


## The influence of contact with nature in the rehabilitation of people addicted to chemical substances living in Therapeutic Communities\*


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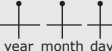

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**Objective:** to identify the influence of nature on the stress, anxiety and depression symptoms among people welcomed in Therapeutic Communities. **Methodology:** a cross-sectional, qualitative-quantitative, exploratory and descriptive study. It was carried out with people welcomed in Therapeutic Communities in the northeast region of Santa Catarina, in 2021. Mental health was assessed by means of the Depression, Anxiety and Stress Scale-21. The participants expressed their perception using three words that represented their feelings regarding this benefit, creating a Word Cloud. Data analysis took place through stratification of the variables collected, organizing them by absolute and relative frequencies and statistical tests. **Results:** the participants were 88 male individuals living in 3 Communities, with a mean age of 39.95 years old. Systemic Arterial Hypertension was the predominant disease and frequent addiction to drugs, alcohol and cocaine was observed. As for the symptoms, 53.4% ( $n=46$ ) had stress symptoms, 41.7% ( $n=36$ ) had anxiety symptoms and 34.8% ( $n=30$ ) had depressive symptoms. The Word Cloud presented the terms "well-being", "calm" and "peace" as benefits of contact with nature. **Conclusion:** the participants have high stress, anxiety and depression levels, but they consider closer contact with nature after being welcomed in the Therapeutic Community as a positive factor in their rehabilitation.

**Descriptors:** Therapeutic Community; Mental Health Assistance; Green Areas; Substance Abuse Treatment Centers.

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## A influência do contato com a natureza na reabilitação de pessoas em situação de dependência química residentes em Comunidades Terapêuticas

**Objetivo:** identificar a influência da natureza sobre os sintomas de estresse, ansiedade e depressão em acolhidos em Comunidades Terapêuticas. **Metodologia:** estudo transversal, quali-quantitativo, exploratório e descritivo realizado com acolhidos em Comunidades Terapêuticas da região nordeste de Santa Catarina, em 2021. A saúde mental foi avaliada pela Escala de Depressão, Ansiedade e Estresse-21. Os participantes expressaram sua percepção utilizando três palavras que representaram os seus sentimentos com relação a esse benefício, criando-se uma Nuvem de Palavras. A análise de dados ocorreu por meio da estratificação das variáveis coletadas, sendo estas organizadas por frequências absolutas e relativas e testes estatísticos. **Resultados:** participaram 86 acolhidos do gênero masculino em 3 Comunidades, com idade média de 39,95 anos. Hipertensão Arterial Sistêmica foi a doença predominante; drogas de adição frequentes foram álcool e cocaína. Quanto aos sintomas, 53,4% (n=46) apresentavam sintomas de estresse, 41,7% (n=36) sintomas de ansiedade e 34,8% (n=30) sintomas depressivos. A Nuvem de Palavras apresentou os termos "bem-estar, calma e paz" como benefícios do contato com a natureza. **Conclusão:** os participantes apresentam índices de estresse, ansiedade e depressão elevados, porém consideram o contato mais próximo com a natureza após o seu acolhimento na Comunidade Terapêutica como um fator positivo em sua reabilitação.

**Descritores:** Comunidade Terapêutica; Assistência à Saúde Mental; Áreas Verdes; Centros de Tratamento de Abuso de Substâncias.

## Influencia del contacto con la naturaleza en la rehabilitación de personas con dependencia química residentes en Comunidades Terapéuticas

**Objetivo:** identificar la influencia de la naturaleza en los síntomas de estrés, ansiedad y depresión en personas albergadas en Comunidades Terapéuticas. **Metodología:** estudio transversal, cualitativo-quantitativo, exploratorio y descriptivo realizado con personas albergadas en Comunidades Terapéuticas de la región noreste de Santa Catarina, en 2021. La salud mental fue evaluada por la Escala de Depresión, Ansiedad y Estrés-21. Los participantes expresaron su percepción mediante tres palabras que representaban sus sentimientos respecto a este beneficio, creando una Nube de Palabras. El análisis de los datos se realizó a través de la estratificación de las variables recolectadas, que se organizaron por frecuencias absolutas, relativas y pruebas estadísticas. **Resultados:** participaron 86 personas albergadas de género masculinos en 3 Comunidades, con una edad promedio de 39,95 años. La enfermedad predominante fue la Hipertensión Arterial Sistémica; las adicciones más frecuentes fueron al alcohol y a la cocaína. En cuanto a los síntomas, el 53,4% (n=46) presentó síntomas de estrés, el 41,7% (n=36) presentó síntomas de ansiedad y el 34,8% (n=30) presentó síntomas depresivos. La Nube de Palabras presentó los términos "bienestar, calma y paz" como beneficios del contacto con la naturaleza. **Conclusión:** los participantes presentan altos niveles de estrés, ansiedad y depresión, pero consideran que tener un contacto más cercano con la naturaleza después de haber ingresado a la Comunidad Terapéutica es un factor positivo en su rehabilitación.

**Descriptoros:** Comunidad Terapéutica; Atención a la Salud Mental; Áreas Verdes; Centros de Tratamiento de Abuso de Sustancias.

## Introduction

Mental health is an integral part of health and well-being, as described in the definition of health in the Constitution of the World Health Organization (WHO)<sup>(1)</sup>: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or illness". Just like other health conditions, mental health can be affected by a variety of socioeconomic factors, which must be addressed through comprehensive strategies for promotion, prevention, treatment and recovery, in a comprehensive approach by governments<sup>(2)</sup>.

In contrast to the concepts proposed by the WHO, in 1991, other authors<sup>(3)</sup> incorporated the ecological and social theory of health, in which the determinants are presented in layers from the closest to the individual, characterized as individual determinants, to the most distant, in which we find the macro-determinants at the society level. In this way, the ecological theory expanded the diverse evidence showing systematic and avoidable differences between social, ethnic and geographic groups in the European population in terms of access, acceptance and quality of health care<sup>(3)</sup>.

Thus, it is understood that, in addition to the individual ability to manage thoughts, emotions, behaviors and interactions with others and with the environment, mental health is also subject to social, cultural, economic, political and environmental factors, such as national policies, social protection, living standards, working conditions and community support<sup>(4)</sup>.

Exposure to adversity in youth may be a preventable risk factor for mental disorders<sup>(5)</sup>. Depending on the local context, some individuals and groups in society are at a significantly higher risk of experiencing mental health problems<sup>(6)</sup>. This vulnerability includes family members living in poverty, people with chronic health conditions, infants and children exposed to abuse and neglect, minority groups such as indigenous populations, the aged population, people who experience discrimination and violations of their rights, such as lesbian, gay, bisexual and transgender individuals, the prison population and people exposed to conflicts, natural disasters or humanitarian emergencies, and adolescents exposed to substance use<sup>(5)</sup>.

Substance abuse (or drug addiction) is a neuropsychiatric disorder characterized by a recurrent desire to continue using a drug despite the harmful consequences<sup>(7)</sup>. Thus, addiction to substances is related to biological, social and psychological factors, whose negative repercussions on the users' health and families do not prevent them from continuing use, generating repeated self-administration and consequent tolerance, abstinence and compulsive consumption behaviors. Substances include alcohol, psychotropic drugs, cocaine, crack and marijuana<sup>(8)</sup>.

