

Correlation between physical activity and self-efficacy in Chinese university students

Hao Liu* and Xia Dai*

CORRELACIÓN ENTRE LA ACTIVIDAD FÍSICA Y LA AUTOEFICACIA EN ESTUDIANTES UNIVERSITARIOS CHINOS

KEYWORDS: Leisure-time physical activity, physical activity self-efficacy, university student.

ABSTRACT: Physical inactivity is becoming increasingly prevalent in Chinese university students. This study aims to assess the leisure-time physical activity level of the Chinese university students and to examine the correlation between the physical activity level and the self-efficacy to overcome barriers to physical activity. Five hundred and thirty Chinese university students participated in the study voluntarily. The International Physical Activity Questionnaire (IPAQ, Chinese Short version) and the Self-Efficacy to Overcome Barriers to Physical Activity Scale (SOBPAS) are adopted. The results suggested: (1) the level of leisure-time physical activity in Chinese University students is relatively low; (2) self-efficacy to overcome barriers to physical activity is significantly correlated with the physical activity, it can be used as a predictor of university students' leisure time physical activity.

Despite the benefits of regular physical activity (PA) and the health risks of insufficient physical activity are well documented (Biddle and Mutrie, 2008; Warburton, Nicol and Bredin, 2006), physical inactivity is becoming increasingly prevalent in university students. It has been found that the levels of physical activity dropped steadily from childhood to adolescence, as well as from adolescence to adulthood (Ortega et al., 2013; Telama and Yang, 2000). Surveys indicated that around one third of youths who were physically active in high schools became physically inactive after they entered universities (Bray and Born, 2004), and about 40 to 50 percent of college students were physically inactive (Keating, Guan, Pinero and Bridges, 2005). Another investigation on UK university students revealed that students spent 8 hours per day on sedentary activities such as studying, watching TV, gaming, computer activities, sitting and talking, shopping and hanging out (Rouse and Biddle, 2010). It is regarded that university is a critical context in which students pick up and consolidate certain

life styles (such as physical activity) that might influence their health in future. Without any intervention, physical inactivity in university students can persist over time, even track into their adulthood and negatively affect their health in adulthood (Telama et al., 2005). So, it is crucial to develop interventions to stop the decrease of physical activity in university students.

University students do not engage in physical activity or drop out of physical activity because of various perceived barriers. Generally, the perceived barriers to physical activity in university students fall into two categories, i.e., external barriers and internal barriers. Lack of time and lack of social support are most frequently mentioned external barriers to physical activity in university students, body image, psychosocial anxiety, as well as fatigue-laziness are internal barriers to physical activity in university students (Gomez-Lopez, Gallegos and Extremera, 2010; Martinez-Lemos, Puig-Ribera and Garcia-Garcia, 2014).

110 Correspondence: Xia Dai. Department of Physical Education, Shenzhen University, Nanhai Ave 3688, Shenzhen, P. R. China. Tel: +86755-26733343. E-mail: 292693391@qq.com

* Department of Physical Education, Shenzhen University, Shenzhen, P. R. China

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Self-efficacy is a central component of the social cognitive theory (Bandura, 1997), which refers to a person's belief in his/her ability to execute behaviors necessary to achieve desired outcomes. Self-efficacy is associated with many health behavior such as smoking cessation and physical activity, it determines whether health behavior change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures (Luszczynska and Schwarzer, 2005). Empirical studies have indicated that self-efficacy to overcome barriers to physical activity is a significant predictor of adolescents' physical activity participation (Allison, Dwyer and Makin, 1999; Petosa, Hartz, Cardina and Suminski, 2005). A review of determinants of physical activity in adolescence suggested that self-efficacy had significant and positive correlation with physical activity in 28 studies (Van der Horst, Paw, Twisk, and Van Mechelen, 2007).

