Sacomori, C.; Felizola, F.L.V.; Kruguer, A.P.; Sperandio, F.F. y Cardoso, F.L. (2013) Nivel de actividad física y función sexual de mujeres / Physical activity level and sexual function of women. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 13 (52) pp. 703-717. Http://cdeporte.rediris.es/revista/revista52/artinfluencia420.htm

ORIGINAL

PHYSICAL ACTIVITY LEVEL AND SEXUAL FUNCTION OF WOMEN

NIVEL DE ACTIVIDAD FÍSICA Y FUNCIÓN SEXUAL DE MUJERES

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Código UNESCO / UNESCO Code: 2411.18 Fisiología del movimiento / Physiology of Movement
Clasificación Consejo de Europa / Classification Council of Europe: 4. Educación Física y deporte comparado / Physical Education and Compared Sport

Recibido 22 de agosto de 2011 **Received** August 22, 2011
Aceptado 3 de junio de 2013 **Accepted** June 3, 2013

ABSTRACT

The purpose of this study was to evaluate the influence of physical activity on the sexual function of women from 18 to 40 years old. Questionnaires about level of physical activity, perceived ability and scale of sexual function were applied on 114 women, physically active or not. The results showed no significant differences in sexual function scores for women considering the levels of physical activity (low, moderate or high). More physically active women tended to show more dyspareunia during or after sexual intercourse. Women with thinner waists and larger hips reported more sexual desire and arousal.

KEY WORDS: Physical Activity, Sexual Function, Women.

RESUMEN

El objetivo del estudio fue evaluar la influencia del nivel de actividad física en la función sexual de mujeres de 18 a 40 años. Fueron aplicados cuestionarios sobre el nivel de actividad física, escala de capacidad percibida y función sexual en 114 mujeres, practicantes o no de actividades físicas. Los resultados no demostraron tener diferencias significativas en la puntuación de función sexual de las mujeres considerando los niveles de actividad física (leve, moderado o intenso). Las mujeres más activas físicamente tendieron a señalar más dispareunia durante o después de la actividad sexual. Las mujeres con cinturas más finas y caderas más anchas refirieron más deseo y excitación sexual.

PALABRAS CLAVE: Actividad Física, Función Sexual, Mujer.

INTRODUCTION

Over the last decade, the sexual function of women has been progressively analyzed along with possible treatments and solutions in cases involving dysfunctions (Seo, Choe, Lee & Kim, 2005). It has been estimated that between 40% and 45% of women suffer from at least one sexual disorder problem (Lewis et al., 2004).

This problem is more prevalent among women (43%) than men (31%) and is related to some factors such as age, education, physical and emotional health problems (Laumann, Paik, & Rosen, 1999), the number of children and relationship satisfaction (Witting et al., 2008). Some studies have revealed that there was a significant link between sexual disorder and feelings of physical and emotional dissatisfaction as well as the decrease of general well-being (Leite et al., 2007; Rosen et al., 2000).

Other studies point out the fact that the practice of physical exercises has positive effects in people's sexual lives with an increase of frequency, sexual satisfaction (Gerber, Johnson, Bunn, & O'Brien, 2005; White, Case, McWhirter & Mattison, 1990; Fox, Gelber & Chasen, 2008) and sexual function (Hoffmann et al., 2009) as results. Penhollow's research (2008) involving 408 university students showed that the level of physical activity and exercise is a key element to sexual satisfaction. It was also reported that physical exercise and its subsequent fitness enhance physical attractiveness and overall well-being, which makes women feel more desired (Penhollow & Young, 2004; Richman & Shaffer, 2000). This indirectly could lead to a good sexual functioning. Hence, the search for a standard body has been one of the reasons why people decide to start with the practice of physical activity since it interferes with women's body language and their sexual confidence. As a matter of fact, physical attraction is an important and highly emphasized aspect in sexual relationships (Donaghue, 2009).

The concepts of physical activity and physical exercise need to be approached differently in order to understand the variation of women's sexual function bearing these two concepts in mind. According to Caspersen (1985), physical activity is understood as any body movement produced by skeletal muscles that results in higher energy expenditure levels than at rest. According to Castellón, De La Cruz & Márquez (2003) and Ainsworth (2003), physical activity is defined as daily activities, household chores, children, work, transport, leisure and various types of sedentary activities. Once the physical activity is planned, repetitive, structured, carried out to maintain and improve the physical condition, then it is called physical exercise.

