Vol. 18(7), pp. 173-180, July 2023
DOI: 10.5897/ERR2023.4336
Article Number: B78644D70791
ISSN: 1990-3839

http://www.academicjournals.org/ERR

ACADEMIC JOURNALS
expand your knowledge

Educational Research and Reviews

Full Length Research Paper

Relationship between Chinese college students' perceived transformational leadership by physical education teachers and their exercise adherence: The mediating role of physical self-efficacy

Wei Ke[1,2] and Jianhao Huang[1]*

[1]Chinese International College, Dhurakij Pundit University, Bangkok, Thailand.
[2]Hengshui University, Hengshui, China.

Received 4 May, 2023; Accepted 31 May, 2023

The interruption of regular physical exercise among Chinese college students is a key cause of the lack of motivation to exercise. Therefore, on the basis of self-efficacy theory, this study analysed the interrelationships between the perception of transformational leadership in physical education (PE) by teachers, physical self-efficacy, and exercise adherence among Chinese college students. A questionnaire survey was conducted using a convenience sample of 448 students from five universities in Hebei Province, China. They perceived transformational leadership by PE teachers to significantly positively influence exercise adherence. In addition, physical self-efficacy partially mediated the relationship between college students' perceptions of transformational leadership by PE teachers and exercise adherence. These findings suggest that university administrators could encourage PE teachers to make greater use of transformational leadership and improve education and guidance regarding physical self-efficacy for college students to promote exercise adherence.

Key words: Transformational leadership, physical self-efficacy, exercise adherence, college students.

INTRODUCTION

The literature indicates that Chinese college students experience substantial academic and employment pressure (Liu et al., 2019; Shao et al., 2020). Motivating college students to maintain long-term regular physical activity in order to promote healthy physical and mental development is a complex and practical problem faced by researchers (Abula et al., 2018; Cairney et al., 2019). Exercise adherence is a behavioural tendency of individuals to exhibit persistence or effort during physical exercise (Dishman, 1994). Some studies have demonstrated that when they no longer have mandatory physical education (PE) courses, most students drop out of PE because they do not form conscious exercise habits and because the effects of PE courses are not

*Corresponding author. E-mail: rollancekimo@gmail.com or 493283736@qq.com.

sustained, which causes a rapid decline in the physical fitness of university students (Yu et al., 2022; Bielec and Omelan, 2022). Therefore, how to improve physical activity adherence among students at university level was the focus of this study.

Transformational leadership by teachers refers to when teachers stimulate awareness of students' higher-level needs or help students to develop their needs and aspirations by making them aware of their responsibility and the importance of the task they are undertaking and by helping them to reach achievements beyond their expectations (Beauchamp et al., 2010). Research regarding teacher leadership and its outcome variables has received attention from researchers in the field of physical exercise. For example, Bum (2018) demonstrated that sport coaches empowered individual exercise participants to manage their willpower, thoughts, and behaviours and that sport coach leadership was critical to adherence to exercise. In a survey of tennis club members, Yoo and Hwang (2017) identified that the leadership behaviours of sports coaches positively affected tennis club members' willingness to persist in the sport, implying that the leadership behaviours of sports coaches ultimately led to club members' continued participation in the sport.

Leadership in exercise groups significantly positively affects member exercise adherence (Wang et al., 2014). Transformational leadership by PE teachers influences individual behavioural outcomes (Morton et al., 2010; Price and Weiss, 2013).

Although few studies have directly demonstrated a relationship between transformational teacher leadership and exercise adherence, indirect evidence, such as that from the aforementioned studies, supports this relationship. Therefore, the present study hypothesized that college students' perceptions of transformational leadership by PE teachers may positively influence their exercise adherence.

