

Health condition of inmates in a prison in the Midwestern region of Santa Catarina state**Condições de saúde de detentos em um presídio da região meio oeste Catarinense****Condiciones de salud de presos en una cárcel de la región medio oeste de Santa Catarina****Received: 03/12/2020****Approved: 01/06/2021****Published: 01/01/2022****Rosemari Santos de Oliveira¹****Lincon Bordignon Somensi²****Claudriana Locatelli³**

This is a descriptive, retrospective, cross-sectional and quantitative study, carried out in 2019 through the analysis of the medical records of incarcerated people in the city of Caçador, in the state of Santa Catarina, Brazil. It aimed to analyze health conditions of inmates. Sociodemographic data, history of habits and addictions, diseases, use of medications, rapid diagnostic test and medical consultations were collected. The analysis was performed using descriptive statistics and chi-square testing. The records of 266 inmates (overcrowded) were considered, in which it has revealed that the majority of inmates were male (96.24%); 20 to 39 years of age (72.26%); brown (48.04%) and white (44.53%); unemployed (45.7%); single (61.57%), with low educational level (52.94% had up to elementary education); used benzodiazepines (28.38%), antidepressants (18.02%) and antipsychotics (14.44%); consumed tobacco (58.2%) and marijuana (44.53%); 95.31% of men and all women underwent rapid diagnostic tests for hepatitis B, syphilis and HIV at time of admission, and on days following entry, both men and women had two medical appointments. Alcohol, marijuana and crack use presented correlation with depression. The context presented shows the need for investments in public policies to improve disease prevention and health promotion for people deprived of liberty.

Descriptors: Prisoners; Health profile; Health promotion; Communicable disease control.

Este é um estudo descritivo, retrospectivo, transversal e quantitativo, realizado em 2019 através da análise dos prontuários das pessoas privadas de liberdade no município de Caçador-SC, com objetivo de analisar as condições de saúde da população carcerária. Coletaram-se dados sociodemográficos, histórico de hábitos e vícios, doenças, uso de medicamentos, realização de teste rápido e consultas médicas. A análise se deu por estatística descritiva e ocorreu através do teste de Qui-quadrado. Considerou-se prontuários de 266 detentos (com superlotação), sendo: maioria do sexo masculino (96,24%); 20 a 39 anos (72,26%); pardos (48,04%) e brancos (44,53%); desempregados (45,7%); solteiros (61,57%), baixa escolaridade (52,94% até fundamental); uso de benzodiazepínicos (28,38%), uso de antidepressivos (18,02%) e de antipsicóticos (14,44%); consumo de tabaco (58,2%), seguido da maconha (44,53%); 95,31% dos homens e todas mulheres realizaram testes rápidos para hepatite B, sífilis e HIV no momento da admissão, e em dias subsequentes à entrada, tanto homens quanto mulheres, duas consultas médicas. O consumo de álcool, maconha e crack mostrou correlação com depressão. O contexto apresentado, mostra a necessidade de investimentos em políticas públicas para melhoria na prevenção de doenças e promoção da saúde de pessoas com privação de liberdade.

Descritores: Prisioneiros; Perfil de saúde; Promoção da saúde; Controle de doenças transmissíveis.

Este es un estudio descriptivo, retrospectivo, transversal y cuantitativo, realizado en 2019 mediante el análisis de las historias clínicas de las personas privadas de libertad en el municipio de Caçador-SC, Brasil, con el objetivo de analizar las condiciones de salud de la población penitenciaria. Se recogieron datos sociodemográficos, antecedentes de hábitos y adicciones, enfermedades, uso de medicamentos, pruebas rápidas y consultas médicas. El análisis se realizó mediante estadística descriptiva y se produjo a través de la prueba de Chi-cuadrado. Se consideraron las historias clínicas de 266 presos (con hacinamiento), siendo mayoría de sexo masculino (96,24%); de 20 a 39 años (72,26%); pardos (48,04%) y blancos (44,53%); desempleados (45,7%); solteros (61,57%), bajo nivel de estudios (52,94% hasta primaria); uso de benzodiazepinas (28,38%), uso de antidepresivos (18,02%) y antipsicóticos (14,44%); el consumo de tabaco (58,2%), seguido de la marihuana (44,53%); el 95,31% de los hombres y todas las mujeres se sometieron a pruebas rápidas de hepatitis B, sífilis y VIH en el momento del ingreso, y en los días posteriores al ingreso, tanto los hombres como las mujeres tuvieron dos consultas médicas. El consumo de alcohol, marihuana y crack mostró correlación con la depresión. El contexto presentado muestra la necesidad de invertir en políticas públicas para mejorar la prevención de enfermedades y la promoción de la salud de las personas privadas de libertad.