Physical education is compulsory for the freshmen and sophomores in Chinese university, they are required to take a physical education class (90 minutes) once a week. Even so, a high percentage of Chinese university students are sedentary in their leisure time. The purpose of the present study are twofold: (1) to evaluate the leisure-time physical activity in Chinese university students; (2) to examine the correlation between the leisure-time physical activity and the self-efficacy to overcome barriers to physical activity in Chinese university students.

Method

Participants

Totally five hundred and thirty university students from two universities in Guangdong China took part in this investigation voluntarily, including 272 males aged between 17 and 24 years old ($M = 19.32$, $SD = 1.05$), as well as 258 females aged between 17 and 22 years old ($M = 19.24$, $SD = 1.13$).

Instruments

In the present study, a Chinese short version of International Physical Activity Questionnaire (Deng, et al., 2008; Macfarlane, et al., 2007) was used to evaluate university students' leisure-time physical activity. Participants were asked to report the frequency and duration of walking, moderate and vigorous activities lasting at least 10 minutes, plus time spent in two sedentary activities (sitting and lying awake).

The Self-Efficacy to Overcome Barriers to Physical Activity Scale (SOBPAS; Dwyer, et al., 2012) was employed to assess university students' physical activity self-efficacy. It is a 22-item scales in relation to overcoming perceived barriers to physical activity. It consists of five subscales, namely, self-efficacy to overcome internal barriers, harassment barriers, physical environment barriers, social environment barriers, and responsibilities barriers. The SOBPAS question stem states: "how confident are you that you can overcome this thing and still do moderate or vigorous physical activities?" Respondents were asked to rate items on a 5-point scale ranging from 1 (not at all confident) to 5 (very confident). The SOBPAS has proved to have good construct validity, internal consistency reliability, and predictive validity (SOBPAS; Dwyer, et al., 2012). In this study, back-translation was employed to develop the Chinese version of SOBPAS. Results of statistics based on the data from present study suggested that the Chinese version of SOBPAS has acceptable internal consistency reliability, the Cronbach's coefficient alpha for the subscales ranged between .69 and .79.

Data analysis

The SPSS 20.0 for Windows was used to perform statistical analyses in the present study.

All data from the IPAQ for every type of physical activity is converted to metabolic equivalent scores and expressed in MET-minutes/week. The conversion formulas is as follows (www.ipaq.ki.se): (1) Walking MET = $3.3 * \text{minutes/per day} * \text{days/per week}$; (2) Moderate MET = $4.0 * \text{minutes/per day} * \text{days/per week}$; (3) Vigorous MET = $8.0 * \text{minutes/per day} * \text{days/per week}$; (4) Total physical activity MET = Walking MET + Moderate MET + Vigorous MET.

Independent Samples *t* test was adopted to analyze the difference in physical activity between male and female students. Pearson Correlations test was used to analyze the correlation between physical activity level and physical activity self-efficacy.

Results

The physical activity levels of the male and female students were presented in Table 1. The results of *t* test indicated that there was significant difference in Vigorous physical activity ($t = 5.62$, $p < .01$) as well as in total level of physical activity ($t = 3.47$, $p < .01$) between male and female students, but no significant difference were found between male and female

students in moderate physical activity ($t = 4.62, p = .64$) as well as in walking ($t = 1.50, p = .13$).

The Means and standard deviations of different types of self-efficacy to overcome barriers to physical activity were presented in Table 2. For the male students, the results of Correlation test suggested that vigorous physical activity was significantly correlated with self-efficacy to overcome social environment barrier ($r = .15, p < .05$), except for this, no other significant correlations were found. For the female students, the results indicated that vigorous physical activity was significantly correlated with self-efficacy to overcome social environment barriers ($r = .18, p < .05$), self-efficacy to overcome responsibility barriers ($r = .16, p < .05$), as well as the total self-efficacy ($r = .16, p < .05$). Except for these, no other significant correlation were found.

