Research in Health Science
ISSN 2470-6205 (Print) ISSN 2470-6213 (Online)
Vol. 4, No. 3, 2019
www.scholink.org/ojs/index.php/rhs

Original Paper

Determinants of Physical Activity among Jordanian University Students

Khaldoun M Hamdan, PhD, RN[1] & Abeer M Shaheen, PhD, RN[2*]

[1] Assistant Professor, Al-Ahliyya Amman University, Jordan

[2] Associate Professor, School of Nursing, The University of Jordan, Amman, Jordan

[*] Abeer M Shaheen, PhD, RN, Associate Professor, School of Nursing, The University of Jordan, Amman, Jordan

Received: June 9, 2019 Accepted: June 22, 2019 Online Published: July 3, 2019

doi:10.22158/rhs.v4n3p191 URL: http://dx.doi.org/10.22158/rhs.v4n3p191

Abstract

Study Purpose: *The purposes of this study were to examine the relationships between university students' physical activity, self-efficacy and perceived benefits and barriers to exercise, and to identify predictors of physical activity among university students.*

Methods: *A cross-sectional design was used in this study. A translated version of Exercise Benefits/Barriers Scale and Exercise Self-efficacy Scale were used to collect study data. A convenience sample of 517 university students participated in the study. Pearson correlation and multiple linear regression analysis were used to analyze the data.*

Results: *Exercise self-efficacy demonstrated the highest positive correlation with physical activity ($r=0.31$, $p<0.001$) followed by exercise benefits ($r=0.24$, $p<0.001$). Exercise barriers were negatively correlated with physical activity. Exercise self-efficacy and exercise benefits significantly predicted physical activity among university students.*

Conclusions: *The results of this study indicated that exercise self-efficacy and perceived benefits of exercise affect university students' participation in physical activity.*

Keywords

Exercise, Exercise self-efficacy, Exercise benefits, Exercise barriers, University students

1. Introduction

Young people aged between 10 and 24 constitute 1.8 billion of the worlds' population. The majority of this youth population is concentrated in developing countries (United Nations, 2015). In Jordan, young people makeup the largest proportion of the population, since more than 70% of the population is under

the age of 30 (USAID, 2016).

Physical Activity involves regular participation in light, moderate, and/or vigorous activity that could be planned or incidental as a part of daily life or leisure activities (Susan, Sechrist, & Pender, 1995). Globally, physical inactivity is responsible for causing 3.2 million deaths**;** it is the fourth leading risk factor for global mortality (World Health Organization (WHO), 2017). However, regular physical activity is strongly related to the prevention of major non-communicable diseases such as cardiovascular disease, diabetes, and obesity that exert great economic burden globally specifically in developing countries (Lachat et al., 2013; Lee et al., 2012). Although the benefits of regular physical activity are well documented in the literature, World Health Organization (WHO) statistics indicated that 23% of the adults aged 18 and over were insufficiently physically active in 2010 (WhO, 2015). Several research studies also found that university students do not engage in sufficient physical activity during the period of study at university (American college health association, 2008; Han et al., 2008; Rouse & Biddle, 2010; Sigmundová, Chmelík, Sigmund, Feltlová, & Frömel, 2013). In addition, Jordanian studies that examined physical activity of university students revealed that university students' physical activity levels were also insufficient (Abu-Moghli, Khalaf, & Barghoti, 2010; Haddad, Kane, Rajacich, Cameron, & Al-Ma'aitah, 2004; Shaheen, 2015).

Participation in physical activity is influenced by several factors including individual, interpersonal, and environmental factors (Taber, Meischke, & Maciejewski, 2010). Perceived barriers to physical activity are the anticipated, imagined, or real blocks and costs that prevent the individual from being physically active (Alligood, 2014). Some research studies suggest that perceived barriers are the key predictor of participation in physical activity (Gómez-López, Gallegos, & Extremera, 2010; Gómez-López, Granero-Gallegos, Baena-Extremera, & Ruiz-Juan, 2011). University students perceived lack of time, lack of social support, feeling of laziness, physical exertion, not liking the physical activity or not seeing its usefulness, feeling incompetent to perform physical activity, cultural barriers, lack of accessible and suitable sporting places, the presence of other priorities, lack of motivation, and feeling tired as barriers to physical activity (Daskapan, Tuzun, & Eker, 2006; Ebben & Brudzynski, 2008; El-Gilany, Badawi, El-Khawaga, & Awadalla, 2011; Gómez-López et al., 2011; Lovell, El Ansari, & Parker, 2010; Mudronja, Petracic, & Pedisic, 2011; Yan & Cardinal, 2013).