Descritores: Prisioneros; Perfil de salud; Promoción de la salud; Control de enfermedades transmisibles.

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INTRODUCTION

The prison population grows disorderly every year, causing large agglomerations of people in prisons. Thus, the prison model in Brazil generates numerous obstacles for governments to keep individuals deprived of liberty in cells, which are precarious and overcrowded, in addition to other factors linked to the structure of prisons. This fact, in most prisons, can favor the spread of diseases, allowing for epidemics and contamination¹.

The care of inmates in prisons has been provided for in Brazil since 1984, but only in 2003 a ministerial decree organized actions and health services in the prison system based on principles and guidelines of the Unified Health System (SUS)¹. Therefore, people deprived of liberty have rights to health care². Much has been discussed by public authorities about the organization of health systems and the process of regionalization of health care in prisons so that they could offer health services to the prison population based on universality, equity, integrality and resoluteness of care in the absence of health care³.

The prison system must have an adequate infrastructure to offer rights such as: health, education, work and other needs⁴. In Brazil, studies show that prisons present several adverse conditions such as inadequate physical space, idleness, lack of professionals dedicated to health, social work and education to work in unhealthy environments, in which inequities and illnesses are intensified⁴⁻⁶.

The precariousness of the Brazilian prison system favors the proliferation of endemic diseases in prisons, with the main diseases that culminate among inmates are drug-related disorders, such as mental disorders, which occur due to abstinence, sexually transmitted infections (STIs) as the Human Immunodeficiency Virus (HIV), hepatitis B and C, herpes and syphilis⁶⁻⁸. Tuberculosis is another common health condition in Brazilian prisons due to overcrowding⁹.

Also, there is precariousness in the identification of communicable diseases upon admission, due to the lack of trained health professionals in the prison environment, thus causing deficiency in health promotion and disease prevention⁵.

Although Brazilian¹⁰⁻¹² and international¹³⁻¹⁷ studies show concern with the health conditions of the prison population, as these environments are potentially prone to the spread of some diseases, especially STIs, there is still little research showing the real health conditions of this population at time of admission. Still, existing studies are generally carried out in large prisons located in metropolitan regions, such as Rio de Janeiro and São Paulo^{7,9,10,18}.

In the case of the state of Santa Catarina, there is an issue non compliance to the Brazilian Criminal Execution Law, which guarantees the health of people deprived of liberty; however, many prisoners begin their sentences while infected with various diseases, and thus can spread diseases to other inmates. Also, when some of these inmates are acquitted, there is a high probability of them transmitting these diseases to their family members. Thus, this study aims to analyze the health conditions of the prison population.

METHODS

This is a descriptive study, with a cross-sectional retrospective design and a quantitative approach, through the analysis of the medical records of people deprived of liberty in the city of Caçador-SC.

The city of Caçador is located at 412.2 km from the state's capital, Florianópolis, and has a population of 79,313,000 inhabitants, according to a 2020 census¹⁹. The city is considered a regional center, as it aggregates the municipalities of the Contestado region. The Caçador city prison brings together several municipalities in Santa Catarina: Fraiburgo, Videira, Joaçaba, Água Doce, Rio das Antas, Santa Cecília, Lebon Régis, Timbó Grande and other municipalities in its surroundings that have a partnership with the city.

The study population consisted of individuals deprived of liberty, who were admitted from January to December 2019, and who were still detained at the time of data collection, which took place from January to December 2019.

The search took place through the institution's system, which released the medical records of people deprived of liberty in this prison so that they could be analyzed according to the defined and selected variables.

The variables considered were: a) Sociodemographic data: age, gender, skin color, marital status, educational level, city of origin and profession; b) History of habits and addictions - use of legal and illegal drugs; c) History of non-communicable chronic illnesses and infectious diseases - diabetes, hypertension, depression, Acquired Immunodeficiency Syndrome (AIDS/HIV), hepatitis B, syphilis, and others; d) Use of prescribed medications with medical monitoring; e) History of rapid diagnostic testing - HIV, hepatitis B and syphilis. All information obtained from data collection was transferred to the Microsoft Excel 2010 program database.

