

Measuring the Impact of Psychoactive Substance on Health-Related Quality of Life: An Update

Francisco González-Saiz^{*,1}, Oscar Lozano Rojas^{1,2} and Ioseba Iraurgi Castillo³

¹Fundación Andaluza para la Atención e Incorporación Social (FADAIS), Junta de Andalucía, Sevilla, EU, Spain

²Departamento de Psicología, Universidad de Huelva, EU, Spain

³Unidad de Asistencia Psicosocial de Rekalde, Bilbao, País Vasco, EU, Spain

Abstract: *Background:* The number of publications dealing with measurement of the quality of life and health in the area of drug dependence has increased in recent years. Its main application is as an indicator of the effectiveness of intervention in harm reduction, although there are also comparative and methodological studies.

Data Sources and Study Selection: The literature was reviewed to identify studies on abuse or substance dependence and HRQoL. The bibliographic sources used for the review are PubMed, EMBASE, CINAHL and PsycInfo. Additional articles were identified from references to relevant articles.

Results: 111 articles were identified. The HRQoL of people who abuse or are dependent on substances is lower than the general population. The presence of physical and psychiatric comorbidity also affects patients dependent on opiates, and substitution programs improve HRQoL.

Conclusion: The measurement of HRQoL in the area of drug dependence is a suitable complement for finding out the deterioration caused by substance use, abuse or dependence. It is also a useful indicator for evaluating therapeutic results in this population.

INTRODUCTION

Drug and alcohol abuse currently represent one of the main concerns of public health experts. The National Survey on Drug Use and Health (2006) shows that abusive drinkers of alcohol make up 50.9% of the American population over 12 years of age, the prevalence of marijuana use the month before makes up 14.8%, cocaine use of 2.4%, and other substances such as crack or heroin are used by 0.7% and 0.3% respectively [1]. In Europe, the data published by the European Monitoring Centre for Drugs and Drug Addiction are no more positive, showing an estimated prevalence of cannabis use during the month before of around 4%, and 1% the year before for cocaine, and it is estimated that from 1 to 8 cases per 1000 inhabitants have problems derived from opiate use [2].

The drug and alcohol abuse has clear consequences for personal health. Usually, deterioration is gradual and caused by their continuous use, although acute intoxication can bring on health problems. In this context, the study of health-related quality of life (HRQoL) of drug abusers allows us to find out their perception of their physical, psychological and social health.

The measurement of this construct is widely used in the area of health as demonstrated by its use in medical, psychological and social research, which has been on the rise in recent decades [3]. Although there are different operative definitions of the health-related quality of life concept, most

authors consider it a subjective perception of the patient's level of physical, emotional and social functioning and well-being, as well as its repercussion on his daily life [4].

It has a variety of applications, and is used in studies of effectiveness, for clinical decision-making, monitoring population health, etc. [5].

In drug addiction, measurement of the HRQoL has been applied only for a relatively short time. Among the first publications on this construct is the one by Reno and Aiken [6]. These authors report that measurement of aspects of daily life is a suitable complement to classic indicators related to drug abuse, crime and employment in the evaluation of harm reduction programs.

Since then, this construct has been applied for different purposes and on a diversity of samples in the area of drug addiction. The purpose of this article is to review the literature on HRQoL measurement in drug-dependent populations and evaluate the impact of substance abuse and related problems on the HRQoL.

METHODOLOGY

The literature was reviewed to identify drug misuse and abuse studies in which the HRQoL is measured. The bibliographic databases consulted in the search were Medline, CINAHL, EMBASE and PsycInfo, without time restrictions. The search was concluded on July 30, 2007.

The search strategy began by entering the following terms along with HRQoL: "dependence", "addiction", "drug abuse", "alcohol", "heroin", "cocaine", "cannabis". These terms were also entered in Spanish to identify articles written in this language indexed in the bibliographic databases. Given the scant number of articles that appeared, it was

*Address correspondence to this author at the Fundación Andaluza para la Atención e Incorporación Social, Conjunto Residencial Las Góndolas, Local 10, Portal C, Manzana 4 (Sevilla-Este), 41020, Sevilla, Spain; Tel: +34954712610; Fax: +34954712619; E-mail: pacogonzalez@comcadiz.com

decided to accompany the above terms by *quality of life – QoL*.