However, it is noted that the research referring to the association between physical activity and women's sexual function is rather scarce after the effect of supervised exercise practice has specifically been analyzed by a few studies (Gerber et al., 2005; White et al., 1990; Fox et al., 2008; Hoffmann et al., 2009). Moreover, such studies generally deal with sexual function and sexuality issues in women minority groups with very specific profiles in relation with a disease or

menopause. Thus, the aim of this research is to evaluate the influence of physical activity level in the sexual function of young adult women inside the general population.

MATERIALS AND METHODS

This is a descriptive, correlational and transversal type of field research.

PARTICIPANTS

The study was conducted on 114 women aged between 18 and 40 who attended the wowen's network for the fight against cancer in the municipality of Florianopolis in order for the cervix cancer tracking exams to be carried out. It also included women from Florianopolis who regularly practice any type of sport.

The inclusion criteria were: healthy, not pregnant, sexually active women who agreed to take part in the study and signed the detailed and free consent agreement of the ethics committee. And the exclusion criteria: physical disability that might undermine mobility and factors that might affect the sexual function (the use of certain medicines like beta blockers, thiazide diuretics, antidepressants, thioridazine and tranquilizers like diazepam).

INSTRUMENTS

All the women taking part in this research replied to four instruments: International Physical Activity Questionnaire (IPAQ), Rating of Perceived Capacity (RPC), the Figure Rating Scale (FRS) developed by Stunkard, Sorensen and Schlsinger (1983) and the Female Sexual Function Index (FSFI). The IPAQ short form is an instrument that allows us to assess the weekly time amount spent on moderate or vigorous physical activities in different life situations. This IPAQ version was tested for its reproducibility and validity in Brazil (Guedes, Lopes & Guedes, 2005; Pardini et al., 2001) and the level of physical activity was transformed into metabolic equivalents and then classified in three levels: low, moderate and high in accordance with the authors' recommendations (IPAQ guidelines, 2011).

The RPC instrument is a scale of values from 1 to 20 that represents a list of activities. Test subjects need to report on the activity that is carried out for at least 30 minutes. It was developed by Wisen, Farazdaghi & Wohlfart (2002) and tested in Brasil by Maranhão Neto, de Leon & Farinatti (2008). The answers in this study were gathered in three categories: low capacity (answers of activities from 1 to 7), average capacity (answers of activities from 8 to 11) and high capacity (answers of activities from 12 to 20).

The Figure Rating Scale consists of a nine-figure scale produced by Stunkard et al. (1993), the participants had to point to the image that reflected their body structure and the one showing the figure they would like to have.

The FSFI instrument, developed and validated in the USA (Rosen et al., 2000) and translated into Portuguese (Hentschel, Alberton, Capp, Goldim & Passos, 2007), was used to assess the female sexual function. The questionnaire contains 19 multiple choice questions organized in six domains: desire, sexual arousal, lubrication, orgasm, satisfaction and pain. Each answer is assigned a value from 0 to 5. A final FSFI index ranging from 2 to 36 is obtained thanks to a mathematical model. As a result, the lower the obtained score, the worst the sexual function.

PROCEDURES

First of all, the women were given an explanation on the importance and procedures of the research after a selection process aimed at picking up only those test subjects who fitted the inclusion criteria. The research was approved by the Ethics Committee of the Santa Catarina State University (n. 156/2010). The women privately answered the questionnaires except when faced with illiteracy and terms comprehension problems. If so, the questionnaire would be read out and explained during an interview held by a female researcher in order to prevent discomfort. The first questionnaire to be answered was the IPAQ, the next one was the RPC, then the Figure Rating Scale and finally the FSFI. The data were collected throughout the period between 1st September 2010 and 1st March 2011.

DATA ANALYSIS

The data were tabulated in the statistical program SPSS version 17.0 then analyzed by descriptive statistical resources (frequency, percentage, median, interquartile range). The Kolmogorov Smirnov normality test was run and none of the variables had a normal distribution. So the Spearman's Correlation test and the Kruskall Wallis test were used with $p<0.05$.

RESULTS

CHARACTERISTICS OF PARTICIPANTS

The social demographic profile and health problems of the participating women were analyzed in line with the three categories of physical activity level (chart 1). It was noticed that most of them were married, had an average level of education and did not practice any type of physical activity in their free time. As regards the marital status, education and health problems that could affect the sexual functioning, there was no significant difference within the groups classified according to the three levels of physical activity: low, moderate, high.

Table 1. Social demographic profile and health problems of the participating women in relation to the level of physical activity obtained by the IPAQ.

