

Impact of sexual activity prior to a sports competition in amateur athletes

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Abstract:

The scientific community remains unsure about the possible effects of sex on physical performance and the impact by gender or practice goal. Because of this, some athletes prefer to abstain from sexual intercourse before a competition because of the belief that it could harm their performance. We aimed to explore the beliefs and experiences of athletes after engaging in sexual activities prior a sports competition. 869 amateur athletes (358 females and 511 males) with two sport practice goals (472 competitive and 397 recreational) completed the survey. The survey was divided into two sections: demographic variables and experiences and perceptions about sexual activity before sports competition. In the first question about their perception of the influence of sexual intercourses on sports performance, 50.6% of athletes considered that sexual activity before competition did not negatively influence physical performance. Furthermore, no significant gender and sport practice goal differences were found. A total 616 (70.9%) reported having had sex prior to a sports competition and significant gender-differences were found in frequency of sexual activity prior to a sports competition ($p=.0001$, $ES=.02$) and in their perceptions regarding the impact of sexual activity on their performance. Significant gender-differences were found between athlete's perceived sensations before competition ($p=.001$; $ES=.04$). Athletes who described using substances (5.4%) or ergogenic aids (20.3%) prior to competition, perceived these did not impact their performance. Our findings demonstrate that the effect of sexual activity on athletic performance continues to be a concern. Half of amateur athletes believe that their sports performance could be impacted by engaging in sexual activities prior to competition. Coaches should consider the psychological aspect that can affect sports performance.

Key Words: sport, performance, physical, abstinence, sexual intercourse.

Introduction

Since ancient times, coaches, athletes & sports professionals have believed that sexual activities prior to a sports competition could negatively affect their athletic performance (Kegler et al., 2005; Zavorsky & Newton, 2019). While the scientific community remains unsure about the possible effects of sex on physical performance, nowadays, abstinence is still practiced among athletes of sports such as boxing and football, in which aggression is considered a valuable trait (Anshel, 1981; Fischer, 1997; Vajda & Reguli, 2018). It was believed that levels of aggressive behavior, frustration & concentration would build up by being abstinent, especially the night before competition. Paradoxically, it was also believed that too much anxiety or aggression might result in poor performance (Mcglone & Shrier, 2000; Thornton, 1990).

Another misconception among athletes and coaches is that sexual activities prior to competition would decrease glycogen storage and impact testosterone levels (Mcglone & Shrier, 2000). Hormones such as testosterone are proposed to play a crucial role in sport performance and few studies shown a positive correlation between exercise and free testosterone levels (Brownlee et al., 2005). So, it could be hypothesized that sexual activity prior sports competition could increase free testosterone concentration levels.

However, studies do not provide conclusive data on free testosterone hormone concentrations after exercise. One study does not found changes in testosterone levels after sexual activity prior sports competition or exercise testing (Hengevoss et al., 2015). Another study, demonstrate that masturbation may take effect on free testosterone levels in young males, but relevant hormone ratios appear unchanged (Isenmann et al., 2021).

Despite the variety of oppositional theories about how sexual activity could impact an athlete's performance, these remain an under researched and unanswered matter by the scientific community. Among the physiological data available it seems that maintaining sexual activity 10 to 12 hours before competition does not impact negatively athletic performance (Soori et al., 2017; Stefani et al., 2016). For instance, Zavorsky and colleagues did not find significant differences in lower and upper body muscular strength and physical work capacity of males following sexual intercourse 7.6 hours before physical exercise (Zavorsky et al., 2019). Similarly, Valenti and colleagues, found in a group of experienced males in resistance training no significant differences on lower muscle strength between abstinence of sexual intercourse 12-hrs before a bout of isokinetic dynamometry test (Valenti et al., 2018). When compared with sexual abstinence, sex within 2 hours before a sports competition did not reduce performance in endurance or strength levels of former female athletes (Soori et al., 2017; Stefani et al., 2016).

