

## Original Article

### Levels of physical activity, body image and their relationship in Chilean university students from a health school.

MAURICIO CRESP BARRIA<sup>1</sup>, CLAUDIA MACHUCA BARRIA<sup>2</sup>, RODRIGO MORAGA<sup>3</sup>, JOSE FERNANDEZ FILHO<sup>4</sup>, PEDRO DELGADO FLOODY<sup>5</sup>.

<sup>1</sup>Physical Education program, School of Education, Universidad Católica de Temuco, Temuco, CHILE.

<sup>2</sup>Nutrition and dietetics program, Health Sciences School, Universidad Católica de Temuco, CHILE.

<sup>3</sup>Universidad Adventista Chile, Sede Chillan.

<sup>4,2</sup>Bio-Sciences of the Human Movement's Laboratory, Federal Univeristy of Rio De Janeiro, BRAZIL.

<sup>5</sup>Physical Education program, School of Education, Universidad de la Frontera de Temuco, CHILE

*Published online: April 30, 2018*

*(Accepted for publication April 15, 2018)*

**DOI:10.7752/jpes.2018.s168**

#### Abstract :

It is relevant to investigate the risk factors presented by university students of programs related to careers in the area of health, which are apparently healthy. Today, there are profound changes in lifestyle and diet in the young population. The subjects selected in the investigation were 104 (n = 104), and was representative (total n = 142) with a 5% error and 95% reliability. The data were collected through the use of two self-administered surveys: a) body shape questionnaire (BSQ) and b) A questionnaire was used to assess the level of physical activity (IPAQ, 2009). For the data analysis, statistical software SPSS (Statistical package for social sciences 20.0) was used. This research has a descriptive, transversal, correlational and non-experimental design, whose objective is to determine and correlate the values of the level of physical activity and body awareness. Those selected are first-year students from three programs (nutrition, kinesiology, occupational therapy), academics from the health school, Catholic University of Temuco, Chile. An analysis was made of bivariate samples of Kendall's Tau-b. The results showed that there is no significant correlation between the levels of physical activity and physical perception in the Health students of the Catholic University of Temuco.

**Keywords:** Body image, physical activity, health, university students.

#### Introduction

Main problems associated with bad habits in all age groups, are related to lack of physical exercise and poor diet. In Chile, the national health survey 2009-10, using the ATP II criteria that includes measurement of the waist circumference, blood pressure, plasma cholesterol level HDL, triglycerides and glycaemia, reported an increment in the incidence of SM from 22,6 in 2003 to 35,3% for adults, more frequently in women (41,7%), than in men (31%). It also reported an increment of six times between 15 and 24 years, and in those who were 65 years or more with a strong education level. There is a higher prevalence in urban populations than rural and among regions, being the IX region, whose capital is Temuco, the highest national prevalence 42%. (National Health Survey, Chile 2009-2010).

The regular practicing of physical activity, understood as any movement that requires the body to work harder than normal is associated with different benefits, either physical or psychological and plays an important role in the prevention of some chronic noncontagious disease. Moreover, it has been proven that greater amounts of physical activities in the early stages of the life cycle has long term health benefits, such as high bone density, cardiovascular endurance and lower blood pressure, over weight and obesity.

Although most chronic diseases (such as cardiovascular diseases) typically occur in adulthood, some risk factors are determined to a large extent by behaviors learned in childhood (Saez & Bernui, 2009). Regular physical activity has also proved to ward off feelings of depression, fatigue, perceived stress and anxiety, among other psychological disorders, as well as high self-esteem and better mood (Jimenez et al, 2009, Biddle et al, 2000).

Studies with adolescents and college students have shown the relationship between perceived physical competence and different indicators of psychological well-being (Ryan & Frederick, 1997; Reinboth & et al, 2004) as the subjective vitality; defined as an overall evaluation that the person makes about his life (Pavot & et al, 2001), and self-esteem, and also as the evaluation that the individual makes and keeps about himself, which leads to a positive or negative attitude about oneself (Rosenberg, 1965; Reinboth & et al, 2004).

