











REVIEW
VERSION 2: PEER REVIEW - APPROVED

Assessment of anxiety in drug-dependent adults institutionalized in rehabilitation centers

Evaluación de la ansiedad en adultos drogodependientes institucionalizados en centros de rehabilitación

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ABSTRACT

Consumption of psychoactive substances has been a controversial issue to world public health due to its harmful effects that go beyond the individual's physical health and affect other areas of their lives such as the social, family-related, academic and work-related spheres. Consequently, as consumption increases, psychological disorders of diverse kinds become evident; anxiety is one of the most prevailing. These problems are more apparent in patients recovering from their addiction since their situation makes them vulnerable. Therefore, this research aims to describe the anxiety levels in drug-dependent adults institutionalized in rehabilitation centers. For this purpose, search engines in PubMed and Scopus were used, using Boolean operators and descriptors in Spanish and English; besides, PRISMA was used to identify and select information. The most significant finds include sex-related differences where women have more prevalence of anxiety than men. Furthermore, these patients' most frequent psychiatric comorbidities include depression, ADHD, antisocial disorder and psychotic disorder. Finally, new non-pharmacological approaches showing promising results have been found to treat anxiety, such as electrical acupuncture, martial arts and physical exercise.

Keywords: Anxiety; Rehabilitation Centers; Substance-related Disorders.

RESUMEN

El consumo de sustancias psicoactivas ha sido un tema controversial para la salud pública mundial debido a sus efectos negativos, que van más allá de la salud física del individuo y afectan a otros ámbitos de su vida, como el social, familiar, académico y laboral. Por consiguiente, a medida que incrementa el consumo, empiezan a manifestarse trastornos psicológicos de diversa índole; entre los más prevalentes se encuentra la ansiedad. Estos problemas son más notorios en pacientes que están pasando por el proceso de recuperación de su adicción, debido a que en la situación en la que se encuentran los convierte en vulnerables. Por lo tanto, el objetivo de esta investigación consiste en describir los niveles de ansiedad presente en adultos drogodependientes institucionalizados en centros de rehabilitación. Para ello, se utilizaron motores de búsqueda en PubMed y Scopus, mediante operadores booleanos y descriptores en español e inglés; además, se empleó el método PRISMA para la identificación y selección de información. Los hallazgos más significativos incluyen diferencias relacionadas con el sexo, donde las mujeres presentan una mayor prevalencia de ansiedad en comparación con los hombres. Además, las comorbilidades psiquiátricas más frecuentes en estos pacientes incluyen la depresión, el TDAH, el trastorno antisocial y el trastorno psicótico. Por último, se han encontrado nuevos enfoques no farmacológicos para tratar la ansiedad que han demostrado resultados prometedores, como la electroacupuntura, las artes marciales y el ejercicio físico.

Palabras clave: Ansiedad; Centros de Rehabilitación; Trastornos Relacionados con Sustancias.

INTRODUCTION

One of the most important preventable causes of mortality in our environment is the consumption of illegal substances, a problem that has increased in the last years,⁽¹⁾ like consumption-related mortality, particularly in developing countries.⁽²⁾ In June 2018, the United Nations Office on Drugs and Crime of the World Health Organization (WHO) estimated that more than 250 million people aged 15 to 64 had consumed drugs at least once the previous year.^(1,3) From this figure, 29 million adults are drug addicts or have undergone a disorder related to drug consumption.⁽¹⁾ Besides, it has been informed that, among the most typical drugs, alcohol ranks first with 283 million consumers, followed by cannabis and cocaine.⁽⁴⁾

Approximately 18 million persons consume cocaine annually, with the United States ranking first on this list and some countries of the European Union.⁽⁵⁾ However, because of the relatively great demand for this kind of drug, the Latin American countries, specifically Colombia, Peru, Ecuador and Bolivia, where an increase of up to 76 % has become evident in the last three years.^(5,6) Therefore, South America and the Caribbean have been considered the regions where most cocaine is trafficked and produced at the world level.⁽⁷⁾