Perceived benefits of physical activity are the anticipated positive outcomes that will occur from engagement in physical activity (Alligood, 2014). Perceived benefits from physical activity among university students reported by previous studies were improvement and maintenance of health, enjoyment, stress reduction, enhancement of physical performance, life enhancement, social interaction, and to feel good (Ebben & Brudzynski, 2008; Lovell et al., 2010; Poobalan, Aucott, Clarke, & Smith, 2012; Yan & Cardinal, 2013). Recent studies about physical activity indicated that individuals who perceived more benefits from physical activity and fewer barriers to physical activity were more active than those who reported high perceived barriers and low perceived benefits (King, Vidourek, English, & Merianos, 2013; Lovell et al., 2010; Poobalan et al., 2012; Taymoori, Niknami, Berry, Ghofranipour,

& Kazemnejad, 2009).

Perceived exercise self-efficacy is the judgment of personal capability to organize and execute exercise. Higher perceived self-efficacy results in decreased perceptions of barriers to physical activity (Alligood, 2014). Studies of physical activity among university students supported the importance of self-efficacy for engaging in physical activity (Taymoori et al., 2009). A Chinese study that involved five hundred and thirty university students revealed that self-efficacy was positively correlated with physical activity (Liu & Dai, 2017). Another Turkish study that examined self-efficacy and physical activity among university students revealed that higher self-efficacy levels increased participation in physical activity for university students (Gen çay, Gen çay, Aydin, Akkoyunlu, & Demir, 2016).

University students reported insufficient levels of physical activity. Promoting physical activity during university period will increase their chance to be healthy adults and decrease their risk for non-communicable diseases (Hoyt, Chase-Lansdale, McDade, & Adam, 2012; Racette et al., 2014). Examining factors that enhance university students' engagement in physical activity is very important to develop appropriate intervention programs. The purposes of this study were to examine the relationships between Jordanian university students' physical activity, self-efficacy and perceived benefits and barriers to exercise, and to identify predictors of physical activity among Jordanian university students.

2. Methods

2.1 Design

A cross-sectional descriptive design was used in this study.

2.2 Sample and Sampling

The target population of this study was all university students in Jordan (N=236,000). Convenience sampling technique was used to select the study sample. In convenient sampling the researchers select the most accessible participants. The sample size was calculated using the G power program. By utilizing α level of 0.05 two tail, effect size of 0.2 and power of 0.8, a Z test indicated that a minimum of 369 students were needed for this study.

2.3 Ethical Consideration

Ethical approval was obtained from the Research Committee at the faculty of nursing at Al-Ahliyya Amman University prior to data collection. In addition, a written consent form was obtained from each participant prior to being involved in the study.

2.4 Data Collection Procedure

The researcher approached two governmental and two private universities. Data were collected between October 2013 and February 2014. Students were recruited from different university faculties. The questionnaires were distributed to the students at the beginning of the lectures after full explanation of the study purpose and procedure. Students filled the questionnaire and returned it to the researcher in the same lecture. Examination periods were avoided during data collection to eliminate

any possible influence on students' responses.

2.5 Measures

2.5.1 Perceived Benefits and Perceived Barriers to Exercise

Perceived benefits and perceived barriers to exercise were measured using the Exercise Benefits/Barriers Scale (EBBS) developed by Sechrist, Walker and Pender (1987). The scale uses a four point Likert format (1= strongly disagree, 2= disagree, 3= agree, 4= strongly agree). The Benefits scale is composed of 29 items, with score range between 29 and 116. Higher scores indicate higher perception of perceived benefits. An example of subscale items is "Exercise decreases feelings of stress and tension for me". The Barriers scale is composed of 14 items, with score range between 14 and 56. Higher scores indicate higher perception of perceived barriers. An example of subscale items is "Exercising takes too much of my time". The scale is a reliable and a valid measure. The Cronbach's alpha reported in a previous study for the total scale was 0.95, 0.95 for the benefits scale, and 0.86 for the barriers scale. Test-retest reliability for the total scale was 0.89, 0.89 for the benefits scale, and 0.77 for the barriers scale (Sechrist et al., 1987). In the current study the Cronbach alpha coefficient was 0.88 for the EBBS scale, 0.83 for the exercise barriers scale, and 0.94 for the exercise benefits scale.

