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SEXUAL DESIRE AND EXCITATION IN RELATION TO PHYSICAL ACTIVITY IN YOUNG ADULTS

DESEO Y EXCITACIÓN SEXUAL EN RELACIÓN CON LA ACTIVIDAD FÍSICA EN JÓVENES ADULTOS

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ABSTRACT

Sexual desire is a state of motivation that can induce individuals to participate in sexual activity. Physical activity is related to well-being in both social and sexual relationships. The aim of this study was to analyze sexual desire in relation to physical activity and its impact on sexual excitation and inhibition in a population of young adults. The total sample consisted of 485 participants (327 women and 158 men), aged 18 to 35 years. This study required the completion of a sociodemographic questionnaire, the Sexual Desire Inventory (both dyadic and solitary subscales), the Physical Activity Questionnaire (IPAQ) and the Sexual Inhibition and Sexual Excitation Scales (SES-SIS). The main results showed that

there is a relationship between desire and physical activity with excitement and sexual inhibition, concluding that individuals at moderate and high physical activity levels have greater interest in sexual behavior. Future research could propose exercise as an intervention for issues related to a lack of sexual desire.

KEYWORDS: Sexual desire; Physical activity; Sexual behavior; Sexual health

RESUMEN

El deseo sexual es un estado de motivación que puede inducir a la actividad sexual. La actividad física está relacionada con el bienestar social y sexual. El objetivo del presente estudio fue analizar el deseo sexual en relación con la actividad física y su impacto en la excitación e inhibición sexual en una población de jóvenes adultos. La muestra estuvo conformada por 485 participantes (327 Mujeres y 158 Hombres), entre 18 y 35 años. Este estudio requirió el cumplimiento de un cuestionario sociodemográfico, Inventario de Deseo Sexual (diádico y solitario), Cuestionario de Actividad Física (IPAQ) y Escalas de Inhibición y Excitación Sexual (SES-SIS). Los principales resultados mostraron relación entre el deseo y la actividad física con la excitación y la inhibición sexual, concluyendo que actividad medios y altos contribuyen de forma positiva en la sexualidad. Futuras investigaciones podrían proponer el ejercicio como intervención en problemas de deseo.

PALABRAS CLAVE: Deseo Sexual; Actividad física; Conducta Sexual; Salud Sexual

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INTRODUCTION

Society constitutes a central origin for the generation of images and stereotypes of beauty in western society and these stereotypes strengthen the notion that thin bodies are indicative of good health and sexual attractiveness. As a consequence of these stereotypical beliefs, some individuals engage in physical activity for aesthetic purposes (Penhollow & Young, 2008; Sacamori, Felizola, Kruguer, Sperandio & Cardoso, 2013; Uhlmann, Donovan, Zimmer-Gembeck, Bell, & Ramme, 2018). These practices should contribute to a consideration of the effect of physical activity involvement on attraction to the opposite sex as well as on how body image distortion may affect sexual desire (Haavio-Mannila & Purhonen, 2001).

Sexual desire is a state of motivation that can induce people to search for, or participate in, a sexual activity (Corona et al., 2013). This desire is provoked by an interaction among internal cognitive processes, neurophysiological and affective components that serve to propagate the species or provoke pleasure in the person that experiences the involvement (Corona et al., 2013). Sexual desire can be recognized in two forms: solitary sexual desire, which is the type of desire that does not involve a partner and implies abstaining from intimacy with others; and dyadic sexual desire which is related to the presence of, and intimacy with, another individual (Ortega, Zubeidat & Sierra, 2006; Dosch, Ghisletta, & Van der Linden, 2016). At the hormonal level, communication within the endocrine system is important for dyadic relationships as sexual desire is related to these hormonal influences through the experience of desire or through the sexual response of the body through excitation, erection and lubrication (Corona, Isidori, Aversa, Burnett & Maggi, 2016).

The body image of males and females, as well as their perceived physical aptitude, have been found to significantly predict sexual satisfaction (Penhollow & Young, 2008; Pujols, Meston & Seal, 2010; Sacamori et al., 2013). These perceptions and feelings about the body have sociocultural, group and interpersonal influences that are strong enough to affect the sexual experiences and health of individuals as well (Mor, Pujols et al., 2010; Parfionov, Davidovitch & Grotto 2014). As such, the image of a deficient body lacking in efficacy, assertiveness and sexual esteem contributes to sexual avoidance and less dyadic and solitary desire (Dosch et al., 2016). To the contrary, a positive body image is associated with a greater frequency of sexual activity, adventurous activity, opportunism and function (Koyuncu, Tok, Canpolat & Catikkas, 2010; Pujols et al., 2010) and thus drives more frequent sexual experiences as well as stronger feelings of greater desirability which results in fewer sexual difficulties (Huang, Lee & Chang, 2007; Penhollow & Young, 2008).