	All n=114		Low n=41		Moderate n=45		High n=28		Chi square test
	f	%	f	%	f	%	f	%	
Marital status									
Married	66	57.9	25	61	29	64.4	12	42.9	
Single	44	38.6	15	36.6	14	31.1	15	53.6	p=.397
Divorced	4	3.5	1	2.4	2	4.4	1	3.6	
Education									
Primary	12	10.5	5	12.2	4	8.9	3	10.7	
Secondary	60	52.6	21	51.2	26	57.7	13	46.4	p=.895
Higher	42	36.8	15	36.6	15	33.4	12	42.9	
Health problems									
Diabetes	1	9	1	2.4	0	0	0	0	p=.407
Arterial hypertension	5	4.4	4	9.8	1	2.2	0	0	p=.100
Depression	11	9.6	6	14.6	3	6.7	2	7.1	p=.401
Recurrent urinary infection	21	18.4	12	29.3	6	13.3	3	10.7	p=.078
Physical activity during free time**									
None	48	42,1	25	61	20	44,4	3	10,7	
Walk	21	18.4	8	19.5	9	20	4	14.2	
Gym (Bodybuilding+ aerobics)	26	22.8	6	14.6	11	24.4	10	35.7	
Aerobics (bicicleta/natación/danza)	10	8.7	2	4.8	2	4.4	6	21.4	
Volleyball/Football	6	5.2	0	0	2	4.4	3	10.7	
Martial arts	2	1.7	0	0	0	0	2	7.1	
Pilates	1	0.8	0	0	1	2.2	0	0	
Sexual function***									
1 to 2 /month	21	18.4	10	25	4	9.3	7	25	
1 to 2 /week	46	40.4	19	46.4	20	44.4	7	25	p=.050
3 to 5 times /week	36	31.6	10	25	16	35.5	10	35.7	
7 or over/week	6	5.3	1	2.4	3	6.6	2	7.1	
Masturbation frequency***									
Never	74	64.9	29	70.7	31	68.9	14	50	
1 to 2 /month	22	19.3	10	24.4	6	13.3	6	21.4	p=.322
1 to 2 /week	8	7	1	2.4	3	6.6	4	14.3	
3 to 5 /week	4	3.5	0	0	3	6.6	1	3.6	

Note: n = number of participants; f = frequency; % = percentage; * significative value of p for $p<0.05$; ** the chi square test was not run because no suitable frequency was obtained for each category; *** showed 5 lost data items.

Among the descriptive data referring to the anthropometric, gynecologic, obstetric characteristics as well as the age of the participants (chart 2), only the body weight showed significant statistical differences with relation to the groups

according to the level of physical activity so that the women with moderate physical activity level showed greater body weight values.

Table 2. Anthropometric, gynecologic, obstetric and participants' age characteristics in relation to the level of physical activity.

	All n=114		Low n=41		Moderate n=45		High n=28		Kruskal Wallis test
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	
Age (years)	29.0	12	27.0	12	32.0	11	27.0	12	p=.316
Weight (Kg)	58.50	11	57.50	11	64.0	13	57.0	11	p=.025*
Body mass ratio	22.7	4.7	23.3	4.7	23.0	4.9	22.2	3.3	p=.172
Waist circumference (cm)	73.0	11	71.0	9	76.0	14	72.3	9	p=.145
Number of pregnancies	1	2	1	1	1	2	0	2	p=.618
Number of births	0	1	0	1	1	2	0	1	p=.202

Note: n = number of participants; Mdn= Median; IQR = interquartile range.

Level of Physical Activity (IPAQ) and Perceived Cardiorespiratory Capacity

In relation to the level of physical activity obtained through the IPAQ, 41 women (36%) showed a low result, 45 women (39, 5%) showed a moderate result and 28 women (24, 5%) showed a high result.

With respect to the perceived physical capacity, 49 women (43%) showed a low result (scoring from 1 to 7) corresponding to different situations "from being able to remain seated until walking fast/pedaling during 30 minutes"; 48 women (42,1%) showed an average capacity (scoring from 8 to 11) referring to "jogging/pedaling ("Cooper") until running/pedaling in a bit faster rhythm during 30 minutes"; and 17 women (14,9%) showed a high capacity (scoring from 12 to 20) as they managed to "at least keep running fast/pedaling during 30 minutes and/or to carry out aerobics training for competition".

There was a positive and moderate correlation between the classification of physical activity level obtained through the IPAQ and the classification that was set up for the perceived physical capacity [ρ (rho)=,473, p=,01].