Self-efficacy theory supports leadership models (Chelladurai, 2007). Self-efficacy theory involves subjective assessment of an individual's ability to complete an aspect of an activity, and this assessed ability directly influences the individual's behaviour (Bandura, 1986). Physical self-efficacy is often used in relation to physical exercise to examine an individual's level of confidence in a sport. Sun et al. (2005) argued that physical self-efficacy is the level of belief an individual holds in their physical ability to accomplish their goals in a sport. Education research has demonstrated that transformational leadership is a valuable tool with which teachers can enhance student self-efficacy in learning (Slavich and Zimbardo, 2012) and that transformational leadership by teachers significantly predicts students' self-efficacy in learning (Yüner, 2020). Thus, in the context of physical activity, college students' perceptions of transformational leadership by PE teachers may positively influence their physical self-efficacy.

Self-efficacy significantly affects individual behaviour by helping to optimise cognitive processes, determining the selectivity and persistence of behaviours, and influencing the acquisition of new behaviours and the performance of acquired behaviours (Bandura and Watts, 1996). In addition, self-efficacy is closely related to physical exercise behaviour (McAuley and Blissmer, 2000). Collins et al. (2004) suggested that individuals with higher self-efficacy in physical exercise have higher adherence to physical exercise programs. In previous studies, self-efficacy has often served as a mediator that reflects the effects of external environmental stimuli on an individual's internal psychology and behaviour (Theodoropoulou et al., 2017; Darr et al., 2018; Xu and Qi, 2019). Similar findings exist in the field of physical exercise. An empirical study by Wu and Pender (2002) demonstrated that self-efficacy was the most critical predictor of physical activity and that interpersonal influences indirectly affected physical activity, with self-efficacy mediating this process, suggesting that self-efficacy is a key mediating variable. Similarly, the present study hypothesized that physical self-efficacy is a crucial mediator of the effect of college students' perceptions of transformational leadership by PE teachers on their exercise adherence. Therefore, in this study, physical self-efficacy was empirically investigated as a mediating variable to examine the relationship between perceived transformational leadership and exercise adherence among college students.

The leadership of university PE teachers, which has rarely been addressed in research on the antecedent mechanisms affecting physical exercise adherence, is crucial in the development of physical exercise habits among college students (Kocaeksi et al., 2015; Jiang and Jia, 2018). Therefore, this study used self-efficacy theory to explore the mechanisms by which college students' perceptions of transformational leadership by PE teachers affect exercise adherence, as well as the mediating role of physical self-efficacy in this relationship. Thus, this study proposed the following hypotheses:

(1) College students' perceptions of transformational leadership by PE teachers positively influences exercise adherence.
(2) College students' perceptions of transformational leadership by PE teachers positively influence physical self-efficacy.
(3) Physical self-efficacy mediates the relationship between college students' perceptions of transformational leadership by PE teachers and their exercise adherence.

MATERIALS AND METHODS

Research framework

This study used college students' perceptions of transformational

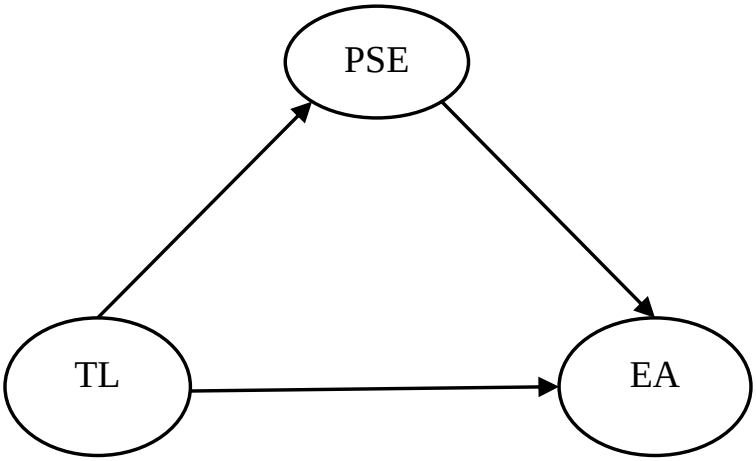

Figure 1. Author Research framework. TL, Transformational Leadership; EA, Exercise Adherence; PSE, Physical Self-Efficacy.
Source: Author

leadership by PE teachers as an independent variable, exercise adherence as a dependent variable, and physical self-efficacy as a mediating variable. On the basis of the aforementioned research hypotheses, the research structure shown in Figure 1 was proposed.

