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Prevalence of sexual dysfunction risk in cocaine users in a sample of Spanish men

Marina A. Cabello-García[1], Francisco Javier del Río[2,3],*, Antonio Daniel García-Rojas[4], Francisco Cabello-Santamaría[5]

[1]Psychology department, University of Malaga, 29071 Malaga, Spain
[2]Psychology department, University of Cadiz, 11519 Puerto Real, Spain
[3]Biomedical Research and Innovation Institute of Cadiz, INIBICA, 11009 Cadiz, Spain
[4]Pedagogy department, University of Huelva, 21071 Huelva, Spain
[5]Andalusian Institute of Sexology and Psychology, 29001 Malaga, Spain

*Correspondence
franciscojavier.delrio@uca.es
(Francisco Javier del Río)

Abstract

Sexuality should be able to be experienced in a healthy way. This can be affected by drug use in general and cocaine use in particular. Other aspects that can influence sexuality are anxiety and sexual attitudes. The main aim of this work is to explore and analyse how cocaine use affects men's sexual response. In the present study, the GRISS (Golombok Rust Inventory of Sexual Satisfaction) questionnaire was used to assess sexual function, the SOS (Sexual Opinion Survey) questionnaire to evaluate sexual attitudes, and the STAI (State-Trait Anxiety Inventory) questionnaire to measure sexual anxiety. The sample consisted of 471 male cocaine users and 82 male non-users. The sampling was carried out in different treatment centres throughout Spain. The results indicate that male cocaine users score worse on the GRISS questionnaire, indicating a higher likelihood of sexual dysfunction, worse scores on the SOS questionnaire and higher anxiety levels. It is also observed that scores on the GRISS questionnaire did not improve over time. The differences were statistically significant and the initial study hypotheses were confirmed. The practical utility of this research lies in the applicability of these data in addiction treatment centres, and the potential for these centres to enhance specific interventions that promote healthy sexuality.

Keywords

Cocaine; Sexual dysfunctions; Trait-state anxiety; Sexual opinion survey; HJ-Biplot

1. Introduction

Sexuality is an important aspect of people's lives. The human being is a sexed entity from birth to death, which makes it essential, for the well-being of the individual, to take actions to lead a healthy sexual life. The World Health Organisation defines the term "sexual health" as a state of physical, emotional, mental and social well-being related to sexuality, which is not merely the absence of disease, dysfunction or disability [1]. According to this definition, individuals have the right to fully enjoy their sexuality and to take actions to achieve sexual well-being and pleasure. Associated with this human quest for pleasure is the use of addictive substances. Drug use has been used to escape from problems and discomfort, and to enjoy the pleasurable effects of the drugs. However, drug use not only causes pleasurable effects, but also fundamentally exerts detrimental effects on the human being in general and on the sexual response in particular [2–6]. Despite these detrimental effects of substance use on sexual response, the two issues are closely related, as professionals working in addiction treatment centres are well aware, mainly in the following manner: 1. Through users' expectations of the positive effects it can have on sexual response (drug myths); 2. High prevalence of drug use in people who have been sexually abused in childhood [7]; 3. Using drugs to gain the confidence needed to relate to a

potential sexual partner; 4. Non-acceptance of one's sexual orientation; 5. Drug use and prostitution.

Cocaine is an alkaloid with stimulant action on the central nervous system and anaesthetic action on the peripheral nervous system [8]. It is obtained from the chemical processing of leaves of the plant *Erythroxylum coca*. In 2021, in Spain, the percentage of males aged 14 to 18 who reported having used cocaine at some time in their life was 3.4 [9]. Likewise, roughly one in ten people aged 15–64 years reported having used cocaine powder at some time in their lives (11.7%), with a median age of onset of consumption of 21.1 years [10]. In 2022, the prevalence of cocaine use in Spain among men aged 15–64 was 3.5 per cent [10]. In 2020, a total of 17,490 people sought treatment for cocaine problems [9]. These data give an overview of the impact of cocaine use in Spain.