Comparison of the Sexual Function among the three levels of physical activity

The answers of the domains and sexual function score of the participants were compared in relation to the independent variable level of physical activity (chart 3). The data showed that there was no influence from the level of physical activity (low, moderate, high) on the participants' sexual function score. In relation to the specific domains, there was a significant difference among the

three groups only in the domain “pain related to sexual intercourse” since the women who practiced vigorous physical activity presented more dyspareunia in comparison with moderate or low physical activity.

Table 3. Domains and total score of sexual function in groups with low, moderate and high level of physical activity.

	All n=114		Low n=41		Moderate n=45		High n=28		Kruskal Wallis test
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	
Sexual desire	3.6	1.8	3.6	1.8	3.6	1.8	3.6	1.8	p=.831
Sexual arousal	4.5	1.2	4.5	1.5	4.5	1.2	4.5	2.1	p=.872
Lubrication	5.1	1.8	5.4	1.8	4.8	1.8	4.5	2.0	p=.153
Orgasm	4.8	2.0	4.8	1.8	5.2	1.8	4.8	1.6	p=.612
Sexual Satisfaction	5.2	1.6	5.2	1.6	5.2	1.8	5.2	1.2	p=.995
Pain	5.2	2.1	5.2	1.6	5.6	2.4	4.0	2.3	p=.041**
FSFI*	27.8	6.6	28.4	5.9	27.7	6.7	27.3	8.5	p=.557

Note: n = number of participants; Mdn = Median; IQR = Interquartile Range; * a value from 0 to 5 is assigned to each answer of the domains of the Sexual Function Index (FSFI), the score is obtained through a mathematical model that allows us to get a final index which varies from 2 to 36 meaning that the lower the obtained value is, the worst the sexual function is. ***the higher the values, the least dyspareunia is mentioned.

In the search of correlations between sexual function and the other controlled variables, no significant correlations were found between the total sexual function score and the variables: level of physical attractiveness, perceived capacity rating, age, number of pregnancies, weight and body image. However, the domain pain was negatively correlated (ρ=-. 233. P=. 012) with the level of physical activity in such a way that the more physically active women tended to mention more dyspareunia during or after sexual intercourse. Furthermore, the number of pregnancies was negatively correlated with the domains desire (ρ = -. 205, p =.031) and sexual arousal (ρ = -.240, p = .012) so that the women with more children showed less desire and sexual arousal. Finally, the body weight was positively correlated (ρ=.212, p=.027) with the domain orgasm so that the greater the body weight, the higher the frequency and satisfaction with orgasm. Similarly, the variable waist-hip relation was negatively correlated with the domains desire (ρ=-.263; p=.011) and sexual arousal (ρ=-.269; p=.009).

DISCUSSION

Level of Physical Activity and Perceived Capacity Rating

Around 36 % of the participants in this study showed low physical activity level, 39.5% moderate and 24.5% high. Resorting to the same instrument and using another classification, Zanchetta, Beriti, Barros and Carandina (2010) obtained similar proportions in women from Sao Paulo (Brazil) aged from 18 to 59 so that

4.4% were sedentary, 7.3% insufficiently active, 67.0% active and 21.2% very active.

It must be pointed out that the International Physical Activity Questionnaire (IPAQ) short version used in this study is an instrument that allows us to assess the weekly time amount spent on physical activities whose level goes from moderate to vigorous in different life situations (work, household chores, transport and leisure) taking the last week as reference (Matsudo et al., 2002). However, the protocol used minimizes the biases of measurement. As in any self-narrative, this method is subject to memory failures of the test subjects and the possibility that they make erroneous estimates about some aspects (frequency, intensity, duration) of the practiced physical activity.
Additionally, the measure of the physical activity level obtained through the IPAQ had a moderate correlation with the perceived physical capacity. Very probably, people with higher level of physical activity consider themselves more than able to endure greater exercise intensities during 30 minutes.

Comparison of the Sexual Function among the three levels of physical activity

No influence of the physical activity level (low, moderate, high) was found on the score of the participants' sexual function. This differs from the results found by Hoffmann et al. (2009) in a supervised exercise program for the treatment of depression that concomitantly improved the sexual function of the participating women. Possibly, the non-supervised practice of physical activity without the necessary safety issues (overcharge, progressive overcharge, adaptation, specificity, variability, reversibility and individual differences) is not enough to promote improvements in women's sexual function.

