PREVALÊNCIA DE DOENÇAS CRÔNICAS NÃO TRANSMISSÍVEIS EM POPULAÇÃO PRIVADA DE LIBERDADE EM UMA PENITENCIÁRIA ESTADUAL

PREVALENCE OF CHRONIC NON-COMMUNICABLE DISEASES IN A POPULATION DEPRIVED OF LIBERTY IN A STATE PENITENTIARY

PREVALENCIA DE ENFERMEDADES CRÓNICAS NO TRANSMISIBLES EN UNA POBLACIÓN PRIVADA DE LIBERTAD EN UNA PENITENCIARÍA ESTATAL

https://doi.org/10.56238/sevened2025.021-045

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RESUMO

Em todo o mundo, a população carcerária total supera os 10,7 milhões de pessoas. Segundo o World Prison Brief, do Institute for Crime & Justice Policy Research, os Estados Unidos têm a maior população carcerária do mundo, com 1.767.200 indivíduos apenados (2021), seguidos pela China, com 1.690.000 indivíduos (2018). O Brasil ocupa a terceira posição, com 839.672 pessoas encarceradas (junho de 2022), representando uma taxa de 390 detentos por 100 mil habitantes. Desses, 5,4% são mulheres, sendo os homens a grande maioria da população carcerária. O Brasil possui um total de 1.384 instituições para atender essa demanda, com uma capacidade oficial de 482.875 detentos, o que representa uma taxa de ocupação de 173,9%, indicando um grave problema de superlotação no sistema prisional. Este estudo teve como objetivo estimar a prevalência de doenças crônicas não transmissíveis (DCNTs) e seus fatores de risco na população carcerária da Penitenciária Estadual de Ponta Grossa. Realizou-se um estudo de coorte transversal, retrospectivo e descritivo, analisando os prontuários médicos de 407 detentos. A prevalência de hipertensão foi de 5,42%, dislipidemia 0,74%, diabetes mellitus 0,49% e uso de drogas ilícitas 37,68%. A análise estatística não revelou uma associação significativa entre o uso de drogas ilícitas e as DCNTs, embora as tendências sugiram uma relação. Os resultados indicam uma população carcerária jovem, com alta prevalência de uso de drogas ilícitas. Embora a prevalência de DCNTs tenha sido baixa, esses indivíduos estão em maior risco de desenvolver essas condições, especialmente devido aos desafios

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da vida prisional e ao acesso limitado a cuidados de saúde. É crucial melhorar as intervenções de saúde nessa população, o que pode ter implicações mais amplas para a saúde pública.

Palavras-chave: DCNT. Pessoas privadas de liberdade. Saúde prisional. Uso de drogas. Hipertensão.

ABSTRACT

Worldwide, the total prison population exceeds 10.7 million people. According to the World Prison Brief, from the Institute for Crime & Justice Policy Research, the United States has the largest prison population in the world, with 1,767,200 individuals incarcerated (2021), followed by China, with 1,690,000 individuals (2018). Brazil ranks third, with 839,672 people incarcerated (June 2022), representing a rate of 390 inmates per 100,000 inhabitants. Of these, 5.4% are women, with men making up the vast majority of the prison population. Brazil has a total of 1,384 institutions to meet this demand, with an official capacity of 482,875 inmates, which represents an occupancy rate of 173.9%, indicating a serious problem of overcrowding in the prison system. This study aimed to estimate the prevalence of chronic noncommunicable diseases (NCDs) and their risk factors in the prison population of the Ponta Grossa State Penitentiary. A cross-sectional, retrospective, descriptive cohort study was conducted, analyzing the medical records of 407 inmates. The prevalence of hypertension was 5.42%, dyslipidemia 0.74%, diabetes mellitus 0.49%, and illicit drug use 37.68%. Statistical analysis did not reveal a significant association between illicit drug use and NCDs, although trends suggest a relationship. The results indicate a young prison population with a high prevalence of illicit drug use. Although the prevalence of NCDs was low, these individuals are at higher risk of developing these conditions, especially due to the challenges of prison life and limited access to health care. It is crucial to improve health interventions in this population, which may have broader public health implications.

Keywords: NCDs. People deprived of liberty. Prison health. Drug use. Hypertension.