Among the treatment options for the addiction to chemical substances, one of the most emerging situations is Therapeutic Communities (TCs). TCs were created in 1979 with the intention of responding to problems arising from drug addiction, thus having an environment that is necessarily free of drugs and a form of treatment in which patients are treated as the main protagonists of their cure<sup>(9)</sup>. It is a structured system, with precise limits and well-defined functions, clear rules and controlled affections, based on norms, timetables and responsibilities. The entire structure is for patients to focus completely on the treatment, thus representing intense work, both for the professional team and for the patients. The objectives of TCs are not only good treatment results, but also the consequences of social rehabilitation, involving intervention also in other places, outside the TC space<sup>(9-10)</sup>. In order to deal with the demand from patients who seek TCs, the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária*, ANVISA) and the National Anti-Drug Department (*Secretaria Nacional Antidrogas*, SENAD) issued a resolution that was able to regulate the operation of all TCs in the country<sup>(11)</sup>. The vast majority of Brazilian TCs ground their actions on regulating their residents, based on discipline, work, coexistence and religious approaches that, together, seek to modify the subjective aspects of people addicted to chemical substances. Each of the four pillars has its positive and negative aspects in the rehabilitation process, which renders effectiveness of these institutions questionable, as well as their structure and organization referring to the asylum period experienced decades ago in Brazil<sup>(12)</sup>.

Countless epidemiological and experimental studies have shown a possible association between the existence of intra-/extra-urban green areas and a series of beneficial effects on the mental and physical health of the population<sup>(13-16)</sup>. The absence of green areas in residential areas has been associated as one of the contextual factors that play an etiological role in the occurrence of common mental disorders<sup>(13)</sup>. A cross-sectional study<sup>(14)</sup> conducted in four European cities with 3,748 participants found that the longer the time spent visiting green areas, the higher the mental health assessment scores, regardless of the cultural and climatic contexts. In a longitudinal survey of 65,407 adults (>15 years old), the authors verified that the increase in green spaces close to the place of residence was associated with lower risks of psychiatric morbidities among men aged >35 years old and women aged >41 years old<sup>(15)</sup>. Another research study associated adults' exposure levels to green areas (adjusted for socioeconomic and demographic variables) with a decline in daytime salivary cortisol as a biomarker of variation in the stress levels<sup>(16)</sup>.

In this scenario, it becomes necessary to understand to which extent green areas (nature) influence people's mental health, specifically those in a situation of addiction to chemical substances living in TCs. The hypotheses of this study are as follows: i) the number of records of people with stress, depression and anxiety symptoms is inversely proportional to their contact with nature; and ii) neighborhoods with a higher percentage of green areas per inhabitants show fewer cases of people with depression, stress and anxiety symptoms. Therefore, the current study aimed at identifying and evaluating the influence of the coexistence of people in a situation of addiction to chemical substances with green areas in residential care spaces (TCs).

## Methodology

### Study design

This is a cross-sectional study with a quali-quantitative approach, of an exploratory and descriptive nature.

### Scenario

The study was carried out in three TCs in the northeast region of Santa Catarina: 2 (two) in the city of Joinville (SC) and 1 (one) in Araquari (SC), Brazil. All institutions have similar approaches that involve exposure of people in a situation of dependence to work activities inherent to the routines of the places (kitchen, maintenance, vegetable garden, gardening), as well as moments of multidisciplinary care in groups and individually, with reflective and religious approaches. They are a reference for Social Assistance and Health services in municipalities from northern Santa Catarina and are strategically positioned in places far from urban areas and very close to the green areas of the region. Of the 3 therapeutic communities, 2 have 30 vacancies and 1 has 60 vacancies. They all have a Psychology professional in common. Only males were treated in the therapeutic communities where the data were collected.

### Period

The data were collected from June to July 2021, through face-to-face interviews.

### Selection criteria

People in a situation of addiction to chemical substances living in therapeutic communities, aged at least 18 years old and residing in any Brazilian city were included in the study. The exclusion criteria adopted corresponded to abandonment and/or discharge from the community during data collection.

## Definition of the sample

In this study, people in a situation of addiction to chemical substances living in TCs were selected by convenience sampling. Selection of the sample in a non-probabilistic way was through the consecutive selection of individuals during the data collection period. The participants were characterized through the following variables: sex, age group, place of birth, gender, profession, neighborhood and city of residence. As clinical characteristics, the following are cited: previous diseases, addictive drugs, medication use and time living in the TCs. To verify the existence of divergences or not in the results, all three Therapeutic Communities were chosen as the dependent variable, allowing for a comparison of the profiles found among them.

## Instrument used for data collection

A structured interview-type instrument was used, with closed and open questions about the patients' health history and their relationship with nature before and during the reception in the community<sup>(17)</sup>. Mental health was assessed by the Depression, Anxiety and Stress Scale-21 (DASS-21), adapted and validated for the Portuguese language<sup>(18)</sup>. DASS-21 is a self-report instrument with 21 questions; its score is based on a four-point Likert-type scale from 0 (It did not apply to me) to 3 (It applied to me a lot), referring to the feeling during the last week. Questions 1, 6, 8, 11, 12, 14 and 18 comprise the stress subscale; questions 2, 4, 7, 9, 15, 19 and 20, the anxiety subscale; and questions 3, 5, 10, 13, 16, 17 and 21, the depression subscale. For the final score, the values of each subscale were added and multiplied by two to correspond to the original scale score (DASS-42). The stress symptoms were classified as follows: 0-10 = Normal; 11-18 = Mild; 19-26 Moderate; 27-34 = Severe and 35-42 = Extremely severe. The anxiety symptoms were classified as follows: 0-6 = Normal; 7-9 = Mild; 10-14 = Moderate; 15-19 = Severe and 20-42 = Extremely severe. The depression symptoms were classified as follows: 0-9 = Normal; 10-12 = Mild; 13-20 = Moderate; 21-17 = Severe and 28-42 = Extremely severe. The participants who considered contact with nature as positive were asked to indicate their perception using three words that could represent their feelings in relation to such benefit.

## Data collection

Also in the data collection phase, information was checked in the physical records of the people living in the TCs, such as sex, age group, place of birth, gender, profession, neighborhood and city of residence.

## Data treatment and analysis

Data treatment was through stratification of the variables collected, which were tabulated in an Excel spreadsheet. Such variables were organized by means of absolute and relative frequencies. The Word Clouds tool was used as a qualitative analysis device<sup>(19)</sup>. Word Clouds (WCs) are images usually presented as an illustration to the superficial reading of the common sense. The size of each word indicates its frequency, admitted as a proxy for the relevance of a given theme in all hypertexts<sup>(19)</sup>. In the current paper, the WCs served as support for content analysis and deal with the benefits of contact with nature and of the changes notices due to increased contact with nature after being welcomed in the TCs.

Statistical analysis was employed with the purpose of evaluating the interaction between the variables established through the frequency analysis by Chi-square using a data matrix that relates the stress, anxiety and depression symptoms and contact with nature; this analysis was performed in the R statistical environment<sup>(20)</sup>.

