

Determinants of Leisure-time Physical Activity and Future Intention to Practice in Spanish College Students

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Few studies analyze determinants and patterns of physical activity among college students, so it has not been possible to carry out effective interventions to promote this practice. The aim of this study was to analyze the associations between some personal, social, and environmental determinants, practice of physical activity and future intention to practice in a sample of 639 university students (321 men and 318 women), mean age 21.43 years (± 2.78). Physical fitness self-perception, physical activity history, and coach's support to practice physical activity have a direct effect on the practice of physical activity and an indirect effect on future intention to practice, both in men and women. The practice of physical activity has also a direct effect on future intention to practice. Likewise, the participation in sport competitions predicts practice of physical activity and future intention in men, whereas being a member of a sports club predicts practice and future intention in women.

Keywords: determinants, physical activity practice, future intention, college students

Son escasos los estudios que analizan los determinantes y patrones de práctica de actividad física en universitarios, no pudiéndose realizar intervenciones eficaces para promocionar dicha práctica. El objetivo del presente trabajo consistió en analizar las asociaciones entre diversos determinantes personales, sociales y ambientales, la práctica de actividad física actual y la intención futura de práctica, en una muestra de 639 universitarios (321 hombres y 318 mujeres), con una edad media de 21.43 años (± 2.78). La forma física percibida, la historia de actividad física previa y el apoyo del técnico/entrenador a practicar actividad física tienen un efecto directo sobre la práctica de actividad física e indirecto sobre la intención futura de práctica, en hombres y mujeres. La actividad física practicada también tiene un efecto directo sobre la intención futura. Además, en los hombres, la participación en competiciones deportivas predice la práctica de actividad física y la intención futura de práctica, mientras en el grupo de mujeres el ser miembro de un club deportivo determina la práctica actual y la intención futura de práctica.

Palabras clave: determinantes, práctica de actividad física, intención futura, universitarios

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Regular practice of physical activity is associated with various physical health benefits such as reducing the risk of cardiovascular illnesses, some types of cancer, non-insulin-dependent diabetes mellitus, obesity, and osteoporosis, as well as psychological health benefits such as reducing stress and anxiety, and increasing self-esteem (i.e., American College of Sport Medicine [ACSM], 1991; Pastor & Pons, 2003; Taylor, Sallis, & Needle, 1985; US Department of Health and Human Services [USDHHS], 1996; World Health Organization [WHO], 2003). Consequently, regular practice of physical activity is considered an essential variable for healthy life-style and its promotion has become a top priority of public health (USDHHS, 1996).

Diverse studies indicate that the levels of practice of physical activity decrease significantly between adolescence and adulthood (García-Ferrando, 2001; Stephens, Jacobs, & White, 1985). This decrease is partially due to the fact that youths leave the academic environment and begin university or professional studies, where physical activity becomes a voluntary activity that is not included in the syllabus (Calfas, Sallis, Lovato, & Campbell, 1994; García-Ferrando, 2001; Lowry, Kremer, & Trew, 2007). For authors like King et al. (1992), leaving the school setting to enter the university is one of the big life transitions.

The university is an ideal context in which to learn how to fill up one's personal and professional life, consolidating a life style that will determine one's present and future health (Reig, Cabrero, Ferrer, & Richart, 2001). Thus, the importance of appropriate promotion of life styles that are physically active during this stage. Therefore, it is necessary to identify the factors that may affect the practice of physical activity and will help to predict the future intention of practicing (Buckworth & Dishman, 2002a). In this sense, there are few studies that analyze the determinants and patterns of the practice of physical activity in specific populations such as university students (Keating, Guan, Piñero, & Bridges, 2005; King et al., 1992; París, 1996), so that it has not been possible to carry out effective interventions to promote such practice. The sample of the present study is made up of university students, which is an advance in our knowledge of this segment of the population.