With reference to the role of the impact of self-perceptions on sexual desire, it is necessary to consider sexual excitation and inhibition outcomes. According to the Dual Control model of sexual response, sexual excitation is the overall result of the balance between sexual excitation and sexual inhibition, given that the two exist independently and are necessary for appropriately adaptive responses (Bancroft, Graham, Janssen, & Sanders, 2009). In this regard, those individuals with high levels of excitation are at higher risk of risky sexual behaviors and those individuals with higher levels of inhibition are more likely to suffer from sexual dysfunction (Granados, Salinas & Sierra, 2017; Moyano & Sierra, 2014).

Various investigations have provided a review of the long-term benefits associated with engagement in physical exercise (Kulig, Brener & McManus, 2003; Jiménez, Zagalaz, Molero, Rulido & Ruiz, 2013). These outcomes include the prevention of

illness and the improvement of cognitive functioning, as well as improved joint and muscular functioning (Adeniyi, Adeleye, & Adeniyi, 2010; Corona et al., 2016; La Vignera, Condorelli, Vicari, D'Agata & Calogero, 2011; La Vignera, Condorelli, Vicari, D'Agata & Calogero, 2012; Hackney, Lane, Register-Mihalik & O'Leary, 2017; Sgrò y Di Luigi, 2017; Stojanovska, Apostolopoulos, Polman & Borkoles, 2014).

Despite these known benefits, competitive sport participation has been associated with a delay in initiating sexual activity (Miller, Sabo, Farrell, Barnes, & Menick, 1998), whereas more recreational activity has been associated with an earlier involvement in sexual relations (Nogueira, Wijtzes, van de Bongardt, van de Looij-Jansen, Bannink & Raat, 2016) and high-performance sport has been associated with complications in sexual relations (Sgrò & Di Luigi, 2017). In this regard, it has been noted that female, elite-level athletes may experience dissatisfaction with their body and experience anxiety about their social body (Koyuncu et al., 2010) associating their sport participation with a need for less sexual activity and concerned for their risk of pregnancy (Habel, Dittus, De Rosa, Chung, & Kerndt, 2010; Miller et al., 1998; Sgrò & Di Luigi, 2017). In the male competitive sport environment, men may develop doubt about their physical self which can also negatively influence their sexual behavior (Sgrò & Di Luigi, 2017). Various studies (Habel et al., 2010; Miller et al., 1998; Taliaferro, Rienzo & Donovan, 2010) indicate that women athletes may be less sexually active whereas the opposite occurs for male athletes. Other studies (Lane, Register-Mihalik, O'Leary & Hackney, 2016; Sgrò & Di Luigi, 2017) have considered the possibility that high levels of training may contribute to the diminishment of libido in men and contribute to abnormal sperm characteristics whereas similar involvement may contribute to amenorrhea, menstrual dysfunction or infertility in women athletes (Hackney et al., 2017) which may be understood as a physiological adaptation that carries with it the saving of bioenergetic resources and is manifested in the lessened libido.

On the other hand, findings from various research studies indicate that individuals who engage in competitive forms of physical activity may be able to avoid consuming alcohol or drugs and may choose not to engage in sexual activity to stay focused on their training (Kulig et al., 2003), which would make it easier for them to avoid risky situations (Habel et al., 2010; Sgrò & Di Luigi, 2017). In addition, it has been found that exercise involvement improves erectile function in healthy men and young men (Hsiao et al., 2012; La Vignera et al., 2011; La Vignera et al., 2012; Sgrò & Di Luigi, 2017), which can have an impact of their sex drive, orgasm quality and satisfaction (Sgrò & Di Luigi, 2017). Similar studies with women have found that yoga strengthens desire, excitation, lubrication, orgasm and sexual satisfaction (Finley, 2017). Furthermore, sport participation has been linked to greater social competence, problem resolution, self-esteem, self-efficacy, and academic performance (Taliaferro et al., 2010; Stojanovska et al., 2014) as well as with overall well-being (Huang et al., 2007; Penhollow & Young, 2008),

including higher levels of happiness and life satisfaction (Jiménez et al., 2013; Sacomori, Felizola, Kruguer, Sperandio, & Cardoso, 2013).