Two other aspects that can influence sexual response, which are important in drug dependent populations, are anxiety and sexual attitudes. Anxiety is a common response during the withdrawal period, which can be more or less intense depending on the type of substance used. Likewise, various researchers point to how anxiety negatively affects sexual response and favours the appearance of different sexual dysfunctions [11–15]. On the other hand, people's sexual attitudes will influence the expression of sexuality in their lives. For this reason, and from a clinical and therapeutic standpoint,

it is necessary to have a positive and open attitude towards sexuality in order to be able to tackle the different sexual problems and dysfunctions that people may have throughout their lives, and more specifically, the difficulties that may be a consequence of drug use.

The importance of this work is primarily practical, as it is aimed at professionals working with drug dependent patients and addiction treatment centres. In these centres, therapy usually consists of achieving and maintaining abstinence over time. Therapy focuses on the different areas of the patient, but rarely addresses the sexual area. This research shows what the consequences are on sexual response after cocaine use. Being able to discuss these issues with patients can serve as a protective factor against possible relapses in consumption.

The main aim of this work is to explore and analyse how cocaine use affects men's sexual response. Based on what has been described by other authors, the following hypotheses are put forward: 1. Male cocaine users will have greater difficulties on average in sexual response than men who have not used cocaine. 2. Male cocaine users will exhibit worse sexual attitudes on average than men who have not used cocaine. 3. Male cocaine users will have higher anxiety on average than men who have not used cocaine. 4. The sexual response of male cocaine users will not improve with abstinence.

2. Materials and methods

2.1 Study design and site

The present study was conducted using an *ex post* facto retrospective design [16], to assess the consequences of cocaine use on sexual response in men. The sampling was carried out in different addiction treatment centres spread throughout Spain (see Acknowledgements).

2.2 Study population

The sample in this study consisted of 553 men, of whom 471 were in the consumer group and 82 in the non-consumer group. They were recruited from addiction treatment centres throughout Spain (see Acknowledgements). To collect the information, we first contacted the directors of the different centres, explaining to them what the research consisted of and asking for their voluntary participation. They were then sent the questionnaires on paper, with instructions on how to administer the surveys and informed consents with the patients. The therapists in the different centres were also contacted and given specific instructions about their task. Finally, the centres forwarded the questionnaires to the researchers for data analysis. The questionnaires contained no personal information that could link the answers to individual patients. The mean age of the user group was 32.79 (standard deviation 6.77), and the mean age of the control group was 36.30 (standard deviation 8.30). The youngest person in the case group was 18 years old, and the oldest was 50. In the control group, the youngest person was 19 years old, and the oldest was 61. The mean couple time in the consumer group was 92.54 months (standard deviation 86.45), and in the control group the mean couple time was 130.80 months (standard deviation 97.04). In the consumer group, the couple with the longest relationship

had been together for 360 months, and in the control group the figure was 396 months. Since the GRISS questionnaire assesses sexual responsiveness in heterosexual persons, all participants were heterosexual.

The inclusion criteria for the group of consumers were as follows: 1. Meeting DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) diagnostic criteria for cocaine addiction [17]. 2. Being in an addiction treatment centre. 3. Abstaining from drug use for a period of at least 3 months. 4. Having at least a 2-year history of cocaine use. 5. Having a partner for more than 6 months. The following were set as exclusion criteria: 1. Taking any type of medication that would affect sexual response. 2. Meeting the criteria for dual pathology. 3. Not having a partner at the time of research participation. Inclusion criteria for the non-consumers group were as follows: 1. Being in a relationship for more than 6 months. 2. Being over 18 years of age. 3. Being in a relationship during their participation in research. The exclusion criteria were: 1. Consumption of cocaine or another addictive substance. 2. Taking medication that might affect sexual response. 3. Being in treatment for a psychological disorder.