The titles and abstracts in this first set of articles were reviewed to select only those articles in which HRQoL was a variable in the study. The bibliographic references mentioned in the articles selected in this first stage were also reviewed. Another group of articles was found in this way, including only those in which HRQoL was a study variable.

Finally, articles in which the HRQoL had not been measured with a generic or specific instrument were excluded, although it was decided to include articles on theory. Articles on HRQoL and tobacco and the medical use of psychoactive substances not related to substance misuse and abuse (for example, studies on cannabis in cancer patients) were also excluded.

We use the generic concept “drug use” when use of psychoactive substances is mentioned without specifying whether the subjects comply with diagnostic criteria of abuse (or harmful use) or dependence of DSM-IV or CIE-10 in the articles reviewed. The term “drug abuse” is used when the subjects were diagnosed for abuse or dependence (or harmful use) of substances according to DSM-IV or CIE-10 criteria.

A total of 111 articles were selected in this review after applying the abovementioned criteria. Of them, in 33.3% (37 articles) HRQoL was studied for alcohol consumption, in 23.4% (26 articles) HRQoL was studied in opiate abusers, 2.7% (3 articles) were on cocaine consumers and another 2.7% were on benzodiazepine consumers. In the remaining percentage of articles (37.9%), the sample is made up of multi-users, or the study mentions that they are patients in treatment for addiction, or persons with problems of substance abuse or addiction.

RESULTS

HRQoL: Measurement in the Area of Drug Addiction

HRQoL in the area of drug addiction has been measured with both generic and specific instruments. The generic instruments are characterized by their content not being adapted to any specific health problem. On the other hand, they are sufficiently versatile to be applied to samples of patients with different affections. They are therefore useful when the purpose of the study is to compare the HRQoL of psychoactive substance users with other groups of patients or with the general reference population.

These tests are widely used in other areas and the metric properties have been studied on a diversity of samples. However, this support does not exempt them from checking for each application, since, as pointed out by the APA standards, the metric properties must be analyzed for the population under study and for the purposes proposed [7]. More so, considering that the main handicap of this type of instrument is that it may not discriminate adequately. Nevertheless, the lack of psychometric information on these tests is a constant in the specialized literature on drug addiction. Of the instruments used with psychoactive substance users, there have been favorable reports on the reliability and validity of SF-36 [8, 9], WHOQOL-BREF [10], EQ-5D [11] and the Quality of Life Interview Brief Version -QOLI-BV- [12].

The distinctive characteristic of instruments specific to HRQoL is that their content is adapted to the population subject of the study, and therefore, this type of instrument is attributed greater sensitivity in detecting changes in the HRQoL. This makes them a likely instrument for studying efficacy and effectiveness, although not for comparing with other samples of subjects. In the area of drug addiction, the specialized literature reviewed shows that at the present time there are three specific instruments: IDUQOL, ALQoL and HRQoLDA.

The Injection Drug User Quality of Life Scale – IDUQoL- [13] was conceptualized to be grounded in the life experience of injection drug users, and to be responsive to changes in their life conditions. Its content was defined based on review of the specialized literature and by group discussion with persons with substance abuse and addiction problems. This instrument was the subject of several psychometric studies. Brogly *et al.* [13] report a test-retest reliability of 0.74. The same authors provide evidence of validity converging with Flanagan’s quality of life scale [14], and a negative association with the use of injection in the month before and the need for emergency attention during the previous six months. Later, Hubley, Russel and Palepu [15] provide new psychometric evidence for this scale. In their study, they find an α reliability coefficient of 0.88 and a test-retest coefficient of 0.78. Among the validity evidence, they present an analysis based on internal structure that shows the one-dimensionality of the scale, while validity evidence based on its relationship with other variables shows its relationship with heroin and speed and an overdose in the last six months. They also find moderate correlations with the Satisfaction with Life and with Rosenberg’s Self-Esteem Scale. This instrument has a Spanish version adapted by Morales-Manrique *et al.* [16], for which they find a Cronbach’ α reliability of 0.86 and test-retest reliability of 0.79. Among the validity evidence based on relationships with other variables, they provide significant relationships with the type of residence (stable-unstable), sharing needles, daily heroin use, daily crack use, cocaine use, having taken an overdose, needing emergency attention and having been hospitalized.