From the database, the information was analyzed using descriptive statistics techniques. Tables were made using the synthesis of information obtained, in absolute number and percentage. To verify the association between the diseases in the medical records (Hypertension, Diabetes and Depression) with drug use (Alcohol, Tobacco, Marijuana, Crack and Cocaine), the Chi-Square test was used. A 95% confidence interval was considered, with a significance of $p < 0.05$, using the IBM SPSS Statistics 22.0 software.

This research was developed in accordance with Resolution CNS 466/2012 of the Ministry of Health and submitted to the Research Ethics Committee - CEP of the Universidade Alto Vale do Rio do Peixe - UNIARP, approved under Opinion No. 3,619,569. Before starting the research, a copy of the project was sent along with a written request to the prison in the municipality of Caçador for authorization to carry out the study at the institution. Upon approval, the collection of data from the medical records began, characterizing the use of secondary data, without access to the inmates.

RESULTS

The prison in Caçador - SC has space for 96 people (20 in the women's wing and 76 in the men's wing). However, this prison unit is operating at about 200% over capacity. At the time of data collection, there were 266 inmates; of these, 256 men and 10 women (Table 1).

The profile of men showed that most were between 20 and 39 years of age, white or brown, single, with complete elementary education and unemployed. The profile of the women showed that most were between 20 and 39 years of age, white or brown, married, with incomplete high school education and unemployed (Table 1).

Approximately 55% lived in the city of Caçador and 7.03% lived in the city of Lebon Régis; and the others were from several cities in the state of Santa Catarina, including a smaller number of prisoners from the state of Paraná (12 people), Rio Grande do Sul (3 people) and Pará (2 people).

As for rapid diagnostic tests and medical consultations by this population, it was found that 95.31% of men and all women underwent rapid tests for hepatitis B, syphilis and HIV upon admission. In days subsequent to admission, both men as women had approximately two medical consultations.

Table 1. Persons deprived of liberty according to sociodemographic data. Caçador-SC, December 2019.

Variable	Men No. (%)	Women No. (%)
Gender	256 (96.24)	10 (3.76)
Age		
Up to 19 years	11 (4.30)	1 (10.00)
20 – 39 years	185 (72.26)	6 (60.00)
40 – 49 years	38 (14.84)	3 (30.00)
50 – 59 years	12 (4.69)	
60+ years	10 (3.91)	
Mean ± SD	32.31 ± 39.80	31.20 ± 15.88
Self-reported skin color		
White	114 (44.53)	5 (50.00)
Brown	123 (48.04)	5 (50.00)
Black	18 (7.03)	0 (0.00)
Indigenous	1 (0.39)	0 (0.00)
Educational level		
No information	4 (1.57)	
Incomplete elementary school	59 (23.14)	1 (10.00)
Complete elementary school	76 (29.80)	0 (0.00)
Incomplete high school	56 (21.96)	4 (40.00)
Complete high school	56 (21.96)	3 (30.00)
Incomplete higher education	3 (1.18)	2 (20.00)
Complete higher education	1 (0.39)	0 (0.00)
Marital status		
No information	2 (0.78)	0 (0.00)
Single	157 (61.57)	3 (30.00)
Married	93 (36.47)	7 (70.00)
Widowed	3 (1.18)	0 (0.00)
Occupation		
Retired	8 (3.13)	0 (0.00)
Farmer	18 (7.03)	0 (0.00)
Self-employed	11 (4.30)	0 (0.00)
Production assistant	10 (3.91)	0 (0.00)
Unemployed	117 (45.70)	7 (70.00)
Electrician	3 (1.17)	0 (0.00)
Student	14 (5.47)	0 (0.00)
Auto-mechanic	4 (1.56)	0 (0.00)
Driver	4 (1.56)	0 (0.00)
Machine operator	7 (2.73)	0 (0.00)
Constructor	24 (9.38)	0 (0.00)
Painter	3 (1.17)	0 (0.00)
General services	4 (1.56)	0 (0.00)
Salesperson	3 (1.17)	0 (0.00)
Others	26 (10.16)	3 (30.00)

Mental illnesses were the most frequent. Depression stood out in both men (19.53%) and women (30%), followed by psychosis in men and sleep disorders in both men and women. A portion of the male population had syphilis (Table 2).