Nevertheless, and beside the benefits, there is a predominant sedentary behavior compared to being physically active (Garcia, 2006; US Department of Health and Human Services, 1996). In Western society, the body and body image are widely cultivated because it is considered necessary when introducing to others. In addition, there is a direct relationship in the improvement of perceived competence and personal acceptance, favoring the development of self-esteem (Fox & Kenneth, 2000).

Corporal image is a fascinating topic that has a direct and equal implication over identity and appearance. Conceptualized publications talk about it, emphasizing new studies and aspects of body image and current body image (Ozuna & et al,2006;Gil & et al , 2007).

The student population is subject to a series of physiological changes, common in young people, in which possible sociological and cultural changes are added; the beginning of college, abandonment of the family home on numerous occasions, the beginning of an adult life, and so on. This also has a direct impact on dietary habits, which in many cases will be maintained throughout the life (Gonzalez & et al, 2002).

Some students leaving further away from educational centers have poor eating habits, due to the lack of time (Troncoso & Amaya, 2009) to cook or prepare healthy food that was probably consumed at home during the school stage (Espinoza & et al, 2011).

The Ministry of Health the Chile created the National council for health in 1998 (Vio & Salinas,2006), published the first dietary guidelines for Chileans in 1997 (Ministry of Health / INTA / Depto. Nutrition University of Chile,1997), and a second version in the year 2005 (Ministry of Health / INTA / Vida Chile,2005). It also established the mandatory Nutritional labelling for processed food from the year 2006 ( Ministry of Health. Nutritional labeling of food,2006) and created the global strategy against obesity (EGO-Chile), in the same year (Ministry of Health Chile. Global Strategy against Obesity, 2008). These strategies were oriented to prevent and control obesity, promote physical activity and healthy eating.

Considering the important role that universities have in the country, whose number of students increased from 100.000 in the eighties to more than 700.000 in the middle of 2000, the National health council decided to stimulate the implementation of “healthy universities”, with the idea of influencing positively over the health and well-being of the students, and contribute to the development of similar initiatives, in the different fields in which future professionals will work (Langue & Vio,2006).

It is relevant to research the risk factors presented in apparently healthy students. Nowadays there are profound changes in the life style and diet in young population. The consumption of fast food has increased to the detriment of additional cooking, regular physical activity has decreased by the rise of passive entertainment and there has been a surge in the consumption of alcohol and tobacco; so that risk factors cannot be simply considered as additives, but multipliers ( Lopez et al,2003). This is the main reason to research students or future professionals in academic programs related to the area of health promotion. The objective of the research is to describe and correlate values of physical activity level and body image in first year students of three academic programs of the health school, Catholic University of Temuco, Chile

## Materials and Methods

**Participants :** The subjects selected in the research were 104 (n=104), and it was representative (total n=142) with a 5% of error, and reliability of 95%. Non-probability sample was chosen for the access to the information of phonoaudiology, kinesiology, nutrition, and dietary of the health school of Universidad Católica de Temuco. Chile.

The study design corresponds to a descriptive - correlational and non-experimental cross-sectional study type. Inclusion criteria for participation was: a) to be between 18 to 25 years old, b) to be enrolled in health career and c) be a freshman in 2015.

**Ethical criteria :**This study was based on the declaration of Helsinki for biomedical research involving human subjects. The students were informed about the aim of the research, giving them written consent prior to any intervention. The individuals or their parents granted their written consent, stating identity confidentiality of the participants, as well as the researcher commitment not to publish data without official publication. Also, this study was sanctioned by the ethical Committee of Universidad Católica de Temuco, Chile.

## Instruments and Statistical procedures :

Data was collected through the use of two self-administered surveys: a) body shape questionnaire (BSQ). This survey has 34 questions and is derived from four subscales; body dissatisfaction, fear of being fat, low self-esteem and desire to lose weight.( Cooper et al,1987) b) Questionnaire was used, which evaluates the level of physical activity, composed by 7 guiding questions of physical activities developed during the last week prior implementing the test (IPAQ,2009). The results were classified in minutes performing high intensity activity, moderate and sedentary which is multiplied by a specific factor for each one that gives a final result in mets/ min / week.