The ALQoL 9 [17] is an adaptation of the SF-36 designed for alcohol-dependent patients. This scale includes an item for each one of the SF-36 dimensions, except for mental health, which has two items. The authors find a Cronbach’ α reliability coefficient of 0.85 in a sample of outpatients and 0.71 for inpatients. The intraclass coefficient correlation (ICC) varied from 0.57 to 0.78 for all of the items. With regard to validity evidence, the authors report that the scale has a one-dimensional structure.

The purpose of the Health Related Quality of Life for Drug Abusers Test (HRQoLDA Test) [18] is to assess how addiction to psychoactives substances affects a person’s daily life by evaluating physical/psychological health and social functioning. It is a quality of life instrument specific to drug users and is based on the bi-axial concept of addiction of Edwards and Gross [19]. According to this concept, addiction is defined by two axes, one substance “dependence” itself, and the other “problems” (medical, psychological and social) that results from substance use. The HRQoLDA is a self-test of 22 items coded on a 5-point Lickert-type scale.

Low scores on this scale show worse quality of life and high scores show higher quality of life. It was constructed from specialized literature and expert opinion. Reliability shows an alpha coefficient between 0.79 and 0.87 in samples of users of different drugs, and a two-half reliability of 0.86. Validity evidence shows that this instrument is sensitive to change after treatment [20], and relationships with the OTI health scale, the GHQ-28 psychological adjustment scale, addiction measured by the SCAN and with opiate, cocaine and cannabis use [21].

HRQoL and its Relationship to Pattern of Substance Use

The psychoactive substance use can have different patterns, some forms of use being more related than others to the deterioration of the HRQoL. The evidence available to now is still scarce, and more research on how the various patterns of abuse impact on the HRQoL is still necessary. Up to now, the most consistent evidence shows that the HRQoL is negatively affected by frequency of consumption, whether alcohol [22-26], cocaine/crack [16, 21, 27] or heroin [15, 21]. There are also studies providing evidence that injection also causes deterioration of the HRQoL [13, 15, 16].

In addition to the above, new evidence is necessary on whether other variables, such as the amount used, years since consumption began, etc. associated with the use pattern are related to the HRQoL.

HRQoL: Drug Use and Medical Comorbidity

Studies with drug abusers were included in the bibliographic search regardless of whether there was comorbidity with other health problems. This criterion allowed us to identify the relatively frequent appearance of studies that compare the HRQoL of drug users with those of other users who also suffer from other health problems. Two groups of studies could be distinguished: a) those that analyze the HRQoL in drug users and who also have other infectious diseases, and b) those on drug users that have other psychiatric problems.

Studies on the first group concentrated mainly on comorbidity between substance abuse or dependence and HIV and HVC. In general, drug abusers infected by HIV have a more deteriorated HRQoL than drug abusers not infected by this virus. Rosenbloom *et al.* [27] find that alcohol + HIV patients had lower HRQoL and more psychiatric comorbidities compared with patients with only HIV or those with only alcohol dependence or abuse. Vaarwerk and Gaal [28] compare a group of HIV+ hard-drug-using women with another HIV+ non-drug-using group, and conclude that HIV+ women who take drugs have a worse HRQoL than those who do not. A study by Wisniewski *et al.* [29] analyzes the HRQoL by sex and the use of injection and finds that being an HIV+ woman is a more determining HRQoL factor than injection.

The studies analyzed show that the presence of HVC has a negative repercussion on the HRQoL, although this disease is not a determining factor, as drug consumption is more influential. Constenbader *et al.* [30] points out that the HRQoL of drug users with HVC+ is more deteriorated than drug users with HVC-. However, these authors found in a multiple regression analysis and that drug and alcohol abuse is related to HRQoL, even without having HVC. Gjeruldsen

et al. [31] come to a similar conclusion, finding that patients with hepatitis C have a worse HRQoL than their population reference group, although this deterioration is not explained only by HVC. Drug use is also related to HRQoL deterioration. Dalgard *et al.* [32] compared a sample of injectors with HVC and another without the virus. They found that the HRQoL is considerably more deteriorated in injectors than in the population. However, they did not find worse HRQoL in injectors with VHC than injectors without the infection, so they concluded that infection with HVC *per se* does not negatively affect HRQoL of active injectors.

