Original Article

# Association between nutritional status and patterns of drug use in patients of Psychosocial Care Centers for Alcohol and Drugs[1]

Daniele do Rocio Ribeiro[2]
Denise Siqueira de Carvalho[3]

The purpose of this study was to evaluate the nutritional status of patients at the start of treatment and at the third month of treatment at the Psychosocial Care Centers for Alcohol and Drugs in Curitiba, in the state of Paraná, and verify its relationship with socioeconomic and demographic aspects, as well as drug use patterns in the two groups. A total of 254 adults were evaluated, 175 from the group at the start of treatment, and 79 from the group in the third month. The two groups presented changes in nutritional status, both low weight and excess weight. Low weight was associated with women and the recent use of crack, and excess weight with alcohol use time and frequent use of marijuana. The study showed the great vulnerability of this population in relation to the nutritional aspect.

Descriptors: Substance-Related Disorders; Nutrition Assessment; Drug Users; Nutritional Status.

Corresponding Author:
Denise Siqueira de Carvalho
Universidade Federal do Paraná, Saúde Comunitária
Rua Padre Camargo, 280, 7º andar
CEP: 80060-240, Curitiba, PR, Brasil
E-mail: dnutri@gmail.com

# Associação entre o estado nutricional e padrões de uso de drogas em pacientes atendidos em Centros de Atenção Psicossocial Álcool e Drogas

O objetivo deste estudo foi avaliar o estado nutricional de pacientes em início e no terceiro mês de tratamento nos Centros de Atenção Psicossocial Álcool e Drogas de Curitiba-PR e verificar a sua relação com os aspectos socioeconômicos, demográficos e padrões de uso de drogas nesses dois grupos. Foram avaliados 254 adultos, 175 do grupo de início de tratamento e 79 de terceiro mês. Ambos apresentaram alterações no estado nutricional, tanto baixo peso como excesso de peso. O baixo peso associou-se ao sexo feminino e uso recente de crack, e o excesso de peso ao tempo de uso de álcool e ao uso frequente de maconha. O estudo demonstrou a grande vulnerabilidade dessa população em relação ao aspecto nutricional.

Descritores: Transtornos Relacionados ao Uso de Substância; Avaliação Nutricional; Usuários de Drogas; Estado Nutricional.

# Asociación entre el estado nutricional y estándares de uso de drogas en pacientes atendidos en Centros de Atención Psicossocial Alcohol y Drogas

El objetivo de este estudio fue evaluar el estado nutricional de pacientes en inicio y en el tercer mes de tratamiento en los Centros de Atención Psicossocial Alcohol y Drogas de Curitiba-PR y verificar su relación con los aspectos socioeconómicos, demográficos y estándares de uso de drogas en ésos dos grupos. Fueron evaluados 254 adultos, 175 del grupo de inicio de tratamiento y 79 de tercer mes. Ambos presentaron alteraciones en el estado nutricional, tanto bajo peso como exceso de peso. El bajo peso se asoció al sexo femenino y uso reciente de crack, y el exceso de peso al tiempo de uso de alcohol y al uso frecuente de marihuana. El estudio demostró la grande vulnerabilidad de esa población con relación al aspecto nutricional.

Descriptores: Trastornos Relacionados con Sustancias; Evaluación Nutricional; Consumidores de Drogas; Estado Nutricional.

## Introduction

Dependence on alcohol and other drugs strongly influences the nourishment and nutritional status of individuals, both biologically (as it affects appetite, adequate ingestion of nutrients, and the nutritional status) and socially (interfering in eating habits, self-care, and adequate food choices). Both malnutrition[1-3] and obesity and episodes of compulsive eating[4-6] have been reported by patients who use drugs or who

are undergoing treatment for dependence. Studies have shown that the foods chosen by drug users are normally low in nutritional quality, inexpensive, and quick and easy to prepare and consume[7-8].