For data analysis, the statistic software SPSS (Statistical Package for the social Sciences 20.0) was used. After analyzing the variables individually and collectively in different situations, is meant to answer the main goal of the study. Thus a correlational analysis was performed using bivariate samples of kendall’s Tau-b.

**Results**

Table 1.BSQ\_Image\_Body \* Academic Program

Table 4 Gender \* Level Physical Activity IPAQ

|                    |                    | Academic Program      |                         |                            | N° Total   |
|--------------------|--------------------|-----------------------|-------------------------|----------------------------|------------|
|                    |                    | Nutrition<br>(33,65%) | Kinesiology<br>(32,69%) | Speech therapy<br>(33,65%) | (%)        |
| BSQ_Image<br>_body | Do not worry       | 23 (65,71%)           | 23 (67,64%)             | 20 (57,14%)                | 66 (63,4%) |
|                    | Barely worried     | 6 (17,14%)            | 4 (11,76%)              | 8 (22,85 %)                | 18 (17.3%) |
|                    | Moderately worried | 6 (17,14%)            | 2 (5,88 %)              | 6 (17,14 %)                | 14 (13.4%) |
|                    | Extremely worried  | 0 (00,0%)             | 5 (14,70%)              | 1(2,85 %)                  | 6 (5.7%)   |
| <b>Total</b>       |                    | 35 (100,0%)           | 34 (100,0%)             | 35 (100,0%)                | 104 (100%) |

In level “No worried” three academic programs vary in a similar amount, regarding the level “slightly worried” the career of speech therapy leads the preferences with 8 people, in the “moderately worried” level nutrition and speech therapy present 6 cases and the kinesiology program only 2. In the area “extremely worried” nutrition program does not present any case, speech therapy only 1 and kinesiology program presents an alarming number of 5 cases.

Table 2.Gender \* BSQ\_Image\_Body

|              |           | BSQ Image Body                |                                  |                                      |                                    | N° Total      |
|--------------|-----------|-------------------------------|----------------------------------|--------------------------------------|------------------------------------|---------------|
|              |           | N° Not<br>Worried<br>(63,46%) | N° Barely<br>Worried<br>(17,30%) | N° Moderately<br>worried<br>(13,46%) | N° Extremely<br>worried<br>(5,76%) | (%)           |
| Gender       | Feminine  | 43 (65,15%)                   | 14 (77,77 %)                     | 13(92,85%)                           | 5(83,33%)                          | 75 (72,12 %)  |
|              | Masculine | 23 (34,84%)                   | 4 (22,22 %)                      | 1 (7,14%)                            | 1(16,66 %)                         | 29 (27,88 %)  |
| <b>Total</b> |           | 66 (100,0%)                   | 18 (100,0%)                      | 14(100,0%)                           | 6(100,0%)                          | 104 (100,0 %) |

In relation to the gender variable, it is observed that men are not very worried of their body image as women. 23 out of 29 people were found in the first level that corresponds to “do not worry”. However, in the group of extremely worried there are 5 feminine cases and only one masculine, but it is worth pointing out that in general women and men are found in the same group1 not worried, but spread over the levels slightly worried(2) and moderately, worried (3), which would be more acceptable for a normal population. Moreover, the percentage distribution between men and women in the sample may have altered the statistic results.

Table 3. Level Physical Activity / IPAQ \* Academic Program

|                                 |          | Academic Program      |                         |                            | Total       |
|---------------------------------|----------|-----------------------|-------------------------|----------------------------|-------------|
|                                 |          | Nutrition<br>(33,65%) | Kinesiology<br>(32,69%) | Speech therapy<br>(33,65%) | (%)         |
| Physical activity level<br>IPAQ | Inactive | 10 (34,48 %)          | 8(27,58 %)              | 11(37,93%)                 | 29 (27,88%) |
|                                 | Moderate | 7 (19,44%)            | 13(36,11 %)             | 16(44,44%)                 | 36(34,61%)  |
|                                 | High     | 18(46,15%)            | 13(33,33%)              | 8(20,51%)                  | 39(37,5%)   |
| <b>Total</b>                    |          | 35 (100%)             | 34(100%)                | 35 (100%)                  | 104(100,0%) |