The practice of physical activity cannot be explained and predicted by a single variable, but instead requires the interaction of several variables (Buckworth & Dishman, 2002a). In general, works that have studied the determinants of practice have focused on the differentiation between personal factors or determinants, and social and environmental factors (Leslie et al., 1999; Lowry et al., 2007; Sallis et al., 1992).

From the viewpoint of personal factors, it has been shown that prior history of physical activity is positively associated with habitual participation in physical activity in university students or in general in adulthood, and it is therefore considered one of the most important personal

determinants (Blasco, 1997; Carrión, 2006; Myers, Weigel, & Holliday, 1989; Tammelin, Nayha, Laitinen, Rintamaki, & Jarvelin, 2003). Thus, there is a direct relation between adolescents' levels of physical activity and their level of activity in adulthood.

Other personal predictors of physical activity practice, according to the literature, are related to the self-perception of aptitude and physical fitness (Castillo, Balaguer, & Tomás, 1997; Wold, 1989). Investigations carried out with university students have revealed a positive relation between self-perceived physical fitness and the practice of physical activity in leisure time (Drummond, 1996; Lamb & Morris, 1993).

The intention of being active in the future has also been shown to be a personal predictor of the practice of physical activity in diverse studies (Biddle & Goudas, 1996; Godin, 1994), finding a consistent and positive relation between these variables. The explanation of this association can be found in the theory of planned action (Ajzen, 1991), which states that the immediate determinant of behavior is a person's intention to perform that behavior. Likewise, diverse longitudinal studies based on the theory of planned action have shown that current practice of physical activity is a positive predictor of the future intention to practice (Armitage, 2005; Rhodes, Macdonald, & McKay, 2006). In a similar vein, Rhodes & Plotnikoff (2005), on the basis of various social cognitive models, among them the theory of planned action, have shown that current practice of physical activity can be used as a measure of future sport practice.

With regard to social factors or determinants, Bandura's (1986) social cognitive theory allows us to grasp the importance of social variables in taking up, maintaining, or giving up of the practice of physical activity. This behavior is learned during the socialization process, in which the proximal context assigns a certain value to being physically active, and this affects individuals (Balaguer & Castillo, 2002). As people grow up, they receive information about the value of physical activity from parents, siblings, friends, and all their significant others. Thereby, they learn what their immediate environment considers appropriate or inappropriate, and so, what others expect of them. All this is merged with their sense of competence and external aids, which leads to the creation of skills, attitudes, beliefs, and values about the practice of physical activity.

For Hendry et al. (1993), practice of physical activity is directly related to the social models of reference and the reinforcement or support received for such practice. Thus, practice of physical activity and the support of significant others have been shown to be important factors in an individual's practice (Carrión, 2006; Frankish, Milligan, & Reid, 1998; Hendry, Shucksmith, Love, & Glendinning, 1993; Leslie et al., 1999; Moore, Dolansky, Ruland, Pashkow, & Blackburn, 2003; Petosa, Suminski, & Hartz, 2003; Sallis & Owen, 1998; Snyder & Spreitzer, 1979; Ståhl et al., 2001). In this sense, one's family and friends are one of the main socialization agents of physical activity.

Lastly, according to the literature, to be a member of a club (gymnasium) or sports team, and participating in sport competitions are among the notable environmental variables that predict the practice of physical activity (García et al., 1995; Castillo & Balaguer, 1998; Frankish, Milligan, & Reid, 1998; Leslie et al., 1999; Saar & Jürimäe, 2007; Wold, 1989).

Diverse studies have also revealed significant gender differences in personal, social, and environmental factors that determine the practice of physical activity (Buckworth & Dishman, 2002a; Castillo et al., 1997; Patterson et al., 2006; USDHHS, 1996). Therefore, it is appropriate to differentiate men and women in the study the diverse factors or determinants.

The goal of the present work is to examine the association of some personal (history of prior physical activity and self-perception of physical fitness), social (practice of physical activity and support of significant others), and environmental factors (to be a member of a sports club and participation in sport competitions), current practice of physical activity and the future intention to practice in university students.

