

Effect of Drug Use and Influence of Abstinence on Sexual Functioning in a Spanish Male Drug-Dependent Sample: A Multisite Study

Pablo Vallejo-Medina, PhD*[†] and Juan Carlos Sierra, PhD*

*Department of Personality and Psychological Assessment and Treatment, School of Psychology, University of Granada, Granada, Spain; [†]Faculty of Psychology, University of Santo Tomás (Bogotá), Bogotá, Columbia

DOI: 10.1111/j.1743-6109.2012.02977.x

ABSTRACT

Introduction. To date, it has been difficult to address the issue of sexual functioning and drug use, and many approaches to it have basic problems and methodological errors.

Aim. The present cross-sectional study compared the sexual functioning scores of a group of drug users with those of a group of nondrug users. It explored the relationship between drug abstinence and sexual functioning.

Main Outcome Measures. A sample of 905 males participated in this study (549 met the substance dependence criteria and 356 were controls). All of them were assessed with the Changes in Sexual Functioning Questionnaire-Drugs version.

Method. The assessment was conducted from September 2009 to January 2011. The clinical sample was evaluated in nine different substance abuse treatment facilities.

Results. Results show that, overall, all dimensions (pleasure, desire, arousal, and orgasm) were moderately impaired. Yet, differences regarding preferred substance were observed. Pleasure and orgasm were the two areas most significantly impaired. In these areas, all drugs seemed to negatively affect sexual functioning. However, desire and arousal were not affected by all the substances. In addition, at least after 2 weeks of drug abstinence, no relationship was found between drug abstinence and improvement in sexual functioning. The sample studied had an average of 1 year of drug abstinence and was found to have poorer sexual functioning than the control group.

Conclusions. Therefore, these results seem to contradict those that argue that drug use only impairs sexual functioning temporarily. Moreover, they suggest that sexual functioning does not improve just by stopping drug use.

Vallejo-Medina P and Sierra JC. Effect of drug use and influence of abstinence on sexual functioning in a Spanish male drug-dependent sample: A multisite study. J Sex Med 2013;10:333–341.

Key Words. Drug Abuse; Sexual Functioning; CSFQ

Introduction

The human sexual response is multifaceted and related to biological, psychological, environmental, and interpersonal factors [1]. Drug use and abuse affects all these areas, so drugs are likely to have effects on sexual functioning. Yet, most questions regarding the relationship between drug consumption and sexual functioning remain unanswered [2]. This subject (the influence of drugs on sexual functioning) has been considered of great interest by researchers but is difficult to

approach because it is difficult to accurately assess sexual functioning in this population, the process is influenced by many variables and the problem has multiple causes. This may be the reason why there seem to be more theoretical reviews [2–12] than original recent articles on this topic. Moreover, many reviews include studies that used simple questions to assess sexual functioning, did not use a control group, or had a small sample size [2].

Use of drugs for sexual purposes has been common throughout history [13]. In fact, some

consumers make such a strong association between cocaine or methamphetamines and sex that they cannot easily separate the two [14]. Apart from causing a serious health problem in this population due to the adoption of risky sexual behaviors (e.g., [15,16]), drug use leads to alterations in pleasure, desire, arousal, and orgasm.

Sexual pleasure is the subjective value given to pleasurable sexual activity [17]. Desire is conceptualized as an appetitive drive that is necessary to provoke the subsequent physical changes of the sexual arousal phase [18]. Arousal is the physiological preparation for sexual contact, characterized by penile erection in men and vaginal lubrication in women [19]. Orgasm is a sensation of intense pleasure accompanied by an alteration in consciousness and contraction of the genitourinary musculature [20].

In general, according to the studies consulted, use of alcohol [6], benzodiazepines [12], cannabis [8,9], cocaine [2,4,11], opioids [21], methamphetamines [22,23], or hallucinogens [8] may improve various areas of sexual functioning—in low doses and/or in the short term attending to individual differences [2,6–9,22,23]. Yet, these effects seem to be short lived, because dose increases and/or length of use have shown detrimental effects on sexual functioning [2,11,12,24–29].

In addition, recent studies have pointed out that the residual effects of the substance (alcohol, cocaine, opioids, or marijuana) do not disappear as soon as expected [30]. Thus, Cocores et al. [31] indicated that in most cases, sexual dysfunction associated with cocaine and alcohol use resolves spontaneously after 3 weeks of abstinence. Vallejo-Medina and Sierra [30] found that drug users with a mean (*M*) abstinence of 1 year had significantly poorer sexual functioning than a nondrug user group in four areas of sexual functioning (pleasure, desire, arousal, and orgasm).

Aims

The present study had two objectives: (i) compare scores of male drug users—divided into groups depending on their preferred substance—and nondrug users in each area of sexual functioning; and (ii) explore the relationship between drug abstinence and sexual functioning to try to determine how much time of abstinence would be necessary for the scores of both groups to level out.

The sample only included males because the number of females who request drug abuse support is low (10% [32]). However, the authors'

team is currently assessing females in order to reach an appropriate sample size.

Hypotheses

- H1 The sexual functioning of the user group will be significantly lower than that of the control group, with differences depending on the substance used.
- H2 Sexual functioning will improve with increased time of abstinence.