## Ethical aspects

This study was approved in 2021 by the Ethics and Research Committee of the University of the Joinville Region (*Universidade da Região de Joinville, UNIVILLE*), under opinion No. 4,744,867. All ethical aspects related to research with human beings were respected, in accordance with Resolution No. 466/2012 of the National Health Council<sup>(21)</sup>. The individuals welcomed in the TCs were invited to participate in the study and, after reading it together with the researcher, they signed the Free and Informed Consent Form (FICF).

## Results

The survey included 89 people in a situation of addiction to chemical substances potentially eligible to

participate in the research, which took place between June and July 2021. Three participants were excluded because they did not have complete data in their physical records ( $n=2$ ) or because they abandoned treatment during the data collection period ( $n=1$ ). All TCs ( $n=3$ ) are located in the northeast region of Santa Catarina, two in Joinville and one in Araquari. To guarantee secrecy of the communities, they were renamed with letters from the Roman alphabet in order of collection: Community "A" has 45 participants; Community "B", 21; and Community "C", 20. Table 1 presents the sociodemographic and clinical characteristics of the participants. The overall mean age of the participants was 39.91, varying from 18 to 63 years old, all male. Their predominant previous occupation was service provision (general services, carpenters, gardeners, drivers, waiters, pool workers) as source of income, followed by civil construction (bricklayers, masonry assistants, plasterers, electricians, painters); in the statistical analysis ( $\chi^2$ ) of this variable, it was identified that the communities do not differ among themselves according to distribution of the professional activities, confirming what was seen in the frequencies: the service provision category was the one that gathered the highest number of people in all TCs. Of these, 66.2% are from Joinville and the rest come from other cities in Santa Catarina and other Federation states. As for the chronic diseases identified in the participants' medical records, arterial hypertension with 6.9% ( $n=6$ ), HIV with 4.6%, and diabetes with 3.4% appear with a higher incidence, while diagnosed anxiety and depression, together, represent 6.8% ( $n=6$ ); the statistical tests ( $\chi^2$ ) show that the TCs do not differ from each other in terms of previous diseases, with emphasis on the absence of previous diseases in the entire sample. As for the use of addictive drugs, alcohol with 79% ( $n=68$ ) and cocaine with 56.9% ( $n=49$ ), followed by crack with 54.6% ( $n=47$ ) are observed, in addition to marijuana, with 41.8% ( $n=36$ ); the communities differ statistically in terms of heroin and tobacco use.

Table 1 - Sociodemographic and clinical characteristics of the people addicted to chemical substances living in Therapeutic Communities from the northeast region of Santa Catarina, Brazil, 2021

Variables	Community A ( $n=45$ )	Community B ( $n=21$ )	Community C ( $n=20$ )	Total ( $n=86$ )	$\chi^2$
<b>Mean age</b>	40	41.55	39.65	39.91	-
<b>Gender</b>					
Male (mean)	45	21	20	86	-
<b>Profession by area</b>					
Trade	6 (13.3%)	0	3 (15%)	9 (10.4%)	$\chi^2=10.7$
Industry	5 (11.1%)	5 (23.8%)	1 (5%)	11 (12.8%)	DoF=10
Service provision	20 (44.4%)	7 (33.3%)	8 (40%)	35 (40.7%)	$p=0.381$
Civil construction	10 (22.2%)	6 (28.7%)	4 (20%)	20 (23.2%)	
Retired	0 (11.1%)	0	1 (5%)	1 (1.16%)	
No profession	4(8.8%)	3 (14.2%)	3 (15%)	10 (11.6%)	

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Variables	Community A (n=45)	Community B (n=21)	Community C (n=20)	Total (n=86)	$\chi^2$
<b>Comorbidities</b>					
Arterial hypertension	3 (6.6%)	1 (4.7%)	2 (10%)	6 (6.9%)	$\chi^2=9.09$
Diabetes	3 (6.6%)	0	0	3 (3.4%)	DoF=10
Depression	1 (2.2%)	1 (4.7%)	1 (5%)	3 (3.4%)	p=0.52
Anxiety	3 (6.6%)	0	0	3 (3.4%)	
HIV*	2 (4.4%)	0	2 (10%)	4 (4.6%)	
<b>Addictive drugs</b>					
Cocaine	20 (44.4%)	14 (66.6%)	15 (75%)	49 (56.9%)	$\chi^2=4.14$ ; DoF=2; p=0.12
Crack	25 (55.5%)	10 (47.6%)	12 (60%)	47 (54.6%)	$\chi^2=0.63$ ; DoF=2; p=0.72
Heroin	3 (6.6%)	6 (28.5%)	7 (35%)	16 (18.6%)	$\chi^2=5.75$ ; DoF=2; p=0.05
LSD†	3 (6.6%)	1 (4.7%)	4 (20%)	8 (9.3%)	$\chi^2=2.63$ ; DoF=2; p=0.26
Marijuana	20 (44.4%)	11 (52.3%)	5 (25%)	36 (41.8%)	$\chi^2=3.41$ ; DoF=2; p=0.18
Smoking	30 (66.6%)	4 (19.0%)	5 (25%)	39 (45.3%)	$\chi^2=15.4$ ; DoF=2; p=0.0004
Alcoholism	34 (75.5%)	15 (71.4%)	19 (95%)	68 (79%)	$\chi^2=4.14$ ; DoF=2; p=0.12

Absolute frequency and relative frequency (%); \*HIV = Human Immunodeficiency Virus; †LSD = Lysergic Acid Diethylamide

Table 2 shows the data referring to the DASS-21 scale. The mean stress level during the welcome period in the TCs was predominant, recorded in nearly 53.5% (n=46) of the people living in the TCs, who, mentioned this symptom to some extent. Added up, the severe and extremely severe stress levels accounted for 16.2% (n=14). Statistically, the TCs did not differ from each other (p=0.63), with absence of stress as the most prevalent condition. In turn, with regard to anxiety, 41.8% (n=36)

of those living in the TCs had the symptom, with severe and extremely severe forms in 20.8% (n=18); as for the statistics (p=0.54), the TCs do not differ between the symptoms, with those with a normal score as the most prevalent. As for depression, symptoms were observed in 34.8% (n=30), although with severe and extremely severe degrees only in 13.1% (n=12) of the cases; in the statistical analysis, the TCs did not differ (p=0.49), with absence of depressive symptoms prevailing.

