

# Psychosocial beliefs, physical activity and quality of life among shanghai teachers

## Abstract

Understanding psychosocial factors that influence physical activity and quality of life in working teachers may have important implications for future interventions aimed at improving their health. Participants were 238 working teachers ( $M_{age}=51.6\pm5.6$ ) living in Shanghai, China. They completed previously validated questionnaires assessing their perceptions of stress, social support, self-efficacy, physical activity, and quality of life. The results suggest lower stress, higher social support, and more physical activity may directly increase quality of life. The mediating roles of self-efficacy and PA should be taken into account in managing stress and social support in order to promote quality of life among Shanghai teachers.

**Keywords:** Stress, social support, self-efficacy, teachers, Shanghai community

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## Introduction

Psychosocial Beliefs, Physical Activity and Quality of Life among Shanghai Teachers Teachers have been identified as a high-stress occupation that led to reduced physical and psychological well-being.<sup>1</sup> In China, teachers work in an environment with high pressure and receive limited support from the government.<sup>2</sup> Thus, Chinese teachers reported lower well-being, quality of life (QOL) in particular, than other occupations; older teachers also reported lower QOL than younger teachers.<sup>3</sup> Quality of life (QOL) refers to the perceived negative and positive aspects of an individual's life, including physical and mental factors that collectively affect one's overall life satisfaction (World Health Organization Quality of Life Assessment Group [WHOQOL], 1998).<sup>4</sup> Further, QOL has key implications for future health outcomes such as morbidity and mortality.<sup>5</sup> QOL is particularly important for older adults (i.e., >50 years), because they are more vulnerable to poor health.<sup>6</sup> Meanwhile, the global population becomes older and more attention is paid to older adults' QOL.<sup>7,8</sup> Therefore, investigating the risk and protective factors of older teachers' QOL is warranted to inform intervention strategies of promoting their physical and psychological well-being.

## Stress

As previously mentioned, stress negatively affects well-being, including all domains of QOL.<sup>9</sup> Stress is the internal emotions and cognitions in responding to a stimulus, which occurs when an individual perceives excessive environmental demands over one's own capacity.<sup>10</sup> Stress has been identified as one of the most important common psychological problems among teachers, more than one-third of whom reported high levels of stress.<sup>11,12</sup> Although certain levels of stress can inspire people to achieve goals, excessive stress may lead to depression, burnout, and reduced QOL, which in turn increases absenteeism and health expenses.<sup>13</sup>

## Physical activity and correlates

Due to the increased sedentary lifestyle, the health benefits of regular physical activity (PA) have increasingly been recognized by

the medical and health community.<sup>8</sup> Regular PA participation not only reduces the morbidity and mortality of chronic diseases, but also improves an individual's QOL by promoting positive health outcomes.<sup>14,15</sup> Factors that influence the initiation of and adherence to PA can be categorized into three areas:<sup>8</sup> intrapersonal (e.g., self-efficacy), interpersonal (e.g., social support from friends and family), and environmental (e.g., access to PA facilities). Among these factors, social support and self-efficacy are considered two of the most important resources that facilitate PA participation,<sup>16</sup> which in turn promotes QOL.

Social support can be defined as the contact, assistance, and/or information one receives through formal and informal contacts with individuals and/or groups.<sup>17</sup> Social support plays an important role in facilitating PA, especially leisure-time PA. Exercise social support from both friends and family have been consistently shown to contribute to PA participation across diverse population groups.<sup>18,19</sup> In addition to PA participation, social support is associated with various domains of QOL. Workers who receive more social support from friends and family had higher QOL.<sup>9</sup> Moreover, PA intervention targeting social support revealed increases in PA and QOL.<sup>20</sup>

Self-efficacy is referred to as the belief in one's ability to perform a specific task albeit to achieve a desired outcome.<sup>21</sup> High self-efficacy tends to result in greater effort and task persistence to achieve one's goals. Specifically, self-efficacy is a positive predictor of an individual's initiation, participation, and self-regulation in PA,<sup>21</sup> including older adults.<sup>8,22</sup> Individuals with higher exercise self-efficacy are likely to show greater interest in exercise, participate in more exercise, and achieve higher levels of PA than those who possess lower capacities in facing difficulties and obstacles in exercise.<sup>23</sup> McAuley et al.<sup>24</sup> examined the influence of exercise self-efficacy in PA participation among older adults. They found that exercise self-efficacy played an important role in both the adoption and the maintenance of PA at during and after a 6-month intervention program. In addition, exercise self-efficacy indirectly predicted QOL through enhanced health status.<sup>25</sup>

