Association between intention for physical activity practice, social support and physical activity

Associação entre intenção para prática de atividade física, apoio social e atividade física

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Abstract – Intrapersonal and interpersonal aspects have been widely correlated to variations on the physical activity (PA) levels. The aim of this study was to examine the moderating effect of intention for PA practice on the association between social support and leisure PA levels in a sample of college students from Curitiba, Brazil. A questionnaire was administered in a sample of 349 college students from a Physical Education undergraduate program. The variables intention to PA practice, social support (family and friends) and leisure-time PA were obtained through interviews. Poisson regression was used to test the moderating effect of intention to PA practice on the association between social support and leisure-time PA levels. The intention for PA practice showed no moderating effects on leisure PA. Social support from friends was associated with achieving recommended PA levels (≥150min/week), regardless of intention for PA practice (PR: 1.45; 95% CI: 1.09-1.93). In this study, moderating effect of intention for PA practice on the association between social support and leisure-time PA has not been found.

Key words: Intention; Motor activity; Social support; Universities; Young adult.

Resumo – *Aspectos intrapessoais e interpessoais têm sido amplamente analisados e são aqueles que melhor têm explicado as variações nos níveis de atividade física (AF). O objetivo do estudo foi verificar o efeito moderador da intenção para a prática de AF na associação entre apoio social e os níveis de AF de lazer em universitários de Curitiba, Paraná, Brasil. Foi aplicado um questionário em uma amostra de 349 universitários de um curso de graduação em Educação Física. Foram investigadas as variáveis relacionadas à intenção para a prática de AF, ao apoio social (familiares e amigos) e aos níveis de AF no lazer. Foi utilizado a regressão de Poisson para testar o possível efeito moderador da intenção para prática de AF na associação entre o apoio social e os níveis de AF no lazer. A intenção para prática de AF não apresentou efeito moderador na AF de lazer. Foi encontrado associação entre o apoio social dos amigos e o cumprimento de ≥150min/sem de AF, independentemente da intenção para a prática de AF (RP: 1,45; IC95%: 1,09–1,93). Neste estudo não foi observado efeito moderador da intenção para prática de AF na associação entre o apoio social e os níveis de AF no lazer.*

Palavras-chave: *Adulto jovem; Apoio social; Atividade motora; Intenção; Universidades.*

INTRODUCTION

Physical activity (PA) is a complex behavior influenced by personal, social, environmental and community aspects[1,2]. Recently, there has been a growing interest in identifying variables that may explain adherence and maintenance of physical activity in order to promote more effective interventions that contemplate multiple levels of influence [1]. Thus, intrapersonal and interpersonal aspects have been widely analyzed and are those that best have explained variations in PA levels[1].

The intention for physical activity practice (IPAP) shows how much individuals are willing to change their behavior and it is possible to identify both their readiness and transition to active behavior[3]. At the interpersonal level, social support (SS) is described as the action that helps the person to adopt and / or maintain a particular PA practice and may occur in different ways, such as: instrumental or direct, psychological or emotional, and instructional or informational support[4-7].

In Brazil, the evidence on the relationship between IPAP[8], SS[9] and PA has increased in recent years and its results have shown a positive association in adolescents, adults and the elderly[10-12]. In general, investigations have focused on specific groups and direct relations between SS, IPAP and PA[8,9]. However, the moderating role of intrapersonal and interpersonal aspects has been little explored.

The literature has shown investigations on the relationship between IPAP and SS in isolated Brazilian population groups[10-12]. This study intends to investigate these correlations together in order to find how much the combination between them explains the probability of practicing leisure PA at recommended levels. It is possible that SS indirectly acts on PA by increasing IPAP and this, in turn, directly acts on PA levels. This relationship may be important for the sample of this study, physical education undergraduate students, who may have chosen the course because they have an interest in the practice of PA, but according to literature, it has demonstrated low PA levels throughout the course[15].

Thus, understanding the aspects that can explain the practice of PA at recommended levels can improve health promotion initiatives for university students, such as PA promotion programs at universities[1,16]. The aim of this study was to verify the moderating effect of IPAP on the association between SS and the moderate and vigorous leisure activity physical levels (MVPA) in university students from Curitiba, Paraná, Brazil.

METHODOLOGICAL PROCEDURES

Designing

This study is part of a project that monitors the lifestyle of university students in the city of Curitiba-PR conducted in 2013. The study was approved by the Ethics Research Committee of the Catholic University of Paraná (CEP-PUCPR; No. 1.081.859 / 2015). Data collection procedures

followed recommendations of the National System of Ethics and Research.