Research participants

This study was conducted from Nov. to Dec., 2022. College students from 5 universities in Hebei Province, China, constituted the study population. A convenience sampling method was used to select 100 college students from each university, with a total of 500 college students completing the questionnaire. The questionnaire was distributed at the end of the university's PE course with the consent of the course instructor, and the researcher informed the participants of the purpose of the study, the procedures for survey participation, and the confidentiality agreement (the questionnaire was submitted anonymously, and the data were processed anonymously for this study only); if the participants had any concerns, they could refuse to participate or withdraw from the study at any time. The questionnaire was distributed using an online questionnaire application (www.wjx.cn) after the participants had provided informed consent. The participants completed the online questionnaire by scanning a QR code with their mobile phones. A total of 487 questionnaires (97.4%) were returned. After exclusion of invalid questionnaires, 448 valid questionnaires remained (yielding a valid return rate of 89.6%), of which 186 (41.5%) were completed by men and 262 (58.5%) were completed by women.

Research tools

Transformational teaching questionnaire

This study used the Transformational Teaching Questionnaire developed by Beauchamp et al. (2010), a 16-item scale consisting of 4 dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. The scale consists of statements such as 'My PE teacher trusts me'. A 5-point Likert scale was used, with the following options numbered 1 to 5: strongly disagree, disagree, generally agree, agree, and strongly agree. A higher score indicated a higher level of agreement. In this study, the Cronbach's α score were 0.716 for idealized influence, 0.866 for inspirational motivation, 0.904 for intellectual stimulation, and 0.897 for individualized consideration. The Cronbach's α for the overall scale was 0.940.

Exercise adherence scale

This study used the Exercise Adherence Scale developed by Wang et al. (2016), with 14 items across 3 dimensions, namely behavioural habits, studiousness, and emotional experience. This scale consists of statements such as 'I am determined to stick to physical activity'. The responses were scored on a 5-point Likert scale with the options strongly disagree, disagree, generally agree, agree, and strongly agree numbered 1 to 5. A higher score indicated a higher level of adherence to physical exercise. In this study, the Cronbach's α score were 0.708 for behavioural habits, 0.876 for studiousness, 0.860 for emotional experience, and 0.913 for the overall scale.

Physical self-efficacy scale

In this study, the Physical Self-Efficacy Scale developed by Sun et al. (2005) was used. The scale was divided into two dimensions, Physical Self-Presentation Confidence and Perceived Physical Ability, and contained 10 items, such as 'I am quite physically strong'. The scale used a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with a higher total score indicating higher physical self-efficacy. In this study, the Cronbach's α score were 0.877 for perceived physical ability, 0.897 for physical self-presentation confidence, and 0.929 for the overall scale.

Data analysis

IBM SPSS 24.0 and AMOS 24.0 were used for data analysis in this study. SPSS was used for descriptive statistics (mean [M], standard deviation [SD], and correlation analysis). Structural relationships among the variables were calculated using structural equation modelling (SEM) in AMOS. Confirmatory factor analysis (CFA) fit

Table 1. Fit index of each variable and Cronbach's α.

Scales (Criteria)	Cronbach's α ＞0.7	χ2/df <5	RMSEA<0.08	SRMR ≤0.06	GFI ＞0.90	CFI ＞0.90	NFI ＞0.90	TLI ＞0.90
TL	0.940	3.033	0.067	0.040	0.922	0.958	0.939	0.948
EA	0.913	2.389	0.056	0.048	0.944	0.962	0.937	0.953
PSE	0.929	1.948	0.046	0.022	0.972	0.988	0.976	0.985

TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.
Source: Author

Table 2. Descriptive statistics and correlation matrix of the variables.