Recently, a systematic review and meta-analysis found no differences in physical performance in men after having had intercourse between 30min and 24 before (Zavorsky & Brooks, 2022). However, a recent study demonstrated that sexual intercourse within 24 hours before exercise had detrimental effects on lower extremity muscle force (Kirecci et al., 2021). At present there seems to be lack of consensus to support the hypothesis of detrimental performance due to engaging in sexual activities the night prior to a competition.

There is also a paucity of investigation to determine the psychological effects of sexual practice prior to a sporting event (Soori et al., 2017). For instance, sex 2 hours prior or immediately before a competition seems to display a negative psychological effect on athletic performance (Sasvári et al., 2019). On the contrary, some researchers have suggested that sex before competition can elicit a positive relaxation effect (Cooper, 1975). Some studies highlighted that the conditions in which the sexual encounter occur, rather than the sexual activity itself, are most likely associated with decreased performance (i.e. lack of sleep, substance abuse or night time activities) (Anshel, 1981; Thornton, 1990).

Expanding our knowledge regarding the athletes own perceived experience's and views about their sports performance after having engaged in sexual activity is of utmost importance for the sports community. Coaches, sport physicians or team mates may be advising athletes to restrain or change their sex habits.

To the best of our knowledge, no previous studies have analyzed the self-perceptions and views of athletes about their physical performance after sexual activity. Attitudes towards sex may also vary according to their specific practice goal (recreational vs competitive) or even according to their gender. In regards to gender-based differences, studies including female athletes perceptions regarding sex prior to sports performance are lacking. Given the paucity of research in this area the aim of this study was to a) describe and assess athlete's self-perception and views about their sports performance after sexual activity; b) investigate several variables that could influence the athletes athletic performance after sexual activity and c) analyze possible differences in self-perceptions among athletes regarding their sport goals and gender. This data will allow us to better understand the experiences of athlete's sexuality when facing a sports event. We hypothesized that athletes do not view sexual activity as negative for their sports performance nor do they perceive decreased sports performance after sex.

Methods

Participants

Athletes were recruited to complete an anonymous online survey between March and September of 2020. The survey was pre-tested for readability and user facility before recruitment. Participants were recruited online through a Facebook advertisement outreach in the Spain in the Spanish language. Participants were informed of the anonymous nature of the survey before completing the questionnaire & signed an informed consent for participation in the study. Approval for this study was obtained from the Institutional Review Board of the University of Alicante (Spain) (UA-2019-09-24).

Athletes were identified as those practicing any type of sport at the recreational or competitive level for at least one year. The inclusion criteria for participating in the study were adults 18 years or more of age, residing in Spain and being sexually active. The final sample that met inclusion criteria were 869.

Sports practice

The main outcome measures were retrospective reports of views and perceived experiences about engagement on sexual activity prior to sports competition. For this study, a mix of study-specific questions were used. The first section of the survey included self-reported demographic variables of age, gender (female-male), and sports practice main objective (competitive or recreational).

Sexual activity experience prior to sports competition

The second section of the survey included a battery of non-validated, study-specific questions about self-reported experiences and perceptions about sexual activity prior to sports competition and its influence on their physical performance. The broader term *sexual activity* was used in the survey rather than *sexual intercourse* to include (and not limit) the wide range of sexual practices other than penetration participants could have had. Questions regarding their beliefs, experiences and/or perceptions about physical performance during competition after engaging in sexual activities were asked.

To understand athletes beliefs regarding the influence of sex prior to a sports competition the survey included the following question Q1: “Do you believe sexual activity before a sports competition can decrease physical performance?” with three possible answers (yes (1), maybe (2) or no (3)). With the purpose to analyze the athlete’s perception of their performance before sex they were first asked: Q2 “Have you ever maintained sexual activity before a sports competition?” (yes (1) or no (2)). In case of affirmative answer, the participants continued responding to the survey regarding specific aspects related with the sexual activity (duration, time prior to competition, substance abuse, ergogenic substance use and sleep). The following questions were included in the survey:

Q3. With how much time interval between the sexual activity and the sports competition?