Methods

Study Design

This multisite study used an ex post facto design [33] and included the participation of nine drug addiction treatment centers in eight Spanish regions (A Coruña, Alicante, Barcelona, Granada, Lugo, Madrid, Pontevedra, and Ourense).

This research was reviewed and approved by an independent ethics board of the authors' institution in accordance with the 1975 Declaration of Helsinki, as revised in 1983 by the Ethics Committee for Clinical Research.

Settings

The assessment of drug users was made in several sites located in eight different provinces of Spain from September 2009 to January 2011. Prior to the assessment, all participants gave written informed consent. The assessment was performed by a team of specially trained psychologists, who were present throughout the assessment. The information obtained was self-reported. The assessment was conducted in Spanish. It was anonymous and voluntary and the information collected was confidential.

Participants

In total, 905 males participated in the present study. Figure 1 shows the distribution of the various subgroups.

Requirements to participate in the study were: being over 18 years old, being abstinent for at least 2 weeks prior to the assessment, as has been done before [34,35], being able to read and write, and being treated for a substance dependence disorder (Diagnostic and Statistical Manual of Mental Disorders, 4th edition text revision [DSM-IV-TR]). All this information was self-reported and the abstinence period was also confirmed by the clinic facilities. In the control group, the absence of regular drug use in participants' lives was confirmed (a maximum of 45 g of alcohol a day was allowed

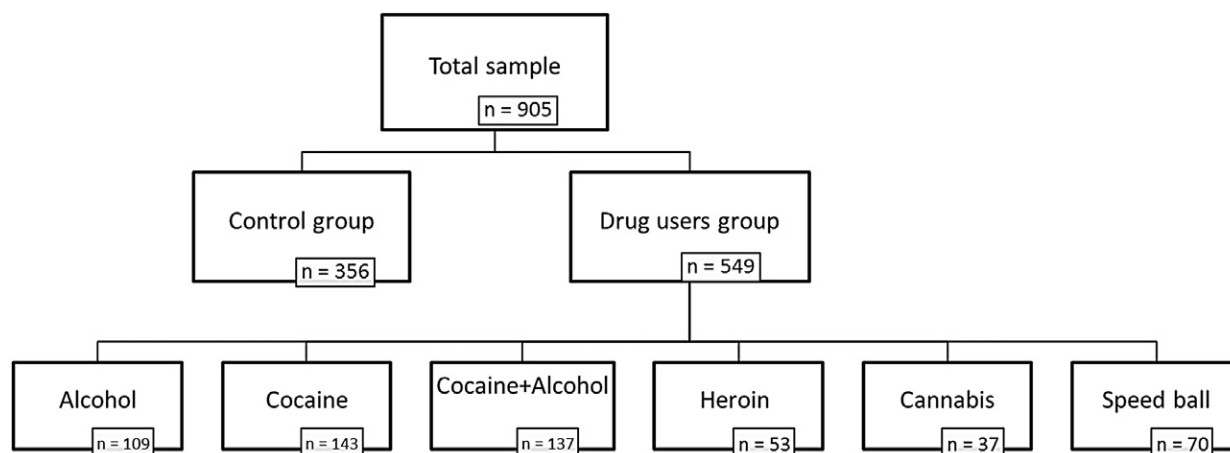


Figure 1 Flow diagram sample

[about 1 L of beer] as well as occasional cannabis use [one joint a week]). The user group was recruited by cluster sampling from the following institutions: Asociación Ciudadana de Lucha Contra la Droga (ACLAD) in A Coruña, Unidad Municipal de Atención a Drogodependientes (UMAD) in A Coruña, Proxecto Home Galicia in (A Coruña, Lugo, Ourense, and Pontevedra), Proyecto Hombre Granada in Granada, Fundación Noray-Proyecto Hombre in Alicante, Institut de Neuropsiquiatria i Addiccions del Parc de Salut Mar-Hospital del Mar in Barcelona, Centros de Atención a las Drogodependencias (CAD) San Blas in Madrid, CAD de Arganzuela in Madrid, and the “Cortijo Buenos Aires” Resource of the Social Service Network of the Regional Government of Andalusia in Granada. The control group was recruited by convenience sampling from adult training centers, community centers, and training courses for jobseekers and universities. Absence of substance use was self-reported.