In this context, Latin America has become a strategic point for the production of cocaine because, being the only region in the world responsible for this activity, adding to it the regulating incapacity resulting from poorly managed domestic policies in each country and due to lack efforts to deal with it, the production of this kind of illegal substances has increased.⁽⁸⁾

Ecuador is not alien to this reality since, according to data obtained in 2007 by the National Council for the Control of Narcotics and Psychotropic Substances, the consumption of illegal drugs such as marihuana, cocaine and cannabis has increased simultaneously with the consumption of alcohol and tobacco. The same study demonstrated that there are significant differences between men and women. For instance, 63 % of men assumed they were active consumers of illegal drugs. On the other hand, women represent 29,9 %.⁽⁸⁾

Though it is true, it has been known for years that addictions to psychoactive substances have adverse effects on the physical and mental health of the individual, an attempt has been made to reduce the impact of consumption in the mental sphere since prolonged use of drugs has the capacity of altering the neuronal circuits of the central nervous system (CNS) irreversibly, which has serious repercussions at the cognitive, emotional and behavioral level.⁽¹⁰⁾ For this reason, anxiety and depression are recognized as the main pathologies in people in the process of rehabilitation.^(6,11)

Although the cause is not well defined, in many cases, this psychological alteration is a consequence of the abuse of psychoactive substances and/or it behaves as a palliative method of the underlying mental disease.⁽¹²⁾ Likewise, there are remarkable differences between sex and anxiety, women being more liable to suffer from this disorder; however, drug consumption has always been higher in men.⁽¹³⁾

There has been an increase in the prevalence of the medical conditions denominated “dual pathologies” or psychiatric comorbidities, characterized by addiction to one or more psychoactive substances and presence of a mental disorder that cohabits in the same patient.^(14,15) These pathologies coexist with the underlying disease. So it challenges the public health systems and the medical staff working at the rehabilitation centers.^(16,17)

The pharmacological treatment for anxiety is widely known. Nevertheless, over time, new non-pharmacological strategies have been adopted, such as acupuncture, physical activity and martial arts, which have not been studied in depth but have shown promising results in patients in drug rehabilitation.^(18,19)

The goal of this piece of research is to describe the levels of anxiety in drug-dependent adults institutionalized in rehabilitation centers. Furthermore, to be transcendent to future research and to contribute knowledge about prevalence in both sexes, the way to correlate among psychiatric comorbidities in this type of patient and the approach for the non-pharmacological treatment of anxiety based on scientific evidence.

METHODOLOGY

To develop this narrative, non-experimental research document of a bibliographic review nature, we used articles available in the e-databases in *PubMed* and *Scopus*, both in English and Spanish. For this purpose, we used the following search terms: anxiety, rehabilitation centers, and substance-related disorders. Besides, we used them together with the Boolean operators “AND”, “NOT” and “OR”.

This way, 208 articles were obtained: *PubMed*, 151 and *SciELO*, 57. The study was generated by finding 208 articles; after removing duplicated citations, 113 articles were determined. Later on, after a preliminary selection process, the eligibility of 41 articles was evaluated. The full text was read, and 24 articles were discarded because they did not contribute full data (n=9) and did not produce any result related to the set goals (n=15). Finally, 17 articles were taken into account at the moment of preparing this study (Figure 1).

RESULTS

Of the 17 final articles, 5 were cross-sectional (Santos-de-Pascual et al.⁽¹⁶⁾, Chen et al.⁽¹⁷⁾, Contreras et al.⁽¹²⁾, Lauvsnes et al.⁽²⁰⁾, Massah and Moradi.⁽²²⁾). Moreover, 3 systemic reviews were found (AshaRani et al.⁽²⁴⁾, Liu et al.⁽¹⁹⁾, Morris et al.⁽¹⁶⁾), 4 cases and controls (Mohamed et al.⁽¹¹⁾, Zeng et al.⁽¹⁸⁾, Srivastava et al.⁽¹⁵⁾, Zhang

et al.⁽²⁵⁾), 1 prospective study (Morgan et al.⁽²⁾), 1 retrospective study (Requena-Ocaña et al.⁽¹³⁾), 2 qualitative studies (Richert et al.⁽²³⁾, Miguel et al.⁽²¹⁾), and 1 random controlled trial (Hallgren et al.⁽²⁶⁾) (Table 1).