(The day before (1), the night before (2), 4 hours before (3), 1 hour before (4))

Q4. Was the sexual activity preceded by some event such as going to a party, staying up early at night? Yes (1) or no (2).

Q5. How much time did the sexual experience last? 1 hour (1), 30 minutes (2) or 15 minutes (3)

Q6. Have you used any substance before, during or after the sexual activity? Yes (1) or no (2).

Q7. Have you used any ergogenic supplement after the sexual activity (such as coffee or energetic drinks)? Yes (1) or no (2).

Finally, with the aim to collect information about their perceived performance related to their expectations to those participants who asked affirmatively to the second question of the second section of the survey:

Q8. How was your performance during competition related with your expectations?

Better (1) or worst (2)

Q9. Did you feel any of the following sensations before competition?

Hyperactivation and motivation (1), sleepiness and tiredness (2) or none of the above (3).

Statistical Analyses

Participant’s responses were collected using a Google Forms and Microsoft Excel®. Data were analyzed using the Statistical Package for the Social Sciences (SPSS, version 22). Mean values, SDs and percentages were used to describe the data. Data distribution was analyzed by the Kolmogorov-Smirnov test. Two-way analysis of variance (ANOVA) test was used to verify possible differences between the outcome measures. The Spearman rank correlation coefficient (p) was used to identify possible associations between outcomes measures. The level of significance was set at $p < .05$. In order to normalize the differences between groups, effect size study was applied using Cohen's delta ($[\text{mean post-test} - \text{mean pre-test}] / \text{standard deviation pre-test}$). To determine the effect size of the intervention, the values for trained subjects published by Rhea (2004) were: trivial effect $d < .25$; small effect $d = .25-.50$; moderate effect $d = .50-1.0$; large effect $d > 1.0$ (Rhea, 2004).

Results

In total, 869 athletes participated in this study. Participants ages ranged from 18 to 61 years (mean age 29.2 (8.4)). 511 (58.8%) identified as male and 358 (41.2%) as female athletes. Of the total sample, 397 (45.7%) practiced their sport with a recreational purpose in opposition to 472 (54.3%) of participants who pursued a competitive-performance sports practice. Of the total sample, 440 (50.6%) athletes considered that sexual activity before competition did not negatively influence their physical performance. However, 429 (49.4%) believed it worsen their performance. A total 616 (70.9%) reported having had sex prior to a sports competition. Table 1 shows the responses regarding different sex factors prior sports competition.

Table 1. Answers about sex prior to competition

<i>With how much time interval between the sexual activity and the sports competition?</i>	The day before	The night before	4 hours before	1 hour before
	46 (7.5%)	407 (66.1%)	117 (19%)	46 (7.5%)
<i>Was the sexual experience preceded by some event such as going to a party, staying up early at night?</i>	Yes	No		
	48 (7.8%)	568 (92.2%)		
<i>How much time did the sexual experience last?</i>	1 hour	30 minutes	15 minutes	Other
	203 (33%)	321 (52.1%)	64 (10.4%)	28 (4.5%)
<i>Have you abused any substance before, during or after the sexual activity?</i>	Yes	No		
	33 (5.4%)	583 (94.6%)		
<i>Have you used any ergogenic supplement after the sexual activity (such as coffee or energetic drinks)?</i>	Yes	No		
	120 (20.3%)	491 (79.7%)		
<i>How was your performance during competition related with your expectations?</i>	Better	Worst	Don't know	
	193 (31.3%)	106 (17.2%)	317 (51.5%)	
<i>Did you feel any of the following sensations before competition?</i>	Hyperactivation and motivation	Sleepiness and tiredness	None	
	194 (31.5%)	132 (21.4%)	290 (47.1%)	

We found no significant differences in the perception of whether sexual activity worsens pre-competition performance based on gender ($p=.32$), sports practice goal ($p=.68$) and the interaction between both ($p=.74$). However, significant differences were found in relation to the frequency of sexual activities before a competition ($p=.0001$, $ES=.02$), where male athletes described a higher frequency of sexual activity. Significant gender-differences were found between athlete's perceived sensations before competition ($p=.001$; $ES=.04$). Table 2 shows results on gender and sport practice goal comparisons.