Data analysis in relation to the variable “level of physical activity” and the academic program, it is possible to see the following: the program with a higher inactive level is speech therapy with 11 cases, followed by nutrition with 10 cases and in the last place the Kinesiology program with 8 preferences. In the moderate level, speech therapy leads the ranking with 16 cases, followed by Kinesiology with 13 and Nutrition with 7; in the high or active level is important to highlight that the career of nutrition shows an overwhelming advantage over the other programs with 18 students that use more than 1500 mets/ min/sem.

|              |           | Physical activity level IPAQ |                      |                 | N° Total     |
|--------------|-----------|------------------------------|----------------------|-----------------|--------------|
|              |           | Inactive<br>(27,88 %)        | Moderate<br>(34,61%) | High<br>(37,5%) | (%)          |
| Gender       | Feminine  | 26(89,65 %)                  | 26 (72,22)           | 23(58,97 %)     | 75 (72,12%)  |
|              | Masculine | 3 (10,34%)                   | 10(27,77)            | 16(41,02 %)     | 29 (27,88%)  |
| <b>Total</b> |           | 29 (100,0)%                  | 36 (100,0%)          | 39 (100,0%)     | 104 (100,0%) |

Regarding the gender of students, women who present a high level correspond to 23 cases more than men who only reached 16. It is important to highlight that the sample of women is bigger, men present only 3 inactive students in relation to the total of 29 people, against a total of 75. Thus, the 3 inactive male represent a 10, 34% of the total and the 26 women represent 34% of the total, hence there is a paradox between the high level represented by women and the inactive level of the 75 totals.

Table 5 Correlation Level of Physical activity – Body Image

|                    |                        | Physical activity<br>IPAQ | BSQ_Body<br>image |
|--------------------|------------------------|---------------------------|-------------------|
| Kendall's<br>Tau_b | Physical activity      | 1,000                     | -,114             |
|                    | level_IPAQ             | .                         | ,194              |
|                    |                        | 104                       | 104               |
|                    | Correlational Quocient | -,114                     | 1,000             |
| BSQ_Body image     |                        | -,194                     | .                 |
|                    | Sig. (bilateral)       | ,194                      | .                 |
|                    | N                      | 104                       | 104               |

The correlational analysis done through bi-varied samples in Kendall's Tau\_b, shows that there is not a significant correlation between the levels of physical activity and physical perception in health students of the Catholic university of Temuco

### Discussion and Conclusion

During the last decade of the twentieth century, a special concern for the cult of the body in Western society has been observed (Baile et al., 2011). In relation to the results obtained in the body image variables (table 2), women showed a higher degree of non-concern 65.15%, coinciding with other research in Chilean universities, which reported results of 64.52%. (Machuca, Cresp & et al, 2014). There are (n = 18) women among the range of worried and extremely worried. Extreme concern is associated with a distorted image of body dissatisfaction, they see their body as a failure, with shame, and they do not feel comfort with their body in private or in public (Thompson and Cafri, 2007). Studies in Chile in young students of both sexes, between 18 and 25 years of age, women with higher levels of body dissatisfaction, are less oriented to perform physical activity and / or develop physical skills, evaluate their physical condition worse, have fewer behaviors to develop physical activities (Cruzat & et al, 2017).

The importance and success of the body image and specially the thin image, has contributed to the unhappiness with one's body and the general population, but on the other side it has increased the demand of treatment to modify the body (cosmetic surgery, liposuction, and so on) (Arroyo & el al, 2008). Research has suggested the importance of a distorted body image as an early symptom in the identification of eating disorder (Sanchez & et al, 2001). Some parts of the population, particularly young women, are submitted to a considerable social pressure to be thin (Camacho, 2006). This also shows that women are very concerned about their body and image, which shows that they are more critical of their body and more concerned about their physical appearance than men (Loland, 1998). This study proves the tendency of women sex (n = 5) they are "extremely worried" compared to their male counterpart (n = 1).