Both social support and self-efficacy are PA correlates, but their relative importance in predicting PA among older adults was not as clear from previous research evidence. On the one hand, research has shown perceived self-efficacy as the most important predictor PA among older adults.<sup>22,26</sup> On the other hand, the World Health Organization's (WHO) Guidelines for Promoting Physical Activity Among Older Persons (1997) suggested low social support as one of the main barriers in PA participation. Orsega-Smith et al.<sup>8</sup> also found that lack of social support from friends and family, lack of time, and poor health were key constraints to leisure-time PA. Fernández et al.<sup>7</sup> suggested that social support might act as an external sources for individuals with low self-efficacy to engage in PA. It would be interesting to see how social support and self-efficacy predicted Chinese older teachers' PA, because social support may play a more important role in collectivist cultures than individualistic cultures, where most of the research was conducted.

### Interaction between stress and physical activity

Ample research findings indicate the role of stress and PA on QOL, yet limited evidence exists regarding their interaction effects on QOL. A systematic review indicated that PA might act as a moderator between stress and physical health by triggering a stress-buffering effect across age groups.<sup>27,28</sup> It is worth noting that this effect may vary across cultures in that significant effects were more often found in North American studies.<sup>27</sup> This study would make the first attempt to investigate this meaningful interaction among Chinese teachers. Although the stress-buffering effect has not been examined on QOL, it is plausible that PA is a particularly important protective factor of QOL among individuals who perceive high stress, which facilitate a stress-buffering effect for maintaining well-being and QOL.

Although a growing body of literature has examined the relationships among social support, self-efficacy, PA, and QOL among older adults,<sup>8</sup> research has yet to study these factors among teachers and in a collectivistic culture. Understanding the physical and psychosocial factors that influence QOL in older teachers has particularly important implications for school and community interventions aimed at improving their health-related outcomes.<sup>6</sup> The purpose of the present study, therefore, was to test a model of QOL in Chinese teachers, and examine the direct and indirect effects of stress, PA, exercise social support, and exercise self-efficacy on QOL. It was hypothesized that (a) stress would negatively predicted QOL; (b) exercise social support and exercise self-efficacy would positively predicted PA, which would in turn positively predicted QOL; and (c) exercise social support would predicted QOL. Whether there would be an interactions effect between stress and PA on QOL would be a research question of this study.

## Method

### Settings and Participants

With the rapid development of economy, Shanghai has been experiencing great changes during the last few decades as one of the most industrialized cities in China. As a result, the living conditions have been improved greatly, and many workers are getting richer than before (Chan et al., 2009). On the other hand, workers living in Shanghai are also encountering the negative effects of this rapid development. More and more workers from other cities swarmed into Shanghai to look for jobs and live, which makes the city more crowded, and the working environment more competitive than ever before (Chan et al., 2009).

Participants were 238 (99 males, 139 females; Mage=51.6±5.6) working teachers who were randomly recruited from eight Shanghai communities. The sampling inclusion criteria were: aged 30 to 65 years, Shanghai residents, and having the ability to complete the health outcomes questionnaires in Chinese with accepted reliabilities and validities. This study obtained institutional approval in Shanghai. All participants signed consent forms before they joined this study.

## Measures

**Demographic variable:** To characterize the participants in this study, self-reported personal information on age, gender, vocation, income, and race were obtained through face to face interview.

**Stress:** Perceived stress was measured by the 10-item Perceived Stress Scale (PSS-10), which consists of six negative and four positive items. It is one of most widely used instruments to measure a global level of perceived stress in various clinical and research settings, cultures and populations, and has been translated into many languages.<sup>10</sup> The Chinese version of the PSS-10 has also been used in research areas such as mental health and physical activities. It has demonstrated high internal consistency reliability and construct and concurrent validity.<sup>29</sup> The PSS-10 measures the extent to which one perceives aspects of one's life as uncontrollable, unpredictable, and overloading. Participants are asked to respond to each question on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they have felt or thought a certain way within the past month. The PSS-10 scores are obtained by reversing the scores on the four positively stated items, and then summed across all 10 items. The higher total scores indicate greater perceived stress.<sup>30</sup> In the present study, the Cronbach's alpha for the total scale was .79.