HRQoL: Drug Use and Psychiatric Comorbidity

There is such a diversity of studies in the specialized literature interested in the analysis of HRQoL and psychiatric comorbidity that no clear conclusion could be reached. Of research done with psychiatric patients in general, some point out that persons with comorbidity have a more deteriorated HRQoL than drug abusers alone [33, 34]. However Garg *et al.* [35] did not find this relationship, and only found worse scores of comorbid patients in the SF-36 vitality dimension.

With respect to Axis I disorders, after monitoring the effects of variables such as sex, time the psychosis went untreated and adherence to treatment, Wade *et al.* [36] found in a sample of young people (15-30 years of age) with a first psychotic episode, that substance abuse disorder is not associated with a worse HRQoL. In the study by Ouimette *et al.* [37], they report that patients with post-traumatic stress disorder and substance use disorders had worse scores than persons with only substance abuse in the mental health dimension, although significant differences did not appear in the physical health dimension. Concerning comorbidity between substance abuse and bipolar affective disorder, there are two studies in the specialized literature. Singh *et al.* [38] compare the HRQoL in patients with bipolar affective disorder and substance dependence to patients diagnosed with only one, and a healthy control group. The overall scores were significantly worse in the dual patients than in the rest of the groups. Weiss *et al.* [39] affirm that patients with bipolar disorder and a previous history of substance abuse or current abuse have a worse HRQoL than bipolar patients without substance abuse.

In the review of comorbidity with Axis II disorders, a study by Fassino *et al.* [40] appears. In this one, HRQoL is examined in abusers of opiates with personality disorder, without personality disorder and a control group. The authors find that heroin users with personality disorders have a worse HRQoL than heroin abusers without personality disorder.

HRQoL: Comparison with the General Population and Other Groups of Patients

The comparative studies reviewed consistently find that drug users have a more deteriorated HRQoL than the general population [30, 41-44]. An analysis of published SF-36 studies shows that the widest difference in scores is found in the two subscales that measure emotional and physical role. On the other hand, the subscale where differences from the reference population are smallest is physical functioning.

With regard to other groups, Millson *et al.* [43] report that the HRQoL of opiate users is more deteriorated in all SF-36 dimensions except physical functioning compared to patients who have minor medical problems. On the other hand, when compared with patients with serious medical problems, opiate users have a better HRQoL in physical functioning and physical role, but score worse in pain, vitality, social functioning, emotional role and mental health. Smith and Larson [45] compare the HRQoL using the *Multi-dimensional Index of Quality of Life* (MILQ) in a sample of drug abusers in treatment with patients who had had a cardiovascular operation. These authors find that drug users have a more deteriorated HRQoL than the cardiovascular patients in all of the dimensions except physical functioning and physical health.

HRQoL: Application in Treatment Programs with Opiate Substitutes

HRQoL measurement for evaluation of opiate substitution programs is probably the most outstanding application of this construct in the area of drug addiction, appearing in this review in 20.5% of the articles found. One of the main reasons for this diffusion is that the physical, psychological and social health of patients in these programs is much deteriorated, and is often considered chronic [46]. Therefore, a general health measure such as the HRQoL is a suitable indicator to complement other classic indicators (morbidity, overdose, HIV, employment, etc.), and find out how treatments with opiate substitutes are impacting on the personal situation of these persons [47].

All the methadone maintenance program monitoring studies found in the specialized literature report an improvement in the HRQoL of the patients [48-51]. On the other hand, buprenorphine studies also point out improvements in the HRQoL of these patients, not finding significant differences between them and patients on methadone [52-55]. Perneger *et al.* [56] monitored patients that take heroin intravenously and found that their HRQoL improved in general, especially in the mental health, emotional-role and social functioning dimensions.

DISCUSSION

Drug use and disorder due to abuse or dependence of psychoactive substances is a disease that affects the physical, psychological and social dimension of an individual's health. Therefore, measurement of the HRQoL is a suitable approach for finding the extent to which these disorders deteriorate people's lives.