Table 2 - Description of the stress, anxiety and depression variables using the DASS-21 scale (n=86) in the Therapeutic Communities from the northeast region of Santa Catarina, Brazil, 2021

	Community A (n=45)	Community B (n=21)	Community C (n=20)	Total (n=86)	$\chi^2$
<b>DASS-21' Stress</b>					
Normal – n (%)	20 (44.4%)	11 (52.3%)	9 (45%)	40 (46.5%)	$\chi^2=6.13$
Mild – n (%)	12 (26.6%)	3 (14.2%)	7 (35%)	22 (25.6%)	DoF=8
Moderate – n (%)	7 (15.5%)	1 (4.7%)	2 (10%)	10 (11.6%)	p=0.63
Severe – n (%)	3 (6.6%)	3 (14.2%)	1 (5%)	7 (8.1%)	
Extremely severe – n (%)	3 (6.6%)	3 (14.2%)	1 (5%)	7 (8.1%)	
<b>DASS-21* Anxiety</b>					
Normal – n (%)	27 (60%)	14 (66.6%)	9 (45%)	50 (58.1%)	$\chi^2=6.93$
Mild – n (%)	1 (2.2%)	1 (4.7%)	3 (15%)	5 (5.8%)	DoF=8
Moderate – n (%)	8 (17.8%)	2 (9.5%)	3 (15%)	13 (15.1%)	p=0.54
Severe – n (%)	5 (11.1%)	1 (4.7%)	3 (15%)	9 (10.4%)	
Extremely severe – n (%)	4 (8.9%)	3 (14.2%)	2 (10%)	9 (10.4%)	

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	Community A (n=45)	Community B (n=21)	Community C (n=20)	Total (n=86)	$\chi^2$
<b>DASS-21' Depression</b>					
Normal – n (%)	29 (64.4%)	14 (66.6%)	13 (65%)	56 (65.1%)	$\chi^2=7.44$
Mild – n (%)	4 (8.9%)	0	4 (20%)	8 (9.3%)	DoF=8
Moderate – n (%)	5 (11.1%)	3 (14.2%)	2 (10%)	10 (11.6%)	p=0.49
Severe – n (%)	2 (4.4%)	2 (9.5%)	1 (5%)	5 (5%)	
Extremely severe – n (%)	5 (11.1%)	2 (9.5%)	0	7 (8.1%)	

Absolute frequency and relative frequency (%); \*DASS-21 = Depression, Anxiety and Stress Scale – Short Form(21)

With regard to the influence of contact with nature, which specifically in the scenarios studied were areas surrounded by native forest close to environmental preservation areas, as shown in Table 3, all participants were unanimous in stating that, after entering the TCs, they increased their level of contact on a daily basis ( $n=86$ ). Of this total, 80.2% ( $n=69$ ) mentioned the presence of green or recreational areas in their neighborhood, although without making use of these spaces. As for having green areas close to their homes, the percentage changed, dropping to 72% ( $n=62$ ); there was no statistically significant difference between the TCs considering these variables. In relation to growing plants at home or taking care of gardens, 45.34% of the people living in the TCs ( $n=39$ ) reported having previously had this relationship; added to those who had contact in the TCs, this figure increased to 93.02% ( $n=80$ ) of the

cases and there was a statistically significant difference between the TCs considering this variable ( $p=0.046$ ). With regard to breeding or contact with domestic animals (dogs, cats, birds), 51.1% ( $n=44$ ) reported continuous contact before entering the TCs, which, added to those who started to have contact within the TCs, increased the percentage to 89.53% ( $n=77$ ) of the answers, with no statistical difference between the TCs. When asked about their contact with nature before and after entering the TCs and the impact of this closer contact, 90% ( $n=78$ ) of the people living in the TCs made a reference to the positive impact on improving their health as a whole; and 10% ( $n=8$ ) did not consider such contact relevant to the improvement of their health status, as shown in Table 3; statistically, although the positive answers to contact with nature prevailed, there was no significant difference between the answers in the TCs ( $p=0.23$ ).

Table 3 - Influence of contact/non-contact with nature in those welcomed by Therapeutic Communities in the northeast region of Santa Catarina, Brazil, 2021

	Community A (n=45)	Community B (n=21)	Community C (n=20)	Total (n=86)	$\chi^2$
<b>Do you have contact with nature?</b>					
Yes	45 (100%)	21 (100%)	21 (100%)	86	
No	0	0	0	0	
<b>2. Contact frequency</b>					
Every day	45 (100%)	21 (100%)	20 (100%)	86	
<b>3. Presence of green areas for recreational purposes in your neighborhood of origin</b>					
Yes	35 (77.7%)	15 (71.4%)	19 (95%)	69 (80.2%)	$\chi^2=3.88$
No	10 (22.2%)	6 (28.5%)	1 (5%)	17 (19.8%)	DoF=2 $p=0.14$
<b>4. Presence of green areas near your house</b>					
Yes	30 (66.6%)	16 (76.1%)	16 (80%)	62 (72%)	$\chi^2=1.45$
No	15 (33.3%)	5 (23.8%)	4 (20%)	24 (28%)	DoF=2 $p=0.48$
<b>5. Growing plants or garden at home</b>					
Yes	21 (46.6%)	5 (23.8%)	13 (65%)	39 (45.3%)	$\chi^2=9.67$
No	2 (4.4%)	3 (14.2%)	1 (5%)	6 (6.9%)	DoF=4
No, only in the Therapeutic Community	22 (48.9%)	13 (61.9%)	6 (30%)	41 (47.7%)	$p=0.046$

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	Community A (n=45)	Community B (n=21)	Community C (n=20)	Total (n=86)	$\chi^2$
<b>6.Domestic animals at home</b>					
Yes	23 (51.1%)	9 (42.8%)	13 (65)	44 (51.1%)	$\chi^2=8.54$
No	2 (4.4%)	4 (19%)	4 (20%)	10 (11.6%)	DoF=4
No, only in the Therapeutic Community	20 (44.5%)	8 (38%)	3 (15%)	32 (37.2%)	p=0.073
<b>7.Comparison of contact with nature before and after entering the Therapeutic Community (positive changes in physical and mental health)</b>					
Yes	39 (86.7%)	19 (90%)	20 (100%)	78 (90%)	$\chi^2=2.91$
No	6 (13.3%)	2 (10%)	0	8 (10%)	DoF=2 p=0.23

Absolute frequency and relative frequency (%)

Figure 1 presents the WC that reflects the perception of the people living in the TCs regarding the benefits of contact with nature in the TCs under study. In TC A (n=45; Figure 1A), predominance of words that reflect a sense of well-being is noticed in the WC, such as "alívio", "calma", "paz" and "alegria" ("relief", "calm", "peace" and "joy"). Other frequent words were "Deus", "amor" and "contemplação" ("God", "love" and "contemplation"), denoting one of the activities carried out in the TCs, characterized by contact with nature in order to provide contemplation and relaxation. In TC B (n=21; Figure 1B), the most frequent words were "calma" and "paz" ("calm" and "peace") and, in smaller proportions, "bem-estar", "felicidade" and "ânimo" ("well-being", "happiness" and

"mood"). In TC C (n=20; Figure 1C), the most frequent words were "alegria", "paz" and "bem-estar" ("joy", "peace" and "well-being"). Other words that bring a sense of connection with spirituality also appear, such as "pureza", "liberdade" and "Deus" ("purity", "freedom" and "God"). Figure 1D shows the WC resulting from the grouping of words defined by those welcomed in all three TCs, studied in relation to the perceptions of the benefits of contact with nature. In this WC, presence of the words "calma" and "paz" ("calm" and "peace") is observed, which were also noticed individually in the other clouds. Other words were also highlighted, such as "felicidade" "bem-estar", "alegria" and "tranquilidade" ("happiness", "well-being", "joy" and "tranquility").