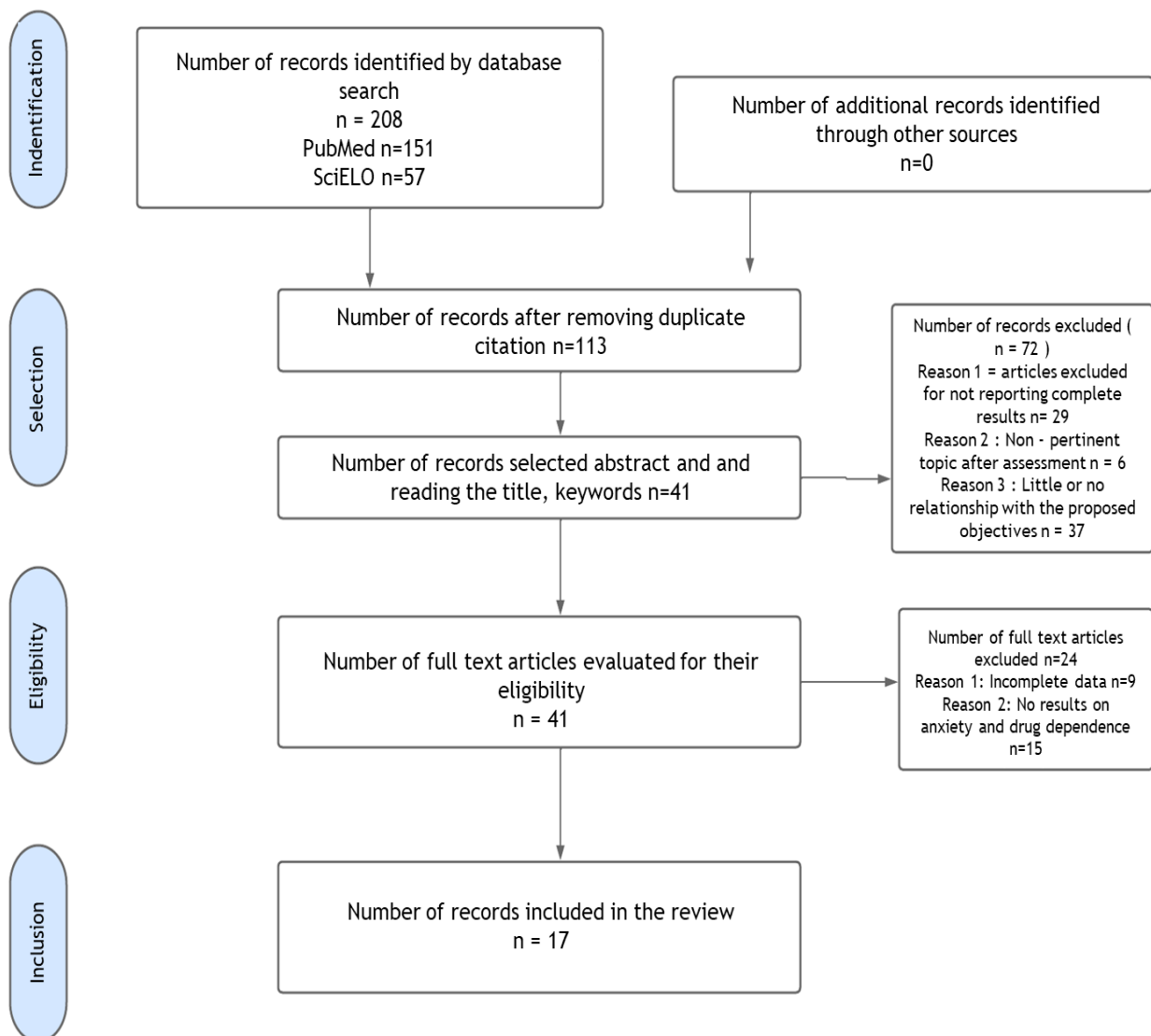


Figure 1. Flow diagram of the bias of the included articles

DISCUSSION

Relation between sex and anxiety

In their cross-sectional study conducted in Spain (2020), Santos-de-Pascual et al.⁽¹⁶⁾ determined that men have higher rates of antisocial personality disorder, dependence on psychoactive substances and dependence on alcohol. In contrast, women are more affected by anxiety disorders and alcohol dependence. Lauvsnes et al.⁽²⁰⁾ found that women developed higher levels of anxiety and depression, whereas men had more prevalence of hyperactivity and impulsiveness. Similarly, Requena-Ocaña et al.⁽¹³⁾ concluded that women had more prevalence of anxiety and eating disorders. They went to rehabilitation centers less frequently and consumed more anxiolytics than men.

On the contrary, Contreras et al.⁽¹²⁾ found out that the rate of anxiety and depression is higher in men; these finds can probably be explained by the fact that the size of the study sample was restricted to 88 patients with male predominance (79,55 %).

Something new found in this piece of research was the fact that Miguel et al.⁽²¹⁾, in their qualitative study, discovered that almost half the male consumers of “*crack*” had psychiatric symptoms, depression and anxiety. Meanwhile, in their cross-sectional study conducted in India (2018) exclusively on methamphetamine-dependent women, Massah y Moradi⁽²²⁾ reported a high prevalence of psychiatric hospitalization, anxiety and depression, probably due to lack of intervention in the dependence on this psychoactive substance.

Table 1. Artículos contenidos en los resultados.

Article title	Author, Year	Study design	Study results
Mental health in people with Substance Use Disorder: Differential aspects between men and women.	Santos-de Pascual et al. 2020 ⁽¹⁶⁾	Cross-sectional	Males have a higher prevalence of antisocial personality than females. In clinical syndromes, men are more likely to experience substance abuse, anxiety and alcohol dependence problems, whereas women present with anxiety, depression, alcohol dependence, substance abuse and dysthymia.
Anxiety and depression in patients addicted to psychoactive substances.	Contreras et al. 2020 ⁽¹²⁾	Cross-sectional descriptive	The participants showed anxiety and depression, and the time of consumption was related to the intensity of the symptomatology. There was a greater probability of consumption with greater intensity of the affective disorder.
ADHD and Mental Health Symptoms in the Identification of Young Adults with Increased Risk of Alcohol Dependency in the General Population-The HUNT4 Population Study.	Lauvsnes et al. 2021 Noruega ⁽²⁰⁾	Cross-sectional	In alcohol-related disorder, women had higher scores in anxiety and depression, while men had higher prevalence of hyperactivity and impulsivity and elevated risk of developing ADHD.