**Exercise social support:** The Exercise Social Support survey<sup>31</sup> was used to measure social support from friends, which has 13 items rated on a 5-point Likert scale ranging from 1 (none) to 5 (very often). Item scores are coded and summed up to get the total score of exercise social support from friends, with a higher averaged total score indicating greater social support from friends. The Cronbach's alpha coefficient of this scale was .90 in the present study.

**Exercise self-efficacy:** The exercise self-efficacy measure was designed to assess participants' self-efficacy with respect to continued exercise participation (at least three times per week for 40 min at moderate intensity) over incremental week periods for 8 weeks. This measure has also been shown to be predictive of exercise behavior<sup>24</sup> and internally consistent. Participants indicated their degree of confidence for eight item on a scale ranging from 0% (no confidence at all) to 100% (completely confident). It has good internal consistency reliability and reliability. In the present study, the Cronbach's alpha coefficient for the total scale was .99.

**Physical activity:** The short self-administered version of the International Physical Activity Questionnaire IPAQ (IPAQ-SF) was used to measure physical activity. The IPAQ-SF is a 7-item scale, assessing the amount of minutes spent in walking, in vigorous and moderate intensity activity, and in sedentary activity during the last 7 days. For all categories, participants have to define on how many days and how many minutes they spent at a specific activity category. For all categories, the amount of Metabolic Equivalents (METs)-minutes is calculated by multiplying the amount of minutes with 8 (vigorous), 4 (moderate), 3.3 (walking), or 1.3 (sitting), respectively.<sup>32</sup> Besides these four subscores, a total score is calculated by summing the METs-minutes of the first 3 categories together.<sup>33</sup> To improve the normality of

the distribution for energy expenditure, a logarithmic transformation was used due to the non-normal distribution of energy expenditure of participants' physical activity. The IPAQ-SF has good test-retest reliability and moderate criterion validity in healthy adults.<sup>33</sup>

**Quality of life:** QOL was measured using the Chinese version of Quality of Life Scale-Brief (WHOQOL Group, 1998), which was developed as a short form of the WHOQOL-100 and translated into Chinese so that it would be suitable for Chinese elderly population. It is a self-reported questionnaire containing 26 questions, each representing one facet of the WHOQOL-100, as well as one facet on overall quality of life, and one on general health. Each item is rated on a five-point Likert scale (1=very dissatisfied to 5=very satisfied). It produces scores for four domains related to QOL: physical (physical health and functional status), psychological (psychological well-being), social relationships (personal relationships and social support), and environment. Item scores for each domain are coded and summed up to get the total QOL score, with a higher total score indicating better QOL. The Cronbach's alpha coefficient for the total scale was .85 in the present study.

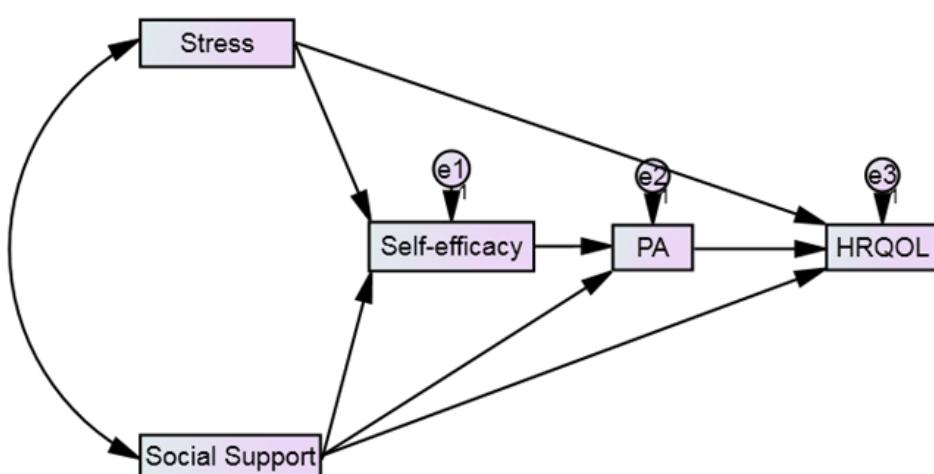
## Procedure

The participants who signed the consent form were given a full explanation about the study purpose, the potential benefits and risks,

the confidentiality, and withdrawal rights. After that, they were directed to complete the self-reported questionnaires of stress, social support, exercise self-efficacy, physical activity, and QOL. To minimize participants' tendency to give socially desirable responses, they were encouraged to answer the questions truthfully and independently. They were also assured that their responses were confidential.