Despite the high relevance of the nutritional aspect in the health of drug users, in Brazil, studies involving this theme are still rare. The Psychosocial Care Centers for Alcohol and Drugs (CAPS AD – *Centro de Atenção Psicossocial Álcool e Drogas*), generate opportunities for the development of studies aimed at evaluating the health conditions and nutrition of the patients treated by creating adequate conditions for the recovery and promotion of the health of these individuals.

In light of the above, the purpose of this study was to evaluate the nutritional status of patients at the start of treatment and at the third month of treatment at the CAPS AD centers in Curitiba, Paraná, and verify the relationship between the nutritional status and the socioeconomic and demographical aspects in these two groups, as well as the patterns of drug use.

## Materials and Methods

This study is a cross-sectional descriptive observational study, with data collected in the period from April to September 2012, involving patients being treated for alcohol dependence and/or other drugs at CAPS AD centers in Curitiba, Paraná.

Two groups of patients were evaluated: one at the beginning of treatment, and the other at three months of treatment. All the individuals were adults, in the range of 20 to 59 years of age. The study was performed at all five CAPS AD units that treat adults in the city of Curitiba, Paraná. People without cognitive conditions to answer the questionnaires and pregnant women were not included in the study.

The number of patients treated at CAPS AD centers in the year prior to the study was used to calculate the sample, with was obtained using the StatCalc program by Epi Info, version 6.04, obtaining a sample of 171 individuals at the beginning of treatment and 134 at the third month of treatment.

The questionnaire used in the interviews was comprised of closed questions related to the socioeconomic and demographic issues, as well as drug use patterns. To assess nutritional status, the weight and height of the patients were measured. The anthropometric equipment used in obtaining the weight variable was a portable scale with capacity for 180 kg and precision of 100 g. The patients were weighed without shoes or jackets, standing at the upright at the center of the scale with their body weight evenly distributed between the feet. Their height was obtained by measuring it once using a portable stadiometer with precision of 1mm. The patients were positioned standing upright with their arms extended along the length of their bodies, with their heads up. Based on the weight and height data obtained, the body mass index (BMI) was determined. To classify the nutritional state, we used the cutoff points proposed by the World Health Organization[9].

All data collection instruments were previously tested on a group of ten patients at one of the CAPS AD units studied, with the goal of foreseeing problems with the language used, understanding of the questions, and adequacy.

The data was entered and analyzed in the Epi Info program (version 3.5.4). For the categorical variables, proportions were calculated and chi-squared tests were applied. For the continuous variables, the averages and standard deviations were used, and ANOVA (Analysis of Variance) or KW (KrusKal-Wallis) tests were applied. For all tests, a significance level lower than 0.05 was adopted.

The bivariate and multivariate analyses were undertaken using the Stata program (version 8). In the bivariate analysis, two conclusions were considered: the presence and absence of low weight, and the presence and absence of excess weight. The patients with low weight were excluded from the analysis when the conclusion was excess weight. The independent variables used in the analysis were those related to the socioeconomic and demographic situations and drug use patterns.

The socioeconomic variables were: sex, age group, ethnicity, education, marital status, living partners (alone or in shelters/with family or friends), family income per capita, living situation (owned or given/rented), building type, and participation in income transference programs.

For the use pattern variables, for each drug studied (alcohol, tobacco, marijuana, cocaine, crack, inhalants, and hallucinogens), the recent use, use frequency, and use time of the drug were assessed.

For recent use, the following items were considered: lack of use in the last year; last use over three months and less than 12 months prior; last use less than three months and more than one month prior; and use within the last month. The frequency of use was considered: use of the drug less than three times per week and more than three times per week. Use time was classified into: experimental use or less than

one year; use during one to five years; use during six to ten years; and over ten years of use. The following variables were also analyzed: exclusive use of legal drugs (yes or no), and the number of drugs used in the last year (p < 5 drugs/p ≥ 5 drugs).

The independent variables that, in the bivariate analysis, proved to be associated with the conclusion with an observed significance level less than or equal to 20% (p ≤ 0.20) in the chi-squared test were selected for multivariate analysis, maintaining in the final model those that presented a value of p < 0.05. The following were considered confounding variables: age group, income per capita, and number of drugs used in the last year (< 5 drugs / ≥ 5 drugs).

