



PHYSICAL ACTIVITY, SELF-ESTEEM AND BODY COMPOSITION AMONG MALE COLLEGE TEACHERS

Neeraj¹ⁱ,

Parminder Singh Ahluwalia²

¹Assistant Professor,

Department of Physical Education,
RSD College, Ferozepur City, Punjab,
India

²Director of Sports,

Panjab University Chandigarh,
India

Abstract:

The aim of the present study was to assess the relationship of physical activity level with self-esteem, anthropometric characteristics and body composition among male college teachers. Total 300 male college teachers from different colleges of Malwa Region of Punjab were selected through purposive sampling technique. The age of subjects ranged between 31 to 60 years. Height was measured by using the standard anthropometric rod. Body weight of the subjects was measured with a portable weighing machine. Body mass index was then calculated using the formula weight (kg)/height² (m). The skinfolds thicknesses of body parts of the subjects were taken with Harpenden skinfold caliper. Percentage body fat as estimated from the sum of skinfolds was calculated using standardized equations. Physical activity level of the subjects was evaluated with the help of International Physical Activity Questionnaire (IPAQ) long version (2002). Self-esteem of the subjects was examined with the help of Rosenberg's self-esteem scale. The results of the study revealed that 30 % of male college teachers were physically inactive, 54.67% were moderately active and 15.33% were highly physically active. It was shown from results that 47 % of male college teachers had normal weight, 41.33% were overweight and 11.67% were reported to be obese. The result of the study shows that physical activity level of college teachers was found to have significantly negative relationship with height ($p < 0.05$), weight ($p < 0.05$), BMI ($p < 0.05$), fat percent ($p < 0.05$) and lean body mass ($p < 0.05$). Self-esteem had significantly positive association ($p < 0.05$) with physical activity level among college teachers. It is concluded that the physical activity enhances the self-esteem and body composition among the college teachers.

ⁱCorrespondence: email neerajdewra1@gmail.com

Keywords: physical activity, percent body fat, self-esteem, inactivity, college teachers

1. Introduction

Physical Activity is defined as any body movement produced by skeletal muscles that result in a substantial increase over the resting energy expenditure (Taras, 2005). It refers to the movement of large muscle groups, as when moving the whole body. Physical activity's main characteristics are intensity, duration and frequency and its main settings are leisure, work, home and transport. All kinds of physical activities, or lack of these activities, have physiological/medical consequences (Naughton et al., 2015). Globalization and urbanization affected the interests in physical activity in two ways. One, the use of motorized vehicles (passive modes of transport) has increased since the last three decades. The second reason is that high velocity traffic, pollution, lack of parks, sports facilities and recreational facilities have an additional effect (WHO, 2014). Despite the proven health benefits of physical activity, most of the world continues to live in a sedentary society (European health report, 2002). Physical inactivity has been labeled as one of the biggest public health problems of 21st century (Blair, 2009). According to World Health Organization, 23 % of the population is physically inactive globally. It has been identified as the fourth leading risk factor for global mortality causing an estimated 3.2 million deaths globally (WHO, 2015). Furthermore, physical activity level drops significantly with increasing age; physical activity commonly lower among females; and the overall inactivity scenario is poorer in urban areas (WHO, 2008).

Physical inactivity refers to low levels or the absence of physical activity. It represents the lower end of the activity spectrum. Sedentary behavior includes a number of occupations that have in common very little energy expenditure (Aires, 2009). Watching television or videos-that is, time spent in front of a screen or, more generally, time spent sitting daily-is a commonly used indicator of sedentary behavior.