## Data analyses

Data were analyzed by the Statistical Package of the Social Sciences (SPSS 22.0, SPSS Inc.). Internal consistency estimates and descriptive statistics were calculated on all study variables. Pearson product-moment correlation were computed to assess the strengths of association between physical activity, QOL, and three psychosocial variables (stress, social support, and self-efficacy). Using Analysis of Moment Structures (AMOS) version 22.0, all psychosocial variables from correlation matrices were analyzed to examine the hypothesized model described in Figure 1 using path analyses. In line with the recommendation of Bentler (1999), various indices for model data fit were examined to evaluate the adequate fit of the model to the data. These indices included the chi-square statistic ( $\chi^2$ ), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Relative Fit Index (RFI), Bentler-Bonett Non-normed Fit Index (NFI), and Goodness of Fit Index (GFI).



**Figure 1** Hypothesized Model of the Variables (N=238).

## Results

### Descriptive analyses, scale reliability and correlation

Alpha coefficients for each measure are presented in Table 1.

**Table 1** Descriptive statistics, internal consistency, and correlations among variables (N = 238)

Subscale	Range	1	2	3	4	5
1. Stress	0-40	-0.79				
2. Social support	01-May	-.18*	-.9			
3. Self-efficacy	0-100	-.21**	.20**	-.099		
4. Physical activity	0-4	-.02	.20**	.20**	(NA)	
5. QOL	26-130	-.48**	.31**	.19**	.17*	-0.85
M		20.95	2.61	78.36	2.84	91.46
SD		5.48	0.77	27.23	0.85	10.91

**Note** Cronbach's alpha coefficients are provided along the diagonal; QOL, quality of life; M, mean; SD, standard deviation; \*\* p< .01; \*p< .05.

As shown, self-report measures demonstrated acceptable levels of reliability, exceeding Nunnally's<sup>34</sup> criterion of .70. In addition, the descriptive statistics indicated that the self-reported variables were above the midpoint, showing positive perceptions of the study constructs.

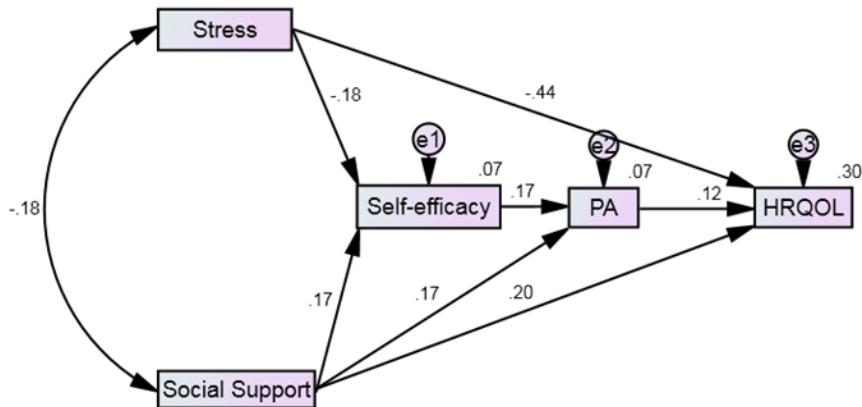
Pearson bivariate correlations were computed in order to determine the relationships among stress, social support, self-efficacy, physical activity, and QOL. These values are presented in Table 1. As shown, stress was negative associated with social support, self-efficacy, and QOL. Consistent with the theoretical prediction, social support was positively correlated with self-efficacy, physicals activity, and QOL. Self-efficacy was positively associated with physical activity and QOL. Further, physical activity was also positively related with QOL in the present study.