For this purpose, we designed a structural equation model in which the personal, social, and environmental variables analyzed will act as predictors of the practice of physical activity in university students, and in turn, practice will predict future intention to practice (see Figure 1).

Method

Participants

The sample was made up of 639 university students (321 males and 318 females), who are representative of the students registered in 27 first- and second-cycle careers in the city of Valencia, in the academic course 2005-2006, with age ranging between 18 and 29 years ($M = 21.43$, $SD = 2.78$). Nonprobabilistic or convenience sampling was used to select the sample; we selected the subjects who were accessible from the available population. The estimation error of the sample was $\pm 4\%$, with a confidence level of 95.5%.

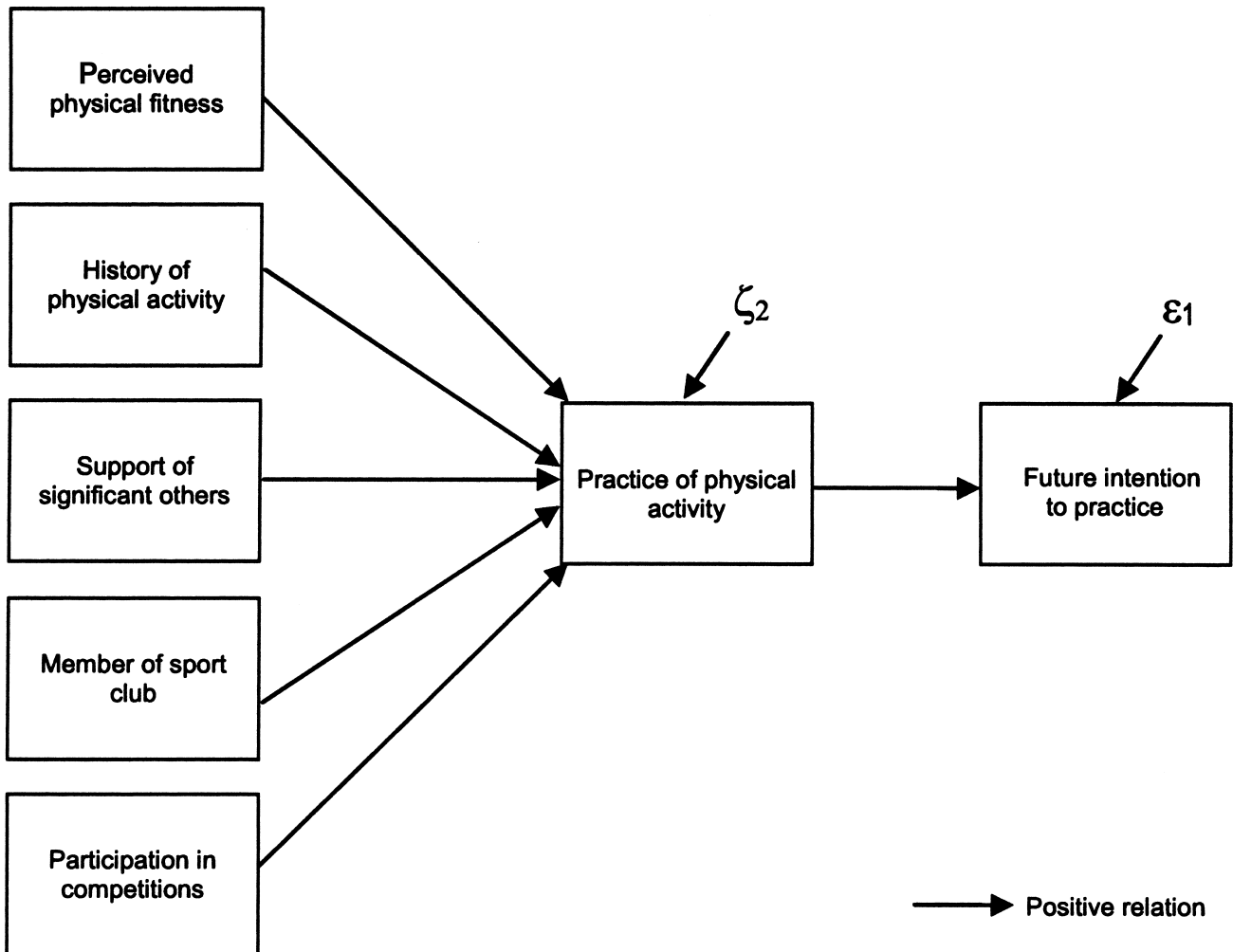


Figure 1. Statistical representation of the hypothesized model Determinants – Practice of physical activity - Future intention to practice

Instruments

The variables in this study were assessed by means of the Health-Behavior in Schoolchildren Inventory (Wold, 1995) translated to Spanish by Balaguer (2002) and adapted to university students for this study (for more information about the variables, see Balaguer, 2002). To measure the practice of leisure-time physical activity, we created a combined index of the frequency and duration of practice, with scores ranging between 1 (*I never practice any physical activity*) to 5 (*I practice 6-7 days/week in sessions lasting 30 or more minutes*). The decision to reflect physical practice with a duration of 30 minutes or more is because practice recommendations for adults determine that at least 30 minutes' duration is necessary to produce physical and psychological health benefits (Morey, 1999; USDHHS, 1996; WHO, 2003).

Moreover, we measured university students' future intention to practice physical activity, with scores ranging from 1 (*definitely not*) to 4 (*definitely*). Likewise, self-perceived physical fitness was assessed with scores ranging between 1 (*regular*) to 4 (*very good*), as well as the history of physical activity before entering the university, ranging from 1 (*less than once a week*) to 5 (*6-7 times a week*). The