The results were presented in an odds ratio, confidence intervals, and p values.

This study was approved by the Research Ethics Committee of the Health Sciences Department of the Federal University of Paraná, under the registration number CEP/SD 1282.207.11.12 CAAE 0198.0.091.085-11. All the participants signed the Term of Free and Informed Consent.

## Results

The total population of participants in the study was 268 individuals. However, in this study, only adults were considered for the analysis, following the criteria of the World Health Organization (≥ 20 to < 60 years of age). Thus, four individuals between 18 and 20 years of age were excluded, as they are considered adolescents in the classification of nutritional status, as well as ten elderly people (> 60 years).

A total of 254 individuals were evaluated, 48 of which were female and 206 male; 175 belonged to the group at the start of treatment, and 79 to that in the third month of treatment.

Among the patients at the start of treatment, most were Caucasian single males in the age range of 31 to 40 years; however, most of them declared they were living with a spouse and/or children. The predominant income extract was from 0.5 to 1.49 minimum wages per capita, and the average family income was R$ 1,458.62 (± 1,320.60). They had low education levels – over half did not complete elementary school. Most had their own brick homes. The average number of people per home was 3.3 (± 1.86), and most did not participate in any income transference program. The group of participants in the third month of treatment presented socioeconomic and demographic characteristics similar to the first group, except for the age range, which was higher (41 to 50 years) and married marital status.

The average of weight (kg) in the group at the start of treatment was 71.2 (± 15.48), and for that in the third month it was 75.68 (± 15.60), presenting a statistically significant difference between the groups (p < 0.05). The average height (m) was 1.69 (± 0.83) in the group at the start of treatment and 1.70 (± 0.83) for that in the third month, not representing a statistically significant difference.

The average BMI of the patients at the start of treatment was significantly lower than for those in the third month of treatment. For nutritional classification, only 52.6% of the group at the start of treatment and 41.8% of the group in the third month were at a normal weight (Table 1).

Table 1- Nutritional status of the two groups of patients being treated at CAPS AD in Curitiba, Paraná, Brazil – 2012

| Nutritional Status | Start of Treatment (n = 175) | Third Month (n = 79) |
|---|---|---|
| Average BMI (kg/m²) and standard deviation | 24.8 (±4,7) | 26.1 (±4.8)[a] |
| Classification of nutritional status | % (n) | % (n) |
| Low weight | 6.3 (11) | 2.5 (2) |
| Normal weight | 52.6 (92) | 41.8 (33) |
| Excess weight | 28.0 (49) | 39.2 (31) |
| Obesity | 13.1 (23) | 16.5 (13) |

[a] Statistically significant difference between the two groups p < 0.05

In general, the frequency of changes in nutritional status (low weight and excess weight) was greater among the women than among the men. In the third month group, low weight was significantly higher in women (Table 2).

Table 2 - Classification of nutritional status by sex in the two groups of patients being treated at CAPS AD units in Curitiba, Paraná, Brazil – 2012

| Classification of Nutritional Status | Start (n = 175) | | Third Month (n = 79) | |
|---|---|---|---|---|
| | Female (n = 35) | Male (n = 140) | Female (n = 13) | Male (n = 66) |
| | % (n) | % (n) | % (n) | % (n) |
| Low weight | 11.4 (4) | 5.0 (7) | 15.4 (2)a | -a |
| Normal weight | 42.9 (15) | 55.0 (77) | 38.5 (5) | 42.4 (28) |
| Excess weight | 28.6 (10) | 27.9 (39) | 15.4 (2) | 43.9 (29) |
| Obesity | 17.1 (06) | 12.1 (17) | 30.8 (4) | 13.6 (9) |

[a] Statistically significant difference between sexes p < 0.05

In the bivariate analysis, the low weight variable was significantly associated with the female gender (p = 0.0101), recent use of marijuana (p = 0.0152), recent use of crack (p = 0.0072), and recent use of inhalants (p < 0.001). The excess weight variable, on the other hand, was significantly associated with the age group (p = 0.0417), time of alcohol use (p = 0.0075), and frequent use of marijuana (p = 0.0272).