Variable	M	SD	TL	EA	PSE
TL	4.022	0.496	1		
EA	3.874	0.533	0.609***	1	
PSE	3.860	0.835	0.332***	0.556***	1

***p＜0.001.2.TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.
Source: Author

indices chi-square (χ2)/degrees of freedom (df), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), goodness of fit index (GFI), normed fit index (NFI), Tucker-Lewis Index (TLI), and comparative fit index (CFI) were used to analyse the structural validity of the scale and the degree of model fit. The fit indices met the specified criteria, indicating good fit: χ2/df < 5 (Schumacker and Lomax, 2012), RMSEA < 0.08, SRMR ≤ 0.06, GFI > 0.90, NFI > 0.90, TLI > 0.90, and CFI > 0.90 (Hu and Bentler, 1999).

Direct, indirect, and total effects among predictors, mediators, and outcome variables were analysed using a bias-corrected nonparametric percentile bootstrap method (Preacher and Hayes, 2008). The mediating role of physical self-efficacy in the effect of transformational leadership on exercise adherence was examined on this basis. In the data analysis, the bootstrap method was repeated 5000 times, and 95% confidence intervals were calculated. When the upper and lower limits of the confidence interval did not contain 0, the mediating effect was significant. Transformational leadership, exercise adherence, and physical self-efficacy were included as observed variables in the analysis.

RESULTS

Reliability and validity tests

CFA yielded a Cronbach's α value of >0.7 (Taber, 2018) for the transformational leadership, exercise adherence, and physical self-efficacy variables. Thus, all three scales exhibited high reliability and validity (Table 1).

Descriptive statistics and correlation analysis

M, SD, and correlation analyses were performed for the three scales. The M score for the Transformational Teaching Questionnaire was moderate to high (M = 4.022, SD = 0.496), the M for the Exercise Adherence Scale was moderate to high (M = 3.874, SD = 0.533) and the M for the Physical Self-Efficacy Scale was moderate to high (M = 3.860, SD = 0.835). These results demonstrate that the participants generally had positive attitudes towards perceived transformational leadership, exercise adherence, and physical self-efficacy. The relationship between the scales was examined through correlation analysis (Table 2). Transformational leadership was significantly positively correlated with exercise adherence (r = 0.609, $p < 0.001$) and physical self-efficacy (r = 0.332, $p < 0.001$). Exercise adherence and physical self-efficacy were also significantly positively correlated (r = 0.556, p < 0.001). The correlation coefficients ranged between 0.332 and 0.609, a low to medium level; therefore, no serious covariance