variable support of significant others (parents, friends, partner, and sports coach) to practice a physical activity was measured with scores ranging from 1 (*I have none*) to 5 (*very often*). Lastly, we also measured the variables to be a member of a sports club, ranging from 1 (*no*) to 3 (*yes, and I also practice sport activities of the club*), and participation in sport competitions, ranging from 1 (*no*) to 3 (*yes*).

Procedure

After a series of prior negotiations with the Teaching and Investigating Personnel of various university centers

(faculties, schools, and residences) from the universities of Valencia, the dates and schedules to administer the questionnaires were fixed. The information, which was voluntary and anonymous, was collected between February and May of 2006, and at least one investigator was present to give instructions and clear up any possible doubts that could arise during the administration.

Results

Descriptives and Differentials

Analyses were carried out to control gender because diverse studies have shown the existence of gender differences in most of the variables included in this work (Buckworth & Dishman, 2002a; Castillo et al., 1997; Patterson et al., 2006; USDHHS, 1996).

In Table 1 are displayed the statistics and gender differentials of the variables used in this study. The results show that male university students practice physical activity an average of 2-3 times a week, in sessions of 30 min or more, whereas females participate in physical activity an average of once a week. Moreover, both males and females reported a high intention of practicing some physical activity in the future, had a long history of prior physical activity before entering the university, as well as high support for the practice physical activity by parents, friends, and partner. In the remaining variables (self-perceived physical fitness, coach/instructor support, to be a member of a sports club, and participation in competitions), the males presented high scores, whereas the females had low scores. At a differential level, the males practiced more physical activity than the females, and reported more intention of future practice, perceived

Table 1
Descriptives and Differential Analysis of the Variables of the Study by Gender