Main Outcome Measures

1. Changes in Sexual Functioning Questionnaire-Drugs (CSFQ-D [30]). The CSFQ-D is a 15-item adaptation for drug users developed from the Spanish validation [34,36,37] of the CSFQ-14 [38]. It is answered on a five-point Likert scale. The CSFQ-D has shown strong factor invariance between user and nonuser males and good fit in four dimensions assessing four different areas of sexual functioning in the previous month: pleasure (e.g., *How much pleasure do you get when you have sexual activity [sexual intercourse, masturbation]?*), desire (e.g., *How often do you desire to engage in sexual activity?*), arousal (e.g., *How often do you get a hard on [an erection]?*), and orgasm: (e.g., *Are you able to come [ejaculate] when you want to?*). Possible bias was analyzed through Differential Item Functioning (DIF) but no DIF between the user and nonuser sample was found in any items. The scale has good reliability, with an alpha coefficient ranging from $\alpha = 0.83$ in pleasure to $\alpha = 0.61$ in orgasm. The questionnaire also had good external validity indicators. In the present study, the alpha coefficients obtained were 0.82 for pleasure, 0.70 for desire, 0.73 for arousal, and 0.55 for orgasm. Higher scores indicate better sexual functioning.
2. *Cuestionario de Consumo de Sustancias* (CCS, Questionnaire on Substance Use; [39]) The CCS is a short, simple, and clear 16-item questionnaire containing the diagnostic criteria of the DSM-IV-R. It is useful to diagnose problems of substance dependence, abuse, and intoxication. In the present study, only the dependence-related items were used. Items are responded in a dichotomous (yes/no) scale. Spearman’s correlation with the diagnosis made by the various institutions (using European Addiction Severity Index and/or personal interviews) was 0.85, $P > 0.00$. Reliability was 0.88 in the original version and 0.89 in the present study.
3. Substance use record. The variables assessed were preferred substance, amount of substance used, frequency of use, and length of use. This information was used to calculate severity of substance use (severity = frequency * length). Time of abstinence was also obtained through self-reports or urine or blood tests, depending on the procedure used in each institution.
4. Sociodemographic questionnaire

Study Size and Bias

The objective was to obtain a control group of about 300 males—which would provide a confidence level of 92% and an estimation error of 5%—given that one of the limitations of earlier studies was the absence or small size of control groups [2,26]. In such studies, the user group usually focused on one single substance and had a small size. The present study had a considerable sample size and achieved a less biased comparison by applying the same methodology to the different substance groups. Seven groups were formed: control, alcohol, cocaine, cocaine + alcohol, heroin, marijuana, and speedball (cocaine + heroin). The aim was to obtain a sample of about 50 participants in each group and therefore work with a confidence level of 95%; however, it was not possible to reach this number in the marijuana group. Sample size estimation was calculated with Power*G3 software (Universität Kiel, Kiel, Germany) [40].

To date, some studies have used simple questions or questions with little empirical support to assess sexual functioning in drug users [2]. Others have used well-established questionnaires with good psychometric properties but which have not been adapted or validated in drug users. The present study used the CSFQ-D, a questionnaire that has shown a highly equivalent structure in nonusers and users and that does not show any bias for such groups. This minimized errors in the assessment and data comparison as much as possible.

Statistical Methods

The scores of the various groups of users were compared to those of non-users by means of an analysis of covariance (ANCOVA), controlling for the effect of age—given that significant differences were found between groups. Next, differences between the control group and the experimental groups were located using a Honestly Significant Difference (DHS) Tukey post hoc test that provided good control of type I errors and had good power with large samples [41]. This test was accompanied by the ω^2 , a measure of effect size that is less biased for this type of test than the η^2 [42]. The ω^2 was interpreted using Cohen's classification [43]: a low association ranged from 0.01 to 0.05, a medium association ranged from 0.06 to 0.13, and a high association was 0.14 or higher.

Relationships were assessed using partial Pearson correlations, controlling for age, given that significant age differences were found. Cohen's classification [43] was used to interpret

the magnitude of the correlations: a low relationship ranged from 0 to 0.30, a moderate relationship ranged from 0.30 to 0.50, and a high relationship was 0.50 or higher.

Subjects with missing data were eliminated depending on the needs of each analysis. The final N is shown in each analysis.

Results

Significant differences were observed in the age of the various groups (marijuana users were younger than control, cocaine, cocaine + alcohol, heroin, and speedball, and alcohol were older than all others), $F(6, N = 901) = 14.52, P < 0.00$. Yet, when the sample was divided into two groups (drug users [$M = 35.27$, standard deviation (SD) = 8.61] and nondrug users [$M = 35.20$, SD = 11.55]), no age differences were observed between groups, $t(907) = -0.01, P = 0.92$. Significant differences were found in level of education both when considering all groups, $F(6, N = 886) = 61.16, P < 0.00$, and when considering drug users vs. nondrug users, $t(892) = 20.42, P < 0.00$. The remaining sociodemographic data are shown in Table 1.

Differences in sexual functioning between each drug user group and the nonuser group were analyzed. Given that there were significant differences when comparing the ages of each user group, an ANCOVA was performed, controlling for the effect of age. Significant differences were observed in all the areas of sexual functioning assessed: (i) pleasure, $F(6, N = 889) = 9.50, P = 0.00, \omega^2 = 0.06$; (ii) desire, $F(6, N = 889) = 4.60, P = 0.00$, corrected $\omega^2 = 0.06$; (iii) arousal, $F(6, N = 888) = 4.46, P = 0.00, \omega^2 = 0.07$; and (iv) orgasm, $F(6, N = 881) = 8.75, P = 0.00$, corrected $\omega^2 = 0.06$. Because of the impossibility of calculating post hoc tests with one covariate, a DHS Tukey post hoc test was performed with an exploratory purpose. Based on the significant differences found, a one-to-one comparison was made using age as a covariate. Results are shown in Table 2.