Sample

Participants were non-probabilistically selected for convenience. Students of the Physical Education undergraduate program (Bachelor's degree and Licentiate) were invited to compose the sample (n = 465). The sample power was calculated *a posteriori* using the GPower 3.1.1 software, allowed detecting associations of prevalence ratio of 1.44 with a power of 80% to alpha value of 5%.

Instruments

• PA practice

PA practice was measured using the IPAQ - short version (International Physical Activity Questionnaire), where students reported "how many days a week" and "how much time per day" they practiced MVPA during a usual week during leisure time[17]. The weekly PA practice time was categorized according to current recommendations used in other studies[12], with participants being classified as "≥150min / week" or "<150min / week".

• SS

SS was considered as an independent variable and was evaluated through six questions related to the frequency with which in the last three months a friend or relative performed incentive actions (practiced, invited, encouraged) the PA practice[18]. Each question presented three response options (never, sometimes, always), which were summed to produce a score (0-6 points), for each SS source. Then, according to the authors' criteria, the score was categorized according to the median and the variable was classified into two SS levels (High *versus* Low) from both family and friends.

• IPAP

IPAP was assessed by four questions. The participant was first questioned about his intention to practice PA on a regular basis in the next two weeks. The choices were "yes" or "no." The two subsequent questions asked about the chance of the individual to practice PA on a regular basis in the next two weeks and three months, respectively. For both there were four answer options: none, low, intermediate or high. In the last question, the participant should indicate the option that best represented his behavior in the PA practice[19]. Later, the scores and the variable categorized according to the median into "High Intention" and "Low Intention", were calculated.

• Covariables

Variables age, body mass index (BMI), socioeconomic status (SES), gender and marital status (without partner/with partner) were included as covariables. Age group was evaluated by means of an age-related question and was later classified into categories: <18, from 18-24 and ≥ 25 full years. BMI was calculated based on height and body mass measurements using a

digital scale and stadiometer (Wiso model W721). In order to classify BMI, the parameters of the World Health Organization (WHO)[20] were used, namely: BMI of 18.5-24.9 kg/m2, classified as normal; BMI of 25-29.9 kg/m2 as overweight; BMI≥30 kg/m2 as obesity. Students aged <18 years were classified according to Cole et al [21]. SES was classified according to criteria established by the ABEP (Brazilian Association of Research Companies)[22]. For purposes of analysis, university students were grouped into three levels: High (A1 and A2), Intermediate (B1, B2, C1 and C2) And Low (D, E).

Data collection

Self-administered questionnaires with the guidance of two interviewers with average application time of 45 minutes per class were used. Days and times of collection were established by the university, respecting the class schedules. To identify possible doubts about the questionnaires and their application, a pilot study was carried out, with university students that were not included in the sample.

Data analysis

Data were analyzed with descriptive statistics by frequency distribution (absolute and relative) and chi-square test. Poisson regression for the estimation of Prevalence Ratios (PR), with confidence intervals (95% CI) was used to test the association between individual, interpersonal and PA variables. IPAP was tested regarding a possible moderating effect on the relationship between SS (family and friends) and PA. In the multivariate model (forced entry), only variable sex was selected because it was the only one presenting p value <0.20. Analyses were performed using the SPSS 20 and STATA 12.0 software and significance level was maintained at 5%.

RESULTS

The analytical sample consisted of 349 university students, mostly males (60.2%), aged 18-24 years (80.5%), normal BMI (66.7%), single (90.5 %), intermediate SES (66.2%) and physically active (54.7%). The refusal rate was 24.94%. The highest proportion of students that perform ≥150min / week of PA (Table 1) received high SS from friends (66.9%, p <0.001) and had high intention to practice PA (80.4%; p <0.001).

   Regarding the characteristics related to IPAP (Table 2), men presented high intention (56.2%, p <0.001) and people with high SS from friends had high intention (59.7%, p <0.001).

   Table 3 shows the bivariate analysis among sociodemographic, interpersonal and intrapersonal factors. The female gender had a marginal and inverse association with performing ≥150min / week of PA (PR: 0.74; 95% CI: 0.54-1.00 p = 0.054).In addition, for those with low IPAP, the high SS from friends presented a marginal and positive association with adequate PA levels (PR: 1.61; 95% CI: 0.96-2.67 p = 0.066), but regardless of IPAP, SS from friends was positively associated with performing ≥150min / of

PA (PR: 1.48; 95% CI: 1.11-1.96 p = 0.007).

