

TITLE: Quality of Life in a community sample of young cocaine and/or heroin users: the role of mental disorders

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Abstract

Purpose Drug addiction and psychiatric disorders are frequently concomitant; however, few studies have investigated the impact of psychiatric disorders other than substance use disorder (SUD) on Health-Related Quality of Life (HRQoL) in drug users not in treatment. We studied the association of psychiatric disorders other than SUD with HRQoL in a street-recruited sample of cocaine and/or heroin users.

Methods Cross-sectional study in 287 young users of cocaine and/or heroin in Barcelona, Spain. HRQoL was assessed with the Nottingham Health Profile (NHP). Patterns of drug use and mental disorders were assessed using the Spanish version of the Psychiatric Research Interview for Substance and Mental Disorders-IV (PRISM); and degree of dependence through the Severity of Dependence Scale (SDS). The association of mental disorders with HRQoL was assessed through a Tobit regression analysis.

Results The overall NHP score was 23.9 (SD=20.5, range 0 to 91.7). Sixty-one percent of the sample had two or more SUDs; 22% had at least one non-SUD Axis I disorder (anxiety, mood, psychotic or eating disorder) and 27.2% had a Borderline Personality Disorder (BPD) and/or Antisocial Personality Disorder. Variables negatively associated with the global NHP score were psychosis (transformed beta coefficient: 15.23; 95% Confidence Interval [CI]:4.48-25.97), BPD (9.55; 95%CI:2.95-16.15), severity of dependence (8.12; 95%CI:3.37-12.87), having two or more SUDs (for two or three SUDs: 6.83; 95%CI:2.08-11.59) (>3 SUDs: 7.70; 95%CI:1.72-13.68) and the intravenous use of some substance (10.20; 95%CI:6.00-14.40).

Conclusions HRQoL among street-recruited illegal substance users was impaired, particularly among those with psychiatric comorbidity, psychosis and Borderline Personality Disorder being especially relevant.

Keywords Quality of Life, Borderline Personality Disorder, Psychotic disorders, Substance Use Disorder, illicit drug users, PRISM.

Introduction

Despite the changing trends in illegal drug use, heroin and cocaine are still a major public health issue in Europe. Cocaine is the most used illegal stimulant among the young general population (15-34 years), while heroin is still responsible for most of the morbidity and mortality related to drug use [1].

Health-Related Quality of Life (HRQoL) has been of great interest in drug dependence where it has been used as an impact indicator of therapeutic strategies in harm reduction programs [2-4], to compare quality of life between drug users and other study populations [5,6], or simply analyzed in terms of the characteristics of study subjects [7-9]. It has recently been suggested that it may be used as an outcome measure in drug use therapeutic studies [10]. Furthermore, some studies evaluating psychiatric disorders have reported impaired HRQoL in patients with mood, anxiety or personality disorders [11-13]; other studies have reported that HRQoL improves after remission of these disorders [14,15].

Psychiatric comorbidity (also called dual diagnosis) is the simultaneous occurrence of a Substance Use Disorder (SUD) in a person with at least one other non-SUD psychiatric diagnosis. This comorbidity is very common and has serious clinical, prognostic and therapeutic consequences [16-20]. Drug users with psychiatric comorbidity develop more medical (e.g.: Human Immunodeficiency Virus (HIV) infection, Hepatitis), and psychosocial problems and have poorer prognosis than those without it [21-23]. It also increases the use of health care services, especially emergency services [24-26].

While HRQoL has been studied widely in drug users in the general population; there are very few studies on self-perceived HRQoL among illegal drug users with psychiatric comorbidity and most of them have been carried out on drug users seeking treatment, and yielded inconsistent results [27-29]. The ITINERE project studying illegal drug users in the community found a negative effect on HRQoL of receiving psychiatric treatment, as an indirect way of assessing the influence of psychiatric comorbidity in these subjects [30,31]. In a subsample of the ITINERE project it was possible to identify psychiatric disorders but HRQoL was not studied at that point [32,33]. Thus, the aim of this study was to identify the impact on HRQoL of mental disorders other than SUD in a street-recruited sample of cocaine and/or heroin users. The hypothesis was that subjects with psychiatric disorders would have a worse HRQoL.