Physical activity is the key strategy for reducing risk of chronic diseases. Regular physical activity helps to build and maintain healthy bones and muscles, reduces the risk of developing obesity, reduces feelings of depression and anxiety and promotes psychological well-being. Moreover, adequate levels of physical activity will decrease the risk of a hip or vertebral fracture and help control weight. It is reported in various studies that physical activity reduces adiposity in both overweight and normal children, improves musculo-skeletal and cardiovascular health and fitness, positively influences concentration and memory and thereby on intellectual performance (Strong et al., 2005). Self-Esteem is a way one feels about on self-including the degree to which one possesses self-respect and self-acceptance. In order to an attitude of self-approved, a feeling of self-worth is an important ingredient of mental health and loss of self-esteem and feeling of worthiness are common depressive symptoms (Rosenberg, 1965). Self-esteem is affected by a variety of influence ranging from formative childhood experiences in relation to our parents to our own standards or ideal self (Murphy et al, 2005; Vishalakshi and Yeshodhara, 2012).For instance, individuals with high self-esteem generally were

brought up by parents who were very accepting of them expressed a lot of affection, and established firm but reasonable rules - all of which fosters a positive self-image. Individuals with low self-esteem usually were brought up by parents who relied on parenting styles that were overly strict, overly permissive or inconsistent. Also, self-esteem is significantly influenced by our experiences of success and failure. Self-esteem is the personal evaluation of ourselves and the resulting feeling of worth associated with our self-concept.

Self-Esteem can be defined in numerous ways. Most commonly, self-esteem is defined on the basis of two psychological processes: evaluation and affect (Mruk, 2006). Evaluation accentuates the role of cognition, while affect emphasizes the role of feelings as they pertain to self-esteem. As such, Mruk (2006) defines four basic ways that self-esteem is defined: (1) as a certain attitude, (2) based on discrepancy, (3) as a psychological response a person holds toward himself or herself, and (4) as a function of personality. In the attitudinal definition, it involves positive or negative cognitive, behavioral, and emotional reactions. When people base their self-esteem on discrepancy, they are measuring the difference between what they see as their ideal self and their perceived self. The closer these two percepts are, the higher their self-esteem is thought to be. The psychological response a person holds towards himself or herself is described as feeling-based, rather than attitudinal alone (Gitau et al., 2014). Many studies demonstrated the relationship of self-esteem with the physical activity levels (Sonstroem et al., 1994). Tremblay et al. (2000) in a study to assess the relationship between physical activity level and self-esteem on children and reported positive association between physical activity level and self-esteem. In another study by Sani et al (2016) on teachers and staff of University of Tabrez, Iran, reported positive association between physical activity level and self-esteem. However, some studies did not find any effect of aerobic exercise on self-esteem or a significant association between physical activity and self-esteem in adolescents (Kaminsky and Dewey, 2014; Walters and Martin, 2000; Abedalhafiz et al., 2012).

Body Composition is one of the components of physical fitness and it refers to the tissue components which make up the body and is usually used to mark the relative percentage of fat and lean body tissue (Reilly et al., 1990). In environments of health and fitness, the main interest is the acquisition of knowledge regarding the relative amount of body mass in relation to fat-free mass and the distribution of fat in the human body, with the additional interest in the changes in these components (Siahkouhian et al., 2006; Baumgartner et al., 2003; Wang et al., 2001). Physical inactivity is one of the main causes of the increase in body fat (Cuprika et al., 2014). In the case of the elderly, the increase in body fat is conditioned by the slower walking speed and functional limitations. Body composition and growth are the key components of health in both individuals and populations. The ongoing epidemic of obesity in children and adults has highlighted the importance of body fat for short term and long-term health. Many previous studies found a significant association between the physical activity levels and obesity status among the

individuals (Helena et al., 2008; Vaidya and Krettek, 2014; Bergman et al 2008; Hallal et al., 2003).

Although much research has been conducted to show the degrees of relation between self-esteem, body composition and physical activity levels among various populations, few studies have attempted to find these correlations among college level male teachers. The present study, therefore, attempts to determine the physical activity status and the impact of physical activity on self-esteem and body composition among the male college teachers.