Variables	Range	Men		Women		<i>t</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Practice of physical activity	1-5	3.26	.96	2.18	1.16	12.58**
Future intention to practice	1-4	3.72	.53	3.35	.69	7.42**
Self-perceived physical fitness	1-4	2.58	.86	1.86	.77	11.07**
History of physical activity	1-5	3.50	.80	3.13	.84	5.05*
Father's support	1-5	3.95	.97	3.77	1.01	2.35
Mother's support	1-5	3.95	.85	3.95	.82	-.09
Support of friends	1-5	3.86	1.03	3.53	.98	4.00
Partner's support	1-5	2.63	1.63	3.01	1.72	-2.81
Coach's support	1-5	2.98	1.78	2.05	1.56	6.94**
Member of a sports club	1-3	1.83	1.96	1.34	1.72	7.30**
Participation in competitions	1-3	2.41	.78	1.50	.72	15.30**

* $p < .05$. ** $p < .01$.

themselves as more physically fit, and reported a longer prior history of physical activity. Likewise, the males scored significantly higher in the variables to be a member of a sports club and participation in sports competitions (see Table 1). With regard to the social variables, differential analyses showed that the males also obtained significantly higher scores in the variable coach support, but there were no gender differences in the remaining social variables.

Associations between Personal, Social, and Environmental Factors, Practice of Physical Activity and Future Intention of Practicing

Prior relational analyses led us to consider the support of the coach/instructor for the practice physical activity the only important social variable for participants in this investigation, with regard to their current practice of physical activity and future intention to practice.

As can be seen in Table 2, practice of physical activity was positively related to the diverse personal, social, and environmental variables analyzed in the study, including the future intention to practice, both in males and females. In males, only the relation between history of physical activity and participation in competitions was nonsignificant. Likewise, future intention to practice was positively related to all the variables of the study in both genders.

The hypothesized model (see Figure 1) was tested with path analysis, using the LISREL program 8.54 (Jöreskog & Sörbom, 2003). The correlation matrixes based on optimal scores in the variables were used as input. The fit of the models was assessed by means of absolute fit indexes: chi square, χ^2/df , the goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and root mean square error of approximation (RMSEA), and of relative goodness-of-fit indexes: the comparative fit index (CFI), and the normed fit index (NFI).

The two models (men and women) hypothesized present good fit indexes [Men: $\chi^2(5) = 10.50, p > .05, \chi^2/df = 2.10, GFI = .99, AGFI = .95, RMSEA = .03, CFI = .99, NFI = .99$; and Women: $\chi^2(5) = 11.45, p > .05, \chi^2/df = 2.29, GFI = .99, AGFI = .94, RMSEA = .03, CFI = .99, NFI = .99$].

Self-perceived physical fitness, past history of physical activity, and the coach's support positively predict the practice of physical activity, both for males and females (see Figure 2). The physical activity practiced also had a direct and positive effect on the future intention to practice. Participation in sport competitions was a positive predictor of the practice of physical activity in males, whereas being a member of a sports club was a positive predictor in females.

The indirect effects indicate that all the determinants analyzed have a significant and positive effect on the future intention to practice via the practice of physical activity in university students, except for the determinants to be a member of a sports club in males and participation in sport competitions in females (see Table 3).

The proposed model explained 47% of the variance of the practice of physical activity in males and 44% in females. And 15% of the variance of the intention to practice was explained in males and 13% in females.

Table 3
Indirect Effects of the Determinants on the Future Intention to Practice via the Practice of Physical Activity

	Men	Women
Self-perceived physical fitness	.15**	.14**
History of physical activity	.10**	.05*
Coach's support	.06**	.05*
Member of a sports club	.02	.05*
Participation in competitions	.06**	.02

* $p < .05$. ** $p < .01$.

Table 2
Pearson Correlations among the Variables of the Study

	1	2	3	4	5	6	7
1. Practice of physical activity	—	.39*	.58*	.43*	.43*	.36*	.36*
2. Future intention to practice	.36*	—	.30*	.19*	.19*	.18*	.27*
3. Self-perceived physical fitness	.58*	.29*	—	.32*	.32*	.32*	.26*
4. History of physical activity	.41*	.19*	.36*	—	.21*	.20*	.10
5. Coach's support	.47*	.20*	.43*	.39*	—	.52*	.44*
6. Member of a sports club	.46*	.21*	.39*	.40*	.54*	—	.39*
7. Participation in competitions	.41*	.29*	.39*	.40*	.52*	.55*	—

Note. In the upper right diagonal are the correlations for the group of males, and in the lower left diagonal, the correlations for the group of women.