At the medical level, it has been found that physical activity improves sexual function in depressed women (Lorenz & Meston, 2012; Lorenz & Meston, 2013; Finley, 2017; Stojanovska et al., 2014), while reducing symptoms of sadness (Sgrò & Di Luigi, 2017) and anxiety (Huang et al., 2007). In the same way, exercise has been found to be effective in the treatment of erectile dysfunction (Esposito et al., 2009; La Vignera et al., 2012; Sgrò & Di Luigi, 2017) and to reduce sexual dysfunction and body weight while increasing testosterone levels (Khoo et al., 2013), including inhibitors of phosphodiesterase type 5 (iPDE 5) that typically are used for the treatment of sexual dysfunction (Maio, Saraeb & Marchiori, 2010). On the other hand, a sedentary lifestyle has been found to negatively influence health, and sexual health in particular (La Vignera et al., 2011; Sgrò & Di Luigi, 2017).

In terms of measurement instruments utilized for the assessment of physical activity, certain researchers have opted to utilize scales that have not yet been fully validated (Miller et al., 1998; Habel et al., 2010; Huang et al., 2007; Nogueira et al., 2016; Taliaferro et al., 2010) or have relied on self-report scales (Esposito et al., 2009; Skoyen, Blank, Corkery & Butler, 2013). To avoid any measurement complications, the International Physical Activity Questionnaire (IPAQ) was utilized in the present study and this instrument has been the most widely used, validated questionnaire in this area of study (Crespo-Salgado, Delgado-Martín, Blanco-Iglesias & Aldecoa-Landesa, 2015; Sacomori et al., 2013; Sigmundová et al., 2015. Hackney et al., 2017).

Given the relationship that has been established between physical activity and sexuality (Sgrò & Di Luigi, 2017), the researchers in the present study proposed to examine the relationship between sexual desire and physical activity patterns in young adults as well as the relationship between physical activity and sexual inhibition or excitation in this population. In this regard, the study was intended to better understand the effects of physical activity on sexual inhibition and disinhibition. These relationships were also examined in relation to the gender and age of the participants. The primary hypothesis of this study was that individuals who engaged in normal or high levels of physical activity would demonstrate higher levels of sexual desire and excitation than would individuals with lower levels of physical activity.

METHOD

Participants

There were 485 participants (327 females and 158 males) involved in the correlational portion of the study. These individuals ranged in age from 18 to 35

years. The males had a mean age of 22.84 years ($SD = 3.22$ years) and the females had a mean age of 22.25 years ($SD = 3.44$ years). 36.5% ($n=177$) of these subjects were 20 years of or younger whereas another 35.9% ($n = 174$) were between 21 and 23 years of age. 16.3% ($n=79$) of the participants were between 24 and 26 years of age whereas 7.2% ($n=35$) were between 27 and 29 years with the remaining 4.1% ($n=20$) 30 years of age or older. A convenience sample was used for the recruitment of participants through the *Google Drive* platform and was advertised on social media networks and university websites (www.ual.es). The questionnaire had a format structured to include sociodemographic information, a physical activity scale and sexual desire subscales, including the inventory of sexual excitation and inhibition.

Instrumentation

Sociodemographic Information

A sociodemographic instrument was used to collect relevant personal data including age, sex and educational background and to determine whether the individual was part of a stable romantic couple of at least three months in duration (Appendix).

Physical Activity

The brief version of the International Physical Activity Questionnaire (IPAQ) (www.ipaq.ki.se) was utilized in the present study and consisted of seven questions that assessed physical activity behaviors. This instrument was selected due to the fact that it allows for a simple and direct estimation of the amount of time invested weekly in physical activity practice. The instrument has been utilized in similar studies of this type (Sacomori et al., 2013; Sigmundová et al., 2015; Hackney et al., 2017) such as the European Opinion Research Group (2003) study. As such, the brief version of this scale was used. The brief version has been previously validated with the Spanish population (Román-Viñas, Ribas-Barba, Ngo, & Serra-Majem, 2013) and a moderate correlation was found in this study between total physical activity ($r = 0.27$; $p < .05$) as well as with time dedicated to vigorous physical activity ($r = 0.38$; $p < .01$), with an associated sensibility and specificity value of 75% ($\kappa = 0.33$). The items comprising this questionnaire are related to sport behaviors, work activities and sedentary behaviors and are differentiated across three levels including walking activities, moderate physical activities and vigorous physical activities (Crespo-Salgado et al., 2015). In order to establish a physical activity level on the IPAQ, it is necessary to multiply minutes of exercise by the total number of days during which the individual engages in exercise. According to this classification, the *Low Physical Activity* classification corresponds with a value of 600 or less; the *Moderate Physical Activity* classification corresponds with a value greater than 600 but less than 3000;

and the *High Physical Activity* classification corresponds with a value of 3000 or more. For our sample, the Cronbach alpha value of internal consistency for the scale was .80, with item-total correlations ranging between .72 and .80. Spearman reliability coefficients ranged between .33 and .72