Next, the relationship between abstinence and sexual functioning was assessed by calculating partial Pearson correlations—controlling for age—between each substance and each dimension of sexual functioning and time of abstinence. Only two significant correlations were found, $r_{\text{heroin-pleasure}} = 0.39^{**}$ and $r_{\text{cocaine-desire}} = -0.20^*$. The various trend charts do not suggest the existence of a nonlinear relationship between abstinence and sexual functioning.

Table 1 Consumption characteristics

	No drugs	Alcohol	Cocaine	Cocaine + alcohol	Heroin	Cannabis*	Speedball	Total
Subjects	356	109	143	137	53	37	70	905
Age (SD)	35.20 (11.55)	42.17 (10.57)	32.89 (6.76)	33.42 (7.44)	36.45 (5.51)	29.27 (7.84)	35.71 (6.52)	35.24 (9.85)
Mean time of use [†]	—	20.88 (9.29)	10.29 (5.91)	11.83 (5.82)	13.48 (6.66)	12.13 (6.57)	15.34 (7.16)	13.73 (7.83)
Mean daily consumption [‡]	—	271.77 (270.05)	0.83 (1.11)	1.11 (1.42)	0.67 (0.72)	9.42 (11.51)	0.90 (0.70)	—
Abstinence time [†]	—	0.90 (1.57)	0.88 (1.25)	0.81 (0.65)	1.38 (2.60)	0.58 (1.09)	1.44 (1.44)	1.05 (2.01)
Illness (%)	—	29.40	19.20	19.00	48.20	25.30	50.00	17.70
Medication (%)	11.10	28.40	24.50	20.70	30.20	22.60	26.70	19.80
Marital status (%)								
Single	22.31	22.00	35.71	35.93	47.36	52.38	37.50	27.96
Long-term relationship	28.24	12.00	7.14	3.12	0	14.28	9.37	19.51
Short-term relationship	6.21	18.00	30.00	28.12	36.84	19.04	34.37	15.12
Married	39.54	24.00	21.42	21.87	15.78	9.52	3.12	30.56
Separate	3.10	22.00	5.71	10.93	0	4.76	15.62	6.34
Widower	0.56	2.00	0	0	0	0	0	0.48
Education (%)								
No studies	1.42	33.33	22.85	24.81	29.41	18.91	29.85	16.55
School	9.37	32.38	32.14	33.83	37.25	51.35	37.31	25.16
High school	34.37	15.23	30.00	30.07	21.56	21.62	16.41	28.07
Training cycle	21.02	15.23	12.14	9.77	7.84	5.40	16.41	15.43
University	33.80	3.80	2.85	1.50	3.92	2.70	0	14.76

*Cannabis (always in units)

[†]Abstinence and mean time of use expressed in years

[‡]Mean daily consumption expressed in grams per day

Table 2 Differences in sexual function according to the substance of choice

Pleasure						Desire					
Control group	M	SD	N	Contrast	ω^2	Control group	M	SD	N	Contrast	ω^2
Alcohol	14.98	2.89	349			Control group	18.47	3.15	350		
Alcohol	13.45	3.82	105	$F = 14.58, P = 0.00$	0.03	Alcohol	16.67	3.97	105	$F = 12.48, P = 0.00$	0.02
Cocaine	13.48	3.58	140	$F = 25.31, P = 0.00$	0.05	Cocaine	17.96	3.32	140	n.s	—
Cocaine + alcohol	13.34	3.65	136	$F = 20.08, P = 0.00$	0.04	Cocaine + alcohol	18.07	3.09	136	n.s	—
Heroin	13.21	3.45	52	$F = 15.75, P = 0.00$	0.04	Heroin	16.69	3.20	52	$F = 13.63, P = 0.00$	0.03
Cannabis	13.11	3.81	37	$F = 14.25, P = 0.00$	0.03	Cannabis	17.32	3.41	37	$F = 6.77, P = 0.01$	0.01
Speed ball	12.63	4.10	68	$F = 32.15, P = 0.00$	0.07	Speed ball	17.26	3.88	68	$F = 7.63, P = 0.00$	0.02
Arousal						Orgasm					
Control group	M	SD	N	Contrast	ω^2	Control group	M	SD	N	Contrast	ω^2
Alcohol	13.29	1.91	349			Control group	11.88	1.81	348		
Alcohol	11.81	2.75	105	$F = 24.30, P = 0.00$	0.05	Alcohol	10.67	2.68	101	$F = 20.94, P = 0.00$	0.04
Cocaine	13.07	2.24	140	n.s	—	Cocaine	11.01	2.14	140	$F = 21.28, P = 0.00$	0.04
Cocaine + alcohol	12.93	2.24	136	n.s	—	Cocaine + alcohol	11.32	2.04	136	$F = 8.97, P = 0.00$	0.02
Heroin	12.62	2.34	52	$F = 4.86, P = 0.02$	0.01	Heroin	10.27	2.51	52	$F = 31.96, P = 0.00$	0.07
Cannabis	12.92	1.85	37	n.s	—	Cannabis	10.83	2.41	36	$F = 10.13, P = 0.00$	0.02
Speed ball	12.65	2.45	68	$F = 5.83, P = 0.01$	0.01	Speed ball	10.85	2.28	67	$F = 16.55, P = 0.00$	0.04

Note: ω^2 = effect size

Discussion

H1 of the study was supported. Male drug users had significantly poorer scores than nonuser males in all the areas of sexual functioning assessed, even though they had an average of 1 year of abstinence; in addition, differences in sexual functioning were found depending on the preferred substance used. Yet, the effect size found was low for most substances. In contrast, H2 was not supported. Sexual functioning did not seem to improve with increased time of abstinence—except in the case of pleasure for heroin users—or, at least, no improvement was found after the first 2 weeks of abstinence.