* $p < .01$.

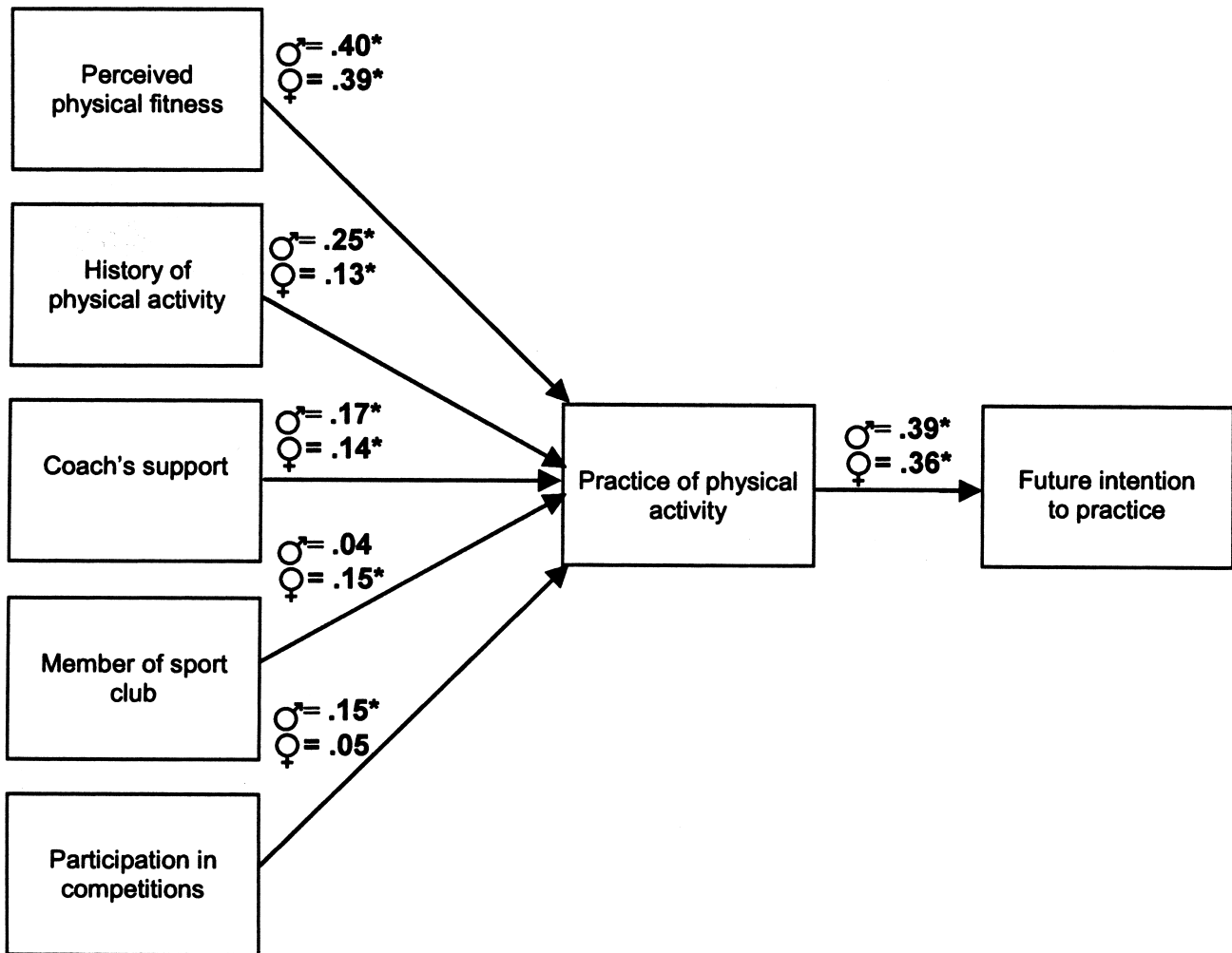


Figure 2. Model Determinants – Practice of physical activity - Future intention to practice. Standardized relations. The value of the coefficient is over the arrow.

