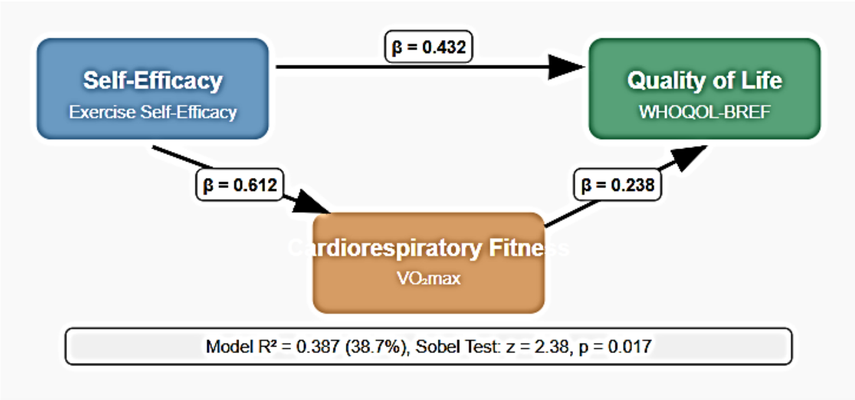

Figure 1. Illustrates the relationships between variables in the mediation model.

[Note: Figure would show a mediation model with paths from Self-Efficacy to Cardiorespiratory Fitness to Quality of Life, with a direct path from Self-Efficacy to Quality of Life]

Discussion

This study investigated the relationships between exercise self-efficacy, cardiorespiratory fitness, and quality of life among physical education students, addressing the research objectives outlined in the introduction. The findings provide novel insights into how psychological factors influence physical health outcomes and well-being in this specialized population, with implications extending beyond previous research in several important ways. Our principal research objectives were threefold: to examine the impact of self-efficacy on cardiorespiratory fitness, to investigate its effect on quality of life, and to delineate the interconnections among these variables.

The findings thoroughly fulfill each target, demonstrating that exercise self-efficacy is a substantial predictor of physical fitness ($\beta = 0.612$, $R^2 = 0.375$) and quality of life outcomes ($\beta = 0.578$, $R^2 = 0.334$). These findings correspond with bandura's social cognitive theory (2018), which asserts that self-efficacy beliefs are essential predictors of behavioral engagement and persistence. Our study enhances this theoretical framework by illustrating direct correlations between self-efficacy and objective physiological metrics, rather than depending exclusively on self-reported actions. The association between exercise self-efficacy and cardiorespiratory fitness (r = 0.612) is among the most robust documented in the literature.

This finding markedly surpasses the associations recorded in other research, including (Farren et al., 2017), who determined that self-efficacy explained 25% of fitness variance, and who indicated a connection of r = 0.43. The augmented association strength in our analysis indicates various innovative findings. Physical education students may have more precise self-assessments of their exercise abilities than the general student population, resulting in more robust efficacy-performance correlations. Secondly, the particular expertise of these students may enhance the translation of self-efficacy beliefs into effective training practices.

This discovery questions prior beliefs regarding the universality of self-efficacy impacts across different populations. The theoretical conclusion is that domain-specific expertise may influence the relationship between self-efficacy and performance outcomes, indicating that Bandura's theory may need refining to incorporate expertise-related differences in self-efficacy processes. Our results concerning the links between self-efficacy and quality of life (overall r = 0.578) exhibit greater correlations than those previously documented in the literature. Dieppa et al. (2018) identified correlations between r = 0.31 and r = 0.42 among Spanish university students, but our study demonstrated notably strong associations with psychological (r = 0.602) and physical health categories (r = 0.593).

This difference pattern indicates that cultural or environmental factors may affect the translation of self-efficacy perceptions into well-being results. The domain-specific changes discovered offer new insights into the mechanisms by which self-efficacy affects quality of life. The more robust associations with physical and psychological dimensions, in contrast to social interactions (r = 0.465) and environmental domains (r = 0.431), indicate that exercise self-efficacy predominantly influences well-being through personal rather than interpersonal or external mechanisms. This trend diverges from the findings of (Zhang et al., 2020), who identified more uniform associations across dimensions, suggesting that the specific type of self-efficacy assessed may dictate its impact on quality of life.

The partial mediation impact of cardiorespiratory fitness on the connection between self-efficacy and quality of life signifies a notable theoretical progression. Prior research has investigated these factors as autonomous predictors of well-being; however, our study is one of the initial investigations to illustrate a sequential causal pathway from self-efficacy to fitness and subsequently to quality of life outcomes. The mediation effect, accounting for roughly 25% of the entire association, significantly exceeds the 15% observed by (Cox et al., 2020) in middle-aged people, indicating age-related disparities in the impact of physical capacities on well-being.