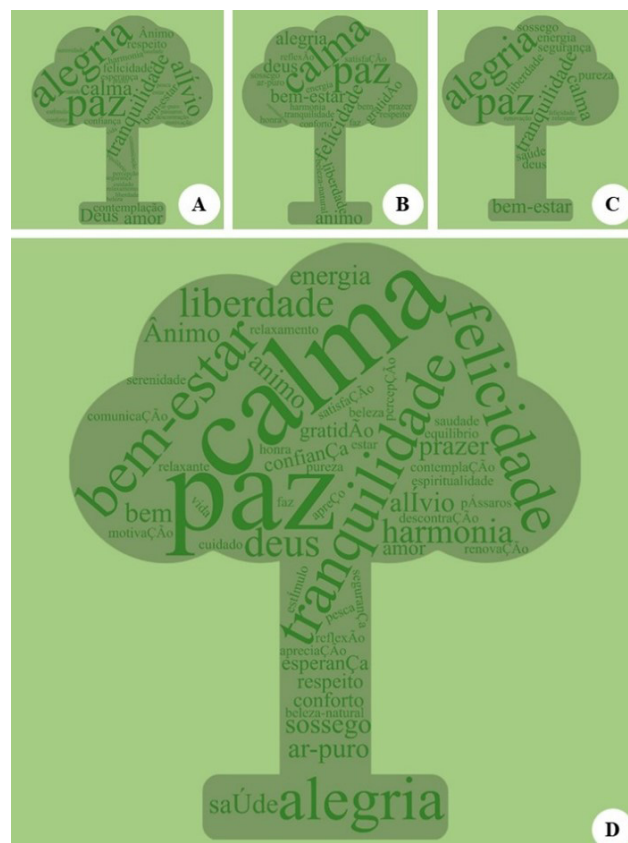


Figure 1 - Word cloud about the perception of the benefits of contact with nature among people welcomed in Therapeutic Communities from the northeast region of Santa Catarina, Brazil, 2021



## Discussion

### Sociodemographic profile of the people welcomed in the TCs

Similarities were identified with regard to the sociodemographic profile of those welcomed in the TCs, in comparison with the data produced in TCs, Psychosocial Support Centers and outpatient treatments in different Brazilian states<sup>(22-25)</sup>. In relation to gender, abusive use of psychoactive substances in men (86.68%) is observed, with addictive drugs (alcohol, tobacco, crack and marijuana) being more frequent in the age group from 21 to 30 years old. In another study<sup>(23)</sup>, the mean age of those admitted for treating addictions to chemical substances was 32 years; crack use predominated in 92.3% of the cases, followed by tobacco (42.9%) and alcohol (38.1%)<sup>(23)</sup>. Other authors found a mean age from 39 to 45 years among people in a situation of addiction to chemical substances; among the most used substances are marijuana (84.2%), alcohol (73.7%), crack (68.4%) and cocaine (60.5%)<sup>(24)</sup>. One study identified that users aged over 35 years old (58.3%) were predominantly dependent on alcohol, while younger users were addicted to multiple drugs, including marijuana and crack and, eventually, alcohol, data also similar to those found in this study<sup>(25)</sup>.

Another aspect that made up the profile was work activity, which, due to addiction to chemical substances, ends up being associated with low schooling levels, contributing to an increase in unemployment<sup>(24)</sup>. In another study, 25% of the people addicted to chemical substances were working at the time of their hospitalization. The functions were varied and, for the most part, they had no employment contracts; in other words, they did not earn any fixed income, placing them in a situation of social vulnerability<sup>(25)</sup>.

### Mental health indicators in the TCs

The use of psychoactive substances can be associated with the presence of other diseases in people addicted to chemical substances. In recent decades, a number of studies have shown an increase in the prevalence of mental disorders, such as anxiety, mood disorders, schizophrenia and attention disorders<sup>(26)</sup>. Another study<sup>(27)</sup> observed high prevalence of psychiatric comorbidities (88.8%), especially Major Depressive Disorder (MDD) and antisocial personality disorder<sup>(27)</sup>. As for depression, it was found that 89 participants (55.3%) had criteria for the diagnosis of Major Depressive Disorder, with 59.1% of them being dependent on alcohol<sup>(28)</sup>. The authors consider that the diagnosis of depressive disorder should be taken into account initially when admitting people in a situation of addiction to chemical substances to any rehabilitation

service, so as to assist with the effectiveness of the treatments<sup>(28)</sup>. They point out that stress was prevalent in 55% of the sample in the resistance phase, with prevalence of psychological and physical symptoms. With regard to the most cited sources of stress, internal factors such as fear of disappointing people are mentioned<sup>(29)</sup>.

Several tools can be used to assess the symptoms that affect mental health. According to the analysis by means of the DASS-21 questionnaire<sup>(23)</sup>, they identified data that corroborate the current study. Most of the participants had a normal classification in the depression, anxiety and stress symptoms, in addition to a significant relationship between these symptoms and the performance of work activities, as the participants who worked showed lower stress, anxiety and depression symptoms when compared to those who did not work. Also according to the same authors, a significant association was found between severe depression, anxiety and stress symptoms and tobacco consumption. When noticing these symptoms, several actions can be taken in an attempt to mitigate such situation. The change in the quality of life of 141 patients with addiction to chemical substances and depression was investigated. The results showed differences between the groups of people in situations of addiction to chemical substances and depression, in the initial phase of the treatment. However, after 2 to 4 months after treatment initiation, differences between the groups under study were no longer observed, with a significant improvement in the quality of life of the individuals who performed physical activities during the aforementioned period<sup>(30)</sup>.

### Benefits of contact with nature

Contact with nature has been an aspect reported in the literature as an element that attenuate problems associated with mental health. The association of tree-lined streets with the use of antidepressants was analyzed in a German population<sup>(31)</sup>. By evaluating the effects of the spatial scale of the street and the distance of the trees from around the participants' homes, the authors found a low rate of antidepressant prescriptions for people who lived within a radius of 100 meters from green areas, when compared to those who lived further away from these areas. Examining the association between contact with nature through parks or recreational areas within a 7-day period and self-reported health and well-being, they noticed that the probability of reporting good health or high well-being levels became significantly greater with contact of at least 120 minutes *per week*<sup>(32)</sup>.

In Rio de Janeiro, Brazil, a study carried out in 2006 with 2,584 participants with the objective of

identifying the association between exposure to green areas close to homes and presence of mental disorders in adults, according to income strata, identified higher proportions of mental disorders: 30% and 39% in men and women, respectively. The researchers pointed out an inversely proportional relationship between mental disorders and presence of green areas in the residential surroundings up to 200 meters in the group of people with intermediate incomes and up to 1,500 meters in the low-income group, which suggests a beneficial effect of urban green areas in the mental health of the lower income population<sup>(33)</sup>.

The results of a study that analyzed several others which related exposure to physical exercise in green areas with improved self-esteem and mood indicated that such exposure improved the participants' self-esteem and mood in both sexes. When comparing age groups, self-esteem was higher among younger people and had decreasing effects with age. People diagnosed with mental disorders had more self-esteem improvements<sup>(34)</sup>.

Evaluating the association between mental health and exposure to natural outdoor environments, a cross-sectional study carried out in Spain with 406 participants showed better mental health, especially around green areas. This relationship was stronger in men, younger people and those with low and medium schooling levels<sup>(35)</sup>.