In the multivariate analysis, low weight was associated with the female gender and recent use of crack (Table 3), and excess weight was associated with use time (years) of alcohol and weekly frequency of marijuana use (Table 4).

Table 3 - Result of logistical regression with low weight as a dependent variable, Curitiba, Paraná, Brazil, 2012

| Variable | Gross OR | CI 95% | p | Adjusted OR | CI 95% | p |
|---|---|---|---|---|---|---|
| Sex | | | | | | |
| Male | 1 | - | - | - | - | - |
| Female | 4.06 | 1.28 – 2.92 | 0.0101 | 4.92 | 1.17 – 20.82 | 0.03 |
| Recent use of crack[a] | 2.2 | 1.24 – 3.91 | 0.0072 | 3.17 | 1.12 – 8.92 | 0.029 |

[a] Statistic tendency test was used (categories: non-use in the last year; last use over three months and less than 12 months prior; last use less than three months and more than one month prior; and use within the last month).

Table 4 - Result of logistical regression with excess weight as a dependent variable, Curitiba, Paraná, Brazil, 2012

| Variable | Gross OR | CI 95% | p | Adjusted OR | CI 95% | p |
|---|---|---|---|---|---|---|
| Use time (years) of alcohol[a] | 2.03 | 1.24 – 3.32 | 0.0047 | 3.83 | 1.51 – 9.68 | 0.005 |
| Frequency of marijuana use | | | | | | |
| < 3 days/week | 1 | - | - | - | - | - |
| 3-7 days/week | 1.96 | 1.07 – 3.64 | 0.0272 | 2.08 | 1.1 -3.88 | 0.021 |

[a] Statistic tendency test used (categories: experimental use or less than one year; use from one to five years; use from six to ten years; and over ten years of use).

## Discussion

Both groups presented changes in nutritional status in relation to the BMI, and only 41.8% of the individuals in the third month of treatment and 52.6% of those at the start of treatment were classified in the range of normality, without any significant difference in nutritional classification between the two groups.

The change in the nutritional status of low weight was the least prevalent in both groups (6.3% in the group at the start of treatment and 2.5% for those at the third month). In a study with 25 adults being treated for chemical dependence in an outpatient service of a hospital in Porto Alegre, Rio Grande do Sul, no cases of low weight were found in the population studied and the prevalence of excess weight was 80% and obesity 8%, with an average body mass index of 27.73 ± 4.15 kg/m$^2$[10]. However, the scarcity of national studies on the nutritional status of adults dependent on alcohol and other drugs makes it difficult to perform a better comparison between similar populations.

International studies with drug users have demonstrated high prevalence of low weight in this population, with even higher levels in individuals infected with HIV. However, there are only a few studies of drug users on an outpatient level. In a case control study with 253 male drug users undergoing detoxification treatment at a hospital in Bangladesh, with a control group composed of 100 healthy men of similar ages, the authors noted that the drug users presented significantly lower indices of BMI, hemoglobin, serum protein, and albumin than the control group. For the BMI, 60% of the drug users had indices lower than 18.5kg/m$^2$ (low weight), compared to 15% in the control group[1]. Another study comparing the nutritional status of HIV-positive and HIV-negative drug users in Chennai, in Southern India, found a high deficit in nutritional status in both groups 52.3% of the HIV-positive users presented low weight according to their BMI, and among the HIV-negative drug users, the percentage was 49.7%[3].