METHOD

Subjects

The participants are a subsample of the ITINERE cohort of regular cocaine and heroin users in Barcelona, recruited between 2001 and 2006 outside health care services [34,35]. Participants were recruited using respondent-driven sampling [36] with different starting points mainly at outdoor scenarios. After the acceptance of the informed consent, an initial interview was conducted to collect data on socio-demographic, HRQoL, social conflict and use patterns for different psychoactive substances through a face to face interview in which the interviewer read out the questions from a computer screen; a dried blood spot was also collected. Overall 62% of the heroin and cocaine users were randomly selected for a second interview to assess their mental health, which took place in the following 30 days [32,33].

Participants had to meet the following requirements regarding cocaine and/or heroin use [34,35]: a) Aged between 18 and 30 years and having been living in Barcelona for at least 6 of the last 12 months. b) Using heroin or cocaine regularly (heroin sub-cohort: at least 12 days in the last 12 months; cocaine sub-cohort: at least 52 days of cocaine use in the last 12 months, with no more than 12 days of heroin use in that period (to exclude regular heroin users), and c) they used cocaine or heroin at least once in the last 3 months prior to the interview. Participants not fluent in Spanish or likely to move to a different city within the next two years were excluded.

Variables

The independent variables were:

- 1) Socio-demographic: gender, age, educational level, employment status, type of accommodation, marital status, admission to prison.
- 2) Substance use: administration route, age of onset of cocaine or heroin use, their levels of heroin and cocaine dependence according to the Severity of Dependence Scale.
- 3) Mental disorders: Substance Use Disorders (SUD) (including abuse and dependence disorders), non-SUD Axis I (including mood, anxiety, psychotic and eating disorders) and Axis II (Borderline Personality Disorder (BPD) and Antisocial Personality Disorder (APD)) psychiatric disorders. Also psychiatric and substance use treatment were considered.
- 4) Presence of major health problems potentially affecting HRQoL (i.e.: pneumonia, tuberculosis, angina or myocardial infarction, endocarditis, stroke, hepatitis C and acquired

immunodeficiency syndrome), was found after the evaluation of 17 medical conditions common among drug users and summarized as a single variable. Serological status for Hepatitis B, C and HIV obtained from a dried blood spot test were also considered among health variables.

All variables were studied in the last 12 months, except for personality disorders, which were considered throughout life.

Measures

Nottingham Health Profile (NHP). HRQoL was assessed using the Spanish version of the NHP [37]. This is a multidimensional questionnaire on health status that has been previously used in drug use studies [4]. It contains 38 items divided into six health dimensions: energy, pain, sleep, social isolation, emotional reactions, and physical mobility. The score is calculated for each dimension in a range from 0 (best) to 100 (worst). The questionnaire also allows a global score with the same range. This global score was calculated as the mean of the 6 dimension scores.

Psychiatric Research Interview for Substance and Mental Disorders (PRISM). For the assessment of mental disorders, SUD and non-SUD, we used the Spanish version of PRISM [38]. The PRISM is a semi-structured clinical interview designed to assess psychiatric disorders according to DSM-IV criteria in drug user subjects, allowing distinction between last 12 months and previous disorders. This interview makes it possible to differentiate primary mental disorders from substance-induced disorders and the expected effects of intoxication and withdrawal. PRISM only assesses two axis II psychiatric disorders: Antisocial Personality Disorder and Borderline Personality Disorder [39].

Severity Dependence Scale (SDS). The severity of cocaine and heroin dependence were evaluated with the Spanish version of SDS [40,41] which measures the psychological components of dependence for a specific substance. It consists of five items coded using a Likert scale with scores ranging from 0-3. Thus the total score ranges from 0 to 15, where higher scores express greater severity. For the statistical analyses, the highest SDS total score obtained for cocaine or heroin by every subject was used, thus taking into account the most severe dependence.