This contrasts with the relatively small number of articles published in the specialized literature compared with other health problems. However, the number of publications increases every year. This fact, along with the appearance in recent years of the first HRQoL instruments specific to this population may be interpreted as a sign that the research community in this field is showing a greater interest in applying and measuring this construct.

In terms of the results found in this review, there is sufficient empirical evidence to state that use and abuse/dependence disorder is related to deterioration of the HRQoL in persons who have it. Compared to the general population, all of the studies analyzed agree that the HRQoL of persons

with use and abuse or dependence is significantly more deteriorated. Furthermore, it should be emphasized that the most affected dimensions are those linked to role (emotional and physical). This result is logical if you consider the similarities between the role limitations asked about (no longer doing daily activities, taking less time to do them or having difficulty in doing them) and the diagnostic criteria that appear in the DSM-IV classifications [57] and CIE-10 [58]. On the other hand, less deterioration observed in physical functioning compared to the general population is also explainable, since abuse or dependence does not usually involve problems of a person's physical mobility.

Of the studies on physical comorbidity and abuse or dependence disorder, the results indicate that suffering from HIV is another handicap on top of the already deteriorated HRQoL of drug consumers. Concerning HVC, the studies show that infected patients have a worse HRQoL, although it cannot be affirmed that having HVC implicitly involves deterioration of the HRQoL.

With respect to psychiatric comorbidity, the lack of research on persons with the same psychiatric disorders does not allow results found in the bibliographic search to be compared. It should be kept in mind that the nature of different psychiatric disorders involves different manifestations in a person's daily life, so the HRQoL may vary from one disorder to another. This fact, and that in the review different results are given, makes it impossible to determine how psychiatric disorders impact on the HRQoL of persons with substance abuse or dependence disorder.

Studies with patients in opiate substitution programs show that they represent a major portion of the HRQoL studies in the area of drug addiction. In general, these studies provide evidence that treatment with methadone, buprenorphine and heroin improve the HRQoL of patients measured at various intervals. Furthermore, comparative methadone and buprenorphine studies do not show differences in effectiveness between these two pharmaceuticals.

Among the limitations in this study is not having collected articles in which no instrument was used to measure HRQoL. This may have left out articles of interest for finding the relationships between HRQoL and substance abuse or dependence, since the authors understand that the multidiscipline nature of the construct allows it to be inferred from the use of various instruments that together offer a vision of the HRQoL. However, the ambiguity with which the concept of HRQoL is sometimes referred to made us decide on a restrictive criterion. This may have been one of the reasons that no studies relating the use of cannabis with the HRQoL appear in this review. On the other hand, there are articles referring to quality of life (a broader concept than the HRQoL), and studies such as the one by Ventegodt and Merrick [59] or Gruber *et al.* [60], who use general quality of life measurements, appear.

Finally, the authors consider that according to the evidence that is appearing, the measurement of the HRQoL is sufficiently pertinent in its application to the field of drug addiction. In this sense, we argue that this measure should be introduced in research as a complement to traditional outcome indicators.

Key Learning Objectives:

1. Give an overview of current HRQoL applications in drug abuse.
2. Show the types of HRQoL measurement instruments and their application depending on the purpose of the study.
3. Identify factors related to the consumption pattern that impacts on the HRQoL.
4. Describe how comorbidity affects the HRQoL of drug users.

Future Research Directions:

1. Advance in the methodological development of HRQoL instruments for application to persons affected by substance abuse or dependence.
2. Providing more evidence on how the consumption pattern influences the HRQoL.
3. To know, through longitudinal studies, the evolution of HRQoL since the beginning of drug use.