Sexual Desire

Participants' sexual desire was assessed through the Sexual Desire Inventory developed by Spector, Carey and Steinberg (1996) and adapted to the Spanish language by Ortega, Zubeidat and Sierra (2006). This inventory measures sexual desire through a series of 13 questions. The instrument differentiates between two factors, which are desire for dyadic sexual activity (items 1-9) and which pertain to sexual activities involving a partner; and solitary sexual activity (items 10-13) which refer to sexual activity that does not involve a partner. All of the items are scored through a Likert-type scale format. The Spanish language version has yielded favorable indices of internal consistency (Cronbach alpha values of .87 and .88 for the dyadic sexual desire and solitary sexual activity subscales, respectively) and a correlation of .49 between the two subscales (Ortega et al., 2006). In addition, level of sexual desire was classified according to the "Sexual Desire Quiz: Maze Women's Sexual Health" (2018) in which individuals scoring at or above a value of 45 are considered to be at the normal sexual desire level whereas those scoring lower than this value are considered to have low sexual desire. In the present study, a Cronbach alpha level of .85 was obtained for this scale with item-total correlational values ranging from .53 to .90. Spearman correlation coefficients ranged between .34 and .83.

Sexual Excitation and Inhibition

The Spanish language version of the Sexual Inhibition/Excitation-Short Form (SIS/SES-SF; Carpenter, Janssen, Graham, Vorts & Wichertas, 2011) was used which was adapted and validated by Moyano and Sierra (2014). This inventory consists of 14 questions, each of which are presented along a 4-point Likert-type scale that includes: the Scale of Sexual Excitation (SES) that assesses the nature of the social encounter; Scale of Sexual Inhibition 1 (SIS1), with items related to concentration on, or distraction from, the sex act; and the Scale of Sexual Inhibition 2 (SIS2) that assesses the individual's concerns about being identified by others or to have become infected with a sexually-transmitted disease (Moyano & Sierra, 2014). Participants are then categorized according to their resultant score along the SES, SIS1 and SIS2 subscales. Those participants with similar scores across two subscales were grouped in SES-SES1, SES-SIS2 and SIS categories. Reliability indices for the Spanish language version have been found to be adequate in the past for both sexes and attained Cronbach alpha values around .60 for the SIS2 and .72 for the SES. The corrected item-total correlations for each factor ranged between .28 and .64. Significant correlations

were also obtained between factors, except between the SES and SIS1 which demonstrated the independence of those two factors (Moyano & Sierra, 2014). In the present study, Cronbach alpha values of .69 for the SIS1 and .75 for the SES were obtained and item-total correlations for each factor were .30 and .77, respectively. In addition, the correlations between the SES and SIS1 also demonstrated that the factors were independent in this study.

PROCEDURE

The data were collected through an online questionnaire created on *Google Drive* which was linked to various social networks. The data was collected between December of 2017 and March of 2018. The instructions needed to complete the questionnaire were accessible to the participants once they completed informed consent to participate in the study. In addition, three questions served as a filter for the sample which allowed the participant to continue with the survey or not. One filtering question pertained to whether the potential participant was between the ages of 18 and 35 years of age. Two additional questions asked whether the potential participant had a physical limitation or chronic illness that would impede or affect in any way their involvement in physical activity.

In order to conduct the study, approval from the Committee on Ethics at the University of Almeria was first obtained. At the beginning of the questionnaire, the participants were informed about the purposes of the investigation and the voluntary and anonymous nature of their involvement. All participants provided their consent for involvement in the study. Anonymity and confidentiality were assured during the collection of the data and the retention of the data was maintained under the terms of European legislation regarding protection of data (COM, 2012)

STATISTICAL ANALYSIS

The statistical analyses were conducted using the SPSS v. 23.0 program for Windows (SPSS Inc., Chicago, IL, USA). Quantitative data is presented in the form of means and standard deviations and the qualitative data is presented as frequencies and percentages. All data were found to be normally distributed through the KS test. Continuous variables were analyzed through Student *t tests* and ANOVA, using the Bonferroni post-hoc analysis and eta squared as an estimate of effect size. For the examination of the categorical variables Chi-squared tests were applied. Correlations were assessed using Pearson's *r* statistic.