* $p < .01$.

Discussion

In this work, we analyzed the predictive power of various personal (history of past physical activity and perceived physical fitness), social (support of a coach/instructor to practice physical activity), and environmental factors (to be a member of a sports club and participation in sport competitions) for the practice of physical activity, and the effect of physical activity itself on future intention to practice in a sample of 639 university students who were representative of the students registered in first- and second-cycle careers in the city of Valencia. The analyses were performed differentiating by gender.

Regarding the personal factors or determinants analyzed, the results obtained indicate that the variables history of past physical activity and self-perceived physical fitness are positive predictors of university students' practice of physical activity, as well as of their future intention to practice.

History of past physical activity has the highest predictive power for practice of physical activity and for future intention to practice, both in males and in females. These results are consistent with those obtained in previous studies, in which it was concluded that physical fitness in childhood and adolescence determined more practice of physical activity in adulthood (Blasco, 1997; Carrión, 2006; Castillo et al., 1997; Denninson, Straus, Mellits, & Charney, 1988; Myers et al., 1989; Tammelin et al., 2003; Wold, 1989). It is necessary therefore to design physical activity programs to promote adequate development of physical fitness at early ages, mainly in childhood and adolescence, which would lead to a decrease of physical inactivity in adulthood.

The gender differences found in these two personal variables help to explain why women are less active physically than men: women perceive themselves as being less physically fit and they also obtain lower scores in the history of past physical activity. Likewise, the results are in

accordance with studies carried out with adolescents, which showed that boys perceive themselves as being more physically fit than girls, and they are also physically more active than girls (Balaguer & Castillo, 2002), and this is coherent with their history of past physical activity when samples of university students are analyzed. Moreover, history of physical activity affects future intention to practice, and hence, a higher percentage of boys than of girls will perform physical activity in the future.

With regard to the social variables analyzed in this study, coach's support towards the practice of physical activity was shown to be the only positive predictor of practice in university men and women, which is along the lines of the study of Buckworth and Dishman (2002a), in which they reported a positive association between participation in programs of supervised physical activity and coaches' social support. These results indicate the role of coaches in the practice of physical activity in university students. Coaches should promote appropriate positive motivational climates (i.e., climates of task involvement and autonomy support) in the physical activity or training sessions, in which development of autonomy, competence, and social relations is enhanced, as well as self-determined motivation, thus producing more adherence and consequently, less intention of quitting the practice of physical activity. Thus, coaches should be aware of the kind of feedback they provide to practitioners, because they can influence them to continue to be physically active, thus preventing the increase in the percentage of sedentariness. In fact, not all the youths who participate in supervised physical activities inform about positive experiences, but instead they sometimes report some rather unpleasant experiences that provoke situations of stress or anxiety (Balaguer, 2007), which can lead to the increase of the already high number of sedentary people.

In previous investigations, the importance of the support of parents, siblings, friends, or even one's partner for the practice of physical activity has been shown (Carrión, 2006; Frankish et al., 1998; Hendry et al., 1993; Leslie et al., 1999; Moore et al., 2003; Petosa et al., 2003; Sallis & Owen, 1998; Snyder & Spreitzer, 1979; Ståhl et al., 2001), indicating that such support has positive effects on the practice of physical activity in both genders, although such effects are higher in the group of women, especially when the support comes from the family (Castillo, Balaguer, García-Merita, & Valcárcel, 2004; Frankish et al., 1998; Leslie et al., 1999; Wallace, Buckworth, Kirby, & Sherman, 2000). Despite this fact, in the present study, family and friends were not associated with the practice of physical activity either in women or in men. In the future, investigations should be carried out with university students in order to analyze the possible differences in the influence of significant others on the practice of physical activity, depending on gender.