In Denmark, the prospective association between green spaces and mental health was analyzed. Approximately 1 million people were evaluated from birth to 10 years of age. The study showed that high levels of presence of green spaces are associated with lower levels of mental disorders during childhood. More green areas during childhood were associated with a lower risk of developing mental disorders later in life. Those who grew up far from green areas are 55% more likely to develop these disorders<sup>(36)</sup>.

In 2021, a survey was carried out in the city of São Paulo with different types of land cover using the population database of the Mental Health Survey of the Megacities of São Paulo ( $n=4,287$ ) and associations with depression and anxiety diagnoses. The percentage of different green spaces, mainly grassy areas, was negative when associated with the presence of anxiety, whereas roofs, asphalt and shade were associated with the presence of anxiety. The data indicate the need to increase green spaces in urban environments, especially in megacities, improving the residents' mental health<sup>(37)</sup>.

In a study carried out in Coimbra, Portugal, which related mental health, physical activity and green areas, it was shown that most of the participants positively evaluated their health status while in contact with green areas. Mental health scores are worse in women and the level decreases with age. The participants who enjoyed

green areas daily presented higher mental health scores. It is also noted that the participants with the best effects were those who did their activities on foot<sup>(38)</sup>.

In a paper carried out with 958 adults in Barcelona, a relationship was found that suggests the potential protective role of green spaces on mental health (depression and anxiety), as well as a reduction in the self-reported history of depressive symptoms and use of benzodiazepines<sup>(39)</sup>. A cross-sectional study carried out in Barcelona with 3,461 adults evaluated the association between exposure to green areas and Subjective General Health (SGH). Considering mental health status, social support and physical activity as mediators of this association, it was identified that surrounding residential vegetation and subjective residential proximity to green spaces were associated with an improvement in SGH<sup>(40)</sup>.

The influence of proximity to green areas on mental health benefits was analyzed, associated with a reduction in the subsequent risk of depressive symptoms, as well as whether this association had been modified by age, sex, or population density<sup>(41)</sup>. The authors identified a 6% lower incidence of high depressive symptoms associated with increased proximity to green areas, with this relationship being stronger in areas with higher population density ( $>1,000$  people/m<sup>2</sup>; 8% lower incidence)<sup>(41)</sup>. Investigating the effect of a green living environment on potentially combating incident depression was the topic of a research study conducted in South Africa, which identified an unequal benefit of the derived Normalized Difference Vegetation Index (NDVI) on incident depression among the study participants. The higher NDVI was a predictor of lower incident depression among middle-income participants when compared to their low-income counterparts<sup>(42)</sup>.

The allostatic load analysis is an important marker of chronic exposure to stressful conditions. A cross-sectional study carried out with 206 adults living in North Carolina, United States of America (USA), with the objective of evaluating the relationship between land cover with vegetation close to homes and the allostatic load, identified that living close to vegetation cover provided a 37% reduction in the allostatic load. The observed effects of vegetation cover on the allostatic load and individual biomarkers were consistent with the prevention of depression, cardiovascular diseases and premature mortality<sup>(43)</sup>.

Also in terms of the allostatic load, a research study carried out in Portugal measured the association between geographical accessibility to green spaces and allostatic load in 3,108 7-year-old children. The authors suggest that providing green spaces can contribute to improvements in the health of the population from the beginning of life<sup>(44)</sup>.

## Perceptions of well-being in contact with nature through the Word Cloud

In the city of São Paulo, a study sought to identify and evaluate the profile and perception of visitors to Trianon Park; as a result, green areas and security were highlighted as positive aspects of the place. It is concluded that, in the perception of the visitors, Trianon Park has a good infrastructure, offering positive sensations and contributing to better quality of life in the urban area; in the word cloud that addressed the most cited words related to the park, there was predominance of the words "bom", "verde" and "tranquilo" ("good", "green" and "quiet"), data similar to this study<sup>(45)</sup>.

In turn, in Minas Gerais, to analyze the urban parks from the city of Montes Claros through the construction of socio-spatial imaginaries, the experience and perception of its users in three urban parks, the study showed that, despite the values attributed to the places being of an individual nature and imbued with semiology and affectivity, certain social construction of socio-spatial imaginaries of the urban parks analyzed was noticed, marked by groups that have the same *habitus* perceptible by their lifestyle, in symbolic spaces (fields). Thus, for each object under study, a characteristic spatial imagery was verified according to different needs, interests, values and lifestyles. The words that predominated in the cloud were "paz", "tranquilidade", "natureza" and "atividade física" ("peace", "tranquility", "nature" and "physical activity")<sup>(46)</sup>.

In order to analyze the perception of users of a Psychosocial Care Center for Alcohol and Drugs (*Centro de Atenção Psicossocial Álcool e Drogas, CAPS AD*) regarding the importance of educational activities in Pará, word clouds were used for a qualitative analysis in 2019 and it was observed that, in most of the testimonies, the importance of educational activities was associated with the acquisition of new knowledge, and that it was a way of distancing or reducing thoughts and feelings arising from drug addiction through the use of words such as "ajuda", "ter", "estar" and "mente" ("help", "have", "be" and "mind")<sup>(47)</sup>.

The limitations of this study are related to the application of the collection methodology in three TCs, with a profile exclusively comprised by the male gender, as well as the stratification of the perceptions of the people in the TCs according to their time living there.

## Conclusion

This study is a contribution to the scientific community, having achieved the proposed objective of evaluating the influence of people in a situation of addiction to chemical substances living around green areas in residential care spaces (TCs) from the northeast

region of Santa Catarina. The population under study presents high rates of these symptoms and considers that contact with nature after being welcomed in the TCs exerted a positive impact on their recovery since, during their stay, they end up exposing themselves to various actions that require contact, such as care for orchards, vegetable gardens and animals, going beyond contemplation. This panorama evidences the importance of green areas in providing ecosystem services, which exert a direct impact on human life quality, such as well-being and mental health. Green areas should be recognized as an adjunct element in improving mental health as a whole; it is necessary to encourage not only the creation of more green environments in cities, but also the conservation and expansion of those that already exist. The application of scales that recognize stress, anxiety and depression symptoms could be used both when admitting patients and during their treatment, helping to monitor these symptoms that influence people's rehabilitation. Although mental health and environmental issues are areas of multi- and trans-disciplinary study, it becomes necessary to discuss these themes among health professionals, ensuring that the knowledge gain assists in identifying problems related to mental health and, from that point, articulate resolute, preventive and mainly health promotion actions, resorting to this and other studies as support for its practice in all environments where it operates. The results herein obtained point to the need to carry out research studies that include female patients, as well as a comparison of people in a situation of addiction to chemical substances in other treatment scenarios.