REFERENCES

- [1] Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: National Findings. Rockville, MD 2007.
- [2] Observatorio Europeo de las Drogas y las Toxicomanías. Informe anual 2006. El problema de la drogodependencia en Europa. Luxemburgo: Oficina de Publicaciones Oficiales de las Comunidades Europeas 2006.
- [3] Moons P, Budts W, De Geest S. Critique on the conceptualisation of quality of life: a review and evaluation of different conceptual approaches. *Int J Nurs Stud* 2006; 43: 891-901.
- [4] Bullinger M. Quality of life: definition, conceptualisation and implications: a methodologist's view. *Theor Surg* 1991; 6: 143-8.
- [5] Gilbody SM, House AO, Sheldon T. Routine administration of health-related quality of life (HRQoL) and needs assessment instruments to improve psychological outcome- a systematic review. *Psychol Med* 2002; 32: 1345-56.
- [6] Reno RR, Aiken LS. Life activities and life quality of heroin addicts in and out of methadone treatment. *Int J Addiction* 1993; 28(3): 211-32.
- [7] American Psychological Association, American Educational Research National Council on Measurement in Education. Standards for educational and psychological testing. Washington, DC: American Psychological Association 1999.
- [8] Daepfen JB, Krieg MA, Burnand B, Yersin B. MOS-SF-36 in evaluating health-related quality of life in alcohol-dependent patients. *Am J Drug Alcohol Abuse* 1998; 24(4): 685-94.
- [9] Iraurgi I. A comparative analysis of SF-12 with the SF-36 among patients in methadone treatment. *Adicciones* 2007; 19(1): 59-67.
- [10] Barros da Silva A, Fleck M, Pechansky F, de Boni R, Sukop P. Psychometric properties of the World Health Organization Quality of Life instrument (WHOQoL-BREF) in alcoholic males: A pilot study. *Qual Life Res* 2005; 14(2): 473-8.
- [11] Günther O, Roick C, Angermeyer MC, König HH. The EQ-5D in alcohol dependent patients: relationships among health-related quality of life, psychopathology and social functioning. *Drug Alcohol Depend* 2007; 86(2-3): 253-64.
- [12] Wasserman DA, Sorensen JL, Delucchi KL, Masson CL, Hall SM. Psychometric evaluation of the Quality of Life Interview, Brief Version, in injection drug users. *Psychol Addict Behav* 2006; 20(3): 316-21.
- [13] Brogly S, Mercier C, Bruneau J, Palepu A, Franco E. Towards more effective public health programming for injection drug users: development and evaluation of the injection drug user quality of life scale. *Subst Use Misuse* 2003; 38(7): 965-92.
- [14] Flanagan JC. A research approach to improving our quality of life. *Am Psychol* 1978; 33: 138-47.
- [15] Hubley AM, Russell LB, Palepu A. Injection drug use quality of life scale (IDUQOL): a validation study. *Health Qual Life Outcomes* 2005; 3: 43.
- [16] Morales-Manrique CC, Valderrama-Zurian JC, Castellano-Gomez M, Aleixandre-Benavent R, Palepu A, Cocaine Group. Cross cultural adaptation of the Injection Drug User Quality Of Life Scale (IDUQOL) in Spanish drug dependent population, with or without injectable consumption: Drug User Quality of Life Scale-Spanish (DUQOL-Spanish). *Addict Behav* 2007; 32(9): 1913-21.
- [17] Malet L, Llorca PM, Beringuer B, Leher P, Falissard B. ALQoL 9 for measuring quality of life in alcohol dependence. *Alcohol Alcohol* 2006; 41(2): 181-7.
- [18] Lozano OM. Construcción de un test para medir la calidad de vida relacionada con la salud. Tesis Doctoral. Granada, Universidad de Granada 2005.
- [19] Edwards G, Gross MM. Alcohol dependence: Provisional description of a clinical syndrome. *BMJ* 1976; 1: 1058-61.
- [20] Lozano OM, Rojas AJ, Pérez C, Apraiz B, Sánchez F, Marín A. Test para la evaluación de la calidad de vida en adictos a sustancias psicoactivas (TECVASP): estudios de fiabilidad y validez. *Trastornos Adictivos* 2007; 9(2): 99-109.