Table 2. Comparisons between genders (males vs females) and sport goal (recreational vs competitive).

<i>Q1: Do you believe sexual activity before a sports competition can decrease physical performance?</i>	Gender	Sport goal	n	Mean±SD
	Males	Recreational	225	2.05±.71
		Competitive	286	2.04±.73
	Females	Recreational	172	2.11±.58
		Competitive	186	2.08±.72
	Comparisons	Sig	F	ES
	Males vs Females	.32	.955	0
	Recreational vs Competitive	.68	.171	.001
Gender and Sport Goal	.74	.104	0	
<i>Q2: Have you ever maintained sexual activity before a sports competition?</i>	Gender	Sport goal	n	Mean±SD
	Males	Recreational	225	1.26±.44
		Competitive	286	1.20±.40
	Females	Recreational	172	1.39±.49
		Competitive	186	1.35±.47
	Comparisons	Sig	F	ES
	Males vs Females	0	19.91	.023
	Recreational vs Competitive	.1	2.63	.003
Gender and Sport Goal	.74	.1	.01	
<i>Q3: With how much time interval between the sexual activity and the sports competition?</i>	Gender	Sport goal	n	Mean±SD
	Males	Recreational	225	2.38±.74
		Competitive	286	2.22±.65
	Females	Recreational	172	2.15±.69
		Competitive	186	2.25±.71
	Comparisons	Sig	F	ES
	Males vs Females	.08	3.01	.005
	Recreational vs Competitive	.64	.21	0.01
Gender and Sport Goal	.26	4.98	.008	
<i>Q4: Was the sexual experience preceded by some event such as going to a party, staying up early at night</i>	Gender	Sport goal	n	Mean±SD
	Males	Recreational	165	1.87±.32
		Competitive	227	1.92±.25
	Females	Recreational	104	1.93±.25
		Competitive	120	1.95±.20
	Comparisons	Sig	F	ES
	Males vs Females	.06	3.36	.005
Recreational vs Competitive	.09	2.87	.005	
Gender and Sport Goal	.57	.31	.001	
<i>Q5: How much time did the sexual experience last?</i>	Gender	Sport goal	n	Mean±SD
	Males	Recreational	165	1.91±.27
		Competitive	227	1.94±.23