A national study performed at CAPS AD in Minas Gerais with individuals who sought the institution for alcohol dependence and that had the objective of evaluating the presence of cardiovascular risk factors, with emphasis on hypertension and bodily adiposity in abstinent or non-abstinent alcoholics undergoing treatment, found BMI averages closer to those seen in this study. This study classified the subject into three groups according to their pattern of alcohol use: non-abstinent (reduction of use and unchanged use); recent abstinent (those with one week to three months of abstinence); and longer abstinence (over three months). The BMI average found in each group was 24.42 kg/m$^2$ (± 4.39); 25.88 kg/m$^2$ (± 4.72), and 22.93 kg/m$^2$ (±4.38), respectively, without a significant difference between the groups[11].

This study, on the other hand, found an average BMI of 24.8 kg/m$^2$ (± 4.7) between the group at the start of treatment and 26.1 kg/m$^2$ (± 4.8) in the group at the third month of treatment, with a significant difference between the two groups.

Data from the Family Budget Survey (POF) performed in 2009 by the Brazilian Institute of Geography and Statistics (IBGE) showed a high prevalence of excess weight and obesity in the population of the South region of Brazil. Low weight, however, was less prevalent: only 1% of men and 2.4% of women in the urban population had BMI rates below 18.5 kg/m$^2$[12]. Nevertheless, this study found higher percentages of low weight among drug dependents than those found in the general population.

The women in this study were more vulnerable to low weight. When observing the classification of nutritional status by sex, low weight is found to be more prevalent among them in both groups (11.4% in the group at the start of treatment, and 15.4% in the group in the third month).

The logistical regression showed a significant association between the female gender and low weight. Other studies have demonstrated that women dependent on drugs present more severe malnutrition states than men. A survey involving hospitalized drug dependents found that nutritional status is worse among women. This survey also showed that women presented significantly more problems in social and family relationships than men[13]. In another survey that evaluated HIV-positive patients, both users and non-users of drugs, it was found that, among those who used drugs, the BMI of women was significantly lower[14].

Studies have also shown that women who use drugs seek treatment later than men. This delay is mainly linked to social aspects related to the prejudice and stigmatization they suffer. In addition, the very physiological aspects of women allow health damages caused by drugs to occur first in them and then in men[15-17]. Thus, women tend to arrive at health services more debilitated, especially in relation to nutritional status, as the study showed.

The recent use of crack was also associated with low weight in the population studied. There are various factors that cause crack to be associated with low weight. Crack, which is derived from cocaine, has a strong anorectic power[2]. People dependent

on this drug in an intense, continuous, and repetitive consumption pattern known as "binge", report that they can spend days without eating using only the drug. In addition, the urgency to obtain the substance makes the individual re-direct the money that would be spent on food for this purpose[18]. In addition, there is also the impact in the individual's social and family networks, which many times occurs in the life of a crack dependent. This factor can also interfere in the routine of the person and consequently their nutrition, making meals inconstant and lowering ingestion of foods. Nutrition can also be impaired by lesions in the oropharynx caused by the use of pipes made from tin cans. Repeated contact with heated aluminum provokes boils and wounds in the tongue, lips, face, and fingers[19].

Despite the relevance of low weight, excess weight (overweight and obesity) was the most prevalent change in nutritional status found in the sample studied. This reality, however, is not present only among drug dependents, but also among the Brazilian population in general. Currently, Brazil is in the so-called nutritional transition phase, which consists of the growing rise of obesity that includes nutritional deficiencies, such as iron deficiency anemia and vitamin deficiencies, especially in classes of lower income. According to data from the POF (*Pesquisa de Orçamentos Familiares* - Consumer Expenditure Survey) of 2009[12], in the South region, 58.1% of men and 50.9% of women were overweight. The obesity rates were 16.4% in men and 19.3% in women. The rising tendency of obesity is associated with the decrease in energetic spending of individuals, due to the reduction of occupations that require greater physical effort, as well as the reduction of physical activities associated with leisure, in addition to nutritional factors, such as the decrease in fiber consumption and increase in consumption of fats and sugars. These nutritional changes are associated with changes in the eating habits of Brazilians, with an increase in the number of meals outside of the home, rise in availability and decrease of the cost of high-calorie industrialized foods, and the increase in the consumption of fast foods, among others.