- [21] Lozano OM, Rojas A, Pérez C, González-Saiz F, Ballesta R, Bilbao I. Evidencias de validez del test para la evaluación de la calidad de vida en adictos a sustancias psicoactivas (TECVASP) a partir del modelo biaxial de la adicción. *Psicothema* 2008; 20: 317-23.
- [22] Chen CY, Storr CL. Alcohol use and health-related quality of life among youth in Taiwan. *J Adolesc Health* 2006; 39(5): 752. e9-16.
- [23] Okoro CA, Brewer RD, Naimi TS, Moriarty DG, Giles WH, Mokdad AH. Binge drinking and health-related quality of life: do popular perceptions match reality? *Am J Prev Med* 2004; 26(3): 230-3.
- [24] Foster JH, Peters TJ, Marshall EJ. Quality of life measures and outcome in alcohol-dependent men and women. *Alcohol* 2000; 22(1): 45-52.
- [25] Kraemer KL, Maisto SA, Conigliaro J, McNeil M, Gordon AJ, Kelley ME. Decreased alcohol consumption in outpatient drinkers is associated with improved quality of life and fewer alcohol-related consequences. *J Gen Intern Med* 2002; 17(5): 382-6.
- [26] Volk RJ, Cantor SB, Steinbauer JR, Cass AR. Alcohol use disorders, consumption patterns, and health-related quality of life of primary care patients. *Alcohol Clin Exp Res* 1997; 21(5): 899-905.
- [27] Rosenbloom MJ, Sullivan EV, Sassoon SA, et al. Alcoholism, HIV infection, and their comorbidity: factors affecting self-rated health-related quality of life. *J Stud Alcohol Drugs* 2007; 68(1): 115-25.
- [28] Vaarwerk MJ, Gaal EA. Psychological distress and quality of life in drug-using and non-drug-using HIV-infected women. *Eur J Public Health* 2001; 11(1): 109-15.
- [29] Wisniewski AB, Apel S, Selnes OA, Nath A, McArthur JC, Dobs AS. Depressive symptoms, quality of life, and neuropsychological performance in HIV/AIDS: the impact of gender and injection drug use. *J Neurovirol* 2005; 11(2): 138-43.
- [30] Costenbader EC, Zule WA, Coomes CM. The impact of illicit drug use and harmful drinking on quality of life among injection drug users at high risk for hepatitis C infection. *Drug Alcohol Depend* 2007; 89(2-3): 251-8.
- [31] Gjeruldsen S, Loge JH, Myrvang B, Opjordsmoen S. Drug addiction in hepatitis C patients leads to a lower quality of life. *Nord J Psychiatry* 2006; 60(2): 157-61.
- [32] Dalgard O, Egeland A, Skaug K, Vilimas K, Steen T. Health-related quality of life in active injecting drug users with and without chronic hepatitis C virus infection. *Hepatology* 2004; 39(1): 74-80.
- [33] Bizzarri J, Rucci P, Vallotta A, et al. Dual diagnosis and quality of life in patients in treatment for opioid dependence. *Subst Use Misuse* 2005; 40(12): 1765-76.
- [34] Kalman D, Lee A, Chan E, et al. Alcohol dependence, other psychiatric disorders, and health-related quality of life: A replication study in a large random sample of enrollees in the Veterans Health Administration. *Am J Drug Alcohol Abuse* 2004; 30(2): 473-87.
- [35] Garg N, Yates WR, Jones R, Zhou M, Williams S. Effect of gender, treatment site and psychiatric comorbidity on quality of life outcome in substance dependence. *Am J Addict* 1999; 8(1): 44-54.
- [36] Wade D, Harrigan S, McGorry PD, Burgess PM, Whelan G. Impact of severity of substance use disorder on symptomatic and functional outcome in young individuals with first-episode psychosis. *J Clin Psychiatry* 2007; 68(5): 767-74.
- [37] Ouimette P, Goodwin E, Brown PJ. Health and well being of substance use disorder patients with and without posttraumatic stress disorder. *Addict Behav* 2006; 31(8): 1415-23.
- [38] Singh J, Mattoo SK, Sharan P, Basu D. Quality of life and its correlates in patients with dual diagnosis of bipolar affective disorder.