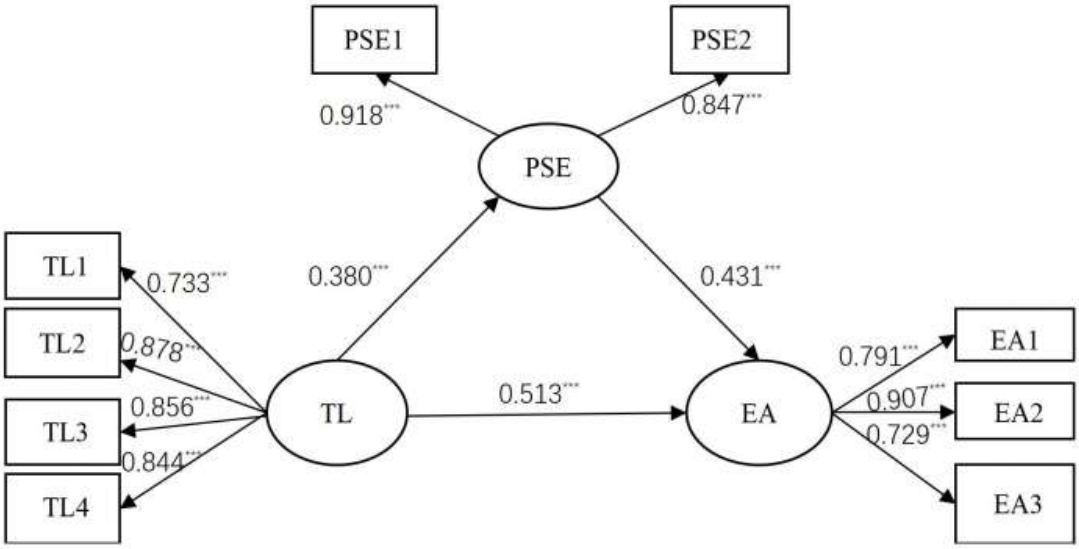

Figure 2. Structural equation model. ***p＜0.001, TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy; TL1, idealized influence; TL2, inspirational motivation; TL3, intellectual stimulation; TL4, individualized consideration; PSE1, Perceived Physical Ability; PSE2, Physical Self-Presentation Confidence; EA1, behavioral habits; EA2, Studiousness; EA3, emotional experience.
Source: Author

Table 3. Bootstrap analysis of mediation effect.

Paths	Estimate	95% Bootstrap CI		R^2
		Lower	Upper	
Standardized total effects				
TL→EA	0.677***	0.580	0.758	0.617
Standardized direct effects				
TL→PSE	0.380***	0.270	0.482	0.145
PSE→EA	0.431***	0.327	0.532	
TL→EA	0.513***	0.407	0.601	
Standardized indirect effects				
TL→PSE→EA	0.164***	0.115	0.222	

***p＜0.001. 2.TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.
Source: Author

problem existed, and thus the next step in the analysis was undertaken.

SEM analysis

SEM analysis was used to test the research hypotheses. First, the model fit was tested. The model had good fit ($\chi 2/df$ = 2.956, RMSEA = 0.066, SRMR = 0.029, GFI = 0.966, CFI = 0.981, NFI = 0.927, and TLI = 0.972). The structural model is shown in Figure 2.

After validation of the structural equation model, the mediation of physical self-efficacy in the relationship between college students' perceptions of transformational leadership by PE teachers and exercise adherence was examined using the bootstrap method. This study examined the direct, indirect, and total effects among transformational leadership, exercise adherence, and physical self-efficacy (Table 3). Transformational leadership significantly positively affected physical self-efficacy (β = 0.380, P < 0.001). Transformational leadership explained 14.5% of the change in physical self-efficacy. Physical self-efficacy significantly positively affected exercise adherence (β = 0.431, P < 0.001). Transformational leadership significantly directly affected exercise adherence (β = 0.513, P < 0.001). The total

standardized effect was also significant when transformational leadership, physical self-efficacy, and exercise adherence were included in the analysis (β = 0.677, P< 0.001). Physical self-efficacy partially mediated the relationship between transformational leadership and exercise adherence (β = 0.164, P < 0.001).

DISCUSSION

Due to exercise adherence is key to the physical and mental health development of college students, research has investigated how to promote exercise adherence and its influencing factors; however, understanding of the mediating mechanisms remains lacking. This study demonstrated that college students' perceptions of transformational leadership by PE teachers significantly positively affected exercise adherence and that physical self-efficacy partially mediated the relationship between college students' perceptions of transformational leadership by PE teachers and exercise adherence.

Theoretical implications

In accordance with Hypothesis 1, this study demonstrated that transformational leadership by PE teachers, as perceived by college students, significantly positively affected exercise adherence. The results of this study support findings from previous studies that leadership positively influences individual behavioural persistence (Oketch and Ainembabazi, 2021; Price and Weiss, 2013; Yoo and Hwang, 2017; Bum, 2018). These findings suggest that transformational leadership is a valid predictor of exercise adherence and that PE teachers should employ transformational leadership to guide their students' efforts in physical exercise. By using transformational leadership to enable students to consider their ambitions and encourage them, PE teachers enable students to perceive care and support from them and to become more willing to commit to remaining physically active (Komarraju, 2013; Scales et al., 2020). These findings suggest that the more students perceive transformational leadership by their PE teacher, the greater their exercise adherence becomes.