In the adjusted analysis (Figure 1), high SS from friends for those with low IPAP presented a marginal and positive association with PA recommendations (PR: 1.59, 95% CI: 0.96-2.65 p = 0.071). The association between SS from friends and compliance with ≥150min / week of PA, regardless of IPAP, was maintained in the adjusted model (PR: 1.45; 95% CI: 1.09-1.93 p = 0.010).

Table 1. Description of sociodemographic, interpersonal and intrapersonal factors with MVPA levels in university students of Curitiba-PR, 2013 (n = 349).

Variables	≥150min/week of MVPA			Total	
	n	%	p	n	%
MVPA	191	54.7		349	100.0
Sex					
Male	128	61.0	0.004	210	100.0
Female	63	45.3		139	100.0
Age group					
< 18 years	12	54.5		22	100.0
18-24 years	156	55.5	0.599	281	100.0
≥ 25 years	23	50.0		46	100.0
BMI					
Underweight	3	37.5		8	100.0
Normal	121	53.5	0.498	226	100.0
Overweight	53	60.2		88	100.0
Obesity	8	47.1		17	100.0
Marital status					
Without partner	173	54.7	0.982	316	100.0
With partner	18	54.5		33	100.0
SES					
Low	37	54.4		68	100.0
Intermediate	123	53.7	0.522	229	100.0
High	30	61.2		49	100.0
SS from family					
Low	104	53.6	0.629	194	100.0
High	86	56.2		153	100.0
SS from friends					
Low	88	45.1	<0.001	195	100.0
High	103	66.9		154	100.0
IPAP					
Low	60	32.6	<0.001	184	100.0
High	131	80.4		163	100.0

MVPA: moderate to vigorous physical activity; BMI: body mass index; SS: social support; IPAP: intention to practice physical activity; P <0.05.

Table 2. Description of sociodemographic and interpersonal factors according to IPAP level in university students of Curitiba-PR, 2013 (n = 349).

Variables	High Intention			Total	
	n	%	p	n	%
Sex					
Male	118	56.2	<0.001	210	100.0
Female	45	32.8		137	100.0
Age group					
< 18 years	10	45.5		22	100.0
18-24 years	135	48.2	0.488	280	100.0
≥ 25 years	18	40.0		45	100.0
BMI					
Underweight	1	12.5		8	100.0
Normal	103	46.0	0.220	224	100.0
Overweight	50	56.8		88	100.0
Obesity	6	35.3		17	100.0
Marital status					
Without partner	147	46.8	0.855	314	100.0
With partner	16	48.5		33	100.0
SES					
Low	33	50.0		66	100.0
Intermediate	106	46.3	0.709	229	100.0
High	23	46.9		49	100.0
SS from family					
Low	85	44.0	0.222	193	100.0
High	77	50.7		152	100.0
SS from friends					
Low	71	36.8	<0.001	193	100.0
High	92	59.7		154	100.0

IPAP: intention to practice physical activity; BMI: body mass index; SS: social support; P <0.05.
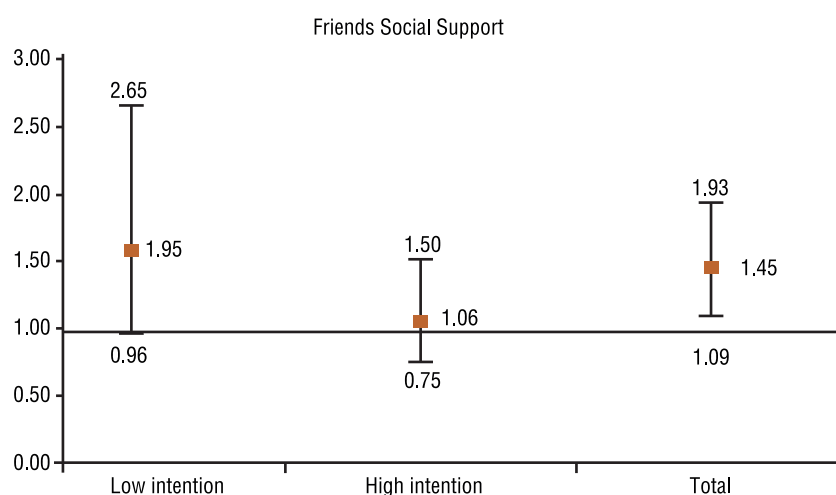

Figure 1. Multivariable association adjusted for sex between SS from friends and MVPA in leisure, according to IPAP, of university students of Curitiba-PR, 2013 (n = 349).