2. Methodology

A descriptive survey type study carried out to ascertain the relationship of physical activity level with the eating attitudes, self-esteem and body composition among the college teachers of Malwa region of Punjab. To obtain the required data with regard to anthropometric measurements, physical activity level, self-esteem, male college teachers of different colleges of Malwa region of Punjab were approached. The subjects were assessed for anthropometric measurements and distributed questionnaires to gather information with regard to physical activity level and self-esteem. The study was conducted on three hundred (N=300) male college teachers from different colleges. The age of the subjects was ranged between 31 to 60 years. The purposive sampling technique was applied for the selection of subjects.

2.1 Physical Activity Level

The International Physical Activity Questionnaire (IPAQ) long form (2002) was used to assess the physical activity level of the college teachers. This version of IPAQ contained 27 questions in detail about walking, moderate intensity and vigorous intensity physical activity which elicit the responses in four domains viz. work domain, transportation domain, domestic & garden domain and recreation, sport, and leisure-time domain. Energy cost was measured in METs (metabolic equivalents of task). The following criterion was applied to classify the levels of physical activity:

- Inactive - < 600 MET-min/week,
- Moderately Active - 600 MET-min/week to 3000 MET-min/week,
- Highly Active - > 3000 MET-min/week.

2.2 Self-Esteem

Self-esteem of the college teachers was examined with the help of Rosenberg's self-esteem scale given by Rosenberg (1965). The scale is 10-item Likert scale with items answered on a four-point scale from strongly agree, agree, disagree to strongly disagree. The items score 0-3, yielding a total score of 0-30. Respondents with a score of 15 or less considered as having low self-esteem. The score between 15 to 25 considered as average score. Respondents with a score greater than 25 considered as having high self-esteem.

2.3 Anthropometric Measurements

Height of the subjects was measured using the standard anthropometric rod to the nearest 0.5 cm (HG-72, Nexgen ergonomics, Canada). Body weight of the subjects was measured with a portable weighing machine to the nearest 0.5 kg. Body mass index was then calculated using the formula weight (kg)/height² (m). The skinfolds thicknesses of body parts of the subjects were taken with Harpenden skinfold caliper.

2.4 Body Composition

Percentage body fat as estimated from the sum of skinfolds was calculated using equations of Siri (1956) and Durnin and Womersley (1974). The regression equations for the prediction of body density from the log of the sum of skinfold thickness at four sites in mm are as following:

30 to 39 years age group:

$$\text{Body Density (gm/cc)} = 1.1422 - 0.0544 (X)$$

40 to 49 years age group:

$$\text{Body Density (gm/cc)} = 1.1620 - 0.0700 (X)$$

> 50 years age group:

$$\text{Body Density (gm/cc)} = 1.1715 - 0.0779 (X)$$

Where

$$X = \log (\text{biceps} + \text{triceps} + \text{subscapular} + \text{suprailliac}).$$

$$\text{Percent Body Fat} = [4.95 / \text{body density} - 4.5] \times 100 \text{ (Siri, 1956)}$$

$$\text{Total Body Fat (kg)} = (\% \text{body fat} / 100) \times \text{body mass (kg)}$$

$$\text{Lean Body Mass (kg)} = \text{body mass (kg)} - \text{total body fat (kg)}$$

2.5 Statistical Analysis

Statistical analysis was performed using SPSS version 16.0 for windows (SPSS Inc, Chicago, IL, USA). Descriptive statistics such as mean, standard deviation, maximum value, minimum value, percentages etc were carried out of physical activity levels, self-esteem and anthropometric and body composition scores among college teachers. The Karl Pearson Product Moment coefficient of correlation analysis was used to identify the associations of physical activity levels with self-esteem, anthropometric and body composition scores among college teachers. The level of the significance was set at 0.05 to test the hypotheses.