Influence of gender and education on cocaine users in an outpatient cohort in Spain.	Requena-Ocaña et al. 2021 ⁽¹³⁾	Retrospective	Women have lower rates of attendance at treatment centers, consume more psychotropic drugs (anxiolytics), anxiety and ED disorders. Men, on the other hand, have higher rates of other substance use disorders (alcohol and cannabis use).
Sociodemographic Characteristics, Patterns of Crack Use, Concomitant Substance Use Disorders, and Psychiatric Symptomatology in Treatment-Seeking Crack-Dependent Individuals in Brazil.	Miguel et al. 2018 ⁽²¹⁾	Qualitative	Most of the males in the sample had been previously treated for "Crack" dependence. In addition, the DSM-IV indicated dual pathologies, with approximately half of the sample presenting psychotic symptoms, depression and anxiety.
The Prevalence of Methamphetamine Dependence among Iranian Women in Methadone Maintenance Therapy in Tehran, Iran.	Massah y Moradi. 2018 ⁽²²⁾	Cross-sectional	The study with women revealed a high prevalence of dependence on psychiatric hospitalization rates, anxiety and depression due to long years of untreated methamphetamine dependence.
Survey of substance use among adolescent drug offenders referred from juvenile courts in Taiwan: Clinical epidemiology of single versus multiple illicit substance use.	Chen et al. 2022 ⁽¹⁷⁾	Cross-sectional	The most common psychiatric comorbidities among these participants were ADHD, major depressive disorder, anxiety, substance-induced psychosis and disruptive behavior. The prevalence of suicide attempts was 38,7 % and of violent behavior 42,5 %, respectively.
Substance use among outdoor treatment-seeking patients with mental illness: A case-control Study from a tertiary care hospital of northern India.	Srivastava et al. 2018 ⁽¹⁵⁾	Cases and controls	The prevalence of any substance use was highest in patients with psychotic disorder, followed by unipolar depression, bipolar and anxiety.
A prospective observational study of heroin users in Johannesburg, South Africa: Assessing psychiatric comorbidities and treatment outcome.	Morgan et al. 2019 ⁽²⁾	Prospective Observational	Of the participants, 49,3 % had at least one psychiatric comorbidity; major depressive disorder, generalized anxiety, post-traumatic stress disorder and suicidal ideation were the most frequent.
Assessment of anxiety and depression among substance use disorder patients: a case-control study.	Mohamed et al. 2022 ⁽¹¹⁾	Cases and controls	Substance use disorders are associated with high levels of anxiety and depression. More specifically, it is associated with severe depression and anxiety.