Table 3. Bivariate association between individual characteristics, SS and MVPA, according to IPAP levels in university students of Curitiba-PR, 2013 (n = 349).

Variables	Moderate and Vigorous Physical Activity (MVPA)														
	Low Intention					High Intention					Total				
	n	%	RP	IC$_{95\%}$	p	n	%	RP	IC$_{95\%}$	p	n	%	RP	IC$_{95\%}$	p
Sex															
Male	35	38.0	1			93	78.8	1			128	60.9	1		
Female	25	27.1	0.71	0.42-1.19	0.199	38	84.4	1.07	0.73-1.56	0.720	63	45.3	0.74	0.54-1.00	0.054
Age group															
< 18 years	4	33.3	1			8	80.0	1			12	54.5	1		
18-24 years	49	33.7	1.01	0.36-2.80	0.979	107	79.2	0.99	0.48-2.03	0.980	156	55.5	1.01	0.56-1.83	0.953
≥ 25 years	7	25.9	0.77	0.22-2.65	0.688	16	88.8	1.11	0.47-2.59	0.808	23	50.0	0.91	0.45-1.84	0.807
BMI															
Underweight	2	28.5	1			1	100.0	1			3	37.5	1		
Normal	38	31.4	1.09	0.26-4.55	0.896	83	80.5	0.80	0.11-5.78	0.830	121	53.5	1.42	0.45-4.88	0.542
Overweight	13	34.2	1.19	0.27-5.30	0.813	40	80.0	0.80	0.10-5.81	0.826	53	60.2	1.60	0.50-5.13	0.425
Obesity	3	27.2	0.95	0.15-5.71	0.959	5	83.3	0.83	0.97-7.13	0.868	8	47.0	1.25	0.33-4.73	0.737
Marital status															
Without partner	55	32.9	1			118	80.2	1			173	54.7	1		
With partner	5	29.4	0.89	0.35-2.23	0.809	13	81.2	0.29	0.57-1.79	0.967	18	54.5	0.99	0.61-1.61	0.988
SES															
Low	10	30.3	1			27	81.2	1			37	54.4	1		
Intermediate	42	34.1	1.10	0.52-2.36	0.787	81	76.4	0.79	0.49-1.27	0.350	123	53.7	0.87	0.58-1.30	0.520
High	8	30.7	0.98	0.38-2.49	0.974	22	95.6	0.85	0.48-150	0.587	30	61.2	0.88	0.54-1.43	0.631
SS from family															
Low	34	31.4	1			70	82.3	1			104	53.6	1		
High	26	34.6	1.10	0.66-1.83	0.711	60	77.9	0.94	0.67-1.33	0.753	86	56.2	1.04	0.78-1.39	0.745
SS from friends															
Low	33	27.0	1			55	77.4	1			88	45.1	1		
High	27	43.5	1.61	0.96-2.67	0.066	76	82.6	1.06	0.75-1.50	0.716	103	66.8	1.48	1.11-1.96	0.007

SS: social support; MVPA: moderate vigorous physical activity; IPAP: intention to practice physical activity; BMI: body mass index; PR: prevalence ratio; 95% CI: confidence interval; P <0.05.

DISCUSSION

High SS from friends for those with low IPAP presented marginal and positive association with practice of ≥150min / week of PA (PR: 1.59; 95% CI: 0.96-2.65 p = 0.071), that is, although IPAP is low, there is a tendency for SS from friends to increase the likelihood of practicing PA at recommended levels. A meta-analysis on SS has identified that individuals who receive higher SS present a more positive health status and health promotion behavior, that is, a greater chance of engaging in regular practice of PA[23].

Given the harm of physical inactivity, the present study presents intervention proposals to promote the practice of PA. Interventions aimed at encouraging habitual practice of PA have been considered a public health priority [24]. Thus, interventions that include activities based on SS from family and friends and operational strategies presented by the transtheoretical model of behavior change - TTM, which investigates the individual's intention to start a PA program can increase the acquisition

of an active behavior[25].

It was identified that 45.3% of university students do not meet the minimum recommendation of PA, a result similar to a study carried out with Physical Education undergraduate students of Sergipe[26], but lower than that found among students from three major areas (Humanities, Exact and Health Sciences) of Curitiba-PR (54.5%), reinforcing that low PA levels are prevalent in university students[15]. The results suggest that students in this area are more active when compared to those of other areas, which can be explained both by amount of PA performed in the course classes, since the national curricular guideline for the Physical Education course defines that the acquisition of skills must occur from theory-practice interaction[27], as well as by the greater involvement and knowledge about PA.