Discussion

According to the WHO (2017), adults aged 18-64 are recommended to do at least 150 minutes of moderate-intensity or at least 75 minutes of vigorous-intensity aerobic physical activity throughout a week. This study revealed that, on average, the amount of physical activity in Chinese university students is very low, and the female students engaged in less physical activity than male students. The amount of physical activity in Chinese students doesn't comply with the levels recommended

by the WHO (2017). Comparing with their counterparts in Europe countries, Chinese university students do less physical activity in their leisure time (Awadalla et al., 2014; Fagaras, Radu, and Vanvu, 2015). Besides the heavy academic load, the influence of Chinese traditional philosophy and culture about health preserving might be another explanation for the low physical activity in Chinese university students. According to the culture, Centering Prayer or Some form of contemplation, as well as gentle exercise are believed good for health. The significant correlation between vigorous physical activity and self-efficacy to overcome social environment barriers, as well as the significant correlations between vigorous physical activity and self-efficacy to overcome responsibility barriers in female students are probably due to the influence of Chinese traditional culture as well. In addition, female student need more social support and has to take more familiar responsibilities is likely related to their less physical activity. To encourage students perform more physical activity, firstly, it is necessary to make students understand the benefits of physical activity, especially the benefits of aerobic exercise, secondly, administrators must take actions to provide students with more opportunities to be active and make correspondence policies to remove the barriers to students physical activity.

Physical activity level (MET - min/week)	Total (n = 530) Mean (SD)	Males (n = 272) Mean (SD)	Females (n = 258) Mean (SD)
Vigorous MET	124.98 (210.84)	176.74 (231.96)	75.88 (175.43)
Moderate MET	283.47 (283.26)	289.30 (269.52)	277.94 (295.99)
Walking MET	782.28 (431.87)	811.18 (435.37)	754.87 (427.52)
Total MET	1190.73 (566.20)	1277.23 (528.29)	1108.69 (589.27)

Table 1. Means and standard deviations for the MET values for physical activity

Table 2. Means and standard deviations of different types of self-efficacy to overcome barriers to physical activity

Self-efficacy to overcome	Males (n = 272)	Females (n = 258)
	Mean (SD)	Mean (SD)
Internal barriers	3.06 (.83)	2.97 (.72)
Harassment barriers	2.54 (.92)	2.32 (.84)
Physical environment barriers	2.96 (.92)	2.80 (.82)
Social environment barriers	2.92 (.86)	2.77 (.80)
Responsibilities barriers	2.71 (.83)	2.60 (.80)
ALL barriers	2.86 (.72)	2.73 (.64)

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PALABRAS CLAVE: Actividad física de ocio, actividad física autoeficaz, estudiante universitario.

RESUMEN: La inactividad física es cada vez más frecuente en los estudiantes universitarios chinos. Este estudio tiene como objetivo evaluar el nivel de actividad física de los estudiantes universitarios chinos y examinar la correlación entre el nivel de actividad física y la autoeficacia para superar las barreras a la actividad física. Quinientos treinta estudiantes universitarios chinos participaron voluntariamente en el estudio. Se aprueban el Cuestionario Internacional de Actividad Física (IPAQ, Versión Corta Chino) y la Autoeficacia para Superar Barreras a la Escala de Actividad Física (SOBPAS). Los resultados sugieren: 1) que el nivel de actividad física en los estudiantes universitarios chinos es relativamente bajo; (2) la autoeficacia para superar las barreras a la actividad física está significativamente correlacionada con la actividad física, puede ser utilizado como predictor de la actividad física de los estudiantes universitarios de tiempo libre.