Caution should be used when comparing the present study with others reviewed. In most studies, there is no information about the time of abstinence of participants. It would therefore be an error to compare current drug users with subjects in abstinence like those assessed in this study—who had been in abstinence for at least 2 weeks, with an average of about 1 year.

The results of the present study agree with those obtained by other studies [26,35,44] in which, overall, poorer sexual functioning was found in major substance users. However, the present study can be used to make a detailed analysis of the effect of the various substances on the different areas of sexual functioning. The study shows that pleasure and orgasm were the dimensions most impaired, while arousal and desire were not so affected. It is particularly interesting to note that, in most cases, SDs of consumers were much

greater than those of controls. This may reflect greater individual differences in the sexual functioning of these patients.

Heroin

Our results showed that heroin affected the four dimensions evaluated: pleasure, desire, arousal and orgasm. Orgasm was the dimension most affected by heroin, with a moderate effect size. This had been suggested by several authors [27,45–47]. After orgasm, pleasure was the second dimension most affected by heroin. Other authors such as Gay et al. [48] and Palha and Esteves [44] also found this dimension to be impaired in opioid users. Desire was the next area affected by heroin, which was the most detrimental drug for this area despite its low effect size. These results agree with those found by other authors, who observed that heroin users were less stimulated by erotic images than consumers of other drugs and the control population [24]. There seems to be a lack of motivation toward sexual stimuli among opioid users, as if reinforcing stimuli—unconditioned for the normal population—were displaced by stimuli associated to drug use in this population [49,50]. Finally, differences in arousal were significant but their effect size was practically negligible.

Speedball

As a drug with an opioid component, speedball followed a similar trend to heroin and also affected the four dimensions assessed in this study. Pleasure

was the dimension most affected by speedball, which was more detrimental to this dimension than any other drugs assessed in this study. Opioids seem to have a very negative effect on pleasure [44,48]. Orgasm was the second area of sexual functioning most affected by speedball. The literature on the influence of opioids on orgasm is consistent with the present results [27,45,47]. Desire was the third area most affected by this drug, which supports the findings of Aguilar et al. [24] in speedball users. Finally, differences in arousal were significant but negligible.

Alcohol

After heroine and speedball, alcohol was the last substance that affected all areas of sexual functioning assessed. Although its effect size was always low, alcohol was the substance that most impaired sexual arousal. Our data, like those of Dişiz and Oskay [51], partially contradict those of other authors [4,52,53] who argued that alcohol causes transient erectile dysfunction. Although the present study found this area to be impaired, it does not seem to be just a temporary problem, because erectile ability was still affected after a year and, according to the results, did not seem likely to improve just with abstinence. As previous studies did [27,52,54], we also observed that alcohol negatively affected orgasm. In addition, alcohol users were found to have lower pleasure scores. To the best of our knowledge, no previous studies have related alcohol consumption with impaired sexual pleasure. Finally, alcohol has also been associated with inhibited sexual desire [5,11,24,25], which was also found in the present research.

Cocaine and Cocaine + Alcohol

Cocaine and cocaine + alcohol showed a similar trend and should therefore be interpreted jointly. On the one hand, neither desire nor arousal seemed to be affected by use of this substance. On the other hand, cocaine alone and cocaine combined with alcohol also seemed to have a long-term negative effect on sexual functioning. No studies reviewed have shown sexual pleasure to be affected by cocaine use, in spite of the various problems it seems to cause: dyspareunia, low arousal [27], anorgasmia, decrease of desire [55,56], erectile dysfunction [57,58], and priapism [59,60]. Finally, orgasm was found to be impaired by cocaine and, to a lesser extent, by cocaine + alcohol. These results are also consistent with those obtained by other authors [55,56]. This

shows that cocaine and cocaine + alcohol negatively affect the ability to reach orgasm.

Cannabis

Cannabis seems to be the substance that least affects sexual functioning in the long term. However, it had an effect on some of the dimensions assessed in this study. Pleasure was the dimension most affected by long-term cannabis use. These results have also been observed by other authors [5,27,61]. Orgasm was the second area most affected in cannabis users. Reviews [8,62] highlighted a contradiction in the results on the effects of cannabis on pleasure and orgasm. The present study found these areas to be impaired in abstinent cannabis users, although the effect size was low. Finally, cannabis did not seem to have a noticeable effect on desire or arousal.