	Females	Recreational	104	1.98±.13
		Competitive	120	1.96±.18
	Comparisons	Sig	F	ES
	Males vs Females	.01	5.59	.009
	Recreational vs Competitive	.72	.12	.001
	Gender and Sport Goal	.27	1.21	.002
Q6: Have you abused any substance before, during or after the sexual activity?	Gender	Sport goal	n	Mean±SD
	Males	Recreational	165	1.53±1.04
		Competitive	227	1.57±1.07
	Females	Recreational	104	1.65±1.11
		Competitive	120	1.78±1.13
	Comparisons	Sig	F	ES
	Males vs Females	.08	3.08	.005
Recreational vs Competitive	.36	.838	.001	
Gender and Sport Goal	.61	.25	.001	
Q7: Have you used any ergogenic supplement after the sexual activity (such as coffee or energetic drinks)?	Gender	Sport goal	n	Mean±SD
	Males	Recreational	165	1.25±.87
		Competitive	227	1.21±.87
	Females	Recreational	104	1.08±.96
		Competitive	120	1.20±.86
	Comparisons	Sig	F	ES
	Males vs Females	.22	1.5	.002
Recreational vs Competitive	.61	.24	.001	
Gender and Sport Goal	.31	1.03	.002	
Q8: How was your performance during competition related with your expectations?	Gender	Sport goal	n	Mean±SD
	Males	Recreational	165	1.80±.40
		Competitive	227	1.75±.43
	Females	Recreational	104	1.90±.29
		Competitive	120	1.77±.41
	Comparisons	Sig	F	ES
	Males vs Females	.64	3.44	.006
Recreational vs Competitive	.1	6.73	.01	
Gender and Sport Goal	.22	1.47	.002	
Q9: Did you feel any of the following sensations before competition?	Gender	Sport goal	n	Mean±SD
	Males	Recreational	225	1.98±1.05
		Competitive	286	2.09±1.06
	Females	Recreational	172	2.60±1.31
		Competitive	186	2.43±1.24
	Comparisons	Sig	F	ES
	Males vs Females	.01	36.03	.04
Recreational vs Competitive	.7	.14	0.01	
Gender and Sport Goal	.08	3	.003	

n: number of participants; SD: standard deviation; sig: p-value; ES: effect size.

Discussion

The present study examined retrospective perceptions and experiences of amateur Spanish athletes' sexual activity on physical performance through a cross-sectional survey-based study. To the best of our

knowledge, this is the first largest study to explore female and male athletes experience and perceptions regarding performance during sports competition after sexual activity. We hypothesized that athletes would believe that having sex prior to a sports competition would not affect their performance. However, half of the study participants (50.6%) believed it negatively affected their performance. A previous study on found that 90% (n=62) of male elite endurance runners believed that engaging in sexual activity the previous night would not have a detrimental influence on performance (Martin et al., 2010). These data contrast with the perceptions of our sample whose views were split. Additionally, these views were not impacted by their gender or motive to practice sport. These results may indicate how there still exists the misbelief of sex affecting performance among Spanish amateur athletes.

We did not find a significant association between engaging in sexual activity and other factors such as going to a party or staying up early (7.8%), substance use (5.4%) and ergogenic supplement use (20.3%). This could be due to athletes focus on performance and concern in preserving their physical capacities prior to a sports competition (Sasvári et al., 2019). Athletes tend to display a greater commitment to training and greater motivation by extrinsic (i.e: public recognition) and intrinsic factors (e.i. improvement in their personal brands) (Alexandris et al., 2002; Isoard-Gauthier et al., 2021; López-Fernández et al., 2014).

Our findings indicate that most of the athletes 616 (70.9%) had had sexual intercourse the night before the competition and indicated that the interval time between their sexual activity and the sport competition allowed them to fully recover and therefore not impact their performance. Boone & Gilmore described for sedentary subjects that mental concentration as well as maximum aerobic power and oxygen pulse were not affected by sexual intercourse maintained 10 hours previous to testing (Boone & Gilmore, 1995).

These data are similar to those of Valenti and colleagues who did not find significant differences between lower limb strength levels in abstinent and non-abstinent strength-trained subjects who had sex 12 hours before physical examination (Valenti et al., 2018). Likewise, the physical fitness on vertical jump, handgrip strength, reaction time and number of push-ups of subjects who had sex the previous morning was not affected (Zavorsky et al., 2019). Collectively, these findings suggest that sexual activity may not impact physical performance. In this sense, in our study 290 (47.1%) perceived no changes prior to competition in comparison to the other half of the sample (53.9%) who affirmed having perceived changes in performance. These differences could be explained by other factors such as the duration or type of sexual activity. In our study, a small number of athletes 46 (7.5%) reported having had sex immediately before competing (i.e: 1 hour before). In this sense, Boone and Gilmore described higher heart rate values after exercise when sexual activities were practiced 2 hours prior to exercise (Boone & Gilmore, 1995). Similar findings were described by Martin et al. (2010) in elite athletes who maintained sexual activity 30 minutes before exercising. Moreover, these authors highlight that athlete's displayed decreased levels of coordination during the first kilometer of their training session (Martin et al., 2010). Recently, one study found negative influence of sexual intercourse the night before a football match in the average speed during the match (6.5 vs 6.0km/h, p=0.02) (Peleg-Sagy et al., 2022). This study is the first to show a negative impact in performance on football players and as we have found in our study, this could be explained by the duration or type of sexual activity.