RESULTS

A univariate analysis was conducted with the data obtained. Descriptive statistics revealed that the mean average age of our sample was 22.44 years (SD = 3.37

years). Of this sample, 50.5% of the sample responded that they had a partner for at least three months at the time of the study whereas 40.0% reported that they did not have a partner with the remaining 9.5% indicating that they had some type of intimate relationship during this time but did not consider themselves to have a partner. 84.7% of the sample were classified as possessing normal sexual desire whereas 15.3% were classified with a low level of sexual desire. IPAQ scores revealed that a majority of the participants had a high physical activity level (45.6%) and an additional 34.2% had moderate activity levels. On the scales of sexual excitability, 60.2% of the sample scored at the highest level of SES and 27.42% scored at the highest level on the SIS2.

Table 1. Comparison of Mean Scores by Gender

	Men <i>n</i> =158		Women <i>n</i> =327		Levene Test		<i>t</i>	<i>p</i>
	M	SD	M	SD	<i>F</i>	<i>p</i>		
Age	22.84	3.22	22.25	3.44	0,68	.40	1.81	.07
Walking	2,049.91	3,114.24	1,537.02	2,225.27	8.28	.01	1.85	.06
Moderate Activity	1,455.24	3,437.54	742.67	1,787.31	14.13	.00	2.45	.01
Vigorous Activity	2,304.05	3,867.26	1,538.32	3,922.99	1.45	.22	2.02	.04
IPAQ	5,809.20	7,657.46	3,818.01	6,256.96	6.82	.01	2.84	.00
Desire	66.65	14.70	55.16	16.66	2.51	.11	7.39	.00
Dyadic Desire	49.03	10.72	43.67	11.80	0.12	.72	4.82	.00
Solitary Desire	17.65	6.75	11.47	8.58	21.08	.00	8.61	.00
SES	14.32	3.27	12.83	3.60	1.97	.16	4.37	.00
SIS1	8.02	2.46	8.37	2.55	0.22	.63	-1.43	.15
SIS2	11.19	2.82	11.88	3.09	1.44	.23	-2.34	.02
	Freq.	%	Freq.	%			<i>X</i> ²	<i>p</i>
Level IPAQ								
Low	23	14.6%	75	22.9%			9.35	.01
Medium	48	30.4%	118	36.1%				
High	87	55.1%	134	41%				
Level Desire								
Low	10	6.3%	64	19.6%			14.45	.00
Normal	148	93.7%	263	80.4%				
Level Exc.								
SES	118	74.7%	174	53.2%			21.26	.00
SES-SIS1	0	0.0%	2	0.6%				
SES-SIS2	9	5.7%	30	9.2%				
SIS	1	0.6%	4	1.2%				
SIS1	2	1.3%	12	3.7%				

Partner	SIS2	28	17.7%	105	32.1%	6.29	.04
	With Partner	69	43.7%	176	53.8%		
	No Partner	68	43%	126	38.5%		
	Other relations	21	13.3%	25	7.6%		

Note: M = Mean; SD = Standard deviation; p comparison by sex (t Student for continuous variables and X² for categorical variables). Excitation level: SES-SIS1; SES-SIS2; SIS: Same score on both scales.

In comparing the values of the responses for men and women, significant gender differences can be noted for mean scores for both moderate and vigorous physical activity ($p < .05$), with higher mean scores found for the males. Significant gender differences also appeared for activity level ($p < .05$) with 22.9% of the women reporting a low level of physical activity in comparison to 14.6% of the men. In addition, the men demonstrated significantly higher scores on the variables of desire and SES ($p < .05$). Nonetheless, the value on SIS2 ($p < .05$) was significantly higher among women. Similarly, there were a greater percentage of women who were involved with a partner (53.80%) (Table 1).

Possible gender differences in the entire sample in relation to sexual activity with, and without, a partner resulted in the identification of significantly greater mean scores for solitary desire ($p < .01$) for the group without partners. As a follow-up, mean difference analyses were conducted in relation to age groups.

Subsequently, a test of mean group differences was conducted in relation to age groups. In order to maintain roughly similarly-sized age groups, the oldest age group was established as age 27 and older. In this analysis, significant differences were revealed in relation to the variable of partner status with a higher percentage of individuals in the oldest group involved with a partner. Significant differences ($p < .01$) were also found among the SES variables and in relation to desire with the most notable differences appearing among the group of 21-23 year olds and the group of 27 years of age and older. With regard to age-related differences in desire and subscales the youngest two age groups were found to differ significantly ($p < .01$) from the oldest age group (Table 2).