RESUMEN

A nivel mundial, la población carcelaria total supera los 10,7 millones de personas. Según el Informe Mundial sobre Prisiones, del Instituto para la Investigación de Políticas sobre Crimen y Justicia, Estados Unidos tiene la mayor población carcelaria del mundo, con 1.767.200 personas encarceladas (2021), seguido de China, con 1.690.000 personas (2018). Brasil ocupa el tercer lugar, con 839.672 personas encarceladas (junio de 2022), lo que representa una tasa de 390 reclusos por cada 100.000 habitantes. De estos, el 5,4% son mujeres, siendo los hombres la gran mayoría de la población carcelaria. Brasil cuenta con un total de 1.384 instituciones para atender esta demanda, con una capacidad oficial de 482.875 reclusos, lo que representa una tasa de ocupación del 173,9%, lo que indica un grave problema de hacinamiento en el sistema penitenciario. Este estudio tuvo como objetivo estimar la prevalencia de enfermedades crónicas no transmisibles (ENT) y sus factores de riesgo en la población carcelaria de la Penitenciaría Estatal de Ponta Grossa. Se realizó un estudio de cohorte transversal, retrospectivo y descriptivo, que analizó las historias clínicas de 407 reclusos. La prevalencia de hipertensión fue del 5,42%, la de dislipidemia del 0,74%, la de diabetes mellitus del 0,49% y la de consumo de drogas ilícitas del 37,68%. El análisis estadístico no reveló una asociación significativa entre el consumo de drogas ilícitas y las ENT, aunque las tendencias sugieren una relación. Los resultados indican una población carcelaria joven con una alta prevalencia de consumo de drogas ilícitas. Si bien la prevalencia de ENT fue baja, estas personas presentan un mayor riesgo de desarrollar estas afecciones, especialmente debido a los desafíos de la vida en prisión y al acceso limitado a la atención médica. Es crucial mejorar las intervenciones sanitarias en esta población, lo cual puede tener implicaciones más amplias para la salud pública.

Palabras clave: ENT. Personas privadas de libertad. Salud penitenciaria. Consumo de drogas. Hipertensión.

INTRODUCTION

Worldwide, the total population deprived of liberty (PPL) exceeds 10.7 million. According to the World Prison Brief database, Institute for Crime & Justice Policy Research1, the United States of America has the highest PPL in the world, with 1,767,200 incarcerated individuals (2021) followed by China with 1,690,000 individuals (2018). In third place is Brazil, with 839,672 individuals (June 2022), which represents a prison population rate of 390/100,000 inhabitants. Of these, 5.4% are female, with the vast majority of this population being male. Brazil has a total of 1384 institutions to receive all this demand with an official capacity of 482,875 inmates, which represents an occupancy level of 173.9% and an overcrowding of the prison system1.

Since the 2000s, the global prison population has increased by 24%, with variations between continents reflecting population growth. In the Americas, the increase was 41%, and in South America, 175%. In Brazil, the number of people serving a sentence restricting liberty grew 81% between 2006 and 2016, from 401,200 to 726,700, with 40% of these awaiting trial. Persons deprived of liberty (PPL) in Brazil include detainees in closed, semi-open or open regimes, who are held in prison units after initial imprisonment in police stations[2,3].

The overcrowding of the prison system in Brazil is a critical problem, exacerbated by the significant presence of pretrial inmates, who represent about 41% of the prison population[4]. The lack of adequate assistance from the government hinders rehabilitation, increasing the risk of criminal recidivism4. Despite some initiatives, such as the creation of the Association for the Protection and Assistance of the Convicted, the reality of Brazilian prisons remains challenging. Overcrowding, in addition to harming rehabilitation, contributes to degrading conditions, rebellions, and escapes, preventing the prison system from fulfilling its objective of re-educating and reintegrating individuals into society4.

Persons deprived of liberty (PPL) maintain the same fundamental rights as all citizens, even while incarcerated. For this reason, the prison system should focus on rehabilitation. However, adverse conditions such as overcrowding, unhealthiness, violence, and poor diet compromise the health of inmates[5]. Since 1955, the UN has recommended the presence of qualified doctors in prison units, but the lack of health professionals is a recurring problem, aggravated by factors such as fear of the environment, bureaucracy, and prejudice6,7.

Although there are health professionals in some prison units, the distribution is unequal, and many establishments face difficulties in offering comprehensive and adequate care5. Primary Care physicians have the potential to deal with a wide range of

biopsychosocial problems in prisoners, but there is a lack of specific training for this reality. In addition, referral to other sectors of the Health Care Network is hampered by the need for police escorts and the lack of vacancies in public health services, further compromising care for incarcerated people[8].

Chronic diseases are responsible for 60% of annual deaths worldwide and consume up to 75% of public health spending, according to the WHO8. In the prison system, these conditions are often underdiagnosed and untreated, as noted by Vera-Remartínez et al. in a 2014 study in Spain, where half of the inmates had chronic pathologies such as dyslipidemia, hypertension, and diabetes9. Risk factors such as smoking, obesity and cocaine consumption are common among the prison population, but there are few studies covering all these conditions in an integrated manner10. In addition, mental disorders significantly affect people deprived of liberty (PPL), with prevalences up to five times higher than in the general population, influenced by the precarious and unhealthy conditions of some prisons, which suggests that incarceration itself may be a social determinant of health9.