Conclusion

The present results are along the same lines as those of Vallejo-Medina and Sierra [30], which contradicted those of Cocores et al. [31], as sexual functioning in many substance users was still affected even 3 weeks after stopping drug use, although not with a high magnitude. The physiological effect of drugs on the sexual cycle [5,27,63] is likely to dissipate at about 3 weeks of abstinence. Yet, the conditioning brought about by years of drug use—almost 14 months on average in this study—does not seem to disappear so easily. Moreover, as the data suggest, stopping drug use does not seem to lead to an improvement, at least after the first 2 weeks of abstinence. Therefore, drug user patients with sexual problems should receive specific sexual treatment for the areas affected, particularly if we consider that the SDs of consumers were always higher than those of the control group. This may highlight greater individual differences and show that sexual functioning of the whole sample of drug users was not slightly impaired but that some subjects had fully recovered their functioning while others had greater problems. Yet, it is not possible to confirm this with the methodology used in the present study.

Limitations and Future Research

The main limitation of this study is related to the sampling method used, which was not probabilistic and therefore cannot be used to extrapolate results to the general population. In addition, because of the cross-sectional design of the study and the lack of a baseline, results should be taken cautiously and

no causality relations should be inferred. It should also be considered that drug use affects various vital aspects of people; this may also have a direct or indirect influence on the sexual functioning of these patients (medication, psychiatric comorbidity, anxiety, depression, emotional-sexual situation, sexual self-esteem, sexual assertiveness, . . .). The methodology used to reach conclusions, such as the absence of a relationship between abstinence and sexual functioning, is not the most appropriate. Longitudinal studies would be necessary to support or refute this hypothesis. Finally, using the preferred substance as a variable to cluster drug users implies disregarding multiple use and implying that all the effect is caused by the preferred substance, which is inaccurate.

Acknowledgment

The authors wish to thank the following institutions in Spain for their cooperation in this research: ACLAD (A Coruña), CAD de Arganzuela (Madrid), CAD San Blas (Madrid), Institut de Neuropsiquiatria i Addiccions del Parc de Salut Mar-Hospital del Mar (Barcelona), Fundación Noray-Proyecto Hombre Alicante (Alicante), UMAD (Santiago de Compostela), Proxecto Home Galicia (Galicia), Proyecto Hombre Granada (Granada), and the “Cortijo Buenos Aires” Resource of the Social Service Network of the Regional Government of Andalusia (Granada).

Corresponding Author: Pablo Vallejo-Medina, PhD, Facultad de Psicología, Universidad Santo Tomás, Campus San Alberto Magno, Calle 209, Autopista Norte, Av. los Arrayanes Km. 1.6, Bogotá, Colombia. Tel: 0057- 3185164995; E-mail: pablovallejo@usantotomas.edu.co

Conflict of Interest: None.

Statement of Authorship

Category 1

(a) Conception and Design

Pablo Vallejo-Medina; Juan Carlos Sierra

(b) Acquisition of Data

Pablo Vallejo-Medina

(c) Analysis and Interpretation of Data

Pablo Vallejo-Medina; Juan Carlos Sierra

Category 2

(a) Drafting the Article

Pablo Vallejo-Medina

(b) Revising It for Intellectual Content

Juan Carlos Sierra

Category 3

(a) Final Approval of the Completed Article

Pablo Vallejo-Medina; Juan Carlos Sierra

References

- 1 Basson R. Recent advances in women's sexual function and dysfunction. *Menopause* 2004;11:714–25.
- 2 Peugh J, Belenko S. Alcohol, drugs and sexual function: A review. *J Psychoactive Drugs* 2001;33:223–32.
- 3 Bellis MA, Hughes K. Pociones sexuales. Relación entre alcohol, drogas y sexo. *Adicciones* 2008;416:249–58.
- 4 Buffum J, Moser C, Smith D. Street drugs and sexual function. In: Money J, Musaph H, Sitsen JMA, eds. *Handbook of sexuality*, Vol. 6. The pharmacology and endocrinology of sexual function. New York: Elsevier Science Publishers; 1998:462–77.
- 5 Crenshaw TL, Goldberg JP. *Sexual pharmacology: Drugs that affect sexual functioning*. New York: W.W. Norton & Company; 1996.
- 6 Emanuele MA, Emanuele NV. Alcohol's effects on male reproduction. *Alcohol Health Res World* 1998;22:195–201.
- 7 Bang-Ping J. Erectile dysfunction associated with psychoactive substances. *Chonnam Med J* 2008;44:117–24.
- 8 Lévy JJ, Garnier C. Drogues, médicaments et sexualité. *Drogues Santé Et Société* 2006;5:11–48.
- 9 McKay A. Sexuality and substance use: The impact of tobacco, alcohol, and selected recreational drugs on sexual function. *Can J Hum Sex* 2005;14:47–56.
- 10 Miller NS, Gold MS. The human sexual response and alcohol and drugs. *J Subst Abuse Treat* 1988;5:171–7.
- 11 Rosen RC. Alcohol and drug effects on sexual response: Human experimental and clinical studies. *Annu Rev Sex Res* 1991;2:119–79.
- 12 Smith S. Drugs that cause sexual dysfunction. *Psychiatry* 2007;6:111–4.
- 13 Calafat A, Juan M, Becoña E, Mantecón A. Qué drogas se prefieren para las relaciones sexuales en contextos recreativos. *Adicciones* 2008;20:37–48.
- 14 Rawson RA, Washton A, Domier CP, Reiber C. Drugs and sexual effects: Role of drug type and gender. *J Subst Abuse Treat* 2002;22:103–8.
- 15 Bellis MA, Hughes K, Calafat A, Juan M, Ramon A, Rodriguez JA, Mendes F, Schnitzer S, Phillips-Howard P. Sexual uses of alcohol and drugs and the associated health risks: A cross sectional study of young people in nine European cities. *BMC Public Health* 2008;8:155–66.
- 16 Raj A, Saitz R, Cheng D, Winter M. Associations between alcohol, heroin, and cocaine use and high risk sexual behaviors among detoxification patients. *Am J Drug Alcohol Abuse* 2007;33:169–78.
- 17 Haavio-Mannila E, Kontula O. What increases sexual satisfaction? *Arch Sex Behav* 1997;26:399–419.
- 18 Clayton AH, Hamolton DV. Female orgasmic disorder. In: Balon R, Segraves RT, eds. *Clinical manual of sexual disorders*. Arlington, VA: American Psychiatric Publishing, Inc; 2009: 251–71.
- 19 Masters WH, Johnson VE. *Human sexual response*. Boston, MA: Little, Brown; 1966.
- 20 Meston CM, Hull E, Levin RJ, Sipski M. Disorders of orgasm in women. *J Sex Med* 2004;1:66–28.
- 21 Hyatt B, Bensky KP. Illicit drugs and anesthesia. *CRNA* 1999;10:15–23.
- 22 Degenhardt L, Topp L. “Crystal meth” use among polydrug users in Sydney's dance party subculture: Characteristics, use patterns and associated harms. *Int J Drug Policy* 2003;14:17–24.