As for medications, the most used class was benzodiazepines in 50% of women and 28.38% of men, followed by antidepressants (Table 3).

For drug use, tobacco stood out in both men (58.20%) and women (90%); followed by marijuana (Table 4).

The data presented in Table 5 show that the use of drugs such as alcohol, marijuana and crack led to a predisposition to the development of depression, as evidenced by the p -value ≤ 0.05 . The development of hypertension and diabetes did not show any correlation with the drug use, whether legal or illegal (data not shown).

Table 2. Diseases reported in medical records by men and women deprived of liberty. Caçador-SC, December 2019.

Diseases	Men (%)	Women (%)
Arterial hypertension	4.30	10.00
Diabetes mellitus	2.00	0.00
Gastric disorders	2.34	0.00
Respiratory disorders	1.17	0.00
Sleep disorders	11.72	30.00
Depression	19.53	30.00
Psichosis	12.5	0.00
Epilepsy	3.51	10.00
Syphilis	3.90	0.00
HIV/AIDS	1.56	0.00

Table 3. Medication use by inmates. Caçador - SC, December 2019.

Medication	Men (%)	Women (%)
Selective serotonin reuptake inhibitors	5.86	0.00
Tricyclic antidepressants	12.16	7.14
Antipsychotics	14.44	0.00
Antiepileptics	4.05	14.28
Benzodiazepines	28.38	50.00
Antihypertensives	6.75	7.14
Thiazide diuretics	4.50	7.14
Beta-2 adrenergic receptor antagonist	0.90	0.00
Proton pump inhibitors	4.95	0.00
Oral hypoglycemic agents	2.25	0.00
Insulin	0.45	0.00
Antibiotics	4.50	0.00
Antiretrovirals	1.80	0.00

Table 4. Consumption of legal and illegal drugs* by the prison population detained in the prison of Caçador - SC in December 2019.

Drug consumption	Men No. (%)	Women No. (%)
Alcohol	32 (12.5)	2 (20.00)
Tobacco	149 (58.20)	9 (90.00)
Marijuana	114 (44.53)	9 (90.00)
Cocaine	7 (2.73)	1 (10.00)
Crack	43 (16.80)	5 (50.00)

* The percentage of the sum exceeds 100%, as in some medical records it was found the consumption of more than one drug by a person deprived of liberty.

Table 5. Use of legal and illegal drugs and incidence of depression among people deprived of liberty. Caçador-SC, December 2019.

Variables	Number of individuals No. (%)	Depression		p-Value
		Yes No. (%)	No No. (%)	
Alcohol consumption		Yes	No	
Yes	34 (12.78)	21 (61.76)	13 (38.24)	0.001
No	232 (87.21)	33 (14.22)	199 (85.78)	
Tobacco consumption				
Yes	158 (59.40)	38 (24.05)	120 (75.95)	0.06
No	108 (40.60)	16 (14.81)	92 (85.19)	
Marijuana consumption				
Yes	123 (46.24)	37 (30)	86 (70)	0.001
No	143 (53.76)	17 (11.88)	126 (88.12)	
Cocaine consumption				
Yes	8 (3)	3 (37.50)	5 (62.50)	0.09
No	258 (97)	51 (19.77)	207 (80.23)	
Crack consumption				
Yes	48 (18)	26 (54.17)	22 (45.83)	0.05
No	218 (82)	28 (2.84)	190 (87.16)	

DISCUSSION

The prison in Caçador – SC has been operating with overcrowding for some time. Given this, in 2018 the Ministry of Justice was intervened, stipulating that the prisoner limit should be 240 people. However, at the time of data collection, 266 people were found; that is, 26 people above the stipulated limit. Such data show the continuation of overcrowding even after intervention. Overcrowding is common in Brazilian prisons, which favors the development and proliferation of various pathologies, especially communicable diseases.

People deprived of liberty in the prison in Caçador – SC, at the time of the research, are young, male, single and with a low educational level, a profile found in other studies^{5,6,10,18}. These report a population aged between 29 and 49 years, white or brown and with a low educational level, in addition to being unemployed at the time of imprisonment^{5,6,10,18}. Data presented by the Ministry of Justice²⁰ also show that more than half of this population is young people aged 18 to 29 years.