3. Results

Table 1: Descriptive statistics for physical activity level, self-esteem, anthropometric and body composition characteristics among the male college teachers

| Variables | N | Mean | SD | Maximum | Minimum |
|--------------------------------------|-----|--------|-------|---------|---------|
| Height (cm) | 300 | 178.23 | 4.21 | 190.00 | 168.00 |
| Weight (kg) | 300 | 81.64 | 10.71 | 111.00 | 60.00 |
| Body Mass Index (kg/m ²) | 300 | 25.64 | 2.72 | 32.10 | 19.92 |
| Percent Body Fat (%) | 300 | 24.06 | 2.69 | 31.33 | 18.91 |

Neeraj, Parminder Singh Ahluwalia
 PHYSICAL ACTIVITY, SELF-ESTEEM AND BODY
 COMPOSITION AMONG MALE COLLEGE TEACHERS

| | | | | | |
|--|-----|---------|---------|---------|-------|
| Total Body Fat (kg) | 300 | 19.87 | 4.71 | 32.58 | 13.04 |
| Lean Body Mass (kg) | 300 | 61.76 | 6.38 | 81.97 | 46.13 |
| Self Esteem | 300 | 20.30 | 3.55 | 28.00 | 13.00 |
| Physical Activity Level (MET Minutes/week) | 300 | 1483.67 | 1106.06 | 3980.00 | 00.00 |

Table 2: Classification on the basis of body mass index among the male college teachers

| Body Mass Index Categories | Frequency | Percentage (%) | Cumulative Percentage |
|----------------------------|-----------|----------------|-----------------------|
| Under weight | 0 | 0.00 | 0.00 |
| Normal Weight | 141 | 47.00 | 47.00 |
| Overweight | 124 | 41.33 | 88.33 |
| Obese | 35 | 11.67 | 100.00 |
| Total | 300 | 100.00 | |

Table 3: Classification on the basis of physical activity level among the male college teachers

| Physical Activity Level | Frequency | Percentage (%) | Cumulative Percentage |
|-------------------------|-----------|----------------|-----------------------|
| Physically Inactive | 90 | 30.00 | 30.00 |
| Moderately Active | 164 | 54.67 | 84.67 |
| Highly Active | 46 | 15.33 | 100.00 |
| Total | 300 | 100 | |

The descriptive statistics for the physical activity level, self-esteem, anthropometric measurements and body composition components among the male college teachers are shown in table 1. The classification on the basis of body mass index among the male college teachers is presented in table 2. Out of total male teachers, 47 % of male college teachers were found to have normal weight, 41.33% were found to have overweight and 11.67% male college teachers were reported to be obese. However, no male college teacher was observed to be underweight. Table 3 presents the physical activity status of the male college teachers. Out of total male teachers, 30 % of male college teachers were found to be physically inactive, 54.67% were found to be moderately active and only 15.33% male college teachers were reported to be highly physically active.

Table 4: Relationship of physical activity level with self-esteem, anthropometric and body composition characteristics among the male college teachers

| Variables | N | Pearson Correlation Coefficient (r-value) | p-value(Sig.) |
|--------------------------------------|-----|---|---------------|
| Height (cm) | 300 | -0.319* | 0.000 |
| Weight (kg) | 300 | -0.766* | 0.000 |
| Body Mass Index (kg/m ²) | 300 | -0.804* | 0.000 |
| Percent Body Fat (%) | 300 | -0.670* | 0.000 |
| Total Body Fat (kg) | 300 | -0.743* | 0.000 |
| Lean Body Mass (kg) | 300 | -0.737* | 0.000 |
| Self Esteem | 300 | 0.488* | 0.000 |