Mortality among inmates also reflects the serious health conditions of this population. García-Guerrero et al10, in their 2011 study, demonstrated a mortality rate of 6.18% in a Spanish prison, with a mean age of 34.9 years, and with the majority of deaths resulting from "non-HIV-related diseases" (cardiovascular, tumoral, hepatic, respiratory, circulatory, or infectious, with the exception of HIV). HIV, however, was the single most important cause of death. Other important causes of mortality in the prisoner studied were suicides, adverse drug reactions, and aggressions10.

The aging of the prison population and the increase in chronic non-communicable diseases (NCDs), together with antiretroviral treatment, can modify the causes of mortality, bringing them closer to those observed in the general population. These data highlight the urgent need to improve health care in prisons to address NCDs and mental disorders that affect this vulnerable population10.

Thus, it is understood that the identification of the profile of people deprived of liberty (PPL) is essential to understand their sociodemographic and health characteristics, especially in a vulnerable population, often with hidden diseases and difficult access to health services. Tracking the main morbidities among inmates can contribute to improving the care network, preventing diseases and promoting health, with impacts that go beyond the prison system, also benefiting public health in the community. Thus, this study aims to estimate the prevalence of NCDs and their risk factors in the population deprived of liberty in the State Penitentiary of Ponta Grossa.

METHODS

Based on the analysis of the medical records of the prison population of the State Prison of Ponta Grossa, an observational cross-sectional ecological study was carried out. The sample was composed of people deprived of liberty (PPL) of the State Prison of Ponta Grossa, and the prevalence of the main chronic diseases present in the population, such as diabetes, systemic arterial hypertension and dyslipidemia, in addition to the prevalence of illicit drug use, was analyzed.

Data collection occurred through the review of medical records for patient identification, with authorization from the Research Ethics Committee. Before starting data collection, all individuals were informed about the purpose of the study, the mode of application and the destination of the data. In addition, they were informed that participation in the study was voluntary and that the results would be treated confidentially, ensuring the anonymity of the information. All study participants signed the Informed Consent Form (ICF) for the research subjects, under the terms of Resolution 466/2012 of the National Council for Ethics in Research, in two copies. The Informed Consent Form was the responsibility of the principal investigator and the participating researchers. The ICFs obtained were kept confidential and archived by the principal investigator.

The collection was carried out in the penitentiary's infirmary during the months of September 2023 and February 2024. The data obtained were age, diagnosis of systemic arterial hypertension, dyslipidemia and diabetes mellitus, and use or not of illicit drugs. The data were tabulated and the results obtained were analyzed, defining the prevalence of chronic diseases in this population, association with age and drug use.

The data obtained were tabulated in an Excel spreadsheet and exported to the Epi Info 7.2.2.6 program for the necessary statistical analyses. Quantitative data were analyzed using absolute frequencies, percentages, and contingency tables (qualitative variables), and measures such as mean, standard deviation, minimum, median, and maximum (quantitative variables). Fisher's exact test and the chi-square test were used to correlate the variables, and $p<0.05$ was considered significant. In addition, the Odds Ratio (OR) was used to estimate the association between exposure and outcome, calculated by the cross-product method and maximum likelihood (MLE), with 95% confidence intervals.

RESULTS

In all, 407 medical records were analyzed, totaling 407 individuals with a mean age of 32.8 years, median of 31 years (minimum of 20 and maximum of 87), mode of 26, and

more than 75% in the age group under 37 years. The age variance was 68.1 and the standard deviation was 8.25. The prevalence of each age group can be seen in Table 1.

Table 1. Age profile of the population deprived of liberty at the State Penitentiary of Ponta Grossa

Age	Absolute frequency	Relative frequency
20-30	191	46,93%
31-40	157	38,57%
41-50	44	10,81%
51-60	9	2,21%
60+	6	1,47%
Total	407	100%

Source: The authors

Table 2 shows the prevalence of chronic non-communicable diseases and drug use among the individuals analyzed. Systemic arterial hypertension was diagnosed in 5.42% (n = 22) of the inmates, dyslipidemia in 0.74% (n = 3) and diabetes mellitus in 0.49% (n = 2). Regarding the use of illicit drugs, the prevalence was 37.68% (n=153). One of the medical records did not have enough data to be considered yes or no in any of these variables, so it was discarded from the total sum.