References

- Allison, K. R., Adlaf, E. M., Dwyer, J. J. M., Lysy, D. C. and Irving, H. M. (2007). The decline in physical activity among adolescent students: A cross-national comparison. *Canadian Journal of Public Health*, 98(2), 97-100.
- Allison, K. R., Dwyer, J. J. M. and Makin, S. (1999). Self-efficacy and participation in vigorous physical activity by high school students. *Health Education and Behavior*, 26(1):12-24.
- Awadalla, N. J., Aboelyazed, A. E., Hassanein, M. A., Khalil, S. N., Aftab, R., Gab alla, I. I. and Mahfouz, A. A. (2014). Assessment of physical inactivity and perceived barriers to physical activity among health college students, south-western Saudi Arabia, *EMHJ*, 20 (10): 596-604.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman and Company.
- Biddle, S. J. H. and Mutrie, N. (2008). *Psychological of physical activity: determinants, well-being & interventions (2nd edition)*. New York: Taylor & Francis Group.
- Bray, S. R. and Born, H. A. (2004). Transition to university and vigorous physical activity: Implications for health and psychological well-being. *Journal of American College Health*, 52(4), 181-188.
- Deng, H. B., Macfarlane, D. J., Thomas, G. N., Lao, X. Q., Jiang, C. Q. and Cheng K. K. (2008). Reliability and validity of the IPAQ-Chinese: The Guangzhou Biobank cohort study. *Medicine & Science in Sport & Exercise*, 32, 303-307.
- Dwyer, J. J. M., Chulak, T., Maitland, S., et al. (2012). Adolescents' self-efficacy to overcome barriers to physical activity scale. *Research Quality for Exercise and Sport*, 83, 513-521.
- Fagaras, S. P., Radu, L. E. and Vanvu, G. (2015). The level of physical activity of university students. *Procedia – Social and behavioral Sciences*, 197, 1454-1457.
- Keating, X. F. D., Guan, J. M., Pinero, J. C., and Bridges, D. M. (2005). A meta-analysis of college students' physical activity behaviors. *Journal of American College Health*, 54(2): 116-125.
- Lopez, M. G., Gallegos, A. G. and Extremera, A. B. (2010). Perceived barriers by university students in the practice of physical activities. *Journal of Sports Science and Medicine*, 9, 374-381.
- Luszczynska, A. and Schwarzer, R. (2005). Social cognitive theory. In M. Conner and P. Norman (Eds.), *Predicting health behaviour* (2nd ed. rev., pp. 127–169). Buckingham, England: Open University Press.
- Macfarlane, D. J., Lee, C. C., Ho, E. Y., Chan, K. L. and Chan, D. T. (2007). Reliability and validity of the Chinese version of IPAQ (Short, last 7 days). *Journal of Science and Medicine in Sport*, 10(1), 45-51.
- Martinez-Lemos, R. I., Puig-Ribera, A. M. and Garcia-garcia, O. (2014). Perceived barriers to physical activity and related factors in Spanish university students. *Open Journal of Preventive Medicine*, 4, 164-174.
- Ortega, F. B., Konstabel, K., Pasquali, E., Ruiz, J. R., Hurtig-Wennlof, A., Maestu, J, et al. (2013). Objectively measured physical activity and sedentary time during childhood, adolescence and young adulthood: a cohort study. *PLOS One*, 8(4), e60871.
- Petosa, R. J., Hartz, B. V., Cardina, C. E. and Suminski, R. R. (2005). Social cognitive theory variables associated with physical activity among high school students. *International Journal of Sports Medicine*, 26, 158-163.
- Rouse, P. C. AND Biddle, S. J. H. (2010). An ecological momentary assessment of the physical activity and sedentary behavior patterns of university students. *Health Education Journal*, 69(1), 116-125.
- Telama, R. and Yang, X. (2000). Decline of physical activity from youth to young adulthood in Finland. *Medical Science and Sport Exercise*, 32(9), 1617-1622.
- Telama, R., Yang, X., Viikari, J., Valimaki, I., Wanne, O. and Raitakari, O. (2005). Physical activity from Childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine*, 28, 267-273.
- Van Der HORST, K., Paw, M. J., Twisk, J. W. and Van Mechelen, W. (2007). A brief review on correlates of physical activity and sedentariness in youth. *Medicine & Science in Sport & Exercise*, 39, 1241-1250.
- Warburton, D. E., Nicol, C. W. and Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, 174(6), 801-809.
- WHO. (2017). *Global recommendations on physical activity for health*. Geneva: World Health Organization.