2.5.2 Exercise Self-Efficacy

Exercise self-efficacy was measured using the Exercise Self-Efficacy (ESE) scale (Kroll, Kehn, Ho, & Groah, 2007). The scale is composed of 10 items that uses a four-point Likert format (1= not at all true, 2= hardly true, 3= moderately true, 4= exactly true). Scores range from 10 to 40, higher scores indicates higher perceived exercise self-efficacy. The scale is a reliable and valid measure, the Cronbach's alpha for the scale reported in a previous study was 0.93 (Kroll et al., 2007).

2.5.3 Physical Activity

University students' physical activity was measured using the physical activity subscale of the Health-Promoting Lifestyle Profile II (HPLP II) which was developed in 1987 by Walker, Sechrist and Pender (1987). The scale measures the frequency of physical activity using a four-point Likert format (1= never, 2= sometimes, 3= often, 4= routinely). The scale is composed of 8 items. An example of subscale items is "take part in light to moderate physical activity (such as sustained walking 30-40 minutes) 5 or more times a week)" (Walker et al., 1987).

The study scales were translated to Arabic. A bilingual researcher translated scales to Arabic language then a native Arabic researcher who was also fluent in English validated it using the standard back translation technique. After that, the questionnaires were backward translated into English by a native English speaker. Four researchers in health behaviour field reviewed the scales and checked their appropriateness and relevance to Jordanian culture. All of the study scales were pilot tested on 45 students who were excluded from the final analysis.

2.6 Data Analysis

Data were analyzed using the Statistical Package for Social Science (SPSS) version 17 (IBM Corporation, 2012). Descriptive statistics (i.e., percentage, mean, standard deviation, minimum, and

maximum) were used to describe physical activity, exercise benefits, exercise barriers, exercise self-efficacy, and the demographic characteristics of the study sample.

The Exercise Benefits, Exercise Barriers, Exercise Self-efficacy, and Physical Activity subscales were calculated as sums of item scores. The Pearson correlation test was used to examine the associations between physical activity, exercise benefits, exercise barriers, exercise self-efficacy, age, and gender. The normality of the study scales was checked and revealed normal distributed scales. Multiple linear regressions were used to identify predictors of physical activity among university students. Findings were considered statistically significant if the p value was ≤ 0.05.

3. Results

A total of 517 university students participated in the study (response rate= 80%). The sample composed of 377 females (71.8%) and 139 males (28.2%). The mean age of the students was 20.7 $\pm$ 2.4 (range 17-35) years.

3.1 Exercise Related Variables

Table 1 provides a description of exercise related variables. Perceived exercise self-efficacy had the highest mean among exercise variables.

Table 1. Description of Exercise Related Variables (N=517)

Variables	Mean (SD)	Standardized mean Out of 100	Median (Range)
Exercise self-efficacy	24.1(5.4)	66.6	24 (10-40)
Exercise benefits	52.3 (12.7)	45	54 (29-116)
Exercise barriers	36.9 (6.6)	65.89	37 (14-56)
Physical activity	16.4 (5)	51.25	16 (8-32)

3.2 Relationships between Study Variables

The relationships between physical activity, gender, age, exercise self-efficacy, exercise benefits, and exercise barriers among university students are presented in Table 2. The findings showed that exercise self-efficacy demonstrated the highest positive correlation with physical activity followed by exercise benefits. Exercise barriers were negatively correlated with physical activity. Gender and age variables didn't show significant correlations with physical activity among university students.

Table 2. Demographics and Exercise Related Variables Correlated with Physical Activity (N=517)

Variables	Correlation index	P value
Age	-0.35	0.45
Gender	-0.072	0.10
Exercise self-efficacy	0.31**	< 0.001
Exercise benefits	0.24**	< 0.001
Exercise barriers	-0.18**	< 0.001

** Correlation is significant at 0.01 level (2-tailed test) using Pearson correlation.

3.3 Predictors of Physical Activity among University Students

The selection of three variables as predictors in this study was based on the significant correlations with students' physical activity. The multiple linear regression analysis showed that the three variables in the model significantly accounted for 0.15 of the variance ($F = 39.9$, $p < .001$). Exercise self-efficacy and exercise benefits were found to be significant predictors of physical activity among university students (Table 3).