- der and substance dependence. *Bipolar Disorders* 2005; 7(2): 187-9.
- [39] Weiss RD, Ostacher M, Otto MW, *et al.* Does recovery from substance use disorder matter in patients with bipolar disorder? *J Clin Psychiatry* 2005; 66(6): 730-5.
- [40] Fassino S, Daga GA, Delsedime N, Rogna L, Boggio S. Quality of life and personality disorders in heroin abusers. *Drug Alcohol Depend* 2004; 76(1): 73-80.
- [41] O'Brien S, Mattick R, White J, the NEPOD Research Group. Maintenance Pharmacotherapy for opioid dependence and SF-36 health status: A comparison with general population norms and other chronic disorders. *Addict Disord Their Treatment* 2006; 5(4):155-64.
- [42] Neale J. Measuring the health of Scottish drug users. *Health Soc Care Commun* 2004; 12(3): 202-11.
- [43] Millson PE, Challacombe L, Villeneuve PJ, *et al.* Self-perceived health among Canadian opiate users: a comparison to the general population and to other chronic disease populations. *Can J Public Health* 2004; 95(2): 99-103.
- [44] Morgan MY, Landron F, Leher P, for the New European Alcoholism Treatment Study Group. Improvement in quality of life after treatment for alcohol dependence with acamprosate and psychosocial support. *Alcohol Clin Exp Res* 2004; 28(1): 64-7.
- [45] Smith KW, Larson MJ. Quality of life assessments by adult substance abusers receiving publicly funded treatment in Massachusetts. *Am J Drug Alcohol Abuse* 2003; 29(2): 323-35.
- [46] Torrens M, Domingo-Salvany A, Alonso J, Castillo C, San L. Methadone and quality of life. *Lancet* 1999; 353:111.
- [47] Iraurgi I, Casas A, Celorio MJ, Díaz-Sanz M. Calidad de vida relacionada con la salud en usuarios de un programa de metadona. *Revista Española de Drogodependencias* 1999; 24(2): 131-47.
- [48] Padaiga Z, Subata E, Vanagas G. Outpatient methadone maintenance treatment program. Quality of life and health of opioid-dependent persons in Lithuania. *Medicina (Kaunas)* 2007; 43(3): 235-41.
- [49] Villeneuve PJ, Challacombe L, Strike CJ, *et al.* Change in health-related quality of life of opiate users in low-threshold methadone programs. *J Subst Use* 2006; 11(2): 137-49.
- [50] Schwartz RP, Brooner RK, Montoya ID, Currens M, Hayes M. A 12-year follow-up of a methadone medical maintenance program. *Am J Addict* 1999; 8(4): 293-9.
- [51] Torrens M, San L, Martinez A, Castillo C, Domingo-Salvany A, Alonso J. Use of the Nottingham Health Profile for measuring health status of patients in methadone maintenance treatment. *Addiction* 1997; 92(6): 707-16.
- [52] González-Saiz F, Ballesta R, Bilbao I, Lozano OM, Gutiérrez J. Transfer from methadone to buprenorphine in a residential therapeutic community: an addiction-related quality of life assessment. *Heroin Addict Relat Clin Probl*; in press.
- [53] Giacomuzzi S, Kemmler G, Ertl M, Riemer Y. Opioid addicts at admission vs slow-release oral morphine, methadone, and sublingual buprenorphine maintenance treatment participants. *Subst Use Misuse* 2006; 41(2): 223-44.
- [54] Giacomuzzi SM, Ertl M, Kemmler G, Riemer Y, Vigl A. Sublingual buprenorphine and methadone maintenance treatment: a three-year follow-up of quality of life assessment. *ScientificWorldJournal* 2005; 24(5): 452-68.
- [55] Giacomuzzi SM, Riemer Y, Ertl M, *et al.* Buprenorphine versus methadone maintenance treatment in an ambulant setting: a health-related quality of life assessment. *Addiction* 2003; 98(5): 693-702.
- [56] Perneger T, Giner F, del Rio M, Mino A. Randomised trial of heroin maintenance programme for addicts who fail in conventional drug treatments. *BMJ* 1998; 317(7150): 13-8.
- [57] American Psychiatric Association, Manual diagnóstico y estadístico de los trastornos mentales. Barcelona: Masson 1994.
- [58] World Health Organisation. International Statistical Classification of Diseases and Related Health Problems (ICD-10). 1989 Revision. Geneva: World Health Organisation 1992.
- [59] Ventegodt S, Merrick J. Psychoactive drugs and quality of life. *ScientificWorldJournal* 2003; 3: 694-706.
- [60] Gruber AJ, Pope HG, Hudson JI, Yurgelun-Todd D. Attributes of long-term heavy cannabis users: a case-control study. *Psychol Med* 2003; 33(8): 1415-22.