In addition, we have to consider that sexual function is a phenomenon influenced by various biological, social and emotional aspects (Bernhard, 2002) as well as women health conditions (Weiss, 2001). Sexuality is dynamic; it changes through time and space as well as partners (Bernhard, 2002). Baumeister (2000) emphasizes that female sexuality is a lot more flexible with greater changes in terms of preferences, behaviors and responses in relation to the local cultural influences. Unfortunately, we did no manage to control all these factors in the study.

It was observed that women who practiced high physical activity showed more dyspareunia in relation to the low and moderate levels of physical activity. Recently, alterations related to the state of muscular tension such as trigger points in the pelvic floor area have been related to dyspareunia symptoms (Doggweiler Wiygul & Wiygul, 2002; Fitzgerald & Kotarinos, 2003). On the whole, the musculoskeletal disorders by asymmetrical muscular action due to postural disorders, tension/stress or the practice of a particular physical activity may cause dyspareunia and, subsequently, may result in an alteration of the sexual response cycle (Etienne & Waitman, 2006). In this way, both muscular hypotonia and hypertonia of the pelvic floor can inhibit and hinder the sexual response (Rosenbaum, 2007).

No significant correlation was found between the total score of sexual function and age. Despite this, other studies had already revealed that the older women get, the lower their sexual function goes (Verit, Verit & Billurcu, 2009); Lewis et al., 2004). However, as regards dyspareunia, it was verified that it was more prevalent among women aged from 18 to 29 (21%), then it fell down among those aged from 30 to 49 (14%) and it was hardly found among women aged over 50 (8%) (Laumann et al., 1999).

Additionally, the number of pregnancies was negatively correlated with desire and women's sexual arousal so that the women with more children showed less desire and sexual arousal. An epidemiological study conducted in Finland revealed that women with 1 to 3 children had less sexual desire than those without children (Witting et al., 2008). It was also proved with Turkish women aged 19 to 60 that the more births they give, the less their sexual function is (Verit et al., 2009).

A tendency was noted according to which the more body weight women had, the higher their frequency and satisfaction with orgasm. On the contrary, Esposito et al., (2007) observed in Italian women (average age = 42.3 years) that the ones with higher body weight had lower orgasm frequency and satisfaction. The same study highlights the fact that women's sexual disorders seem to be more frequent nowadays yet the relation between female sexual function and obesity is still not clear.

In this sense, it is important to remember that estrogen and testosterone are related to the vaginal, urethral and clitoral blood flow in the relaxation of the vaginal thin muscles (Kaplan & Owett, 1993). In this way, women with higher body fat amount tend to suffer from a hormonal disorder, which will probably influence the female sexual function. Kaplan and Owett's data (1993), describing the female androgen deficiency syndrome, showed that the low level of androgen in women is linked with a significant decrease in sexual desire and libido.

And, finally, it was noted that the higher the value of the waist-hip ratio (accounting for larger waists in relation to the hips), the lower the sexual desire and arousal. It is said, in the Latin American culture, that thinner waists and wider hips are linked with a greater physical attractiveness, which explains why those women experienced more sexual desire and arousal. Similar data is not found in the literature. Apart from that, Esposito et al., (2007) realized that the FSFI score did not correlate with the wait-hip ratio.

Changes in the lifestyle, especially those focused on regular physical activity and a healthy diet, can prevent and treat sexual disorders in both sexes (Esposito et al., 2007). So this highlights the importance of proposing, to the corresponding sectors, public measures that can implement promotion programs of the physical activity for all the population emphasizing the prevention of sexual disorders and guidance on the benefits of physical activity in sexuality and life quality.

CONCLUSIONS

The results in this study did not show significant differences in the score of women's sexual function taking the levels of physical activity (low, moderate, high) into account. Sexuality extends beyond anatomical and physiological boundaries. It is linked with various characteristics such as age, education, low self-esteem, physical inadequacy and sexual experiences. Unfortunately, we did not manage to account for all these factors in the study.

The importance of this study is characterized by the presence of data about women of reproductive age. There was a great diversity of types of physical activity practice, which was very difficult to control during the analysis. It is suggested that new studies be conducted in order to analyze the relation between the practice of physical activity and sexual function in a bigger and more representative population sample and with a better control of the variables.

Furthermore, this study only compares women's sexual function with different levels of physical activity. It is suggested that future studies dealing with this topic follow a controlled experimental design with paired groups using a pedometer instead of a questionnaire in order to measure the level of physical activity. Indeed, the IPAQ may not be suitable to account for the details of physical activity that are meant to influence women's sexual function.

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Referencias totales / Total references: 43 (100%)

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Rev.int.med.cienc.act.fís.deporte- vol. 13 - número 52 - ISSN: 1577-0354