Subsequently, the three physical activity levels (high-, medium- and low-activity in relation to IPAQ scores) were compared and significant differences were found in relation to sexual desire, SES value and SIS1 values. Nonetheless, the eta squared effect size estimates were small. The specific results indicated that the low physical activity group had lower mean values for desire than the other two groups ($p < .05$). In this regard, the low activity group had significantly lower scores than the moderate activity ($p < .01$) and high activity ($p < .05$) groups. With reference to the SIS1, the low activity group had significantly ($p < .05$) higher scores than the high activity group ($p < .05$). Significant differences were also found in the

percentage of individuals with a partner as the low activity group had 60.2% its members involved with a partner. Finally, in terms of excitability, the medium activity group had a mean value of 64.5% in comparison to the 45.9% value in the low activity group (Table 3).



Table 2. Comparison by Age of the Participants

	18-20 yrs n=177		21-23 yrs n=174		24 -26 yrs n=79		27-35 yrs n=55		Prueba Levene			
	M	SD	M	SD	M	SD	M	SD	F	p	F	p
Walking	1710.87	2605.66	1486.74	1797.76	2184.47	3436.61	1680,00	2928.86	3.17	.02	1.35	.25
Moderate Activity	1040.95	3314.00	714.83	1249.34	1540.66	2652.61	771.64	1714.94	3.04	.02	2.20	.08
Vigorous Activity	1481.81	3532.60	1919.26	3923.33	2437.47	5337.81	1423.27	2300.22	1.74	.15	1.31	.27
IPAQ	4233.63	7598.53	4120.84	5375.04	6162.60	8497.26	3874.91	4948.47	2.36	.07	2.00	.11
Desire	56.79	15.96	57.29	17.62	61.78	15.07	66.65	17.71	1.32	.26	6.26	.00
Dyadic Desire	43.60	11.28	45.30	12.43	46.86	10.68	49,55	11.19	0,86	.46	4.18	.01
Solitary Desire	13.19	8.13	11.99	8.63	14.92	7.74	17.11	9,32	2.25	.08	6.10	.00
SES	13.36	3.28	12.68	3.74	13.73	3.36	14.60	3.75	2.05	.10	4.68	.00
SIS1	8.48	2.41	8.07	2.43	7.94	2.59	8.64	3.00	1.44	.23	1.62	.18
SIS2	11.94	2.87	11.74	3.03	10,94	3.01	11.51	3.34	1.07	.36	2.11	.10
	Freq.	%	Freq.	%	Freq.	%	Freq.	%			X ²	p
Level Low	40	22.6%	39	22.4%	10	12.7%	9	16.4%			7.58	.27
IPAQ Medium	60	33.9%	57	32.8%	25	31.6%	24	43.6%				
High	77	43.5%	78	44.8%	44	55.7%	22	40.0%				
Level Low	29	16.4%	32	18.4%	8	10.1%	5	9.1%			4.72	.19
Desire Normal	148	83.6%	142	81.6%	71	89.9%	50	90.9%				
Level SES	108	61.0%	92	52.9%	54	68.4%	38	69.1%			22.99	.08
Exc. SES-SIS1	1	0.6%	0	0.0%	1	1.3%	0	0.0%				
SES-SIS2	18	10.2%	18	10.3%	2	2.5%	1	1.8%				
SIS	1	0.6%	4	2.3%	0	0.0%	0	0.0%				
SIS1	5	2.8%	3	1.7%	4	5.1%	2	3.6%				
SIS2	44	24.9%	57	32.8%	18	22.8%	14	25.5%				
With Partner	66	37.3%	98	56.3%	47	59.5%	34	61.8%			32.74	.00
Without Partner	100	56.5%	57	32.8%	22	27.8%	15	27.3%				
Other relations	11	6.2%	19	10.9%	10	12.7%	6	10.9%				

Nota: M = Mean; SD = Standard deviation; Exc.=Excitability; p comparison by age group (F= ANOVA for continuous variables; X² = chi-square for categorical variables). Level of Excitability: SES-SIS1; SES-SIS2; SIS: Values of scores for the two scales.

Table 3. Group Comparison on IPAQ scores.