2.3 Questionnaires

An *ad hoc* questionnaire was used to gather information on socio-demographic variables and to verify whether participants met the criteria for inclusion in the research. The questionnaire asked about time of use (over 5 years), age, time of abstinence, whether they had a steady partner and how long they had been with their partner, as well as the type of substances used.

The Golombok Rust Inventory of Sexual Satisfaction questionnaire [17], the validated version of which is available in Spanish [18], was used to gauge the sexual response of the male participants. There is a version for men and a version for women, each with 28 items, which are answered on a 5-point Likert-type scale. The men's version has 7 different scales (Infrequency, Non-Communication, Dissatisfaction, Non-Sensuality, Avoidance, Erectile Dysfunction and Premature Ejaculation). The authors' indications for correction were followed. The reliability of this questionnaire, as measured by Cronbach's alpha, was 0.74 in the present research.

The sexual attitudes of the male participants were assessed using the Sexual Opinion Survey scale [19], in the version validated in Spanish [19]. The questionnaire assesses the bipolar construct erotophobia-erotophilia, defined as a learned disposition to respond to sexual stimuli in a negative way (erotophobia), as opposed to a disposition to respond in a positive way (erotophilia). It consists of 21 items that are answered on a Likert-type scale with 7 response options. The reliability of this questionnaire, as measured by Cronbach's alpha, was 0.87 in the present research.

Finally, the State-Trait Anxiety Questionnaire was used to assess the participants' degree of anxiety [20, 21]. It has two scales to assess anxiety: the state anxiety scale, which assesses the patient's anxiety at the present time, while answering the questionnaire; and the trait anxiety scale, which assesses the patient's anxiety in general. Each of the scales consists of 20 items that are answered in a Likert format from 0 to 3 points. The reliability of this questionnaire, measured by Cronbach's

alpha, in the present research was 0.90 on the state anxiety scale and 0.88 on the trait anxiety scale.

2.4 Statistical analysis

First, the Kolmogorov test was performed to check the fit to the normal distribution, in order to decide whether to use parametric or non-parametric tests. Non-parametric tests were then used, namely the Mann-Whitney U test, to compare the differences in means between the two groups of interest, and Spearman's bivariate correlation, to test for a relationship between two variables of interest. Finally, a multivariate analysis was performed using the HJ-Biplot method, to explore the relationship between the different study variables jointly. All calculations were performed with IBM SPSS Statistics for Windows, version 21, except for the HJ-Biplot calculation, which was done with MultBiplot [22]. A p-value of less than 0.05 was considered significant for all analyses.

3. Results

First, the fit to normal distribution was tested using the Kolmogorov-Smirnov statistic to verify the use of parametric or non-parametric tests. For all three questionnaires, the scores indicated that the data did not meet the assumption of normality (significance ranges between 0.000 and 0.014). For this reason, non-parametric tests were carried out. The Mann-Whitney U test was used to test the hypotheses. Table 1 shows the mean scores and standard deviations of both groups in each of the scales of the different questionnaires, as well as the p-value of the Mann-Whitney U test.

Spearman's correlation was performed between the length of time men had not used cocaine and each of the subscales of the GRISS questionnaire. The results range from −0.011 to −0.095, but in all cases, the correlation is not significant. This indicates that sexual response does not improve with abstinence.