Data Analyses

A bivariate analysis was performed to identify the relationship of the global NHP score with the different variables. The statistical significance of differences between qualitative variables was assessed with Chi-

square and Fisher's exact tests, and Mann-Whitney U and Kruskal-Wallis tests were used for quantitative variables. Significance was set at two-tailed p value <0.05.

For the multiple regression analysis, it was important to take into account the influence of the non-normal distribution of the NHP total score. Since there was a high percentage of "ceiling effect" (value 0=10.8%) a Tobit regression model was built [42,43]. With this model, the zero values of the NHP score can be considered censored data, and NHP score is then considered a latent variable. To build the model all the variables with $p < 0.20$ in the bivariate analysis were included and those variables with high p-value were progressively eliminated using the Backward-Step process. Age as a continuous variable and gender were included as adjusting variables in all models. BPD and APD were included as separate variables. As several non-SUD Axis I psychiatric disorders could coexist in the same individual, the overall non-SUD Axis I variable was explored first, then each disorder category was analyzed, and the final model was decided according to the largest decrease in deviance. Model coefficients for the latent variable were estimated using the maximum likelihood method. These estimates were then transformed into estimates of the observed NHP score [44]. The statistical analysis was performed using SPSS version 19 [45] and Tobit regression with R version 2.15 [46].

Additionally, to quantify the impact that variables included in the model had on the HRQoL, Effect Sizes (ES) based on Cohen's d were obtained by calculating the differences in NHP scores between the variables' categories divided by the pooled Standard Deviation. Three levels were considered: small ($ES=0.2$ to <0.5), moderate ($ES \geq 0.5$ to <0.8) and large ($ES \geq 0.8$) [47]. For the subsequent calculation of SDS' effect size, a cut-off point of three was established as this was a graphical turning point for global NHP score means at each category, and consistent with previous results examining cut-off points for dependence [48].

RESULTS

The study sample included 287 regular drug users of cocaine and/or heroin from Barcelona, 48% of them coming from the cocaine subcohort.

From the total, 186 were men (64.8%) and the mean age was 24.3 years (Standard Deviation [SD] 3.42). The majority (78%) had completed secondary education or higher (Table 1). Most of the time during the past 12 months, 46% were working or studying and 33.1% had no stable home; 19.2% were married or with a partner; and 4.9% had been in jail at least one day within this period. The prevalence of major health problems was 7.2%. Positive serology to HIV, Hepatitis C and B infection was obtained for 11.9%, 34.4% and 9.3% of subjects, respectively.

Men were significantly older (24.9 years) than women (23.4 years). In addition, a higher proportion of women had secondary education (85.1%) than men (74.2%), more women were married or with a partner (32.7% vs 11.8%), while hepatitis C infection was more common in men (39.2%) than women (25.5%). No significant gender differences were found in other variables, either socio-demographic or medical.

In the last 12 months prior to the interview, 59.1% used cocaine between 1 and 2 days or less often per week, while heroin was used 3 days or more a week by 37% of participants. For the majority (84.6%), the most frequently consumed type of cocaine was hydrochloride (powder) and over half (57.4%) of the sample usually sniffed it. The earlier mean age of onset of cocaine or heroin use was 16.4 years (SD=2.30). Regarding severity, 74.9% of the sample had an SDS score for cocaine or heroin greater than or equal to three. Almost all used other substances apart from cocaine or heroin, such as cannabis (95.5%) and ecstasy (74.5%).

According to the PRISM, in the last 12 months prior to the interview, 57.8% had at least one cocaine use disorder (abuse: 43.6%, dependence: 47.7%) and 43.6% a heroin use disorder (abuse: 38.7%, dependence: 41.1%). More than half (61%) of the study participants had two or more SUDs. Twenty-two percent of the subjects had at least one non-SUD Axis I disorder, regarding Axis II, 27.2% had either a BPD or APD, both disorders were present in 8.7% of individuals. The most common non-SUD psychiatric disorders were APD (22.6%) and BPD (13.2%), followed by mood (10.1%) and anxiety (9.4%) disorders. During the last year 28% of the participants reported some type of treatment, either psychiatric or for substance abuse/dependence. Women were more likely to have a non-SUD Axis I disorder (29.7% vs

17.7% in men), mainly explained by their higher prevalence of mood disorders (15.8% vs 7% in men). The distributions of APD and BPD also differed by gender.