For variable levels of physical activity (table 3), they are presented with 27.88% with low levels of physical activity, with a difference in sex, with higher levels of physical inactivity in women (table 4). National research found 36.5% of low levels of physical activity, with significant differences by sex (Morales et al., 2017). Different from that reported in Colombian students, with a higher prevalence in the low level with 50.6% (Rangel-Caballero & et al, 2014), as well as the study and García-Puello and in (2015) with 54.8%. Chilean studies demonstrate that physical activity is considered as one of the five strategic topics that compose a Healthy university, and this has been defined as "the university that incorporates the promotion of health to their educative and labor project, with the intention of fostering human development and improve the life style of those who study or work there. At the same time, the aim of the institution is to train them to act as role models or promoters of healthy behaviors in their families, workplace and society in general" (Langue & Vio, 2006). Thus, the Centers for Disease Control and prevention emergency suggests that health professionals should work not only for their own benefit but also to make credible their intervention for an active life style (Frank & et al, 2008).

The present investigation concludes that it is difficult to predict and correlate the level of physical activity with body awareness, it is recommended to use the variables separately. This study of physical activity level and body awareness in university students of the Catholic University of Temuco, Chile, allowed to know that there is no direct relationship (Correlational Quocient -, 114) between both variables (table 5).

While these results cannot be generalized to the entire population, they can be used for future research. More studies are needed to understand these disorders, however, to recognize that the group of students are a population at high risk to develop eating disorders, body image concern and low self-esteem, are key elements to the design of prevention programs with social participation. At the same time, it is necessary to create activities that help to improve their physical, psychological and social health.