Table 3. Regression Analysis of Predictors of Physical Activity (N=517)

Significant predictors of physical activity	B	SE	ß	P value
Exercise self-efficacy	.007	.001	.27	P< 0.001
Exercise benefits	.27	.06	.21	P< 0.001

*Predictors of physical activity final model produced at a = 0.05, F = 39.9, P< 0.001, R^2 =0.15. Excluded variable is exercise barriers.

4. Discussion

This study examined the relationships between university students' physical activity, perceived exercise self-efficacy, perceived exercise benefits and perceived exercise barriers, and identified predictors of physical activity among university students. These findings are a necessary baseline data for promotion programs and interventions to increase physical activity in Jordanian youth.

The level of physical activity among this study sample was relatively low. Similar results were found by a Chinese study that included 530 university students which revealed that the level of leisure-time physical activity among Chinese university students was also low (Liu & Dai, 2017). Another study which included 906 students from eight universities at Czech Republic used a criterion of 10,000 steps every day for physical activity requirements and revealed that only 9% of the students in that study met that criterion. One Iranian study recruited a convenience sample of 300 medical, nursing and allied health students from a local university of medical sciences in Iran. The study found that the lowest subscale score among the six health-promoting behaviors examined in the study was the physical

activity subscale. Another Spanish study reported that 795 out of 1834 university students stated not having done any physical activity for at least one year (Gómez-López et al., 2011). Another study that explored physical activity among 18 to 25 years old youth revealed that only 28% (N=1313) achieved the recommended physical activity levels (Poobalan et al., 2012). A study from Turkey that included 320 health sciences students revealed that the mean score for exercise subscale was the lowest among the six health- promoting behaviors measured in that study (Karadag & Yildirim, 2010).

Our study revealed that perceived exercise self-efficacy and perceived exercise benefits were significant predictors of physical activity among university students. Similarly, a study of university students in Egypt found that self-efficacy levels affect participation in physical activity (Gençay et al., 2016). In addition, one Chinese study revealed that self-efficacy to overcome barriers to physical activity is significantly and positively correlated with university students' physical activity (Liu & Dai, 2017). The university students in the current study perceived higher barriers to exercise than benefits from exercise which was inconsistent with a previous research conducted in the United Kingdom with university students sample (Lovell et al., 2010).

In the current study, university students' gender did not show significant correlation with physical activity. On the contrary, a study that examined barriers to physical activity among 1834 students from the University of Almeria (Spain) revealed that males participated in physical activity more than females (Gómez-López et al., 2011). In addition, a Japanese study of 314 university students found that male students practiced better physical activity than females (Wei et al., 2012). Another Egyptian study that was carried on 1708 students from Mansoura University found that female gender was independent predictor of physical inactivity (El-Gilany et al., 2011). Further studies that examine differences between males and females in physical activity are needed to understand the role of gender in explaining physical activity among university students.

Our results indicated that university students' age did not show significant correlation with physical activity. Similarly, an Egyptian study found that age was not significant variable in predicting physical activity among university students (El-Gilany et al., 2011). In contrary, a Japanese study that examined six health-promoting behaviours including; interpersonal relations, health responsibility, nutrition, physical activity, spiritual growth, and stress management among university students found that all health behaviours progressively declined through second, third, and fourth years (Wei et al., 2012). Also a study that explored physical activity behaviour among 18 to 25 years old youth revealed that physical activity decreased with age (Poobalan et al., 2012).

5. Limitations

The study used convenience sampling to select the study sample, thus it may be not representative for the whole population. Using self-administered questionnaire may result in socially desirable responses. However, this may be reduced by explaining that the questionnaire is anonymous.

6. Conclusion

The results of this study indicated that physical activity levels among university students were low. Exercise self-efficacy and perceived benefits of exercise affect university students' participation in physical activity. Health promotion interventions that target university students should further highlight the benefits of physical activity participation and improve perception of exercise self-efficacy to enhance students' physical activity.

References

Abu-Moghli, F. A., Khalaf, I. A., & Barghoti, F. F. (2010). The influence of a health education programme on healthy lifestyles and practices among university students. *International journal of nursing practice*, *16*(1), 35-42. https://doi.org/10.1111/j.1440-172X.2009.01801.x

Alligood, M. R. (2014). *Nursing theorists and their work*. Elsevier Health Sciences.

American college health association. (2008). American college health association-national college health assessment (ACHA-NCHA) spring 2007 reference group data report. *J Amer Coll Health*, *56*(5), 469-479. https://doi.org/10.3200/JACH.56.5.469-480.