Hypothesis 2 proposed that College students' perceptions of transformational leadership by PE teachers significantly positively affected student physical self-efficacy. The results of this study supported this hypothesis, suggesting that the more frequently PE teachers use transformational leadership, the more college students' physical self-efficacy increases. This finding supports existing research (Salanova et al., 2022; Turnnidge and Côté, 2018). In addition, the use of transformational leadership by PE teachers fosters trust and respect from students, enhances communication and interaction with students, leads to greater student confidence in their athletic abilities, increases student interest and engagement in the classroom, and enhances college students' levels of physical self-efficacy (Komarraju et al., 2010; Bourne et al., 2015; Trigueros et al., 2020).

A critical finding of this study was that a direct and indirect relationship existed between college students' perceived transformational leadership by PE teachers and exercise adherence, with physical self-efficacy playing an indirect role in this process and with transformational leadership influencing exercise adherence primarily through physical self-efficacy.

The results of this study support Hypothesis 3, which proposed that physical self-efficacy mediates the relationship between transformational leadership and exercise adherence. Although research has shown that self-efficacy is key to individual behavioural choices and adherence (Collins et al., 2004), little research exists regarding how transformational leadership affects exercise adherence. This finding suggests that physical self-efficacy is a crucial mediator in the field of physical exercise research. Thus, the present research supports self-efficacy theory. Bandura (2004) argued that physical self-efficacy is central to participation in physical exercise; therefore, PE teachers with a transformational leadership style can effectively motivate students and guide them to greater awareness of their needs by respecting individual differences, caring for students, forming trusting teacher–student relationships, providing positive emotional support to students, and motivating students to work towards their goals (Beauchamp et al., 2010). This positive emotional support helps to enhance students' physical self-efficacy (Wang et al., 2022; Öqvist and Malmström, 2018). When their physical self-efficacy increases, college students become more confident in their athletic ability to overcome difficulties encountered in physical exercise and exhibit increasingly positive emotional responses to the perception of athletic ability, thereby minimising the interruption of regular physical exercise and facilitating the long-term maintenance of regular physical exercise.

Practical implications

The present research makes a number of practical contributions. First, it demonstrates that college students' perceptions of transformational leadership by PE teachers significantly positively affects their exercise adherence; therefore, universities could invite educational experts to train and instruct teachers in transformational leadership theory and to guide and encourage PE teachers to use transformational leadership regularly in PE teaching and management and the organisation of sports competitions. Second, this study demonstrated that physical self-efficacy partially mediates the relationship between college students' perceptions of

transformational leadership by PE teachers and exercise adherence. Therefore, university leaders should encourage PE teachers to form positive teacher–student relationships by listening to students' ideas and suggestions and paying attention to students' psychological needs in order to make students feel motivated and perceive care from their PE teachers, thereby improving college students' physical self-efficacy and physical exercise adherence.

Limitations and future directions

There are several limitations in this study. First, because this study was cross-sectional, it could not determine causal relationships among the variables and provided insight only into the impact of the relationships among the variables studied; therefore, a longitudinal study should be conducted in the future. Second, the relationships among the study variables were analysed at the college student level. This feature may have hindered the diversity of the data by neglecting school-level and PE teacher–level perceptions. Thus, future research could explore college student exercise adherence in a cross-level analysis. Finally, this study was conducted using only self-reported questionnaires. Therefore, future research could supplement these questionnaires with qualitative interviews for more in-depth analysis.

Conclusion

The following conclusions were drawn from this study: College students' perceptions of transformational leadership by PE teachers significantly positively affected student exercise adherence. College students' perceptions of transformational leadership by PE teachers significantly positively affected student physical self-efficacy. Physical self-efficacy partially mediated the relationship between college students' perceptions of transformational leadership by PE teachers and student exercise adherence. Overall, the more college students perceive the transformative leadership of physical education teachers, the more it contributes to the improvement of college students' physical self-efficacy, thus promoting their exercise adherence.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Abula K, Gröpel P, Chen K, Beckmann J (2018). Does knowledge of physical activity recommendations increase physical activity among Chinese college students? Empirical investigations based on the transtheoretical model. Journal of Sport and Health Science 7(1):81-86.