### Path analyses

To evaluate the fit of the model to the data, various indices of fit were examined. Specifically, the chi-square statistic ( $\chi^2$ ) tests whether there is a statistically significant difference between the model and sample data and degrees of freedom (df) for each model estimated. Further, values less than .08 obtained from the RMSEA suggest a well-fit model, whereas values exceeding .10 are typically undesirable. Finally, possible values for CFI, RFI, NFI, and GFI fit

indices range between 0 and 1. CFI, RFI, NFI, and GFI values greater than .90 indicate a good fit of the model to the data, and values greater than .95 are typically considered an excellent fit (Bentler, 1999).

Based on the goodness-of-fit statistics, the sample covariance matrix exhibited an acceptable fit to the hypothesized structural model (e.g.,  $\chi^2 = 1.02$ ; RMSEA =.01 [.00 .11]; CFI =1.0; RFI =.96; NFI =.99; GFI =.99; Bentler, 1999). Figure 2 represents the standardized parameter estimates of the model. All parameter estimates were statistically significant ( $p \leq .05$ ) with appropriate magnitude and direction. Stress and social support had direct relationships on self-efficacy ( $\beta = -.18$  and  $.17$ , respectively). Social support had a direct relationship on physical activity ( $\beta = .17$ ). Similarly, stress, social support, and physical activity had a direct relationship on QOL ( $\beta = -.44$ ,  $.20$ ,  $.12$ , respectively). The variance explained in the dependent variables by the model was as follows:  $\eta^2$  for self-efficacy = 7%,  $\eta^2$  for physical activity =7%, and  $\eta^2$  for QOL=30%. The indirect effects of stress on QOL were small, but the mediating role of self-efficacy and physical activity on QOL was supported.



**Figure 2** Final Model of the Variables (N=238).

**Note** Solid lines represent significant standardized parameter estimates. Squares represent observed variables. PA, physical activity; QOL, quality of life

### Discussion

The main purpose of this study was to examine the mediating effects of exercise self-efficacy and physical activity on the relationships between stress, social support and QOL among Shanghai working teachers. The findings from this study demonstrated that stress has directly negative relationships with self-efficacy and QOL, respectively. Social support has directly positive relationships with self-efficacy, physical activity, and QOL, respectively. Physical activity has a direct positive relationship with QOL among Shanghai working teachers. Further, both self-efficacy and physical activity mediate the relationship between stress and QOL, and the relationship between social support and QOL among Shanghai working teachers.

Physical activity is an effective way to improve functioning capacities and to increase QOL in older adults.<sup>6,25</sup> Previous studies have reported positive relationships between physical activity and QOL. Performing regular physical activity can not only reduce the morbidity and mortality of chronic diseases, but also improve QOL.<sup>14</sup> The present study indicated that more active regular physical activity was positively related to higher levels of QOL, which is in accordance with previous studies.<sup>14,15,35-37</sup> Furthermore, the results showed that social support was positively related to QOL, and stress was negatively related to QOL. Adults with lower levels of stress and greater social support had higher levels of QOL. These findings are supportive of prior studies.<sup>13,6,38-40</sup>

The motivation and adherence of physical activity were influenced by many factors, such as age, vocation, gender, socioeconomic status, and physical or psychological states (Barber, 2013). The findings of this study showed that physical activity had directly positive relationships with self-efficacy and social support, which were the main psychosocial predictors of physical activity. The relationship between self-efficacy and physical activity reported in this study is consistent with the findings from Mailey and McAuley.<sup>36</sup> Social support had a directly positive relations with self-reported physical activity. Those with greater social support demonstrate higher levels of physical activity.<sup>8,24</sup> The results also indicated that social support plays an important role in facilitating physical activity, which is consistent with previous study.<sup>8</sup>

According to the self-efficacy theory, self-efficacy is based on the hypothesis that individuals can self-regulate their own motivations and behaviors.<sup>21</sup> which is related to the belief in one's ability to conduct a challenging task despite barriers and adverse experiences. Self-efficacy has been shown to be one of the significant and consistent predictors of physical activity in adults.<sup>23</sup> In addition, there is evidence suggesting that interventions aiming at enhancing self-efficacy can effectively reduce the dropouts of adults from daily exercise.<sup>24</sup> Moreover, individuals feeling more efficacious about their exercise performance should be more apt to engage in self-regulation, and try to build beneficial exercise environments such as getting supports from family and friends despite inclement weather or the loss of an exercise

partner.<sup>8</sup> The results of the present study indicated that exercise self-efficacy has been positively associated with physical activity in Shanghai working teachers. Therefore, intervention strategies aiming to promote self-efficacy may be beneficial in maintaining long-term physical activity. Findings from the current study showed that self-efficacy was negatively related to individual's psychological states (e.g., stress), and positively related to social support from friends, which is in consistent with previous study.<sup>41</sup> Those with lower stress and greater social support had higher perceived self-efficacy. This suggests that reducing stress and increasing social support may foster positive self-efficacy beliefs in working teachers.