Health-Related Quality of Life

The total NHP mean score was 23.9 (SD=20.5, range 0 to 91.7). The mean scores of the six domains of NHP and total are shown in Figure 1. NHP mean scores were similar between men and women, both for the total score and the different dimensions.

Global NHP mean score by socio-demographic variables and medical conditions are shown in table 1. All factors showed significant differences in terms of the global NHP except for gender, age and marital status. All factors related to substance use and mental disorders, including treatment for any of them, showed significant differences, including both APD and BPD, separately (Table 2). Among non-SUD Axis I disorders grouped by diagnosis classes only subjects with mood disorder and psychosis showed significant differences in NHP global score compared to subjects without them.

In the Tobit regression controlled by age and gender, we found that the variables with a negative impact on the global NHP score were psychosis, BPD, severity of dependence, having two or more SUDs, and the intravenous use of some substance. The effect size was large in all variables.

DISCUSSION

HRQoL in young cocaine and/or heroin users recruited in the street was impaired by the presence of a psychosis, BPD, the number of SUD, their severity of dependence on heroin or cocaine, or the intravenous use of some substance in the previous 12 months. Furthermore, NHP mean scores were worse than those in the Barcelona general population aged 41-49 years [49] (Figure 1). All dimensions were affected, physical mobility and pain being the least impaired, probably in relation to younger age and opiate use, respectively.

The impact of psychiatric comorbidity on HRQoL has mainly been studied in drug users seeking treatment, finding HRQoL impaired when comorbidity was present [28,29]. However, some studies in drug users in treatment did not find any HRQoL differences in the presence of psychiatric comorbidity [27]. Comparisons between studies may be difficult due to research conducted in dissimilar populations or measuring mental disorders and HRQoL with different instruments. Our paper examines this aspect in a street-recruited sample of illegal drug users, including drug users that other studies conducted in health care facilities might overlook. This does not mean that the results in this drug user population can be extrapolated to all cocaine or heroin users, but it may represent, to some extent, a type of drug use closer to that of individuals who do not usually enter treatment. The study used the PRISM [38] for assessing psychiatric disorders, as in the study of Astals et al [27] among heroin users in treatment, where HRQoL was assessed using SF-12 [50], and no relation of HRQoL with psychiatric comorbidity was found; the most frequent current non-SUD Axis I were anxiety disorders (14.3%) followed of mood disorders (7.4%), very similar to our figures.

In our study, besides analyzing non-SUD Axis I disorders as a whole, we explored whether specific disorders had an out-standing role, and found that psychosis alone explained a higher proportion of the HRQoL variance. This can be considered a new contribution to the study of HRQoL among drug using populations as the role of each psychiatric disorder in its impairment is less well known.

Psychotic disorders, albeit less frequent (4.2%), showed the greatest impact on HRQoL. Although HRQoL in patients with schizophrenia has been studied, we have not found any other study exploring HRQoL of substance users with psychosis to compare with. Poorer HRQoL among subjects with a psychotic disorder might be explained, among other aspects, by poor long-term prognosis in these subjects [51], decreased adherence to treatment [52], and more mental illness relapses [53]. Unfortunately

we do not have information about positive and negative psychotic symptoms in these subjects, but the literature points to positive symptoms being relevant for disease onset while negative symptoms are more present in advanced disease [54].

The prevalence of BPD was lower than in other studies in intravenous drug users [55]; but BPD had a high impact on HRQoL, more than SUD and intravenous use. This finding highlights the importance of BPD in the deterioration of HRQoL, in accordance with a study of drug injectors in treatment [55]. Moreover, both BPD and APD have been found to contribute to the persistence of SUD [19], which translates into higher socio-economic costs and greater use of health services compared with other mental disorders [56,57].

The importance of severe psychiatric disorders like psychosis or BPD, together with the presence of SUD in the reported HRQoL precluded a significant contribution in the statistical model of other variables that were relevant in the bivariate analysis, like psychiatric treatment in the last 12 months or some socio-demographic ones like employment status, educational level or type of accommodation, that were found relevant in other studies [58].