In the state of Santa Catarina, according to data provided by the Ministry of Justice²⁰, 62.04% of people deprived of liberty are white and 36.76% are black. In Caçador, there is a peculiarity of the Southern region of the state of Santa Catarina, where the profile of the population deprived of liberty is mostly white, followed by brown.

Prisons in low-income countries often do not have the laboratory infrastructure needed to process conventional serological tests on inmates, as the laboratories are external, and require funding, sample transport and tracking of results, which can involve complicated logistics, making it difficult routine screening for STIs^{4,13}.

The performance of rapid diagnostic tests is used worldwide and shows significant advantages compared to the laboratory method, being introduced into the prison system by the National Policy for Comprehensive Health Care for Persons Deprived of Liberty⁴. It is considered a simple method and does not require specialized professionals, which allows knowledge of the results and immediate care⁴.

According to DEPEN²¹, rapid tests in the prison system aim to prevent the spread of infectious diseases such as the detection of HIV, syphilis and hepatitis B and C. There are many advantages of applying rapid tests in the prison system, such as the realization of early diagnoses for internal control and prevention of infectious and contagious diseases among people deprived of liberty and can serve as support for the mental health team to assist in the therapy of this group¹⁶.

Rapid tests are mandatory in the Caçador penitentiary, offered when people enter the prison institution and during routine consultations. This practice is inserted by the state of Santa Catarina based on the Brazilian National Policy for Comprehensive Care for People Deprived of Liberty to encourage health care for all individuals with infectious diseases and also to detect new cases of diseases in those who are entering the system prison³.

The implementation of rapid tests in Brazilian prisons to diagnose STIs, HIV and Viral Hepatitis represents an advance in the area of prison care, improving the monitoring of infectious diseases and the epidemiological profile²².

One of the main concerns of the application of rapid tests in prisons throughout Brazil is the guarantee of secrecy and confidentiality. Therefore, it is important to ensure that all people deprived of liberty are always tested in association with counseling³. Prisons are key environments for the control of STIs, not only for the prevention of serious complications in already infected patients, but also for the prevention of transmission in the community¹²⁻¹⁵.

When offering rapid testing such as HIV, or other rapid tests, it is important that all health professionals in the prison system remember pre and post-test counseling, paying attention to secrecy and, often, associations of sexual practices, situations of violence, use of injectable drugs that may favor risk of exposure to STI/HIV/Aids.

HIV-positive people have the right to specialized outpatient care, inside or outside the prison system²³. Thus, the use of rapid tests to detect STIs must be implemented in the prison

system through a standard procedure to obtain optimal diagnostic performance, and by a trained and qualified health professional, avoiding false positives or negatives.

As for the prevalence of hepatitis C in the prison population in Brazil, studies carried out in Brazilian prisons show that, in São Paulo, there is a high incidence of it, while it reaches 5%^{8,23} in the prison system of Florianópolis – SC.

When were the morbidities evaluated between 2007 and 2014, the number of AIDS and viral hepatitis cases decreased, while syphilis cases increased by more than 200%¹¹. These data reinforce the importance of carrying out rapid tests in the prison population as a way to prevent the spread of sexually transmitted infections.

Many were the pathologies found in the medical records of the prison population of Caçador-SC, some of which were previous, such as: diabetes, hypertension and hypercholesterolemia, although there are cases in which the prison environment triggers or decompensates a pathology, and the precariousness of the prison unit can collaborate to the increase of pathologies among people deprived of liberty. In research^{14,16-17} it appears that prisons can offer risks of spreading diseases, but also prevention of infections. In this sense, it is necessary to address important issues regarding the organization of health services in prisons to expand to the entire prison population, whether sick or not, aiming at prevention and health promotion.

The data presented in this study corroborate other studies that assessed the mental health of the Brazilian prison population, which show a worrying prevalence of depression and psychosis in this population^{6,7,18}. Depression among men was associated with a lack of discipline in the prison, which favors the increase of interpersonal conflicts and risky activities, while women manifest it through psychological and cognitive changes, presenting a negative attitude about situations and the future¹⁸.

