Proceeding

Physical activity, physical condition and quality of life in schoolchildren

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ABSTRACT

The study analyses the physical condition and quality of life on the physical activity of schoolchildren in a Peruvian educational institution, applying a non-probability and convenience sampling, to 168 first-year high school students, being 41.07% men and 58.93% women. Physical condition was assessed using the ALPHA-Fitness battery, and physical activity and quality of life were assessed using questionnaires with a reliability of .929 and .75, respectively. Regarding the procedures, descriptive analyses, post-hoc comparisons and a multiple regression model were carried out. Among the results, a very active level of physical activity was obtained in the male gender (15.48%) and a moderate level in the opposite gender (9%). Physical activity is related to a medium level of quality of life ($p = .000$), while a low and medium level of physical activity is associated with a better level of physical condition ($p < .05$). In addition, physical condition and quality of life explain 15% and 14%, respectively, in physical activity. It is concluded that the relationship between physical activity and physical condition is positive and bidirectional; thus, physical activity, physical condition and quality of life are positively related.
Keywords: Physical activity; Physical condition; Quality of life; Educational institution.

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INTRODUCTION

Physical activity in recent years is of growing interest given that it is beneficial for health as has been shown in many studies (Warburton and Bredin, 2017). In this context, educational institutions mention that experiences in sport and physical education contribute to mental acuity, skills and strategies that are important to overcome the challenges they face throughout life (Donnelly et al., 2016; Janssen and LeBlanc, 2010). Likewise, there is convincing evidence that participation in physical activity would have a fundamental role in people's physical condition (Einarsson et al., 2015), since it can reduce the risk of various diseases such as obesity, cardiovascular diseases, depression, among others and contribute to the independence of an individual, along with their social well-being (Cerin et al., 2016; Sallis and Glanz, 2006; Ahmed et al., 2012).

Physical activity also plays an important role in the quality of life of patients and the general population (Omorou et al., 2013). In the last 30 years, the evaluation of the quality of life has become increasingly important with regard to health care (Ferrans et al., 2005), as it is a resource for adaptation and healthy growth. When the quality of life declines, a child is less likely to develop normally and mature into a healthy adult (Borras et al., 2011). Thus, among the risks of a sedentary lifestyle, there is a reduction in life expectancy and a negative influence on medical problems (D'Isanto et al., 2017; Tremblay et al., 2010), such as diabetes (Mavrovouniotis, 2012), high blood pressure (Riley and Bluhm, 2012), among others.

According to the reviewed background information, there is a variety of investigations that analyse physical activity, physical condition and quality of life related to health, either separately or together (Hartmann et al., 2010; Gu et al., 2016; Wu et al., 2012; Anokye et al., 2012); however, a study that focuses on the 3 variables mentioned has not been carried out in a Peruvian educational institution. For this reason, the present research had the following objectives: a) to analyse the differences in the level of physical activity, living condition and quality of life according to the student's gender, b) to analyse the interaction between the study variables by means of the Bonferroni test and, finally, c) evaluate a multiple linear regression model to identify whether physical condition and quality of life are predictors of physical activity.

METHOD

Participants
The sampling was of the non-probabilistic and for convenience type. According to Lavrakas (2008), convenience sampling is a type of non-probability sampling in which samples of people are taken since they are convenient data sources for researchers. A total of 168 students ages 11-13 (12.06 ± 0.7) participated in the study, 41.1% corresponding to the male gender and 58.9% to the female gender, from the first year of secondary school in a Peruvian educational institution.

Measurements
For the physical activity variable, the Physical Activity Level Assessment Questionnaire (PALAQ) was taken into account (Jurado et al., 2019). The instrument consists of 5 questions related to participation in sports activity, competitions, frequency and hours per week on a scale where 1 is the lowest value and 5 is the highest; the same ones that are summative in nature, in such a way that the values of 1-5 refer to a sedentary level; 11-16 a moderate level and above 17 an active level.

For the physical condition variable, the ALPHA-Fitness battery was taken into account (Ruiz et al., 2011). The instrument consists of a total of 10 items considering weight, height, waist circumference, triceps crease,

sub-scapular crease, manual grip, long jump, 4x10 meters test and the Course Navette test. The scale was subdivided as follows: X < P20, refers to a low level, P20 ≤ X > P60, a medium level and X ≥ P60, a good level of physical condition. The materials used were a Xiaomi brand digital scale, Mi body Composition 2 model, measuring tape, CAMRY brand digital dynamometer model EH101, cones, adhesive tape, Anytime brand stopwatch model XL-013 and USB. The internal consistency of the instrument was evaluated using Cronbach's Alpha statistic, which was 0.929, which refers to good reliability, since according to Tavakol and Dennick (2011) the accepted values are between 0.7-0.95.