	Low <i>n</i> = 98		Medium <i>n</i> =166		High <i>n</i> =221		Levene Test		<i>F</i>	<i>p</i>	ES
	M	SD	M	SD	M	SD	<i>F</i>	<i>p</i>			
Age	21.86	3.18	22.72	3.40	22.50	3.42	1.23	.29	2.06	.13	.01
Desire	54.91	16.62	60.17	14.51	59.72	18.46	3.11	.04	3.49	.03	.02
Dyadic Desire	43.00	12.75	45.78	9.37	46.22	12.70	5.46	.00	2.70	.07	.01
Solitary Desire	11.91	8.02	14.27	8.34	13.60	8.82	1.11	.32	2.40	.09	.01
SES	12.25	3.49	13.85	3.32	13.38	3.67	1.15	.31	6.44	.00	.03
SIS1	8.78	2.73	8.28	2.34	8.00	2.54	1.67	.18	3.26	.04	.01
SIS2	12.10	3.04	11.62	2.80	11.48	3.15	0.79	.45	1.46	.23	.01
	Freq. %		Freq. %		Freq. %				<i>X</i> ²	<i>p</i>	
Level Exc.	SES	45	45.9%	107	64.5%	140	63.3%				
	SES-SIS1	1	1.0%	0	0%	1	0.5%				
	SES-SIS2	11	11.2%	14	8.4%	14	6.3%	19.25		.04	
	SIS	3	3.1%	1	0.6%	1	0.5%				
	SIS1	6	6.1%	2	1.2%	6	2.7%				
	SIS2	32	32.7%	42	25.3%	59	26.7%				
Partner	With Partner	59	60.2%	77	46.4%	109	49.3%	15.58		.00	
	Without Partner	37	37.8%	76	45.8%	81	36.7%				
	Other relations	2	2.0%	13	7.8%	31	14%				

Nota. Exc.=Excitability; ES=Effect Size; *p* for the variable comparison (*F*= ANOVA for continuous variables; *X*² = Chi-square for categorical variables). Level of Excitability: SES-SIS1, SES-SIS2; SIS: Same calculation for the two scales.

Upon analyzing the correlations, it can be observed that the relationship between desire (dyadic and solitary) and variables such as age (*p*<.01) and SES scores (*p*<.01) were notable. In addition, it can be observed that a negative correlation between solitary desire and SIS2 score (*p*<.01) was present. Although the IPAQ score and desire scores were not significantly correlated it was noteworthy that the

IPAQ vigorous physical activity category was negatively associated with the SIS2 score ($p<.05$) (Table 4).



Table 4. Correlations among the variables.

		Walking	Moderate Activity	Vigorous Activity	IPAQ	Desire	Dyadic Desire	Solitary Desire	SES	SIS1	SIS2
Age	Pearson	0.01	0.02	0.02	0.03	0.16**	0.14**	0.12*	0.11*	0.04	-0.06
Walking	Pearson	1	0.43**	0.24**	0.67**	0.00	0.01	-0.01	0.06	0.02	-0.06
Moderate Activity	Pearson		1	0.41**	0.77**	0.01	0.01	0.01	0.01	-0.07	-0.07
Vigorous Activity	Pearson			1	0.82**	-0.04	-0.02	-0.06	-0.08	-0.05	-0.11*
IPAQ	Pearson				1	-0.02	-0.00	-0.03	-0.02	-0.05	-0.11*
Desire	Pearson					1	0.88**	0.76**	0.57**	-0.02	-0.08
Dyadic Desire	Pearson						1	0.38**	0.53**	-0.04	-0.02
Solitary Desire	Pearson							1	0.40**	0.02	-0.12*
SES	Pearson								1	0.08	-0.08
SIS1	Pearson									1	0.31**

Note: Pearson correlational significance:

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

DISCUSSION

The results of the present study reveal some important findings with respect to the relationship between exercise and sexuality in young adults. As such, the obtained results support the presence of a relationship between level of physical activity and sexual desire, excitation and inhibition.

As a starting point, a larger proportion of the sample was comprised by women although the male sample size was adequate. Exercise levels in our sample of young adults corresponded with a moderate- to moderate-high level of physical activity, which was as expected and consistent with Sigmundová et al. (2015) in which a slightly higher proportion of the sample (21.3%) was at a low level of physical activity compared to the 20.2% of this sample.

Gender differences were also found between men and women and our results corresponded with those of Jiménez-Torres, Godoy-Izquierdo and Godoy (2012) in

which males were more likely to be physically active at the moderate and vigorous activity levels than were women. These researchers (Jiménez-Torres et al, 2012) attributed their findings to greater intrinsic motivation among males to become involved in physical activity.

A related finding was that a greater percentage of women with lower physical activity levels were found to be involved with a partner. This finding could be linked to the findings of the investigation conducted by Davis, Sandberg, Bradford and Larson (2016) who explained that attraction in a relationship tends to be associated with a reduction in physical activity. In contrasting across levels of exercise, it was found in the present study that a greater percentage of individuals with a partner were in the low physical activity group. This finding is supported by the study from Skoyen et al., (2013) in which it was concluded that physical activity involvement and healthy nutritional practices can be shaped by a partner. Nonetheless, these differences were not found in the present sample in a comparison of scores on the IPAQ between individuals with, and without, a partner.