* Indicates significant at 0.05 level

Table 4 presents the association physical activity level with anthropometric characteristics, body composition components and self-esteem among the male college teachers. The results of correlation analyses revealed a significant association of physical activity level with height ($r=-0.319$, $p=0.000$) among male college teachers. Similarly, the results of correlation analyses revealed a significant negative association of weight ($r=-0.766$, $p=0.000$) with the physical activity level among the male college teachers. The body mass index among college teachers also demonstrated significant negative association ($r=-0.804$, $p=0.000$) with the physical activity level. Among the body composition components, a significant negative relationship of percent body fat ($r=-0.670$, $p=0.000$) with physical activity level was reported among male college teachers. The total body fat was also demonstrated significant negative association ($r=-0.637$, $p=0.000$) with the physical activity level among male college teachers. The lean body mass ($r=-0.737$, $p=0.000$) was observed to be significantly associated with the physical activity level in the male college teachers. The self-esteem scores demonstrated significant positive association ($r=0.488$, $p=0.000$) with the physical activity level among male college teachers.

4. Discussion

The primary aim of the study was to assess the status of physical activity level and its association with self-esteem and body composition among the college teachers. The results of the study reported that 30 % of male college teachers were physically inactive, 54.67% were moderately active and 15.33% were highly physically active. However, Indian Council of Medical Research-India Diabetes (ICMR-INDIAB, 2013) demonstrated that 54.4% subjects were inactive, 31.9% subjects were moderately active whereas 13.7% subjects were highly active. The region-wise prevalence of physical inactivity was as follows; Chandigarh-66.8%, Tamilnadu-60.0%, Maharashtra- 55.2% and Jharkhand-34.9%. Differences in physical activity level in the previous survey and present study might be due to the reason that the earlier survey was conducted on the general population, but the present study has been focused on the teachers. The teachers were more active as compared to the general population and might be due to the reason that the education was found to be the factor which contributes to enhance the physical activity (Martinez-Gonzalez et al., 2009). Similarly, Vaidya and Krettek (2014) reported the prevalence of inactivity among 41.7% peri-urban Nepalese population. Patil et al. (2017) conducted a study on adults in Nagpur, Maharashtra and observed that 59% adults were having a sedentary lifestyle, 27% were having a moderately active lifestyle and 14% were having a vigorously active lifestyle. Studies by Agrawal et al (2015) and Azevedo et al (2007) demonstrated the prevalence of inactivity as 86.42%, and 57.1% respectively. A survey by integrated disease surveillance project-NCD (2007) in Maharashtra reported that the physical inactivity levels are as high as 81.65%. Atan et al., (2012) in a study on teachers and health professionals from Turkey reported that the 27.5% teachers were inactive, 61.5% were low active, 11% were adequately active and

among health professionals 27% were inactive, 51.5% were low active and 21.5% were adequately active. In a study that examined university teaching staff, the maximum activity was “walking activity” with 48.3 % (Arslan et al., 2003). In another study, physical education teacher’s physical activity levels were; 41.6 % inactive, 41.6% moderate and 16.8% high active, respectively (Arabaci and Cankaya, 2007). In a study conducted by Brito et al. (2012) on teachers from the Brazil, 46.3% teachers were physically inactive, 42.7% had moderate level of physical activity and only 11% teachers had high physical activity levels. These results indicate that, physical activity levels are generally not adequate in different occupational groups. Varied range in the prevalence of physical activity is because a different type of questionnaire used in different studies. This prevalence of high inactivity oriented lifestyle has to be tackled by educating the population regarding positive benefits of higher levels of physical activity in the daily routine so that it helps them for a longer and healthier life.

It is shown from results of present study that physical activity level of college teachers had significant association with height, weight, BMI and body composition components. Many previous studies by Helena et al. (2008), Vaidya and Krettek (2014), Bergman et al. (2008) and Hallal et al. (2003) found a significant association between the physical activity levels and obesity status. Patil et al. (2017) in his study on adults in Nagpur, Maharashtra reported significant association between physical activity levels and obesity. In another study Ara et al. (2007) determine the relationship between physical activity levels and adiposity among children revealed that the level of physical activity had a significant effect on obesity. This was in concordance with our study. Sullivan et al. (2011) and Sibai et al. (2013) did not find any association between obesity and physical activity levels.