Daskapan, A., Tuzun, E. H., & Eker, L. (2006). Perceived barriers to physical activity in university students. *Journal of Sports Science and Medicine*, *5*(4), 615-620.

Ebben, W., & Brudzynski, L. (2008). MOTIVATIONS AND BARRIERS TO EXERCISE AMONG COLLEGE STUDENTS. *Journal of Exercise Physiology Online*, *11*(5).

El-Gilany, A. H., Badawi, K., El-Khawaga, G., & Awadalla, N. (2011). Physical activity profile of students in Mansoura University, Egypt. *Eastern Mediterranean Health Journal = La Revue De Santé De La Méditerranée Orientale = Al-Majallah Al-Ṣiḥḥīyah Li-Sharq Al-Mutawassiṭ*, *17*(8), 694-702. https://doi.org/10.26719/2011.17.8.694

Gençay, Ö. A., Gençay, S., Aydin, E. E., Akkoyunlu, Y., & Demir, G. (2016). Self-efficacy, Physical Activity Enjoyment and BMI Status of Turkish University Students. *STUDIES ON ETHNO-MEDICINE*, *10*(1), 23-27. https://doi.org/10.1080/09735070.2016.11905467

Gómez-López, M., Gallegos, A. G., & Extremera, A. B. (2010). Perceived barriers by university students in the practice of physical activities. *Journal of sports science & medicine*, *9*(3), 374.

Gómez-López, M., Granero-Gallegos, A., Baena-Extremera, A., & Ruiz-Juan, F. (2011). The abandonment of an active lifestyle within university students: Reasons for abandonment and expectations of re-engagement. *Psychologica Belgica*, *51*(2), 155.

Haddad, L., Kane, D., Rajacich, D., Cameron, S., & Al-Ma'aitah, R. (2004). A comparison of health practices of Canadian and Jordanian nursing students. *Public Health Nursing*, *21*(1), 85-90.

Han, J. L., Dinger, M. K., Hull, H. R., Randall, N. B., Heesch, K. C., & Fields, D. A. (2008). Changes in women's physical activity during the transition to college. *American Journal of Health Education*, *39*(4), 194-199. https://doi.org/10.1080/19325037.2008.10599038

Hoyt, L. T., Chase-Lansdale, P. L., McDade, T. W., & Adam, E. K. (2012). Positive Youth, Healthy

Adults: Does Positive Well-being in Adolescence Predict Better Perceived Health and Fewer Risky Health Behaviors in Young Adulthood? *Journal of Adolescent Health*, *50*(1), 66-73. https://doi.org/10.1016/j.jadohealth.2011.05.002

IBM Corporation. (2012). *IBM SPSS Statistics for Windows, V. N. I. C.* (2012).

KARADAĞ, M., & Yildirim, N. (2010). HEALTH BEHAVIORS IN HEALTH SCIENCES UNIVERSITY STUDENTS IN TURKEY. *Social Behavior & Personality: An International Journal*, *38*(1). https://doi.org/10.2224/sbp.2010.38.1.43

King, K. A., Vidourek, R. A., English, L., & Merianos, A. L. (2013). Vigorous physical activity among college students: using the health belief model to assess involvement and social support. *Archives of Exercise in Health and Disease*, *4*(2), 267-279. https://doi.org/10.5628/aehd.v4i2.153

Kroll, T., Kehn, M., Ho, P.-S., & Groah, S. (2007). The SCI exercise self-efficacy scale (ESES): development and psychometric properties. *International Journal of Behavioral Nutrition and Physical Activity*, *4*(1), 34. https://doi.org/10.1186/1479-5868-4-34

Lachat, C., Otchere, S., Roberfroid, D., Abdulai, A., Seret, F. M. A., Milesevic, J., … Kolsteren, P. (2013). Diet and physical activity for the prevention of noncommunicable diseases in low-and middle-income countries: A systematic policy review. *PLoS medicine*, *10*(6), e1001465. https://doi.org/10.1371/journal.pmed.1001465

Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet*, *380*(9838), 219-229. https://doi.org/10.1016/S0140-6736(12)61031-9

Liu, H., & Dai, X. (2017). Correlation between physical activity and self-efficacy in Chinese university students. *Revista de psicolog ú a del deporte*, *26*(4), 0110-0114.