Given that the exercise self-efficacy was significantly related to stress, social support, physical activity, and HRQOL, effective strategies should be adopted to increase working teachers' exercise self-efficacy including mastery experience, vicarious experiences, social persuasion, and psychological states,<sup>23</sup> which in turn may increase physical activity and finally improve their QOL. Self-efficacy can be accomplished by observing others successfully perform the physical activity, and obtaining verbal persuasion from peers and workmates.<sup>23</sup> When people are exposed to and are successful at a task, they will likely have a heightened sense of self-efficacy for that task. Since social support from friends played a significant role in affecting working teachers' physical activity, social persuasion can be enhanced through a strong social support system in which friends encourage teachers to persist in regular physical activity. Increased funding to develop facilities and programs used for exercise purposes has significant and positive implications for exercise participation.<sup>23</sup>

The results of this study also showed that QOL is not only directly associated with stress, social support, and physical activity, but also indirectly related to stress and social support through the mediating effects of self-efficacy and physical activity. Exercise self-efficacy acts as a mediator for the relationships between stress and physical activity, and the relationship between social support and physical activity. Consistent with previous studies,<sup>25,42,43</sup> these findings suggest that the relationship between psychosocial predictors and QOL is not simply a bivariate association, but is often indirectly related and can be better expressed as following a pathway through mediating factors (e.g., physical activity, self-efficacy). These series of relationships can be best understood from a self-efficacy framework.<sup>21</sup>

Strengths of this study include adoption of a self-efficacy framework and contemporary statistical modeling. However, we acknowledge the limitations of this study. The first limitation involves the generalizability of our findings to other populations. The participants were conveniently sampled from Shanghai, which is the economic center of China. Thus, the findings from this study cannot be generalized to working teachers in other cities because of the different levels of economic development between Shanghai and other cities. Second, all the scales used in this study were based on self-reported surveys, which may lead to participants either over or under reporting their levels of stress, social support, self-efficacy, physical activity, and QOL. Future studies could incorporate objective measures of physical activity (e.g., accelerometers). Finally, the cross-sectional research design results in difficulty establishing cause and effect relationships among the study variables. Therefore, longitudinal studies and experimental research designs are needed to further investigate changes in stress, social support, and self-efficacy over time in Shanghai working teachers, and how these changes affect their physical activity and QOL throughout their lifespans.

The working teachers in Shanghai are experiencing growing levels of stress, decreased levels of physical activity, and reduced levels of QOL.<sup>44</sup> It is vital to explore the direct and indirect effects

of psychosocial beliefs (stress, social support, and self-efficacy) on physical activity and QOL so that intervention programs can be introduced to help them develop coping strategies to prevent stress, foster good social relationship, improve their exercise self-efficacy, facilitate their physical activity, and finally improve their levels of QOL. In spite of several limitations, the findings of this study have provided a new perspective of public health to address the relationships among psychosocial variables, physical activity, and QOL in Shanghai working teachers.

In conclusion, this study is one of the first studies to examine the psychosocial predictors (stress, social support, and self-efficacy), physical activity and HRQOL in Shanghai working teachers based on the self-efficacy theory. The findings of this current study suggest that the relationship between psychosocial predictors, physical activity and QOL is not a simple bivariate association, but is often indirectly related through mediating factors. There is a tendency in teachers with higher stress and less social support to reduce exercise self-efficacy. These reductions, in turn, provide fewer opportunities for working teachers to enhance their physical activity and QOL. Therefore, the findings of this study highlight an important starting point in attempts to address the relationships between psychosocial beliefs, physical activity and QOL among Shanghai teachers, which is a vital aspect of physical activity and public health.<sup>45-57</sup>

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## Conflicts of interests

The authors of this manuscript have no competing interests.

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