The fact that this is a cross-sectional study poses some limitations when determining the relationships between factors that could be directly related to a poorer HRQoL. Furthermore, self-reported information could involve lower quality in the results; however, previous studies have shown that guaranteeing confidentiality and anonymity of the information provided maximizes the accuracy of the participants' answers. Thus the data obtained tend to be valid and reliable [59]. Another limitation may be related to the relatively small number of subjects in the study, as it precluded an in depth analysis of cases that could be comorbid with other Axis I and II disorders.

CONCLUSION

Mental disorders, especially psychotic disorders, BPD and SUD, had the greatest impact on HRQoL of cocaine and/or heroin users recruited from the community, and may indicate a poorer mental health status of community drug users than what might be expected. These findings highlight the importance of interventions aimed at the examination and treatment of psychiatric disorders, especially psychotic and personality disorders among drug users.

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Ethical statements

The study was approved by the institution ethics committee and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All persons gave their informed consent prior to their inclusion in the study.

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Figure 1. Dimensions of Nottingham Health Profile (NHP) and Global score, compared to the general population profile[49]

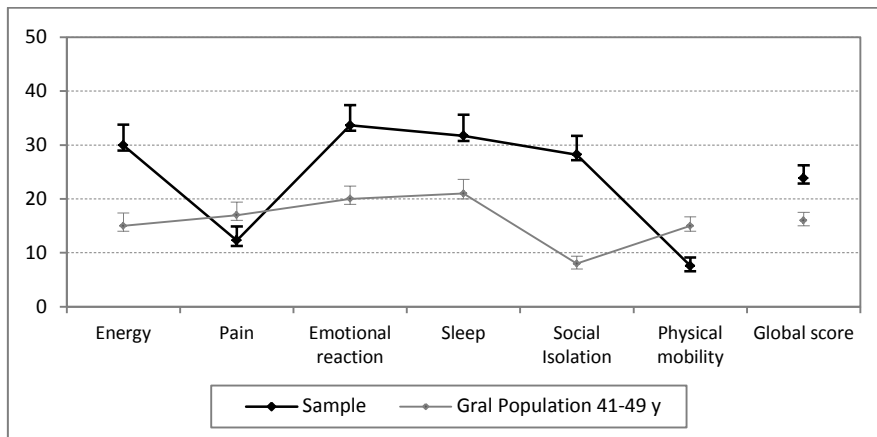


Table 1. Global mean Nottingham Health Profile score in terms of socio-demographic and medical variables

	<i>N (%)</i>		<i>Mean(SD)^d</i>		<i>p value</i>
Gender					0.177
Male	186	(64.8)	23.1	(21.1)	
Female	101	(35.2)	25.3	(19.5)	
Age (years)					0.058
<25	146	(50.9)	21.4	(18.9)	
≥25	141	(49.1)	26.4	(21.8)	
Educational level					<0.001
≤Primary level	63	(22.0)	34.2	(23.4)	
≥Secondary level	224	(78.0)	20.9	(18.6)	
Employment status ^a					<0.001
Working or studying	132	(46.0)	17.7	(17.6)	
Unemployed or disabled	155	(54.0)	29.1	(21.4)	
Type of accomodation ^a					0.031
House or flat	192	(66.9)	22.5	(20.6)	
Homeless ^b	95	(33.1)	26.6	(20.1)	
Marital status ^a					0.072
Never married	221	(77.0)	22.7	(20.3)	
Married or with partner	55	(19.2)	26.5	(21.2)	
Divorced or separate	11	(3.8)	33.3	(18.5)	
History of prison (admission) ^a					0.072
No	273	(95.1)	23.3	(20.2)	
Yes	14	(4.9)	33.8	(24.0)	
Major health problems ^c					0.018
No	259	(92.8)	23.3	(20.3)	
Yes	20	(7.2)	34.5	(22.7)	
Infections serological status					0.001
HIV infection					
No	238	(88.1)	23.0	(20.5)	
Yes	32	(11.9)	35.3	(19.8)	
Hepatitis C Infection					<0.001
No	177	(65.6)	18.4	(17.7)	
Yes	93	(34.4)	36.0	(21.3)	
Hepatitis B Infection					0.018
No	244	(90.7)	23.6	(20.4)	
Yes	25	(9.3)	33.8	(22.6)	

^aIn the last 12 months.