Studies reveal that the prevalence of psychiatric disorders in prisoners has increased compared to the general population. The results of a systematic review and meta-analysis of studies done in prisons over the period 1966-2010 on 33,588 prisoners show an increase in psychosis and severe depression compared to the general population²⁴. Psychotic disorders were observed in 3.6% of male prisoners and in 3.9 of females prisoner, while severe depression was found in 10.2% of women and in 14.1% of men. Among the psychotic disorders, most were cases of schizophrenia following the use of illicit drugs.

The use of drugs such as alcohol, marijuana and crack leads to a predisposition to the development of depression²⁵. In Santa Catarina, and more specifically in the prison of Caçador, it is clear that there are difficulties in proper treatment for mental disorders, as prison officers are not able to identify and act on an individual mental disorder, a fact that it can further harm the person deprived of liberty, harming the prison environment as well.

The results showed high consumption of psychotropic medications. There was an increase in the consumption of psychotropic medications in the population of adolescents, aged 18 years and young adults aged between 18 and 40 years, a context that may be related to a number of factors, including: sociodemographic aspects, such as age, gender, psychosocial factors, in addition to the influence of friends and family²⁶. Also, the consumption of psychotropic medication by the prison population in Caçador may be associated with the consumption of illicit drugs such as marijuana, given that approximately 45% of men and 90% of women report using it. As the consumption of illegal drugs is not allowed, they may have sought to substitute it for legal drugs.

Drug abuse is a reality in the prison system and can be associated with crime. People deprived of liberty are rarely given the attention needed to help them overcome this problem. Mental disorders are common in prisons, with great difficulty in handling the most severe cases²⁷.

Drug use by the vast majority of people deprived of liberty demonstrates social and public health problems in the population of the Brazilian penal system. Many of those who alluded to

the use of some type of drug may present and/or develop some mental disorder during their detention²⁷.

Studies show that 20.3% of alcoholics have a diagnosis of depression or anxiety, and about 10% of cocaine/crack addicts had severe depressive symptoms²⁸.

Alcohol and cocaine consumption aggravates depression, increases the risk of comorbidities and suicide, and interferes with the effectiveness of treatments for depression^{14,29,30}. On the other hand, chemical dependence is one of the risk factors for depression, especially in women, over 60 years of age, of low income and educational level, unemployed and with little family contact³⁰.

Although it is normally expected that small prisons do not present problems usually found in the large ones, such as precarious health conditions, this research showed that the problems presented by the population deprived of liberty in the Caçador-SC prison are similar to other Brazilian prison institutions, a fact that deserves attention and investment in public policy programs to improve disease prevention and health promotion in this population.

CONCLUSION

The present study showed that, in the prison of Caçador-SC, half of inmates are from the city itself, young adults, male, with low educational level, unemployed and single, almost all underwent diagnostic tests upon admission or within two weeks after entry into the presidio.

Depression was the main illness, associated with the use of drugs such as tobacco, marijuana and crack. There was also high consumption of psychotropic drugs, especially benzodiazepines and antidepressants, which may be associated with the use of illicit drugs that are difficult to access in prison, or even due to the high number of individuals with depression and sleep disorders.

Despite advances in guaranteeing the physical integrity of people deprived of liberty, there is still much to be done to change the current health situation in prison systems. There is an urgent need to increase integrated actions in the units of the Brazilian penitentiary system and in the state of Santa Catarina, aiming at the continuous improvement of health services. For these actions to occur, it is necessary to initiate a broad discussion of various sectors and state and federal agencies that seek to recognize the problem and develop effective actions to insert new health services throughout this prison system, providing quality and better health living conditions for people deprived of liberty.

This research is important for the social context, as it shows the need to readjust the number of people deprived of liberty in this prison. This would solve several other problems, such as disease transmission, hygiene and quality of health care, bringing dignity to this population. Thus, further studies are needed in order to understand how it is possible to solve such huge health issues for this population in prison systems.

As limitations, the research in a single prison in the state of Santa Catarina stands out, which allowed the analysis of a small group of inmates and not the state as a whole, adding to this the incompleteness of data and the non-performance of rapid diagnostic tests on admission. In turn, the study enables the assessment and possible organization of health actions in this prison.

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Rosemari Santos de Oliveira contributed to the design, collection and analysis of data and writing. **Lincon Bordignon Somensi** participated in the writing and reviewing. **Claudriana Locatelli** collaborated in the design, collection and analysis of data, writing and reviewing.

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