The results of the present study also revealed that the self-esteem had significantly positive association with physical activity level among college teachers. Similar findings were reported by Tremblay et al. (2000) in a study to assess the relationship between physical activity level and self-esteem on children and reported positive association between physical activity level and self-esteem. In another study by Sani et al (2016) on teachers and staff of University of Tabrez, Iran, reported positive association between physical activity level and self-esteem. The results of present study are also in accordance with Sonstroem et al. (1994) but is at odds with other studies, which did not find any effect of aerobic exercise on self-esteem or a significant association between physical activity and self-esteem in adolescents (Kaminsky and Dewey, 2014; Walters and Martin, 2000; Abedalhafiz et al., 2012). It seems that subject characteristics and type of physical activity may affect self-esteem improvement (Fox, 2000). It is concluded that the physical activity enhances the self-esteem among the college teachers.

A number of recent studies have shown that regular physical activity is beneficial for individuals and communities and particularly for patients with different health problems and physical activity should be encouraged. It is clear that for having a long and quality life, increased physical activity level is required (Vural et al., 2010). Current physical activity recommendations for the general population are that all adults should

perform at least 30 min of moderate intensity physical activity, and preferably in all days of the week (Driskell et al., 2005). A physical activity habit varies according to cultural background, socioeconomic level, individual differences and health status (Bas Aslan et al., 2007).

5. Conclusion

On the basis of the results of the study, it was concluded that 30 % teachers were physically inactive, 54.67% were moderately active and 15.33% were highly physically active. It was shown from results that 47 % teachers had normal weight, 41.33% were overweight and 11.67% were reported to be obese. It was also concluded that physical activity level of college teachers was found to have significantly negative relationship with height, weight, BMI and body composition components and significantly positive association with self-esteem. The physical activity enhances the self-esteem and body composition among the college teachers.

References

- Abedalhafiz, A., Altahyneh, Z. L., Al-Haliq, M. (2012). The relationship between physical activity and self-esteem among students of Zarqa education directorate. *International Journal of Academic Research*. 4(6):39-48.
- Agrawal, A., Varma, K., Gupta, R. (2005). Physical activity of urban middle-aged women in different domains : a cross-sectional study. *Int J Diabetes Dev Ctries*. 10–6.
- Aires, L. (2009). Levels of physical activity, physical fitness and overweight/obesity in children and adolescents Porto: Doctoral dissertation in Physical Activity and Health. Research Centre in Physical Activity, Health and Leisure, Faculty of Sports – University of Porto.
- Ara, I., Moreno, L. A., Leiva, M. T., Gutin, B. and Casaju J. A. (2007). Adiposity, physical activity, and physical fitness among children from Aragon, Spain. *Obesity*, 15(8):1918-1924.
- Arabaci, R., Cankaya, C. (2007). Study on the physical activity level of physical education teachers. *Uludag University Faculty of Education Journal*. XX(1):1-15.
- Arslan, C., Koz, M., Giir, E., Mendes, B. (2003). Investigation of the correlation between at physical activity level and health problems in university educational staff. *Firat University Journal of Health Science*. 17(4):249-258.
- Atan, T., Tural, E., Imamoglu, O., Cicek, G., Tural, S. (2012). Physical activity levels of teachers and health professionals in Turkey. *HealthMED*, 6(6):1935-1942.
- Azevedo, M. R., Luiza, C., Araújo, P., Reichert, F. F., Siqueira, F. V., Cozzens, M., et al. (2007). Gender differences in leisure-time physical activity. *Int J Public Health*. 52:8–15.