^bLiving most of the time in the last 12 months on the street, in abandoned houses or in similar places. ^cPneumonia, tuberculosis, angina or myocardial infarction, endocarditis, stroke, hepatitis C and AIDS.

^dSD: Standard Deviation.

Table 2. Mean Nottingham Health Profile global score in terms of substance use, mental disorders and treatment variables

	<i>N (%)</i>	<i>Mean(SD)^f</i>	<i>p value</i>
<i>Substance use</i>			
Intravenous drug use ^a			<0.001
No	157 (54.9)	15.2 (15.6)	
Yes	129 (45.1)	34.4 (20.9)	
Number of SUD ^{a,b}			<0.001
None	57 (19.9)	10.6 (10.5)	
One	54 (18.8)	23.0 (19.6)	
Two or three	139 (48.4)	27.4 (21.5)	
Four or more	37 (12.9)	32.2 (21.0)	
Age of onset ^c			0.005
<15 years	45 (15.7)	30.5 (19.6)	
15-16 years	119 (41.5)	24.9 (21.4)	
17-18 years	76 (26.5)	21.9 (20.2)	
>18 years	47 (16.4)	17.9 (17.9)	
Severity Dependence Scale \geq 3 ^c			<0.001
No	70 (25.1)	9.8 (13.5)	
Yes	209 (74.9)	29.1 (20.3)	
<i>Mental disorders</i>			
Any non-SUD(Axis I)			<0.001
No	224 (78.0)	21.2 (19.5)	
Yes	63 (22.0)	33.4 (21.4)	
Mood	29 (10.1)	33.8 (20.7)	0.004
Anxiety	27 (9.4)	28.3 (20.2)	0.174
Psychosis	12 (4.2)	46.2 (23.1)	0.001
Eating	3 (1.0)	32.0 (26.7)	0.527
Any non-SUD(Axis II)			<0.001
No	209 (72.8)	19.6 (18.9)	
Yes	78 (27.2)	35.2 (20.3)	
APD ^d	65 (22.6)	33.9 (19.6)	<0.001
BPD ^e	38 (13.2)	40.9 (21.1)	<0.001
Treatment (drugs or psychiatric) ^a			<0.001
None	207 (72.1)	20.6 (18.7)	
Only for drug problems	61 (21.3)	33.4 (21.6)	
Psychiatric (may include drugs)	19 (6.6)	28.9 (25.9)	

^aIn the last 12 months. ^bSUD: Substance Use Disorder. ^cRefers to cocaine or heroin use.

^dAPD: Antisocial Personality Disorder. ^eBPD: Borderline Personality Disorder. ^fSD: Standard Deviation.

Table 3. Tobit regression analysis^a. Factors associated to Nottingham Health Profile global score

	<i>Coeff. Transformed</i>	<i>(95% CI^c)</i>	<i>p value</i>	<i>Effect Size</i>
Gender	3.66	(-0.38;7.69)	0.072	0.11
Age	0.30	(-0.25;0.85)	0.296	0.25
Intravenous use ^b	10.20	(6.00; 14.40)	<0.001	1.06
Number of Substance Use Disorders ^b				
One	4.15	(-1.58; 9.88)	0.194	0.83
Two or Three	6.83	(2.08; 11.59)	0.013	0.92
Four or more	7.70	(1.72; 13.68)	0.034	1.48
Severity of Dependence Scale	8.12	(3.37; 12.87)	0.002	1.04
Psychotic disorder	15.23	(4.48; 25.97)	0.001	1.17
Borderline Personality Disorder	9.55	(2.95; 16.15)	0.001	1.00

^a N=278 due to values missing in some variables.

^b In the last 12 months.

^c CI: Confidence Interval.