Mental health problems among young people in substance abuse treatment in Sweden.	Richert et al. 2020 ⁽²³⁾	Qualitative	The mental health disorders reported were difficulty concentrating, insomnia, anxiety and depression. The results show substantial gender differences, with women reporting higher levels of mental health problems.
Electro-acupuncture improves psychiatric symptoms, anxiety and depression in methamphetamine addicts during abstinence.	Zeng et al. 2018 ⁽¹⁸⁾	Cases and controls	Electroacupuncture could effectively improve symptoms of psychosis, anxiety and depression during withdrawal in patients with methamphetamine addiction and promote patients' rehabilitation.
Non-pharmacological interventions for methamphetamine use disorder: a systematic review.	AshaRani et al. 2020 ⁽²⁴⁾	Systematic review	Behavioral interventions (cognitive behavioral therapy, contingency management, exercise, residential rehabilitation-based therapies, repetitive transcranial magnetic stimulation, and matrix modeling) demonstrated treatment efficacy in promoting abstinence, reducing methamphetamine use and craving.
The effect of tai chi and Qigong exercise on depression and anxiety of individuals with substance use disorders: a systematic review and meta-analysis.	Liu et al. 2020 ⁽¹⁹⁾	Meta-analysis	The results suggested that the effect of Tai Chi was comparable to treatment as usual on depression. Qigong exercise appears to result in an improvement in anxiety compared to substance abuse medication.
Effect of exercise versus cognitive behavioural therapy or no intervention on anxiety, depression, fitness and quality of life in adults with previous methamphetamine dependency: a systematic review.	Morris et al. 2018 ⁽²⁰⁾	Systematic review	Exercise that requires the use of the whole body (aerobic, endurance, strength, cardiovascular and Tai Chi) suggests that it is effective in reducing anxiety, depression, improving quality of life and physical fitness in methamphetamine users.
Effect of Taijiquan Exercise on Rehabilitation of Male Amphetamine-Type Addicts.	Zhang et al. 2020 ⁽²⁵⁾	Cases and Controls	Taijiquan or Tai chi exercise promoted the balance control ability of amphetamine-dependent patients, increased the overall sense of health, vitality, mental health, improved anxiety and reduced craving.
Effects of acute exercise on craving, mood and anxiety in non-treatment seeking adults with alcohol use disorder: An exploratory study	Hallgren et al. 2018 ⁽²⁶⁾	Controlled Trial	A brief aerobic exercise session (cycloergometer) reduced alcohol cravings, anxiety disorder, and improved mood in adults with alcohol use disorder. In addition, the positive effects of exercise were maintained 30 minutes after exercise.

Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder; EDD: Eating Disorders; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders.

Psychiatric comorbidities

In their cross-sectional study, Chen et al.⁽¹⁷⁾ determined that the most frequent psychiatric comorbidities were ADHD, major depressive disorder, anxiety, psychotic disorder and disruptive behavior disorder. On the other hand, Santos-de-Pascual et al.⁽¹⁶⁾ concluded that the patients abusing illegal substances had more prevalence of dual pathologies, including antisocial personality disorder, depression, anxiety and dysthymia. According to Srivastava et al.⁽¹⁵⁾, patients with psychotic disorders, depression, bipolar disorder and anxiety disorder consume more psychoactive substances.

In this context, Miguel et al.⁽²¹⁾ determined the presence of psychiatric comorbidities in consumers of “crack”, where more than one-half of the participants showed psychotic disorders, impulsiveness, depressive symptoms and anxiety. Meanwhile, in the study of cases and controls conducted by Mohamed et al.⁽¹¹⁾, they found a correlation between the consumption of substances and high levels of anxiety and depression. Morgan et al.⁽²⁾ agree with this finding. Their prospective study established that the most everyday psychiatric comorbidity among consumers of heroin was major depressive disorder, followed by an anxiety disorder and post-traumatic stress. Unlike the aforementioned dual pathologies, Richert et al.⁽²³⁾ in Sweden (2020) found that over 50% of participants had difficulties concentrating, falling asleep, hallucinations, aggressiveness and suicidal ideas.

New non-pharmacological treatments

Regarding the efficacy of the new non-pharmacological strategies to manage anxiety in drug-dependent patients in the rehabilitation process, Zeng et al.⁽¹⁸⁾, in their study of cases and controls conducted in China (2018) with methamphetamine-addicted patients, concluded that electrical acupuncture could improve psychotic disorders after 1 to 4 weeks; anxiety, somatization and sleep disturbances improve since the second week and the depressive symptoms required up to 4 weeks. However, AshaRani et al.⁽²⁴⁾ considered the following appropriate to promote abstinence: reducing consumption and anxiety induced by methamphetamines through Cognitive Behavioral Therapy (CBT), contingency management, physical activity, transcranial magnetic stimulation and Matrix model. Out of them, contingency management and CBT alone or in combination with contingency management showed better results. Concerning physical activity, Liu et al.⁽¹⁹⁾ concluded that the effects of martial arts, such as Tai Chi, were similar to the conventional treatments for depression in drug-dependent persons. At the same time, the traditional therapy of Qigong showed improvement in anxiety episodes. Likewise, Zhang et al.⁽²⁵⁾ demonstrated that Tai Chi improved mental health, reducing anxiety and longing to consume amphetamines. Besides, it fostered more ability to control one's balance and a better perception of the health condition.

Morris et al.⁽²⁰⁾ found that physical activity making it possible to exercise the whole body, such as aerobics, resistance, strength, cardiovascular and Tai Chi, showed a decrease in the levels of anxiety and depression as compared to CBT.

On the other hand, Hallgren et al.⁽²⁶⁾, in their controlled study with 140 patients suffering from disorders due to alcohol consumption in Sweden (2018), determined that having an exercise session on a cycle ergometer for 12 minutes was enough to reduce the longing for consumption, improve the state of mind and reduce anxiety. The last two benefits continued up to 30 minutes after the exercise session. Nevertheless, the lack of reduction of the levels of anxiety for a prolonged time may have occurred due to the presence of an initial anxiety-favoring state.

CONCLUSIONS

According to the set goals, this piece of research allowed us to establish the differences relating to sex in patients in the rehabilitation process, where women have higher levels of anxiety, depression, eating disorder, dependence on alcohol and consumption of anxiolytics. In contrast, men more frequently have antisocial personality disorders, hyperactivity, impulsiveness, and dependence on psychoactive substances and alcohol.