For the variable quality of life related to health, the instrument The KIDSCREEN-27 (2004) was taken into consideration with five dimensions on the Rasch scale: Physical well-being (5 items), Psychological well-being (7 items), Autonomy and parents (7 items), Peers and social support (4 items) and school environment (4 items). The scale was summative and was represented as follows: 53-71 refers to a low level, 72-89 a medium level and 90-108 a high level. The internal consistency of the instrument was evaluated using Cronbach's alpha statistic, which was 0.75, which refers to good reliability.

Procedures
The field work was carried out in 2019. First of all, informed consent was obtained from the parents of the study sample. For the purposes of the research, the students were recommended not to do physical activity the day before the test and not to alter their daily diet. The tests were carried out in groups of 20-25 schoolchildren, carrying out a previous demonstration in each test with intervals between 8-10 minutes between each measurement. Likewise, it is important to mention that a 5-minute warm-up was carried out. The questionnaires were filled out in the presence of one of the researchers with an average duration of 25 minutes in both instruments, taking into consideration confidentiality and anonymity. In addition, the medical records of the students were evaluated to verify chronic diseases or health risks.

Analysis of data
It was performed with the SPSS version 24 program, with a statistical significance $p < .05$. In the first place, normality tests were carried out, having as a reference the Kolmogorov-Smirnov test, given the sample of more than 50 individuals; and then carry out a descriptive analysis. Then, the differences between the variables were analysed according to the sex of the student using the one-way ANOVA test. Subsequently, the interaction between the study variables was analysed, for which physical activity was inserted as an independent variable, and physical condition and quality of life as joint dependent variables for both sexes. Likewise, to make the comparison of means between the study variables, the Bonferroni test and the Levene test were used to analyse the homogeneity of variances. Finally, the multiple regression model was used, having as predictive variables the physical condition and quality of life related to health on physical activity.

RESULTS

Table 1 shows that male students obtained better physical performance in the dynamometry test, long jump and the 4x10 meters test, as well as in the ALPHA-Fitness instrument, and the PALAQ and KIDSCREEN-27 questionnaires; while female students obtained a better physical performance in the Course Navette test. By means of the *p*-value less than .05, the significant differences in each case are verified.

Table 1. Differences in physical condition, physical activity and quality of life.

	Male (n = 69) M + SD	Female (n = 99) M + SD	p
Hand grip on both hands (kg)	26.97 ± 1.12	23.84 ± 0.95	.000
Long jump (cm)	153.5 ± 7.77	129.91 ± 5.79	.000
4x10m Test (s)	12.04 ± 0.27	12.67 ± 0.4	.000
Course Navette (s)	8.34 ± 0.43	5.31 ± 0.53	.000
ALPHA-Fitness[a]	2.46 ± 0.5	1.3 ± 0.46	.000
Low (%)	0	41.1	
Medium(%)	22	17.9	
Good(%)	19	0	
PALAQ[b]	2.04 ± 0.85	1.15 ± 0.36	.000
Sedentary (%)	13.69	5	
Moderate (%)	11.9	9	
Active (%)	15.48	0	
KIDSCREEN-27[c]	1.59 ± 0.71	1.16 ± 0.44	.000
Low (%)	22.02	51.19	
Medium (%)	13.7	5.95	
High (%)	5.35	1.17	

Note: a: Physical condition, b: Physical activity, c: Health-related quality of life, M: mean, SD: standard deviation.

Table 2 shows that schoolchildren with a low and medium level of physical activity presented a better level of physical condition when compared with their homologous peers, with a *p*-value lower than .05 in each case.

Table 2. Bidirectional relationship between physical activity and physical condition.

PALAQ[a]	ALPHA-Fitness[b] M + SD	Post-hoc comparisons		SE	p
Low (L) (n = 69)	1.13 ± 0.34	L vs. M	-0.646*	0.117	.000
		L vs. G	-0.682*	0.145	.000
Medium (M) (n = 67)	1.78 ± 0.83	M vs. L	0.646*	0.117	.000
		M vs. G	-0.036	0.146	1.000
Good (G) (n = 32)	1.81 ± 0.86	G vs. L	0.682*	0.145	.000
		G vs. M	0.036	0.146	1.000
ALPHA-Fitness[b]	**PALAQ[a] M + SD**	**Post-hoc comparisons**		**SE**	**p**
Sedentary (S) (n = 107)	1.58 ± 0.73	S vs. M	-0.392*	0.135	.012
		S vs. A	-0.767	0.151	.000
Moderate (M) (n = 35)	1.97 ± 0.71	M vs. L	0.392*	0.135	.012
		M vs. A	-0.375	0.179	.114
Active (A) (n = 26)	2.35 ± 0.49	A vs. S	0.767*	0.151	.000
		A vs. M	0.375	0.179	.114

*Note: a: physical activity, b: physical condition, M: mean, SD: standard deviation, SE: standard error, *The difference in means is significant at the .05 level.*

Table 3 shows that schoolchildren with a medium level of physical activity presented a better quality of life (p = .000) in comparison with a low level of physical activity refers to a low level of quality of life.