With regard to the environmental variables analyzed, the results of the present study indicate that participation in sport competitions predicts physical practice in male

university students, whereas to be a member of a sports club predicts such practice in females. These gender differences are in accordance with the conclusions of the review by Buckworth and Dishman (2002b), that is, competition is an important motivating factor for the practice of physical activity in males, whereas the need to belong or the need for social interaction is more important for females. Nevertheless, in various studies, no gender differences were found in the environmental variables analyzed (García et al., 1995; Castillo & Balaguer, 1998; Frankish et al., 1998; Leslie et al., 1999; Saar & Jürimäe, 2007; Wold, 1989).

From the results obtained, the importance of promoting sports associationism in the university setting, in the form of clubs or sports teams, and of organizing sport competitions can be seen. This investigation has some limitations due to the fact that it does not include other environmental factors related to the physical characteristics of the university setting, which have also been related to more or less practice of physical activity (Ball et al., 2007; Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Giles-Corti & Donovan, 2002; Humpel, Owen, & Leslie, 2002). In the future, the influence of contextual aspects such as availability and accessibility of special lanes for bicycles and pedestrians, the existence of sidewalks, pleasant views, traffic, orography, etc., should be analyzed.

Lastly, current practice of physical activity has been revealed to be a positive predictor of the future intention to continue being active, both in females and in males. This result is along the same lines as the one obtained in the study by Stiggelbout and colleagues (Stiggelbout, Hopman-Rock, Crone, Lechner, & van Mechelen, 2006), who found that current practice of exercise predicted the intention to continue to participate in the future.

Summing up, the results of the study are an attempt to help us understand the determinants of participation in physical activity and the future intention to practice in university students, in order to be able to design and implement effective policies of physical promotion. According to the data obtained, diverse personal, social, and environmental variables should be taken into account. In practical terms, children and adolescents should be encouraged to have a history of physical activity with a high frequency of practice and numerous experiences of practicing during the university stage to ensure future or post-university physical practice. Moreover a high level of practice can contribute to a better self-perception of physical fitness, thus facilitating maintaining one's participation in physical activities, and a stronger future intention to practice. The coach's support of university students' physical activities is also a positive predictor of their level of practice. Hence, the importance of the appropriate selection of personnel to be in charge of the supervision of physical activities in the university setting, people who are capable of creating positive motivational climates in their sessions or trainings that enhance keeping up with physical activity. Likewise, from

the university setting, sports associationism, belonging to clubs or university teams, and the organization of sport competitions should be promoted as essential aspects to enhance the practice of physical activity in the university, and so decrease the rates of sedentariness.

Lastly, we wish to indicate some weaknesses of the study, such as, for example, its cross-sectional nature, which allows referring to associations, but not to cause-effect relations. Nevertheless, the analyses carried out (structural equation models) are a useful tool for the study of linear causal relations between constructs and, although they do not prove causality, they do help investigators to make decisions. Through the technique of path analysis, we attempted to study the effects of some variables that were considered causes of other variables, in turn, considered effects. Thus, we studied the direct effects of the determinants of the practice of physical activity on such practice, and the indirect effects on the intention to practice. Concerning this, we assumed the existence of linear relations between the intention to practice and the remaining observable variables, as well as the lack of correlation of the regression errors and the lack of measurement errors in the variables. Another weakness refers to the use of a single item to measure each one of the variables of the study, except for the index created for the variable practice of physical activity. This is justified by the fact that this study is part of a broader project in which many other variables related to the practice of physical activity were measured, which were not dealt with in the present study, and which allow us to compare our results with international studies which used the same items as this investigation.

With a view to future research, prospective studies are needed to discover the factors that determine beginning to practice physical activity, and those that contribute to maintaining it (Boutelle, Jeffery, & French, 2004). Thus, more effective interventions to increase the levels of physical practice could be developed.

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