One way to explore the relationship between variables is by using the HJ-Biplot method, which is a multivariate analysis technique. The HJ-Biplot technique is a variant of the Biplot graphical visualisation and allows row and column data to be represented as points in a low-dimensional vector hyperspace. High discriminatory power has been demonstrated in other studies with various elements analysed other than psychological variables [23–25]. There is little use of this statistical tool in the psychology area. The information is presented in Fig. 1, where different vectors can be observed, corresponding to the scales of the GRISS questionnaire, the Anxiety questionnaire scales and the vector corresponding to the SOS score. Likewise, the dots correspond to male drug users and the + marks indicate men in the control group (non-drug users). Regarding the distribution of the participants in the graph, it can be observed that the men in the control group were more clustered close to the SOS vector, whereas the male consumers were distributed more dispersed throughout the graph, which indicates a greater variability among them. Regarding the vectors, different groupings can be seen. First, the clustering of both anxiety vectors is observed, which points to the high relationship between the two scores. A high clustering is also observed between premature ejaculation, non-sensuality and erectile dysfunction. Bearing in mind that non-sensuality is defined by the authors of the questionnaire as the absence of erotic play, the grouping between these three vectors indicates that men with ejaculation or erectile difficulties spent little time in erotic play. On the other hand, there seems to be an equal distance between avoidance and dissatisfaction, and infrequency of intercourse and dissatisfaction, suggesting that both variables may affect dissatisfaction with sex. Likewise, the vector of non-communication is also close to dissatisfaction, which may indicate that in situations of dissatisfaction, communication is reduced. The avoidance vector is not close to infrequency, which may indicate that when there is a high frequency of avoidance of relationships, but when there is infrequency of relationships, avoidance is not necessary. Finally, it is observed that the vector of SOS scores is found to form almost a 180-degree angle with the anxiety vectors, indicating that both scores may be inversely affected, *i.e.*, people who have a favourable attitude towards sexuality may have lower anxiety.

4. Discussion

The main aim of this work was to explore and analyse how cocaine use affects men's sexual response. Throughout the paper, this objective has been met by showing how the different scales are related in the multivariate HJ-Biplot analysis. This statistical tool is relatively new and little used in this area, making it difficult to compare the data with those from other studies. Due to the great potential of this tool for handling data and multiple variables, it is recommended to continue using it in the future and to verify the data presented here.

The first hypothesis posits that male cocaine users will have greater difficulties on average in sexual response than men who have not used cocaine. The data show that on all variables of the GRISS questionnaire, male consumers reached higher mean scores and, except for the non-sensuality scale, the differences were statistically significant, confirming the initial hypothesis. In all cases, the score in the consumer group was higher than in the non-consumer group (Infrequency: 3.58 > 2.84; No Communication: 2.37 > 1.73; Non-Sensuality: 2.83 > 2.30; Avoidance: 2.84 > 1.37; Dissatisfaction: 5.18 > 3.68; Erectile Dysfunction: 2.73 > 1.98; Premature Ejaculation: 4.25 > 2.05), which indicates a higher probability of sexual dysfunction in the consumer group. These results are consistent with those of other researchers. Vallejo-Medina *et al*. [26] conducted research with a drug dependent population, in which they also validated a sexuality questionnaire, finding that men with a history of drug use had a worse sexual response than non-users. Jiann [27] concluded that tobacco, alcohol and illegal drugs all have detrimental effects on erectile function.

The second hypothesis proposes that male cocaine users will exhibit worse sexual attitudes on average than men who have not used cocaine. The data presented in this study support this hypothesis, as male consumers performed worse on average and the difference was significant. It seems logical to think that people with a greater number of sexual dysfunctions (as is the case of people who use cocaine) will be more reluctant to have sexual encounters with potential partners, due to the

TABLE 1. Mean scores, standard deviation and contrast of the differences between the scores of both groups.

	Substance user group (n = 471)		Non-user group (n = 82)		
	M	SD	M	SD	p
Infrequency	3.58	2.23	2.84	1.70	0.010
No Communication	2.37	1.91	1.73	1.47	0.007
Non-Sensuality	2.83	2.90	2.30	2.54	0.193
Avoidance	2.84	2.32	1.37	1.61	0.018
Dissatisfaction	5.18	3.00	3.68	1.92	<0.001
Erectile Dysfunction	2.73	2.37	1.98	1.38	0.043
Premature Ejaculation	4.25	2.79	2.57	2.05	<0.001
State Anxiety	18.99	10.32	11.89	7.64	<0.001
Trait Anxiety	24.77	10.08	12.59	6.15	<0.001
SOS	86.87	16.85	97.29	17.90	<0.001