- Bas Aslan, U., Livanelioglu, A., Aslan, S. (2007). Evaluation of physical activity levels in undergraduate students by two methods. *Physical Therapy and Rehabilitation*. 18(1):11-19.
- Baumgartner, T. A., Jackson, A. S., Mahar, M. T. & Rowe, D. A. (2003). Measurement for evaluation in physical education and exercise science, 7th Ed. Boston: WCB McGraw-Hill. pp 32-45.
- Bergman, P., Grijibovski, A. M., Hagströmer, M., Bauman, A., Sjöström, M. (2008). Adherence to physical activity recommendations and the influence of socio-demographic correlates – a population-based cross-sectional study. *BMC Public Health*. 9:1–9.
- Blair, S. N. (2009). Physical inactivity: the biggest public health problem of the 21st century. *British Journal of Sports Medicine*. 43:1-2.
- Brito, W. F., Santos, C. L., Marcolongo, A. A., Campos, M. D., Bocalini, D. S., Antonio, E. L., Junior, J. A. S., Tucci, P. J. F., Serra, A. J. (2012). Physical activity levels in public school teachers. *Rev Saúde Pública*. 46(1):1-5.
- Cuprika, A., Fernate, A. & Cupriks, L. (2014). Physical activities and body composition among women in fitness. *Lase Journal of Sport Science*, 5(2):43-54.
- Driskell, J. A., Kim, Y. N., Goebel, K. J. (2005). Few differences found in the typical eating and physical activity habits of lower-level and upper-level university students. *J Am Diet Assoc*. 105: 798-801.
- Durnin, J. V. G. A. & Womersley, J. (1974). Body fat assessed from total body density and its estimation from skinfold thickness measurements of 481 men and women aged from 16-72 years. *Br J Nutr*, 32:77-97.
- Fox, K. R. (2000). The effects of exercise on self-perceptions and self-esteem. In: Biddle S. J. H., Fox K. R., Boutcher S. H., Faulkner G., editors. *Physical Activity and Psychological Well-Being*. London: Routledge.
- Gitau, T. M., Mickelfield, L. M., Pettifor, J. M. & Norris. S. A. (2014). Eating attitudes, body image satisfaction and self-esteem of South African Black and White male adolescents and their perception of female body silhouettes. *Journal of Child and Adolescents Mental Health*, 26(3):193-205.
- Helena, T., Soares, B. D. A. (2008). Sex, income, and level of education associated with physical activity level among workers. *Rev Saúde Pública*. 42(3):1–6.
- Indian Council of Medical Research-India Diabetes (ICMR-INDIAB, 2013). Physical activity and inactivity patterns in India – results from the ICMR-INDIAB study (Phase-1) [ICMR-INDIAB-5]. *International Journal of Behavioral Nutrition and Physical Activity* 2014, 11:26.
- Integrated disease surveillance project (IDSP) (2007). Noncommunicable disease risk factors survey.
- Kaminsky, L. A., Dewey, D. (2014). The association between body mass index and physical activity, and body image, self-esteem and social support in adolescents with type 1 diabetes. *Can J Diabetes*. 38(4):244–249.