Bandura A (1986). Social foundations of thought and action: a social cognitive theory, Englewood Cliffs: Prentice-Hall.

Bandura A (2004). Health promotion by social cognitive means. Health Education and Behavior 31(2):143-164.

Bandura A, Watts RE (1996). Self-efficacy in changing societies. Journal of Cognitive Psychotherapy.

Beauchamp MR, Barling J, Li Z, Morton KL, Keith SE, Zumbo BD (2010). Development and psychometric properties of the transformational teaching questionnaire. Journal of Health Psychology 15(8):1123-1134.

Bielec G, Omelan A (2022). Physical activity behaviors and physical work capacity in university students during the COVID-19 pandemic. International Journal of Environmental Research and Public Health 19(2):891.

Bourne J, Liu Y, Shields CA, Jackson B, Zumbo BD, Beauchamp MR (2015). The relationship between transformational teaching and adolescent physical activity: The mediating roles of personal and relational efficacy beliefs. Journal of Health Psychology 20(2):132-143.

Bum CH (2018). Relationships between self-leadership, commitment to exercise, and exercise adherence among sport participants. Social Behavior and Personality: An International Journal 46(12):1983-1995.

Cairney J, Dudley D, Kwan M, Bulten R, Kriellaars D (2019). Physical literacy, physical activity and health: Toward an evidence-informed conceptual model. Sports Medicine 49:371-383.

Chelladurai P (2007). Leadership in sports. Handbook of Sport Psychology 3:113-135.

Collins E, Langbein WE, Dilan-Koetje J, Bammert C, Hanson K, Reda D, Edwards L (2004). Effects of exercise training on aerobic capacity and quality of life in individuals with heart failure. Heart and Lung 33(3):154-161.

Darr WA, Ebel-Lam A, Doucet RG (2018). Investigating the extravert advantage in training: Exploring reward sensitivity, training motivation, and self-efficacy as intermediary factors. Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement 50(3):172-184.

Dishman RK (1994). The measurement conundrum in exercise adherence research. Medicine and Science in Sports and Exercise 26(11):1382-1390.

Hu LT, Bentler PM (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal 6(1):1-55.

Jiang Z, Jia ZR (2018). Effects of Physical Education teachers' leadership styles and classroom climate on learning motivation for basketball course. Eurasia Journal of Mathematics, Science and Technology Education 14(4):1351-1357.

Kocaeksi S, Ozbal AF, Yavas H (2015). Examination of Student control ideologies and leadership behaviors of physical education and sports teachers in terms of different variables. Procedia-Social and Behavioral Sciences 186:451-455.

Komarraju M (2013). Ideal teacher behaviors: Student motivation and self-efficacy predict preferences. Teaching of Psychology 40(2):104-110.

Komarraju M, Musulkin S, Bhattacharya G (2010). Role of student–faculty interactions in developing college students' academic self-concept, motivation, and achievement. Journal of College Student Development 51(3):332-342.

Liu X, Ping S, Gao W (2019). Changes in undergraduate students' psychological well-being as they experience university life. International Journal of Environmental Research and Public Health 16(16):2864.

McAuley E, Blissmer B (2000). Self-efficacy determinants and consequences of physical activity. Exercise and Sport Sciences Reviews 28(2):85-88.

Morton K, Keith S, Beauchamp M (2010). Transformational teaching and physical activity: A new paradigm for adolescent health promotion? Journal of Health Psychology 15(2):248-257.