## References

- Arnaiz, P., Acevedo, M., Díaz, C., Bancalari, R., Barja, S., Aglony, M., & García, H. (2010). Razón cintura estatura como predictor de riesgo cardiometabólico en niños y adolescentes. *Revista chilena de cardiología*, 29(3), 281-288.
- Arroyo, M., Ansotegui, L., Pereira, E., Lacerda, F., Valador, N., Serrano, L., Rocandio, A. (2008). Valoración de la composición corporal y de la percepción de la imagen en un grupo de mujeres universitarias del País Vasco. *Nutr Hosp*, 23(4), 366-372. <http://www.aulamedica.es/gdcr/index.php/nh/article/viewFile/4051/4051>
- Baile J, et al.(2011). Imagen corporal, hábitos alimentarios y hábitos de ejercicio físico en hombres usuarios de gimnasio y hombres universitarios no usuarios. *Revista de Psicología del deporte*, 20(2), 353-366. <http://www.rpd-online.com/article/view/783/774>
- Biddle, S.J., Fox, K.R., Boutcher, S.H. (2000). *Physical Activity and Psychological Well-Being*. London, *Routledge & Kegan Paul*.
- Camacho, M. (2006) Imagen corporal y práctica de actividad física en las chicas adolescentes: Incidencia de la modalidad deportiva. *International Journal of Sport Science*, 3(2), 1-19. <http://doi:10.5232/riciye2006.00301>
- Cooper, P., Taylor, M., Cooper, Z. (1987). The development and validation of the Body Shape Questionnaire. *Int J Eat Dis*, 6, 485-94. DOI: 10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O.
- Cruzat, C., Díaz, F., Lizana, P., Aravena, M., Haemmerli, C. (2017). Diferencias en imagen corporal de jóvenes con normopeso y con sobrepeso/obesidad. *Nutr Hosp*, 34(4), 847-855.
- Espinoza, L., Rodríguez, F., Gálvez, J., MacMillan, N. (2011). Hábitos De Alimentación y Actividad Física en Estudiantes Universitarios. *Revista Chilena Nutrición*, 38(4), 458-465. <http://dx.doi.org/10.4067/S0717-75182011000400009>.
- Fox, Kenneth R. (2000). The effects of exercise on self-perceptions and self-esteem. *Physical activity and psychological well-being*, 13, 81-118. <http://psycnet.apa.org/psycinfo/2000-16136-006>
- Frank, E., Tong, E., Lobelo, F., Carrera, J., Duperly, J. (2008). Physical activity levels and counseling practices of U.S. medical students. *Medicine and Science in Sports and Exercise*, 40(3), 413-421. <http://doi:10.1249/MSS.0b013e31815ff399>.
- García, M. (2006). Veinticinco años de análisis del comportamiento deportivo de la población española (1980-2005). *Revista internacional de sociología*, 64(44), 15-38. <http://revintsociologia.revistas.csic.es/index.php/revintsociologia/article/view/26/26>
- García, F., Herazo, Y., Tuesca, R. (2015). Factores sociodemográficos y motivacionales asociados a la actividad física en estudiantes universitarios. *Rev Med Chile*, 143(11), 1411-18. <http://dx.doi.org/10.4067/S0034-98872015001100006>
- Gil, S., Vega, L.A., Romero, G. (2007). Prácticas alimentarias de mujeres rurales: ¿una nueva percepción del cuerpo?. *Salud Pública Mex*, 49(1), 52-62. <http://www.scielosp.org/pdf/spm/v49n1/a08v49n1.pdf>.
- Gonzalez, J., De la Montaña, J., Bernabéz, M. (2002). Comparación de la ingesta de nutrientes con las recomendaciones dietéticas en un grupo de universitarios. *Alimentaria. Revista de tecnología e higiene de los alimentos*, 334, 21-25. <https://dialnet.unirioja.es/ejemplar/60155>.
- IPAQ. (2009). Guidelines for the data processing and analysis of the "International Physical Activity Questionnaire". <http://www.ipaq.ki.se/scoring.htm>.
- Jiménez, M., Martínez, P., Miró, E., Sánchez, I. (2008). Bienestar psicológico y hábitos saludables: ¿están asociados a la práctica de ejercicio físico?. *Internacional Journal of Clinical and Health Psychology*, 8(1), 185-202. <http://www.redalyc.org/html/337/33780113/>
- Lange, I., Vio, F. (2006). "Guía para universidades saludables y otras instituciones de educación superior". *INTA/Universidad de Chile*. <http://www7.uc.cl/ucsaludable/img/guiaUSal.pdf>.
- López, I., Sánchez, A., Johansson, L., Petkeviciene, J., Pretalla, R., Martínez, M. (2003). Disparities in food habits in Europe: systematic review of educational and occupational differences in the intake of fat. *J Hum Nutr Diet*, 16(5), 349-64. <http://doi:10.1046/j.1365-277X.2003.00466.x>.
- Loland, N. (1998). "Body image and physical activity. A survey among Norwegian men and women." *International Journal of Sport Psychology*, 29(4): 339-365.
- Machuca, C., Cresp M., Carter, B., Alamos, P., Delgado, P. (2014). Percepción corporal y Nivel de actividad física en estudiantes universitarios de Nutrición. *Rev. horiz., cienc. act. Fís*, 5, 131-139.
- Ministerio de Salud/INTA/Depto. Nutrición Universidad de Chile. (1997). Guías alimentarias para la población chilena. C Castillo, R Uauy, E Atalah, eds. 1ª ed. Santiago: MINSAL.
- Ministerio de Salud/INTA/Vida Chile. Guía para una vida saludable (2005). Guías alimentarias, actividad física y tabaco. Santiago: MINSAL. Resolución Exenta N° 459 que aprueba la Norma General N° 76. <http://www.inta.uchile.cl/sites/default/files/gpvs.pdf>.
- Ministerio de Salud. Etiquetado nutricional de los alimentos. (2006) Santiago: MINSAL. [https://www.inta.cl/material\\_educativo/cd/Etiquet.pdf](https://www.inta.cl/material_educativo/cd/Etiquet.pdf).