## References

1. Organização Mundial da Saúde. Mental health: a state of well-being. Genebra: WHO; 2020.
2. Organização Pan-Americana da Saúde. Depressão: o que você precisa saber [Internet]. c2023 [cited 2022 Mar 14]. Available from: <https://www.paho.org/pt/file/48094/download?tok=en=lnZZJ2q3#:~:text=A%20depress%C3%A3o%20%C3%A9%20um%20transtorno,durante%20pelo%20menos%20duas%20semanas>
3. World Health Organization. Policies and strategies to promote social equity in health [Internet]. 2007 [cited 2022 Mar 14]. Disponível em: [http://repositori.uji.es/xmlui/bitstream/handle/10234/187797/GoeranD\\_Policies\\_and\\_strategies\\_to\\_promote\\_social\\_equity\\_in\\_health.pdf?sequence=1](http://repositori.uji.es/xmlui/bitstream/handle/10234/187797/GoeranD_Policies_and_strategies_to_promote_social_equity_in_health.pdf?sequence=1)
4. Ministério da Saúde, Secretaria de Atenção à Saúde. Cadernos de Saúde Mental [Internet]. Brasília: Ministério da Saúde; 2013 [cited 2022 Mar 14]. Disponível em: [https://bvsmms.saude.gov.br/bvs/publicacoes/cadernos\\_atencao\\_basica\\_34\\_saude\\_mental.pdf](https://bvsmms.saude.gov.br/bvs/publicacoes/cadernos_atencao_basica_34_saude_mental.pdf)

5. Organização Mundial da Saúde. 66ª Sessão do Comitê Regional da OMS. Plano de ação sobre saúde mental [Internet]. Washington: OMS; 2014 [cited 2022 Mar 14]. Available from: <https://patriciamagno.com.br/wp-content/uploads/2021/05/OPAS-2014-Plano-de-Acao-sobre-Saude-Mental.pdf>
6. Benetti SPC, Pizetta A, Schwartz CB, Hass RA, Melo VL. Problemas de saúde mental na adolescência: características familiares, eventos traumáticos e violência. *Psico-USF* [Internet]. 2010 [cited 2022 Mar 14];15(3). Available from: <https://doi.org/10.1590/S1413-82712010000300006>
7. Zou Z, Wang H, d'Oleire Uquillas F, Wang X, Ding J, Chen H. Definition of Substance and Non-substance Addiction. *Adv Exp Med Biol*. 2017;1010: 21-41. [https://doi.org/10.1007/978-981-10-5562-1\\_2](https://doi.org/10.1007/978-981-10-5562-1_2)
8. Schlindwein-Zanini R, Almeida GM, Helegda LC, Fernandes KC. Wernicke-Korsakoff syndrome, substance use and abuse: neuropsychological and psychomotor effects. *Fiep Bull* [Internet]. 2014 [cited 2022 Mar 14];84:369-72. Available from: [https://www.researchgate.net/publication/264348161\\_WERNICKE-KORSAKOFF\\_SYNDROME\\_SUBSTANCE\\_USE\\_AND\\_ABUSE\\_NEUROPSYCHOLOGICAL\\_AND\\_PSYCHOMOTOR\\_EFFECTS](https://www.researchgate.net/publication/264348161_WERNICKE-KORSAKOFF_SYNDROME_SUBSTANCE_USE_AND_ABUSE_NEUROPSYCHOLOGICAL_AND_PSYCHOMOTOR_EFFECTS)
9. Bolonheis-Ramos RCM, Boarini ML. Comunidades terapêuticas: "novas" perspectivas e propostas higienistas. *Hist Ciênc Saúde Manguinhos*. 2015;22(4):1231-48. <https://doi.org/10.1590/S0104-59702015000400005>
10. Schlemper BR Junior. Bioética no acolhimento a dependentes de drogas psicoativas em comunidades terapêuticas. *Rev Bioética*. 2018;26(1). <https://doi.org/10.1590/1983-80422018261225>
11. Ministério da Saúde, Agência Nacional de Vigilância Sanitária (BR). Resolução RDC no. 101, de 30 de maio de 2001 [Internet]. Brasília: MS; 2001 [cited 2022 Mar 14]. Available from: [https://bvsmms.saude.gov.br/bvs/saudelegis/anvisa/2001/rdc0101\\_31\\_05\\_2001.html](https://bvsmms.saude.gov.br/bvs/saudelegis/anvisa/2001/rdc0101_31_05_2001.html)
12. Barcelos KR, Wandekoken KD, Dalbello-Araujo M, Quintanilha BC. A normatização de condutas realizadas pelas Comunidades Terapêuticas. *Saúde Debate*. 2021; 45(128). <https://doi.org/10.1590/0103-1104202112810>
13. Araya R, Montgomery A, Rojas G, Fritsch R, Solis J, Signorelli A, et al. Common mental disorders and the built environment in Santiago, Chile. *Br J Psychiatry* [Internet]. 2007;190:394-401. <https://doi.org/10.1192/bjp.bp.106.024596>
14. Van den Berg M, van Poppel M, van Kamp I, Andrusaityte S, Balseviciene B, Cirach M, et al. Visiting green space is associated with mental health and vitality: A cross-sectional study in four european cities. *Health Place*. 2016;38:8-15. <https://doi.org/10.1016/j.healthplace.2016.01.003>
15. Astell-Burt T, Mitchell R, Hartig T. The association between green space and mental health varies across the lifecourse. A longitudinal study. *J Epidemiol Comm Health* [Internet]. 2014 [cited 2022 Mar 14];68(6): 578-83. Available from: <https://jech.bmj.com/content/jech/68/6/578.full.pdf>
16. Ward Thompson C, Roe J, Aspinall P, Mitchell R, Clow A, Miller D. More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landsc Urban Plan* [Internet]. 2012 [cited 2022 Mar 14];105(3):221-9. Available from: <https://www.sciencedirect.com/science/article/pii/S0169204611003665>
17. Antônio CG. Métodos e técnicas de pesquisa social. São Paulo: Atlas; 2008.
18. Claudia R. Escala de depressão, ansiedade e estresse (DASS): adaptação e validação para o português do Brasil [Thesis]. Santos: Universidade Federal de São Paulo; 2013 [cited 2022 Mar 14]. Available from: <https://repositorio.unifesp.br/handle/11600/48328>
19. DePaolo CA, Wilkinson K. Get Your Head into the Clouds: Using Word Clouds for Analyzing Qualitative Assessment Data. *TechTrends*. 2014;58(3):38-44. <https://doi.org/10.1007/s11528-014-0750-9>
20. Legendre L, Legendre P. Numerical Ecology. Amsterdam: Elsevier Science & Technology Books; 2012. 1006 p.
21. Conselho Nacional de Saúde (BR). Resolução 466/12. Trata de pesquisas em seres humanos e atualiza a resolução 196 [Internet]. Diário Oficial da União, 12 dez. 2012 [cited 2013 Jun 13]. Available from: <http://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf>
22. Almeida RA, Anjos UU, Vianna RP, Pequeno GA. Perfil dos usuários de substâncias psicoativas de João Pessoa. *Saúde Debate*. 2014;38(102). <https://doi.org/10.5935/0103-1104.20140049>
23. Andretta I, Limberger J, Schneider JA, Mello LT. Sintomas de Depressão, Ansiedade e Estresse em Usuários de Drogas em Tratamento em Comunidades Terapêuticas. *Psico-USF*. 2018;23(2):361-73. <https://doi.org/10.1590/1413-82712018230214>
24. Sezorte FOF, Silva JV. Perfil dos usuários de substâncias psicoativas (spa) acolhidos na comunidade terapêutica religiosa Shalom. *Rev Valore* [Internet]. 2020 [cited 2022 Mar 14];4:426-39. Available from: <https://revistavalore.emnuvens.com.br/valore/article/view/382>
25. Ribeiro M. Avaliação psiquiátrica e comorbidades. In: Ribeiro M, Laranjeira R, organizators. O tratamento do usuário de crack. 2. ed. Porto Alegre: Artmed; 2012. p. 239-50.
26. Diehl A, Souza PM. Principais comorbidades associadas ao transtorno por uso de substâncias. In: Zanelatto N, Laranjeira R, organizators. O tratamento da dependência química e as terapias cognitivo-comportamentais: um guia para terapeutas. Porto Alegre: Artmed; 2013. p. 73-91.