- 23 Kurtz SP. Post-circuit blues: Motivations and consequences of crystal meth use among gay men in Miami. *AIDS Behav* 2005;9:63–72.
- 24 Aguilar De Arcos F, Verdejo García A, López Jiménez A, Montañez Pareja M, Gómez Juárez E, Arráz Sánchez F, Pérez García M. Cambios en la respuesta emocional ante estímulos visuales de contenido sexual en adictos a drogas. *Adicciones* 2008;20:117–24.
- 25 Ávila Escribano JJ, Pérez Madruga A, Olazabal Ulacia JC, López Fidalgo J. Disfunciones sexuales en el alcoholismo. *Adicciones* 2004;16:1–6.
- 26 Bang-Ping J. Sexual dysfunction in men who abuse illicit drugs: A preliminary report. *J Sex Med* 2009;6:1072–80.
- 27 Johnson SD, Phelps DL, Cottler LB. The association of sexual dysfunction and substance use among a community epidemiological sample. *Arch Sex Behav* 2004;33:55–63.
- 28 George WH, Davis KC, Norris J, Heiman JR, Schacht RL, Stoner SA, Kajumulo KF. Alcohol and erectile response: The effects of high dosage in the context of demands to maximize sexual arousal. *Exp Clin Psychopharmacol* 2006;14:461–70.
- 29 George WH, Davis KC, Schraufnagel TJ, Norris J, Heiman JR, Schacht RL, Stoner SA, Kajumulo KF. Later that night: Descending alcohol intoxication and men's sexual arousal. *Am J Mens Health* 2008;2:76–86.
- 30 Vallejo-Medina P, Sierra JC. Adaptation, equivalence, and validation of the Changes in Sexual Functioning Questionnaire-Drugs (CSFQ-D) in a sample of drug-dependent males. *J Sex Marital Ther* 2012 [Epub ahead of print] doi: 10.1080/0092623X.2011.642493.
- 31 Cocores JA, Miller NS, Pottash AC, Gold MS. Sexual dysfunction in abusers of cocaine and alcohol. *Am J Drug Alcohol Abuse* 1988;14:169–73.
- 32 OADA, Observatorio Andaluz sobre Drogas y Adicciones. 2010). Informe sobre el Indicador Admisiones a Tratamiento en Andalucía 2010. Junta de Andalucía, Spain.
- 33 Montero I, León OG. A guide for naming research studies in psychology. *Int J Clin Health Psychol* 2007;7:847–62.
- 34 Vallejo-Medina P, Guillén-Riquelme A, Sierra JC. Psychometric properties of the Spanish version of the Changes in Sexual Functioning Questionnaire-Short-Form (CSFQ-14) in a sample of males with drug abuse history. *Sex Disabil* 2010;28:105–18.
- 35 Vallejo-Medina P, Guillén-Riquelme A, Sierra JC. Análisis psicométrico de la versión española del Brief Sexual Function Inventory (BSFI) en una muestra de hombres con historia de abuso de drogas. *Adicciones* 2009;21:221–8.
- 36 Bobes J, González MP, Rico-Villademoros F, Bascarán MT, Sarasa P, Clayton A. Validation of the Spanish version of the Changes in Sexual Functioning Questionnaire (CSFQ). *J Sex Marital Ther* 2000;26:119–31.
- 37 Garcia-Portilla MP, Saiz PA, Fonseca E, Al-Halabi S, Bobes-Bascaran MT, Arrojo M, Benabarre A, Goikolea JM, Sánchez E, Sarramea F, Bobes J. Psychometric properties of the Spanish version of the Changes in Sexual Functioning Questionnaire Short-Form (CSFQ-14) in patients with severe mental disorders. *J Sex Med* 2011;8:1371–82.
- 38 Keller A, McGarvey EL, Clayton AH. Reliability and construct validity of the Changes in Sexual Functioning Questionnaire Short-Form (CSFQ-14). *J Sex Marital Ther* 2006;32:43–52.
- 39 Vallejo-Medina P, Sierra JC. Adaptación y validación de la Sexual Assertiveness Scale (SAS) en una muestra de varones drogodependientes. (Manuscript under revision).
- 40 Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behav Res Methods* 2009;41:1149–60.