As for psychiatric comorbidities, drug-dependent persons are prone to have an antisocial personality disorder, ADHD, depression, anxiety, substance-induced psychosis, disruptive behaviors, dysthymia, bipolar disorder, impulsiveness, post-traumatic stress disorder and sleep disturbances.

Finally, the efficacy of the new non-pharmacological anxiety-managing strategies used in rehabilitation from drug consumption has been studied, and promising results in the patients have been obtained. The electrical acupuncture sessions improved the symptoms of depression, anxiety, somatization and other psychological disorders. Martial arts, Tai Chi and Qigong, are ideal for treating anxiety episodes because they include deep breathing exercises, body-position techniques, meditation, and relaxation techniques. Cardiovascular and strength training, aerobics, and resistance exercises similarly controlled anxiety and depression.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

AUTHOR CONTRIBUTION

Conceptualization: Alexandra Abigail Encalada Pardo, Rosa Elizabeth Solorzano, Jennifer Garnica, Adriana Condo.

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OBSERVACIONES DERIVADAS DE LA REVISIÓN POR PARES, GESTIÓN EDITORIAL Y RESPUESTA DE LOS AUTORES

Observaciones de la Revisión por Pares:

Revisor 1/2: Dra. en Inv. Psic. Patricia Balcázar Nava, Universidad Autónoma del Estado de México (México)

Las observaciones del revisor se realizaron en forma de comentarios, por lo que se han colocado los párrafos o frases donde se han colocado los comentarios con la finalidad de contextualizar la observación.

1. Resumen: en la frase “Estos problemas con más notorios en pacientes que están pasando por el proceso de recuperación de su adicción, ya que; la situación en la que se encuentran los convierte en vulnerables. Por lo tanto, el objetivo de esta investigación consiste en describir los niveles de ansiedad presente en adultos drogodependientes institucionalizados en centros de rehabilitación”: Colocar “Estos problemas son”. El uso de punto y coma está destinado en una frase de una forma muy específica. Cuidar este tipo de detalles en la puntuación y como ejemplo, este...
2. Introducción: en la frase “un problema que ha aumentado últimos años(1)”. Colocar...ha aumentado en los...
3. Introducción: en la frase “especialmente en países pobres”. debiera eliminarse y sustituirse por otro término, como en vías de desarrollo o con menos recursos económicos, etc.
4. Introducción: las siglas “UNODC” indicar el nombre completo de este organismo.
5. Introducción: las siglas “CONSEP” indicar el nombre completo de este organismo.
6. Introducción: cuidar la puntuación
7. Metodología: sugiero exponer los criterios de inclusión y exclusión del estudio, para comprender la elección de la muestra.
8. Resultados: en la frase “Además, se encontró”. Quizá lo más conveniente es “se encontraron”.
9. Resultados: en la tabla1. En la escritura de los títulos de las investigaciones, no hay una consistencia en cómo se presenta, algunos utilizan de forma indiscriminada mayúscula al inicio de algunas palabras y otros no, cuidar esta presentación.
10. Discusión: en la frase “consumían mayores cantidades ansiolíticos que los varones”. Colocar “cantidades de cantidades de ansiolíticos que los varones”.
11. Discusión: en la frase “a partir de la 2 semana”. Colocar “a partir de la segunda semana”.

Revisor 2/2: PhD. Amador Cernuda Lago, Universidad Rey Juan Carlos, Madrid (España)

Las observaciones del revisor se realizaron en forma de comentarios, por lo que se han colocado los párrafos o frases donde se han colocado los comentarios con la finalidad de contextualizar la observación.

1. Sería interesante de cara a fundamentar más la realidad de esta temática, revisar e incluir en el texto del artículo algún dato de las revisiones de Cochrane sobre este tema que pudieran ser muy adecuadas para incrementar los puntos de análisis y debate de este problema de salud pública. El artículo está muy bien documentado y la metodología es muy correcta, felicidades por la elección del tema.

Respuesta a los revisores por parte de los autores:

Los autores no emitieron carta de respuesta a los revisores y/o editor, sin embargo, aceptaron las recomendaciones y se realizaron las correcciones necesarias.