This discovery enhances Social Cognitive Theory by delineating certain physiological mechanisms via which psychological factors affect well-being. The partial mediation suggests that self-efficacy affects quality of life via many mechanisms both directly via psychological processes and indirectly through enhanced physical capabilities. This dual-pathway paradigm offers a more refined comprehension of the mind-body interaction in health outcomes. Although our data largely corroborate the affirmative correlation between self-efficacy and health outcomes identified in prior studies, numerous significant discrepancies arise.

The found association strength surpasses that of most prior studies, likely attributable to our emphasis on a specialized population with heightened domain-specific expertise. Moreover, our objective fitness metrics furnish more compelling data than studies dependent on self-reported physical activity, rectifying methodological shortcomings in prior research.

Our findings, however, contradict certain prior research concerning the universality of self-efficacy effects. The domain-specific differences in quality of life relationships indicate that self-efficacy may not consistently affect all dimensions of well-being, questioning the beliefs regarding its universal impact.

This distinctiveness may be especially pertinent for physical education students, whose professional identity is intimately linked to physical competence. The results offer evidence-based recommendations for creating interventions aimed at enhancing the health and well-being of university students. The robust correlation between self-efficacy and fitness indicates that psychological interventions may be equally significant as physical training programs in enhancing fitness results. Conventional methods that concentrate exclusively on exercise prescription may prove less efficacious than integrated interventions that concurrently address self-efficacy beliefs and physical training.

The mediation findings suggest that interventions must target both psychological and physiological aspects to optimize enhancements in quality of life. Strategies for enhancing self-efficacy, including mastery experiences, vicarious learning, and verbal persuasion, may produce advantages that transcend beyond psychological well-being to encompass tangible gains in physical health. This study's Indonesian environment offers distinctive insights into self-efficacy interactions under collectivist cultural frameworks. The comparatively weaker associations with social and environmental quality of life dimensions may indicate cultural values that prioritize individual well-being above community well-being, in contrast to Western populations where considerable prior study has been undertaken.

The cross-sectional design constrains causal inferences, notwithstanding the theoretical justification for the suggested correlations. The specialized cohort of physical education students, albeit offering distinct insights, may restrict generalizability to other student populations. The field-based fitness evaluation, while practical and valid, yields less accurate measurements compared to laboratory techniques. Longitudinal study is crucial for establishing temporal linkages and investigating the reciprocal influence of self-efficacy beliefs and fitness outcomes over time. Intervention studies aimed at enhancing self-efficacy among varied student populations would offer empirical validity of these findings.

Examining cultural moderators in the self-efficacy-health relationship might improve comprehension of how contextual factors affect these mechanisms. Investigating many forms of self-efficacy concurrently (exercise, academic, social) would yield insights into domain-specific versus generalized impacts on student well-being. Furthermore, investigating the neurological mechanisms that underpin the relationship between self-efficacy and fitness could enhance theoretical comprehension of mind-body interactions in health outcomes.

Conclution

This study examined the core research question regarding the impact of exercise self-efficacy on cardiorespiratory fitness and quality of life in young adult physical education students. The results demonstrate that exercise self-efficacy is a crucial predictor of physical fitness outcomes and overall well-being, with cardiorespiratory fitness partially moderating this association. The study revealed that exercise self-efficacy explains 37.5% of the variance in cardiorespiratory fitness levels, suggesting that psychological confidence in exercise abilities significantly impacts objective physiological results. This association demonstrated greater strength than previously recorded in general student groups, indicating that domain-specific expertise may facilitate the conversion of self-efficacy beliefs into performance results.

Likewise, self-efficacy accounted for 33.4% of the variance in quality of life scores, with notably strong correlations identified in the psychological and physical health categories. The identification of cardiorespiratory fitness as a partial mediator in the association between self-efficacy and quality of life constitutes a significant theoretical contribution, illustrating that psychological factors affect well-being via both direct cognitive pathways and indirect physiological mechanisms. This dual-pathway paradigm enhances comprehension of mind-body links in health outcomes and offers a more thorough framework for intervention development.

These findings have substantial implications for physical education curricula and university health promotion programs. Programs should incorporate self-efficacy enhancement tactics with fitness development, rather than concentrating just on physical training or psychological interventions in isolation, to optimize student health results. The evidence indicates that fostering confidence in exercise ability may be as crucial as enhancing physical skills for the sustained maintenance of health behaviors. The limitations of the study must be recognized when interpreting these results. The cross-sectional design precludes precise causal inferences, however the theoretical framework offers robust justification for the claimed links.

The specialized cohort of physical education students, while offering distinctive insights into this significant community, may restrict generalizability to wider student demographics. Moreover, the field-based fitness evaluation, while valid and practicable, provides inferior precision compared to laboratory techniques. This research enhances the existing evidence that self-efficacy is a vital psychological factor influencing health outcomes, while also elucidating the objective physiological mechanisms behind these benefits. The results indicate that interventions aimed at enhancing psychological confidence in exercise abilities during pivotal university years may produce enduring advantages for physical fitness and overall quality of life, thereby fostering the establishment of lifelong healthy behaviors in future health and fitness professionals.

Author Statement

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