The study confirmed the literature findings that individuals who frequently perform PA together or are invited by friends to participate in physical activities are more likely to comply with minimum PA recommendation. In the sample investigated, there was a positive association between high PA levels and high friends SS (p <0.001) and high IPAP in leisure (p <0.001). The finding is corroborated by another study conducted in the city of Curitiba, in which SS from family (OR = 2.77, 95% CI = 2.08-3.69) and friends (OR = 2.89, 95% CI = 2.18-3.85) increased by almost three times the likelihood of an individual achieving ≥150min / week of PA. This study also found that high IPAP increases by 2.5 times the likelihood of an individual to have active behavior (OR = 2.51, 95% CI = 1.80-3.51)[12].

Regarding the characteristics related to IPAP, men (p <0.001) and university students with high SS from friends (p <0.001) presented high intention. No evidence was found of the association of SS from family with IPAP, but the fact that individuals are enrolled in a university and involved in a wide and complex network of social, cultural and environmental factors end up by affecting their behavior. Souza et al[8] verified the IPAP of university students in the health area through stages of behavior change, and found a significant difference in the proportion of students in the Physical Education course in the maintenance stage (performed physical activity for more than 6 months) compared to other areas (physical education 82.1%, nursing 33.3%, pharmacy 48.1% physiotherapy 31.3% and nutrition 28.6%), which demonstrates that knowing the benefits of PA can arouse interest in engaging its practice. When the preparation and action stages of physical education students were verified, 10.4% and 7.5%, respectively, they showed an intention to change their behavior in the near future or to maintain the physical activity that they began to change their behavior in the coming months[8].

Females presented a marginal and inverse association with compliance with ≥150min / week of PA (PR: 0.74; 95% CI: 0.54-1.00 p = 0.054). In their study with college students, Gasparotto et al[15] found that males were more likely to meet PA recommendations. In general, women have lower leisure PA levels when compared to men, a characteristic observed in adolescence[10] and in adulthood[12], which is related to social and cultural

aspects, including the lack of incentive of family members for the practice of PA. Therefore, the participation of the family has great importance for the involvement of the adolescent in the practice of PA[29]. Educational actions with parents and family on the importance of the practice of PA and its benefits throughout life are suggested. Practical actions could also be carried out based on the interest and mobilization of parents in relation to the practice through the invitation and/or encouragement and/or practicing together, since there is a greater chance of this behavior being maintained in adult life[29]. As for the university's role in promoting PA, it is expected to serve as a driving force behind these initiatives beyond the experiences that physical education classes provide. It is suggested that PA should be developed on the back shift, improve physical abilities, encourage corporal practice and participation in university competitions.

A study carried out in the city of Pelotas, RS, showed that higher SS from family or friends increases by two times the probability of performing PA. However, as the individual grows, participation in PA with the family decreases, while participation with friends increases[29]. Results from the present study point in this direction, since no association of SS from family with the meeting of PA recommendations was found, while high SS from friends increased by 45% (PR: 1.45; $CI_{95\%}$: 1.09–1.93 p=0.010) the chance of achieving recommended PA levels. Educational actions should be encouraged in all levels of university coexistence (university, friends, community). Active mobility campaigns can positively contribute to university students' PA levels[30].

The study presents characteristics that should be considered when interpreting the results. The cross-sectional design prevents larger cause and effect conclusions among variables. The study sample consisted of a group of university students particularly involved in PA practices, which may have attenuated the effect of SS and IPAP, as participants are exposed to a more favorable social environment and possibly more motivated to intrinsic practice. In addition, participants come from a single institution. These characteristics affect the extrapolation of results to university students from other areas of knowledge and locations. The use of self-reported PA measures can affect the classification of PA levels, but allowed the establishment of specific domains and contexts of PA, SS and IPAP.

CONCLUSIONS

SS from friends and IPAP are associated with compliance ≥150min/week of PA, when analyzed in isolation. SS from friends increases the likelihood of university students to fulfill ≥150min/week of PA. There is a tendency that high SS from friends contributes to increase IPAP. Interventions to increase university students' PA practice should provide involvement of friends. Future studies should explore multiple levels of influence that explain PA adherence and maintenance in a more specific way.

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