Oketch C, Ainembabazi R (2021). Participative leadership style and staff motivation in private universities in Uganda: A case of Kampala international university. International Journal of Business

Management and Economic Review 4(3):20-35.
Öqvist A, Malmström M (2018). What motivates students? A study on the effects of teacher leadership and students' self-efficacy. International Journal of Leadership in Education 21(2):155-175.
Preacher KJ, Hayes AF (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior Research Methods 40(3):879-891.
Price MS, Weiss MR (2013). Relationships among coach leadership, peer leadership, and adolescent athletes' psychosocial and team outcomes: A test of transformational leadership theory. Journal of Applied Sport Psychology 25(2):265-279.
Salanova M, Rodríguez-Sánchez AM, Nielsen K (2022). The impact of group efficacy beliefs and transformational leadership on followers' self-efficacy: A multilevel-longitudinal study. Current Psychology 41(4):2024-2033.
Scales PC, Van Boekel M, Pekel K, Syvertsen AK, Roehlkepartain EC (2020). Effects of developmental relationships with teachers on middle-school students' motivation and performance. Psychology in the Schools 57(4):646-677.
Schumacker RE, Lomax RG (2012). A beginner's guide to structural equation modeling. Psychology Press.
Shao R, He P, Ling B, Tan L, Xu L, Hou Y, Kong L, Yang Y (2020). Prevalence of depression and anxiety and correlations between depression, anxiety, family functioning, social support and coping styles among Chinese medical students. BMC Psychology 8(1):1-19.
Slavich GM, Zimbardo PG (2012). Transformational teaching: Theoretical underpinnings, basic principles, and core methods. Educational Psychology Review 24:569-608.
Sun Y, Lin Y, Wu X (2005). Preliminary Revision of Self-Efficacy Scale of College Students. China Sport Science 25(3):81-84.
Taber KS (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. Research in Science Education 48:1273-1296.
Theodoropoulou E, Stavrou NA, Karteroliotis K (2017). Neighborhood environment, physical activity, and quality of life in adults: Intermediary effects of personal and psychosocial factors. Journal of Sport and Health Science 6(1):96-102.
Trigueros R, Padilla A, Aguilar-Parra JM, Mercader I, López-Liria R, Rocamora P (2020). The influence of transformational teacher leadership on academic motivation and resilience, burnout and academic performance. International Journal of Environmental Research and Public Health 17(20):7687.
Turnnidge J, Côté J (2018). Applying transformational leadership theory to coaching research in youth sport: A systematic literature review. International Journal of Sport and Exercise Psychology 16(3):327-342.
Wang Q, Lee KCS, Hoque KE (2022). The mediating role of classroom climate and student self-efficacy in the relationship between teacher leadership style and student academic motivation: Evidence from China. The Asia-Pacific Education Researcher pp. 1-11.
Wang S, Liu Y, Gu C (2016). Influential Mechanism of Amateur Sport Group Coheslveness on Individual's Exercise Adherence: A requlatory Two-layer Intermediary Model. Journal of Wuhan Institute of Physical Education 50(3):73-80+85.
Wang S, Xiong M, Zhou F (2014). Relationship between leadership behavior of exercise group and individual exercise adherence: Mediate function for exercise self-efficiency. Journal of Wuhan Institute of Physical Education 48(11):66-73.
Wu TY, Pender N (2002). Determinants of physical activity among Taiwanese adolescents: An application of the health promotion model. Research in Nursing and Health 25(1):25-36.
Xu ZZ, Qi C (2019). The relationship between teacher-student relationship and academic achievement: The mediating role of self-efficacy. Eurasia Journal of Mathematics Science and Technology Education 15(10).
Yoo HJ, Hwang YS (2017). Analysis of mediation effect of authentic leadership on the relationship between the sport expertise of all tennis instructors and sports exercise adherence of all tennis club members. Korean Journal of Sports Science 26:773-787.
Yu H, An S, Tao Y, Austin L (2022). Correlation and change in physical activity and physical fitness across four years of college students after one year of COVID-19 lockdown. Healthcare 10(9):1691.
Yüner B (2020). Transformational teaching in higher education: The relationship between the transformational teaching of academic staff and students' self-efficacy for learning. Educational Policy Analysis and Strategic Research 15(4):350-366.