Note: SOS: Sexual Opinion Survey; M: Mean; SD: Standard Deviation.
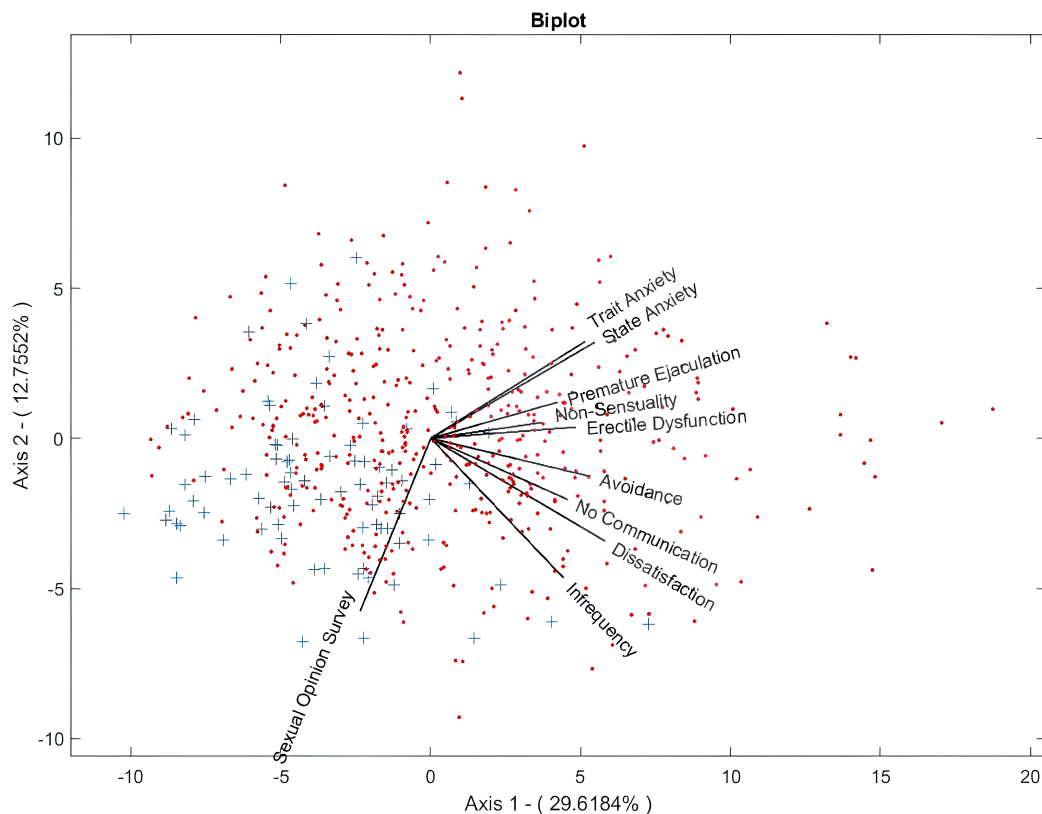

FIGURE 1. HJ–Biplot. Graphical representation of multivariate analysis.

fear and anguish that the possible failure of such an encounter may cause them. It can also be assumed that people who feel more secure in their relationships (because they have fewer sexual dysfunctions, as is the case for people who do not use cocaine), may tend to be more active seekers and more open to new experiences than people who feel more insecure. This reasoning not only coincides with the data from the sexual attitudes questionnaire, but also with the data from the Avoidance scale of the GRISS questionnaire, in which cocaine users scored significantly worse on average. Although some drugs are thought to be recreational and to enhance sexual encounters [28], it is clear that they present difficulties, both in terms of sexual dysfunction and sexual attitudes, at least in comparison with non-users.