In the logistic regression, excess weight (overweight and obesity) was associated with alcohol use time (in years). The literature has demonstrated complex relationships between the ingestion of alcohol and nutritional status. Excessive and chronic use of alcohol has been linked to a deficit in nutritional status due to hepatocellular changes in the absorption of nutrients and by the decrease in food ingestion itself[20]. However, epidemiologic studies have shown an association between BMI and alcohol consumption patterns. Individuals that consume alcohol with a lower frequency, but in higher quantities with each opportunity for consumption, tend to have a higher BMI than those who ingest it daily, but in lower quantities. The rise in BMI can be explained by the fact that, despite the consumption of drinks, there is no lowering in the ingestion of calories during meals, and the alcohol is an additional source of energy (7.1 kcal/g) [21]. So-called central obesity, with the accumulation of fat in the upper body, has been linked to the ingestion of excessive quantities of alcohol in addition to diets rich in fat and a sedentary lifestyle[22].

Excess weight was associated with the use of marijuana with a frequency higher than three times per week. Studies have shown the action of marijuana on human appetite, which occurs through the active component THC (Tetrahydrocannabinol), this being the active ingredient currently studied for therapeutic use for stimulating appetite in patients with cancer and acquired immunodeficiency syndrome (AIDS)[23]. The most frequent observation is the increase in appetite three hours after the use of marijuana. When the effect of the use of marijuana on the weight of individuals was evaluated, the data in the literature was still conflicting. A study involving 3,882 individuals identified an obesity rate in those that used marijuana[24]. However, in another study with the objective of analyzing the association between the use of cannabis and excess weight/obesity in young adults through a longitudinal study with 2,566 young adults, a lower prevalence of excess weight and obesity was found among the marijuana users[25]. Another study found a connection between the use of marijuana with higher ingestion of energy and alcohol, but not with an increase in BMI, lipid profile, and glucose[26]. One study that was based on two representative epidemiologic studies of American adults, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; 2001-2002) and the National Comorbidity Survey-Replication (NCS-R, 2001-2003), to estimate the prevalence of obesity due to consumption of cannabis, concluded that the prevalence of obesity is lower in users of marijuana than in non-users[27]. However, these studies were performed in a population base and did not involve dependent users undergoing treatment.

Among the limitations of this study, we highlight the isolated use of the BMI in the evaluation of nutritional status. Despite being one of the most indicated methods in epidemiologic studies, the BMI has intrinsic limitations, since it cannot differentiate

excess weight of obesity from that originating from muscular hypertrophy, edema, and ascites. Another limitation was that the expected sample of people in the third month of treatment was not reached due to the difficulty in selecting patients that obeyed the criteria for inclusion in this group, which was that of completing three months of treatment during the phase of data collection, since there is a high rate of abandonment of treatment in the initial phases.

The individuals dependent on alcohol and other drugs, due to social, biological, and nutritional factors, were vulnerable with regard to nutrition. Thus, this study was performed to contribute to the discussion of this topic and benefit the knowledge of nutritional aspects of dependent drug users undergoing treatment.

## Final Remarks

The Health Ministry's policy for comprehensive care for drug users proposes that healthcare be done with the perspective of comprehensiveness. This concept includes not only the organizational structuration of healthcare, but also the perception of the subjects in their various dimensions. Thus, nutrition, a fundamental component of human life that is impacted by drug use, should not be left unnoticed in healthcare strategies for this population.

As CAPS are understood as spaces that promote health, they can and should foment actions to guarantee food and nutrition security, be it through monitoring nutritional status, through care and nutritional services, or through the provision of adequate meals both in the nutritional aspect and hygienic/sanitary quality, as well as with respect for cultural characteristics. In addition, still in the multidisciplinary context, noting nutrition also as an integral part of treatment.

This study contributed to an overview of the problem. There are few studies available on the topic, requiring an increase in the production of knowledge regarding it. Matters related to nutritional status and gender, the relationship of the various types of drugs with specific nutritional deficiencies, and changes in nutritional status during treatment are some examples of what must be further studied.

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