- 41 Field A. *Discovering statistics using SPSS*. London: SAGE; 2011.
- 42 Young MA. Supplementing tests of statistical significance: Variation accounted for. *J Speech Hear Res* 1993;36:644–56.
- 43 Cohen J. *Statistical power analysis for the behavioral sciences*. 2nd edition. Hillsdale, NJ: Lawrence Erlbaum; 1988.
- 44 Palha AP, Esteves M. A study of the sexuality of opiate addicts. *J Sex Marital Ther* 2002;28:427–37.
- 45 Chekuri V, Gerber D, Brodie A, Krishnadas R. Premature ejaculation and other sexual dysfunctions in opiate dependent men receiving methadone substitution treatment. *Addict Behav* 2012;37:124–6.
- 46 Zhang Y, Wang P, Ma Z, Xu Z, Li Y. Sexual function of 612 male addicts treated by methadone. *Zhong Nan Da Xue Xue Bao Yi Xue Ban* 2011;36:739–43.
- 47 Gulliford SM. Opioid-induced sexual dysfunction. *J Pharm Care Pain Symptom Control* 1998;6:67–74.
- 48 Gay GR, Newmeyer JA, Perry M, Johnson G, Kurland M. Love and Haight: The sensuous hippy revisited. Drug/sex practices in San Francisco. *J Psychoactive Drugs* 1982;14:111–23.
- 49 Goldstein RZ, Volkow ND. Drug addiction and its underlying neurobiological basis: Neuroimaging evidence for the involvement of the frontal cortex. *Am J Psychiatry* 2002;159:1642–52.
- 50 Waxler BE, Gottschalk CH, Fulbright RK, Prohovnik I, Lacadie CM, Rounsaville BJ, Gore JC. Functional magnetic resonance imaging of cocaine craving. *Am J Psychiatry* 2001;158:86–95.
- 51 Dişsiz M, Oskay UY. Evaluation of sexual functions in Turkish alcohol-dependent males. *J Sex Med* 2011;8:3181–7.
- 52 Roerich L, Kinder BN. Alcohol expectancies and male sexuality: Review and implications for sex therapy. *J Sex Marital Ther* 2002;17:45–54.
- 53 Money J, Leal J, Gonzalez-Heydrich J. Aphrodisiology: History, folklore, efficacy. In: Money J, Musaph H, Sitsen JMA, eds. *Handbook of sexology*. Vol. 6. New York: Elsevier Science Publishers B.V.; 1988:499–515.
- 54 Klassen AD, Wilsnack SC. Sexual experience and drinking among women in a U.S. national survey. *Arch Sex Behav* 1986;15:363–92.
- 55 San Molina L. Disfunciones sexuales asociadas a trastorno por uso de sustancias. In: *Ars Médica*, ed. *Consenso de la SEP sobre patología dual*. España: Barcelona; 2003:162–5.
- 56 Weatherby N, Shultz J, Chitwood D, McCoy H, McCoy C, Ludwig D, Edlin B. Crack cocaine use and sexual activity in Miami, Florida. *J Psychoactive Drugs* 1992;24:373–80.
- 57 Fecik SE. Drug-induced sexual dysfunction. *Medical Update for Psychiatrists* 1998;3:176–81.
- 58 MacDonal PT, Waldorf D, Reinerman C, Murphy S. Heavy cocaine use and sexual behavior. *J Drug Issues* 1988;18:437–55.
- 59 Fiorelli RL, Manfrey SJ, Belkoff LH, Finkelstein LH. Priapism associated with intranasal cocaine abuse. *J Urol* 1990;143:584–5.
- 60 Munarriz R, Hwang J, Goldstein I, Traish AM, Kim NN. Cocaine and ephedrine-induced priapism: Case reports and investigation of potential adrenergic mechanisms. *Urology* 2003;62:187–92.
- 61 Christensen BS, Grønbaek M, Pedersen BV, Graugaard C, Frisch M. Associations of unhealthy lifestyle factors with sexual inactivity and sexual dysfunctions in Denmark. *J Sex Med* 2011;8:1903–16.
- 62 Shamloul R, Bella AJ. Impact of cannabis use on male sexual health. *J Sex Med* 2011;8:971–5.
- 63 Argiolas A. Neuropeptides and sexual behaviour. *Neurosci Biobehav Rev* 1999;23:1127–42.