27. Danieli RV, Ferreira MB, Nogueira JM, Oliveira LN, Cruz EM, Araújo GM Filho. Perfil sociodemográfico e comorbidades psiquiátricas em dependentes químicos acompanhados em comunidades terapêuticas. *J Bras Psiquiatr.* 2017;66(3):139-49. <https://doi.org/10.1590/0047-2085000000163>
28. Pereira PM, Bittencourt RM. Prevalência do transtorno depressivo maior em pessoas com dependência química. *SMAD Revista Eletrônica Saúde Mental Álcool e Drogas.* 2021;17(2):64-71. <https://doi.org/10.11606/issn.1806-6976.smad.2021.173585>
29. Miranda JC, Guimarães CA. Stress level in addicted people under treatment in therapeutic communities. *Bol Acad Paul Psicol [Internet].* 2021 [cited 2022 Mar 14];41(100). Available from: <http://pepsic.bvsalud.org/pdf/bapp/v41n100/a06v41n100.pdf>
30. Barbanti EJ. Efeito da atividade física na qualidade de vida em pacientes com depressão e dependência química. *Rev Bras Ativ Fís Saúde [Internet].* 2012 [cited 2022 Mar 14];11(1):37-45. Available from: <https://rbafs.org.br/RBAFS/article/view/831>
31. Marselle MR, Bowler DE, Watzema J, Eichenberg D, Kirsten T, Bonn A. Urban street tree biodiversity and antidepressant prescriptions. *Sci Rep.* 2020;10(1). <https://doi.org/10.1038/s41598-020-79924-5>
32. White MP, Alcock I, Grellier J, Wheeler BW, Hartig T, Warber SL, et al. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Sci Rep.* 2019;9(1). <https://doi.org/10.1038/s41598-019-44097-3>
33. Barreto PA, Lopes CS, Silveira IH, Faerstein E, Junger WL. Is living near green areas beneficial to mental health? Results of the Pró-Saúde Study. *Rev Saúde Pública.* 2019;53:75. <https://doi.org/10.11606/s1518-8787.2019053001008>
34. Barton J, Lindo J. Qual é a melhor dose de natureza e exercício verde para melhorar a saúde mental? Uma análise multi-estudo. *Ciênc Tecnol Amb.* 2010;44(10):3947-55. <https://doi.org/10.1021/es903183r>
35. Gascon M, Triguero-Mas M, Martínez D, Dadvand P, Forn J, Plasència A, et al. Mental Health Benefits of Long-Term Exposure to Residential Green and Blue Spaces: A Systematic Review. *Int J Environ Res Public Health.* 2015;12(4):4354-79. <https://doi.org/10.3390/ijerph120404354>
36. Engemann K, Pedersen CB, Arge L, Tsirogiannis C, Mortensen PB, Svenning JC. Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *Proc Natl Acad Sci.* 2019;116(11):5188-93. <https://doi.org/10.1073/pnas.1807504116>
37. Moreira TC, Polize JL, Brito M, Silva FDF, Chiavegato F, Alexandre DP, et al. Assessing the impact of urban environment and green infrastructure on mental health: results from the São Paulo Megacity Mental Health Survey. *J Expos Sci Environ Epidemiol.* 2021;32:205-12. <https://doi.org/10.1038/s41370-021-00349-x>
38. Barros CIV. O papel dos espaços verdes na saúde mental da população – caso de estudo na cidade de Coimbra [Thesis]. Coimbra: Universidade de Coimbra; 2017 [cited 2022 Mar 14]. Available from: <https://estudogeral.uc.pt/handle/10316/85371>
39. Gascon M, Sánchez-Benavides G, Dadvand P, Martínez D, Gramunt N, Gotsens X, et al. Long-term exposure to residential green and blue spaces and anxiety and depression in adults: A cross-sectional study. *J Environ Res.* 2018;162:231-9. <https://doi.org/10.1016/j.envres.2018.01.012>
40. Dadvand P, Bartoll X, Basagaña X, Dalmau-Bueno A, Martínez D, Ambros A, et al. Green spaces and General Health: Roles of mental health status, social support, and physical activity. *Environ Int.* 2016;91:161-7. <https://doi.org/10.1016/j.envint.2016.02.029>
41. Bezael CP, Banay RF, Coull BA, Hart JE, James P, Kubzansky LD, et al. The relationship between surrounding greenness in childhood and adolescence and depressive symptoms in adolescence and early adulthood. *Ann Epidemiol.* 2018;28(4):213-9. <https://doi.org/10.1016/j.annepidem.2018.01.009>
42. Tomita A, Vandormael AM, Cuadros D, Di Minin E, Heikinheimo V, Tanser F, et al. Green environment and incident depression in South Africa: a geospatial analysis and mental health implications in a resource-limited setting. *Lancet Plan Health.* 2017;1(4):e152-e162. [https://doi.org/10.1016/s2542-5196\(17\)30063-3](https://doi.org/10.1016/s2542-5196(17)30063-3)
43. Egorov AI, Griffin SM, Converse RR, Styles JN, Sams EA, Wilson A, et al. Vegetated land cover near residence is associated with reduced allostatic load and improved biomarkers of neuroendocrine, metabolic and immune functions. *Environ Res.* 2017;158:508-21. <https://doi.org/10.1016/j.envres.2017.07.009>
44. Ribeiro AI, Tavares C, Ferreira I, Barros H. Associação entre área verde do bairro e marcadores biológicos em crianças em idade escolar. Achados da coorte de nascimentos da Geração XXI. *Amb Int.* 2019;132:105070. Disponível em: <https://doi.org/10.1016/j.envint.2019.105070>
45. Mota MD, Régis MD, Nascimento AP. Perfil e Percepção Ambiental dos Frequentadores do Parque Tenente Siqueira Campos (Trianon), no Município de São Paulo/SP. *Periódico Eletr Fórum Amb Alta Paulista.* 2019;15(2). <https://doi.org/10.17271/1980082715220192184>
46. Durães BM, Veloso S, Niza SMF. Parques Urbanos: Análise temporal do Parque Municipal Milton Prates Em Montes Claros/MG: Impactos ambientais e qualidade hídrica. *Rev Verde Grande.* 2021;3(02):200-16. <https://doi.org/10.46551/rvg2675239520212200216>

47. Teixeira LM, Mendonça X, Santos T, Costa B, Sousa A, Santos G, et al. Práticas educativas em um centro de atenção psicossocial álcool e drogas: percepção dos usuários. Rev Eletr Acervo Saúde. 2020;12(5):e3013. <https://doi.org/10.25248/reas.e3013.2020>

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