The third hypothesis states that male cocaine users will have higher levels of anxiety on average than men who have not used cocaine. Anxiety is a notable aspect of people in a rehabilitation process, and at the same time, it is a very influential aspect in the appearance of sexual dysfunctions, which is why anxiety is worked on both in the treatment of

drug addicts and treatment for sexual dysfunctions. The STAI questionnaire provides two different anxiety scores, State and Trait, and in both the average score obtained by cocaine users is higher on average than those of non-users of cocaine, and this difference is statistically significant, so the hypothesis put forward in the study was accepted. As other authors have pointed out, anxiety is an important factor in the development of different sexual dysfunctions [11, 14, 15], which explains to a large extent why the group of cocaine users had worse average scores on the GRISS scales.

The last hypothesis states that the sexual response of male cocaine users will not improve with abstinence. This hypothesis is designed to detect whether the difficulties acquired with cocaine use are a temporary effect and disappear after cessation of use, or whether they are a more permanent effect. The data show that the dysfunction did not disappear with abstinence, but was maintained. This may be due to the drug dependent person learning about their behaviours and attitudes, which they will maintain after use. Vallejo-Medina and Sierra [29] found that substance users did not significantly improve sexually after one year of abstinence. Similar results were obtained by Jiann [27], who stated that the neurological damage caused by addictive substances is long-lasting.

The present work has a number of limitations. The first refers to the type of substance used by people in treatment. The information provided by those who seek treatment for drug dependence is not free of bias, mainly for two reasons, the first of which is the fact that the person reports on the substance that they think is the main source of the problem, without mentioning, either intentionally or because they do not consider it important, other substances which, having consumed them, could also influence their sexual behaviour. Secondly, it should be borne in mind that the substances consumed are usually adulterated with other active ingredients of which the consumers themselves are unaware, and which may also influence their sexual behaviour. But this is a limitation of all research with drug dependent patients in treatment centres. A second limitation is the number of participants in the control group. This limitation is due to the difficulties in finding people who had not consumed some kind of substance (*e.g.*, cannabis, alcohol were the most frequent), or who were not taking medication that affected sexual response (*e.g.*, antidepressants were the most frequent). As a third limitation, reference is made to the instrument used to assess sexual dysfunctions. Notwithstanding the validity tests of the GRISS questionnaire, there are now instruments that are used more frequently and have shown greater validity [30]. A fourth limitation refers to measures taken in the consumer group. Only anxiety was measured, although depressed mood and anhedonia are also known to be reliable symptoms of cocaine withdrawal. Current research points to a high correlation between anxiety and depression among drug users [31], mitigating the lack of data on depression.

With a view to future research, the following lines of work are suggested. It would be interesting to apply the statistical tool HJ-Biplot with a similar population to confirm the data presented here. It would also be interesting to test the efficacy of addiction treatments in those patients in whom sexual work is done versus those in whom no such work takes place.

Finally, it would also be interesting to compare these data with those on people who are actively using cocaine.

It is necessary to conclude this discussion by pointing out that the practical usefulness of this research lies in the applicability of these data in addiction treatment centres, so that these centres can promote specific interventions that encourage healthy sexuality, which would be a protective factor against relapse into drug use.

5. Conclusions

Cocaine consumption negatively affects sexual response (increasing the likelihood of developing sexual dysfunction) and sexual attitudes, and may increase anxiety levels, compared to those of non-users. The period of abstinence from cocaine use does not improve sexual response. Therefore, it is recommended, in addiction treatment centres, to establish sexuality treatment programmes for these patients, as a possible protective factor against relapse to cocaine use.

ABBREVIATIONS

GRISS, Golombok Rust Inventory of Sexual Satisfaction; SOS, Sexual Opinion Survey; STAI, State-Trait Anxiety Inventory.

AVAILABILITY OF DATA AND MATERIALS

The data are not publicly available due to privacy.

AUTHOR CONTRIBUTIONS

FJDR and FCS—designed the research study. FJDR—performed the research; analysed the data. MACG and ADGR—wrote the manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The present work was approved by the ethics committee of the International Academy of Medical Sexology on 27 February 2020. Male participants signed the informed consent form to take part in the research.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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