In the case of the sexual intercourse duration, 62.5% participants of our study reported a length of sexual activity between 15 and 30 minutes. This length is higher than the one indicated in a study among Northamerican therapists (Corty & Guardiani, 2008). This group of professionals indicated as "optimal" time between three and seven minutes, "desirable" between seven and thirteen minutes and superior to the latter as "too long" (Saies et al., 2014). Similar findings were provided by the study carried out in 500 couples from different countries whose average sexual activity length varied from 6.5 minutes in the 18 to 30-year-old group, to 4.3 minutes in the group over 51 years (Waldinger et al., 2005).

In our study 21.4% participants reported being fatigued due to sexual activity and of those, 17.2% perceived this worsened their performance. Similar findings have been described for long-distance athletes, with a 40% of athletes feeling with a worse sense of physical performance (Martin et al., 2010). These findings highlight the importance of the self-perceived support and trust. As has been shown in a sample of 348 individual and sports team athletes (van de Pol et al., 2015) and for an international sample of 347 athletes (Saies et al., 2014). Moreover, 92.2% of our sample described not engaging in sexual activity preceded by leisure events such as partying and staying up late (together with alcohol and substances consumption). This could possibly be due to athlete's knowledge and understanding of the effects that excessive alcohol consumption can display on their health. Indeed, it has been shown that athletes who consumed alcohol prior to a sports competition still display alcohol blood concentrations that may affected their recovery and protein synthesis (Duplanty et al., 2017; Haugvad et al., 2014; Levitt et al., 2017).

A vast majority of athletes from our study (n=491; 79.7%) declared to not consume supplements or ergogenic supplements after sexual activity and prior to their sports competition. Our findings contrast with data from a systematic review on the topic (Knapik et al., 2016). In this review, a high prevalence of supplement use (50%) was reported by athletes before a sports competition. Haveman and colleagues described that 84% of 45 ultra-endurance cyclists consumed carbohydrate-based supplements before competing (Havemann & Goedecke, 2008). In the 2010 FIFA Soccer World Cup held in South Africa, 71.7% out of 736 soccer players reported

consuming supplements before matches. These differences may be due to the self-reported nature of our study or the high representation of amateur athletes of our sample. To our knowledge, this is the first and largest study to measure self-reported perceptions of performance after sex among athletes. Previous studies in the literature have focused on physiological aspects of male athletes' performance. Our study is limited by it is cross-sectional design and national sampling. In addition, we have not measured the real performance of the athlete's in competition and we have only collected self-perceptions through an online questionnaire. This method and the use of a non-validated questionnaire could be subject of bias. Therefore, caution must be made when interpreting and generalizing results to all athletes. Further experimental and prospective studies are needed to understand the associations and possible influence of sex on sports performance on physiological and psychological outcomes. The design and validation of a valid and reliable questionnaire is warranted.

Conclusions

The effect of sexual activity on athletic performance has been a concern for coaches and athletes for decades as it has traditionally been associated with the perception of decreased performance. In our study, we have found that half of Spanish amateur athletes, regardless of their gender or sport practice goal, perceive that sexual practice can alter their performance. Our findings demonstrate that the effect of sexual activity on athletic performance continues to be a concern. Half of amateur athletes believe that their sports performance could be impacted by engaging in sexual activities prior to competition. Coaches should consider the psychological aspect that can affect sports performance.

Conflicts of interest The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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