- Martinez-Gonzalez, M. A., Varo, J. J., Santos, J. L., De-Irala, J., Gibney, M., Kearney, J. & Martinez, J. A., (2001). Prevalence of physical activity during leisure time in the European Union. *Med. Sci. Sports Exerc.* 33:1142–1146.
- Mruk, C. J. (2006). *Self-esteem research, theory, and practice: Toward a positive psychology of self-esteem*. New York: Springer.
- Murphy, C. M., Stosny, S. and Morrel, T. M. (2005). Change in self-esteem and physical aggression during treatment for partner violent men. *Journal of Family Violence*, 20, 201-210.
- Naughton, P., McCarthy, S. N., McCarthy, M. (2015). The creation of a healthy eating motivation score and its association with food choice and physical activity in a cross-sectional sample of Irish adults. *International Journal of Behavioral Nutrition and Physical Activity* 12(1):74.
- Patil, C., Dhoble, M., Kaware, A. (2017). A study of physical activity levels and its correlates among adults: a cross-sectional study. *Int J Community Med Public Health*. 4(4):1154-1158.
- Reilly, T., Sechei, N., Snell, P. & Williams, C. (1990). *Physiology of sports*. London: E & FN Spon.
- Rosenberg, M. (1965). *Society and the Adolescent Self-image*. Princeton University Press, Princeton, NJ.
- Sani, S. H. Z., Fathirezaie, Z., Brand, S., Pühse, U., Holsboer-Trachsler, E., Gerber, M., Talepasand, S. (2016). Physical activity and self-esteem: testing direct and indirect relationships associated with psychological and physical mechanisms. *Neuropsychiatr Dis Treat*. 12:2617-2625.
- Siahkoughian, M., Rahmaninia, F. & Barahmand, U. (2006). Effects of body composition measures on dimension of Vo₂max. *International Journal of Fitness*, 2:1-6.
- Sibai, A. M., Costanian, C., Tohme, R., Assaad, S., Hwalla, N. (2013). Physical activity in adults with and without diabetes: from the —high-risk‖ approach to the —population-based‖ approach of prevention. *BMC Public Health*. 13(1):1002.
- Siri, W. E. (1956). The gross composition of the body. *Adv Biol Med Phys*, 4:256–280.
- Sonstroem, R. J., Harlow, L. L., Josephs, L. (1994). Exercise and self-esteem: validity of model expansion and exercise associations. *J Sport Exerc Psychol*. 16(1):29–42.
- Strong, W. B., et al. (2005). Evidence Based Physical Activity for School-Age Youth. *The Journal of Pediatrics*, 146, 732-737.
- Sullivan, R., Kinra, S., Ekelund, U., Bharathi, A. V., Vaz, M., Kurpad, A, et al. (2011). Socio-Demographic Patterning of Physical Activity across Migrant Groups in India : Results from the Indian Migration Study. *PLoS One*. 6(10):1–9.
- Taras, H. (2005). Physical activity and student performance at school. *Journal of School Health*, 75(6):214-218).
- The European Health Report. (2002). Introduction. *WHO Reg Publ Eur Ser*; (97):2-5.
- Tremblay, M. S., Inman, J. W., Willmns, J. D. (2000). The Relationship Between Physical Activity, Self-Esteem, and Academic Achievement i n 12-Year-Old Children. *Pediatric exercise science* 12(3).

- Vaidya, A., Krettek, A. (2014). Physical activity level and its sociodemographic correlates in a peri-urban Nepalese population : a cross-sectional study from the Jhaukhel-Duwakot health demographic surveillance site. *Int J Behav Nutr Phys Act.* 39(11):1–12.
- Vishalakshi, K. K. & Yeshodhara, K. (2012). Relationship between self-esteem and academic achievement of secondary school students. *Indian Journal of Applied Research.* 1(12):83-84.
- Vural, Ö., Eler, S., Atalay Güzel, N. (2010). The relation of physical activity level and life quality at sedentary profession. *Spormetre Journal of Physical Education and Sport Science.* VIII(2): 69-75.
- Walters, S., Martin, J.E. (2000). Does aerobic exercise really enhance self-esteem in children? A prospective evaluation in 3rd-5th graders. *J Sport Behav.* 23(1):51–60.
- Wang, Z., Heo, M., Lee, R. C., Kotler, D. P., Withers, R. T. & Heymsfield, S. B. (2001). Muscularity in adult humans: proportion of adipose tissue-free body mass as skeletal muscle. *American Journal of Human Biology,* 13:612-619.
- WHO (2008). *Global Strategy on Diet, Physical Activity and Health.* World Health Organisation.
- WHO (2014). *Physical Inactivity: A Global Public Health Problem.* WHO. World Health Organization.
- WHO (2015). *Physical activity.* WHO. World Health Organization.

Creative Commons licensing terms

Authors will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Physical Education and Sport Science shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflict of interests, copyright violations and inappropriate or inaccurate use of any kind content related or integrated on the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).