Lovell, G. P., El Ansari, W., & Parker, J. K. (2010). Perceived exercise benefits and barriers of non-exercising female university students in the United Kingdom. *International journal of environmental research and public health*, *7*(3), 784-798. https://doi.org/10.3390/ijerph7030784

Mudronja, L., Petracic, T., & Pedisic, Z. (2011). PHYSICAL ACTIVITY AND BARRIERS TO EXERCISE AMONG STUDENTS FROM THE FACULTY OF PHILOSOPHY IN ZAGREB. *6th International Scientific Conference on Kinesiology: Integrative Power of Kinesiology*, 343-346.

Poobalan, A. S., Aucott, L. S., Clarke, A., & Smith, W. C. S. (2012). Physical activity attitudes, intentions and behaviour among 18-25 year olds: A mixed method study. *Bmc Public Health*, *12*.

Racette, S. B., Inman, C. L., Clark, B. R., Royer, N. K., Steger-May, K., & Deusinger, S. S. (2014). Exercise and Cardiometabolic Risk Factors in Graduate Students: A Longitudinal, Observational Study. *Journal of American College Health*, *62*(1), 47-56. https://doi.org/10.1080/07448481.2013.843535

Rouse, P. C., & Biddle, S. J. (2010). An ecological momentary assessment of the physical activity and

sedentary behaviour patterns of university students. *Health Education Journal*, *69*(1), 116-125. https://doi.org/10.1177/0017896910363145

Sechrist, K. R., Walker, S. N., & Pender, N. J. (1987). Development and psychometric evaluation of the exercise benefits/barriers scale. *Research in nursing & health*, *10*(6), 357-365. https://doi.org/10.1002/nur.4770100603

Shaheen, A., Nassar O., Amre, H., & Hamdan-Mansour, A. (2015). Factors Affecting Health-promoting behav-iors of University Students in Jordan. *Health*. https://doi.org/10.4236/health.2015.71001

Sigmundová, D., Chmelík, F., Sigmund, E., Feltlová, D., & Frömel, K. (2013). Physical activity in the lifestyle of Czech university students: Meeting health recommendations. *European journal of sport science*, *13*(6), 744-750. https://doi.org/10.1080/17461391.2013.776638

Taber, D. R., Meischke, H., & Maciejewski, M. L. (2010). Testing Social Cognitive Mechanisms of Exercise in College Students. *American Journal of Health Behavior*, *34*(2), 156-165. https://doi.org/10.5993/AJHB.34.2.3

Taymoori, P., Niknami, S., Berry, T., Ghofranipour, F., & Kazemnejad, A. (2009). Application of the health promotion model to predict stages of exercise behaviour in Iranian adolescents. *Eastern Mediterranean Health Journal = La Revue De Santé De La Méditerranée Orientale = Al-Majallah Al-Ṣiḥḥīyah Li-Sharq Al-Mutawassiṭ*, *15*(5), 1215-1225.

United Nations (2015). *10 things you didn't know about the world's population*. Retrieved from http://www.un.org/youthenvoy/2015/04/10-things-didnt-know-worlds-population/

USAID. (2016). *Jordan/sector profile/youth*. Retrieved from https://www.usaid.gov/sites/default/files/documents/1883/Youth%20Sector%20May%202016.pdf

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: Development and psychometric characteristics. *Nursing research*, *36*(2), 76-81. https://doi.org/10.1097/00006199-198703000-00002

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1995). *Health promotion model-instruments to measure health promoting lifestyle: Health-promoting lifestyle profile* [HPLP II] (Adult version).

Wei, C.-N., Harada, K., Ueda, K., Fukumoto, K., Minamoto, K., & Ueda, A. (2012). Assessment of health-promoting lifestyle profile in Japanese university students. *Environmental health and preventive medicine*, *17*(3), 222-227. https://doi.org/10.1007/s12199-011-0244-8

World Health Organization. (2015, Januray). *Physical activity*. Retrieved June 4, 2016, from http://www.who.int/mediacentre/factsheets/fs385/en/

World Health Organization. (2017). *Health topics Physical activity*. Retrieved from http://www.who.int/topics/physical_activity/en/

Yan, Z., & Cardinal, B. J. (2013). Perception of Physical Activity Participation of Chinese Female Graduate Students: A Case Study. *Research Quarterly for Exercise and Sport*, *84*(3), 384-396. https://doi.org/10.1080/02701367.2013.813895