Table 3. Relationship between physical activity and quality of life.

PALAQ[a]	Kidscreen-27 M + SD[c]	Post-hoc comparisons		SE	p
Low (L) (n = 123)	1.28 ± 0.5	L vs. M	-1.18*	0.116	.000
		L vs. H	-0.14	0.179	1.000
Medium (M) (n = 33)	2.45 ± 0.87	M vs. L	1.18*	0.116	.000
		M vs. H	1.04*	0.199	.000
High (H) (n = 12)	1.42 ± 0.52	H vs. L	0.14	0.179	1.000
		H vs. M	-1.04*	0.199	.000

*Note: a: physical activity, c: health-related quality of life, M: mean, SD: standard deviation, SE: standard error, *The difference in means is significant at the .05 level.*

Table 4 shows that schoolchildren with a low, medium and high level of quality of life presented a better level of physical condition; highlighting the low level with a p-value equal to .000.

Table 4. Relationship between quality of life and physical condition.

Kidscreen-27[c]	ALPHA-Fitness M + SD[b]	Comparisons post-hoc		SE	p
Low (L) (n = 69)	1.12 ± 0.4	L vs. M	-0.27*	0.098	.018
		L vs. H	-0.6*	0.122	.000
Medium (M) (n = 67)	1.39 ± 0.58	M vs. L	0.272*	0.098	.018
		M vs. H	-0.331*	0.122	.023
High (H) (n = 32)	1.72 ± 0.81	H vs. L	0.603*	0.122	.000
		H vs. M	0.331*	0.122	.023

*Note: b: physical condition, c: health-related quality of life, M: mean, SD: standard deviation, SE: standard error, *The difference in means is significant at the .05 level.*

In table 5, in relation to physical activity, when entering physical condition, 15% of the total variance is explained; while adding quality of life explains 14% of the variance. Overall, the model explains 21.3% of the variance. It can be seen that physical activity is associated with high levels of physical condition (ß = 0.291, p = .000) and quality of life (ß = 0.332 p = .000). With an F equal to 22.28 and a *p*-value equal to .000, it indicates that physical condition and quality of life are predictors of physical activity.

Table 5. Multiple linear regression.

Predictors	Physical activity Beta (SD)	t	Sig.
Physical condition	0.291(0.08)	3.9	.000
Health-related quality of life	0.332(0.09)	3.62	.000
R	46.1		
R^2 (%)	21.3		
Model	F = 22.28		.000

Note: SD: standard deviation.

DISCUSSION AND CONCLUSIONS

Among the research objectives, a comparison was made to determine the differences in the level of physical activity, living condition and quality of life according to the student's gender, analyse the interaction between said variables using the Bonferroni test and, finally, analyse the prediction of physical condition and quality of life on physical activity.

A significant difference was found in the APLHA-Fitness test and the PALAQ and KIDSCREEN-27 questionnaires, with male students prevailing in most tests, but not in the Course Navette test, where the female gender obtained a better score (p < .05). Likewise, when analysing the interaction between the study variables, it was observed that a medium level of physical activity allows obtaining a better level of quality of life, which coincides with Hartmann et al. (2010), who stated that the physical activity intervention had a positive impact on the psychosocial quality of life, the same as it was caused by an effect on urban and overweight students, as well as with Gu et al. (2016), who indicated that physical activity mediated the relationship between self-reported physical activity and quality of life, as well as between pedometer-based physical activity and quality of life. Similarly, a low level of quality of life refers to a better level of physical condition; in addition, all levels of quality are related to a better level of physical condition. As well, it is important to mention that both physical condition and quality of life explain 21.3% of physical activity. Globally, with Wu et al. (2012), who indicated that students with a better quality of diet, higher levels of physical activity and normal body weights were statistically significantly more likely to report a better health-related quality of life. Furthermore, Anokye et al. (2012), who suggest that higher levels of physical activity are associated with a better quality of life. Together with Wu et al. (2017), who found that higher levels of physical activity were associated with a better health-related quality of life, while an increase in sedentary behaviour was associated with a lower health-related quality of life among children and teenagers. Finally, García et al. (2015), who found an independent association between physical activity, physical condition and health-related quality of life.

The research had certain limitations such as the study time, which was focused on the year 2019, in addition to being directed only to first-year high school students. As a conclusion, it was observed that both physical condition and health-related quality of life were related to good levels of physical activity. Also, that male students present a better level of physical condition, physical activity and quality of life; compared to female students who prevail in the Course Navette test. This implies that more physical activity should be promoted in girls, as well as a healthy lifestyle.

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