- Ministerio de Salud. Estrategia Global contra la Obesidad (EGO-Chile)(2008). Santiago: Ministerio de Salud. <http://www.ego-chile.cl>.
- Ministerio de Salud Chile. Encuesta Nacional de Salud ENS Chile 2009-2010.(2010).Santiago de Chile: MINSAL.[web.minsal.cl/portal/url/item/bcb03d7bc28b64dfe040010165012d23.pdf](http://web.minsal.cl/portal/url/item/bcb03d7bc28b64dfe040010165012d23.pdf).
- Morales, G., Balboa,T.,Muñoz, S.,Belmar,C.,Soto A.,Schifferli,I.,Guillen,F.(2017).Asociación entre factores de riesgo cardiometabólicos, actividad física y sedentarismo en universitarios chilenos. *Nutr Hosp*,34,1345-1352.
- Pavot,W.,Diener,E.,Colvin,C.,& Sandvik,E.(1991). Further validation of the satisfaction with life scale: Evidence for the cross-method convergence of well-being measures. *Journal of personality assessment*,57(1),149-161. [http://doi.org/10.1207/s15327752jpa5701\\_17](http://doi.org/10.1207/s15327752jpa5701_17).
- Rangel LG., Rojas,LZ.,Gamboa,EM.(2014).Sobrepeso y obesidad en estudiantes colombianos y su asociación con la actividad física. *Nutr Hosp*,31(2),629-36.
- Reinboth,M.,Duda,L.,Ntoumanis,N.(2004).Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and emotion*. 28(3),297-313.<http://doi:10.1023/B:MOEM.0000040156.81924.b8>.
- Reinboth,M.,Duda, JL.(2004).The motivational climate, perceived ability, and athletes' psychological and physical well-being. *Sport Psychol.*;18(3),237-51. [http://The motivational climate perceived ability and athletes' psychological and physical well-being/links/09e41500e6e3f3e754000000.pdf](http://The%20motivational%20climate%20perceived%20ability%20and%20athletes'%20psychological%20and%20physical%20well-being/links/09e41500e6e3f3e754000000.pdf).
- Ryan,RM & Frederick,C.(1997).On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being. *Journal of Personality*,65,529-565.[doi:10.1111/j.1467-6494.1997.tb00326.x](https://doi.org/10.1111/j.1467-6494.1997.tb00326.x).
- Rosenberg, M. Society and the adolescent selfimage(1965). Princeton, NJ: *Princeton University Press*. <http://doi.10.1126/science.148.3671.804>.
- Sáez,Y & Bernui,I.(2009). Cardiovascular risk factors prevalence in adolescents in educational institutions. *Anales de la Facultad de Medicina*, 70(4),259-265. [http://www.scielo.org.pe/scielo.php?script=sci\\_arttext&pid=S1025-5832009000400006&lng=es&tlng=en](http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S1025-5832009000400006&lng=es&tlng=en)
- Sánchez,A.,Madrigal,H.,Martínez,A.,Kearney,J.,Gibney,J.,Irala,J.,Martínez,A.(2001).Perception of bodyimage as indicator of weight status in the European Union. *J Hum Nutr Diet*,14(2),93-102. <http://doi:10.1046/j.1365-277X.2001.00281.x>.
- Ozuna,I.,Hernández,B.,Campuzano, J.,Salmerón,J.(2006).Índice de masa corporal y percepción de la imagen corporal en una población adulta mexicana: la precisión del autorreporte. *Salud Pública.Mex*,48(2):94-03.[http://www.scielo.org.mx/scielo.php?script=sci\\_arttext&pid=S0036-36342006000200003](http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0036-36342006000200003).
- Thompson, J. K., & Cafri, G. (Eds.). (2007). The muscular ideal: Psychological, social, and medical perspectives.<http://dx.doi.org/10.1037/11581-000>
- Troncoso,C.,Amaya,JP.(2009).Factores sociales en las conductas alimentarias de estudiantes universitarios. *Rev Chil Nutr*,36(4),1090-1097. <http://dx.doi.org/10.4067/S0717-75182009000400005>.
- US Department of Health and Human Services (1996). Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: US Department of Health and Human services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- Vio, F.,Salinas,J.(2006).Promoción de salud y calidad de vida en Chile: una política con nuevos desafíos. *Revista Chilena de Nutricion*.33(S1),252-259. <http://dx.doi.org/10.4067/S0717-75182006000300006>.