In the present study, the values obtained for solitary desire were found to be significantly higher in the individuals without partners. This finding could be related to a consideration which was mentioned by Ortega et al. (2006) who found that solitary sexual desire fulfills sexual needs of the individual whereas dyadic sexual activity has an emotional component that reflects the sexual desires of one's partner.

It was also observed within the sample as a whole that dyadic sexual desire was associated with good sexual functioning (Moyano & Sierra, 2014). With respect to sexual desire among women, these findings indicated significantly lower values than for men. Various previous studies (Finley, 2017; Mehmet et al., 2010; Moyano & Sierra, 2014; Pujols et al., 2010) have attributed these tendencies to issues such as financial difficulties, academic and professional pressures and body image distortion influences. At the same time, males in this study had significantly higher values for excitability whereas women had higher levels on the SIS2. In accordance with these findings, the study conducted by Moyano and Sierra (2014) suggested that the higher values demonstrated by men on the SES can be due to the expression of sexual fantasies, sexual behaviors with partners and a higher frequency of masturbation. In contrast to the present study, women in the study conducted by Moyano and Sierra (2014) demonstrated higher values on the SIS1 in relation to distraction during sexual activity whereas the values for men and women on the SIS2, which assesses concerns for being identified or about encountering a sexually transmitted infection were similar across sexes. Knowledge about validity considerations affecting self-report data as well as perceived social norms may have influenced response patterns (Catania, Gibson, Chitwood, & Coates, 1990). In this regard, and in correspondence with the studies conducted by Fisher (Fisher, 2007; Fisher, 2009), the pattern of findings obtained in the present study should be

interpreted with the possibility that there could have been a “social desirability” consideration that influenced the response pattern of males in the interest of creating a more desirable image.

In continuing the comparison across exercise groups, the findings revealed that sexual inhibition linked to fear of being identified or of encountering a sexually-transmitted disease (SIS2) was higher in the high activity level. At the same time, individuals in the moderate and high physical activity groups reached higher levels on the scales of desire and sexual excitation. These findings coincide with those postulated by Huang et al. (2007), Penhollow and Young (2008), and Hackney et al. (2017) who have mentioned that exercise stimulates sexual desire. A different study conducted by Sacomori et al. (2013) with a female-only sample did not find a significant relationship between desire and level of exercise.

With regard to the limitations of this study, we can mention that the data were obtained through self-report and self-administered online questionnaires which can raise the issue of social desirability bias. In addition, it is possible that individuals may have completed the survey on more than one occasion given the ratio of intended responses to completed responses. This study also did not consider the type of physical activity completed or the type of sport (competitive or not) and the level of competition (Federation level, elite sport or professional sport). Relevant variables were also not included in relation to occupation, civil state, number of children or the number of hours devoted to physical activity and sport experiences which would have provided additional depth of understanding. The means of classification of low and normal desire groups could be an additional limitation of the study. Finally, sexual orientation was not taken into account in this study and may have been related to the relationship between desire and physical activity.

Future lines of investigation should consider the variables and considerations that have been mentioned. In particular, future analyses could be conducted on differences with respect to groups differing on sexual desire or in the examination of individuals who may reflect sexual addiction. As such, it would be interesting to determine whether the relationship that was found between exercise level and desire would be consistent across the entire sample.

CONCLUSION

The results obtained in the present study suggest that sexual desire is related to level of physical activity which, in turn, impacts sexual inhibition and excitation in young adults. These findings indicate that moderate and high levels of physical activity contribute in a positive way to the sexual conduct of people, supposing a possible point of departure for future investigators exploring issues with sexual desire among people in which inadequate physical activity might be related. These findings would suggest possible practical implications for the development of

moderate exercise programs designed with the intent of strengthening libido among individuals with low sexual desire.

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Appendix

Sociodemographic questionnaire

Age (age)

Do you suffer from a physical limitation that could impede or affect physical activity in any way?

- Yes
- No

Do you suffer from a chronic illness that could impede or affect physical activity in any way?

- Yes
- No

Gender

- Male
- Female

Do you currently have a partner? (three months or longer)

- Yes
- No
- I have a romantic relationship with a person that I don't consider to be a partner

Educational Level

- Elementary (ESO, Certificado de Estudios Primarios, ...)
- Medium (Secondary education or advanced training)
- Higher education (University level: undergraduate, Master's, doctorate)
- No schooling