Table 2. Prevalence of NCDs and illicit drug use

Variable	Category	Absolute frequency	Relative frequency
HAS	Yes	22	5,42%
	No	384	94,58%
Dyslipidemia	Yes	3	0,74%
	No	403	99,26%
DM	Yes	2	0,49%
	No	404	99,51%
Drug use	Yes	153	37,68%
	No	253	62,32%

Source: The authors

Regarding the distribution of the variables studied within the age groups presented in Table 1, it was observed that among SAH patients 18.18% (n=4) were between 20 and 30 years old, 31.82% (n=7) between 31 and 40 years old, 27.27% (n = 6) between 41 and 50 years old, 9.09% (n = 2) between 51 and 60 years old and 13.64% (n = 3) over 60 years old. Regarding the prevalence of DM among the age groups, it was observed 50% (n=1) in

the group between 31-40 years old and 50% (n=1) in the group between 41-50 years old. Regarding the diagnosis of dyslipidemia, 1/3 (33%; n=1) was in the group between 31-40 years old, 1/3 (33%; n=1) in the group between 41-50 years old, and 1/3 (33%; n=1) in the group over 60 years old. In addition, the prevalence of illicit drug use among the ages was distributed with 48.37% (n=74) between 20-30 years, 39.87% (n=61) between 31-40 years, 11.11% (n=17) between 41-50 years, and 0.65% (n=1) over 60 years, with no data being observed in the age group between 51-60 years. These data can be seen in Table 3.

Table 3. Prevalence of variables by age groups

Age Groups	HAS	DM	Dyslipidemia	Drug use
20-30 years	18.18% (n=4)	0% (n=0)	0% (n=0)	48.37% (n=74)
31-40 years	31.82% (n=7)	50% (n=1)	33.3% (n=1)	39.87% (n=61)
41-50 years old	27.27% (n=6)	50% (n=1)	33.3% (n=1)	11.11% (n=17)
51-60 years	9.09% (n=2)	0% (n=0)	0% (n=0)	0% (n=0)
> 60 years old	13.64% (n=3)	0% (n=0)	33.3% (n=1)	0.65% (n=1)

Source: The authors

The analysis shows a higher prevalence of SAH among the NCDs studied compared to the others. In addition, it was noted that 50% of the patients with SAH were in the age groups below or equal to 40 years. In addition, a high prevalence of illicit drug use was observed (37.68%), with the majority of the prisoners studied under 30 years or less (88.24%).

Statistical analysis of the data did not reveal a statistically significant association between illicit drug use and diagnosis of SAH. The odds ratio calculated was 0.46 (95% CI: 0.15 – 1.24), suggesting a possible association, but without statistical significance (p = 0.09). The same was observed when analyzing the association between DM and drug use. The calculated odds ratio was 1.65 (95% CI: 0.10 – 26.59), suggesting a positive association between the variables but without statistical significance (p=0.6). In addition, when searching for an association between drug use and dyslipidemia patients, the odds ratio calculated was 3.32 (CI 0.29 - 36.97), again suggesting a positive association, but without statistical significance (p=0.31). These data can be seen in Table 4.

Table 4. Statistical analysis: association between illicit drug use and NCDs

Variable	Odds Ratio (OR)	95% CI	p-value
HAS	0,46	0,15 – 1,24	p = 0.09
DM	1,65	0,10 – 26,59	0,6
Dyslipidemia	3,32	0,29 – 36,87	0,31

Source: The authors

DISCUSSION

The age profile found in this study was a young prison population, with a mean age of 32.8 years, and the majority (88.24%) were 40 years of age or less, 46.93% of whom were 30 years of age. This profile is similar to that found in the report of the CNJ (National Council of Justice) which reveals that more than half of Brazilian inmates are up to 29 years old, with the predominant age group being between 18 and 24 years12. Similarly, Carson et al.[13] in their study analyzed the age patterns among the US prison population, highlighting that most of the prisoners are between 25 and 39 years old13. The present study is in line with the current literature regarding the age profile found, where the young trait of most of the prison population in Brazil and worldwide is perceived.

Regarding the prevalence of NCDs among the population deprived of liberty, the diagnosis of systemic arterial hypertension was found in 5.42% of the inmates, dyslipidemia in 0.74% and diabetes mellitus in 0.49%, which is low compared to what is found in the current literature. Wilper et al.[14] conducted a study with a similar proposal evaluating the general health panorama of the US prison population at the national level, where they found a prevalence of SAH of 27.9% and 8.1% of DM14. The age of the population studied by this group was similar to that found in the American prison population, with more than 50% of the sample aged between thirteen and thirty-five years14.

In the Spanish PPL, Vera-Remartínez et al.[9] analyzed the prevalence of NCDs with a sample of 1,170 inmates. The prevalence of SAH was 17.8%, dyslipidemia 34.8%, and diabetes 5.3%[9]. Comparatively, at the national level, Serra et al conducted a study analyzing the epidemiology of NCDs in the Brazilian prison system based on the analysis of a national male penitentiary where they found a prevalence of 24.8% of arterial hypertension, 54.5% of dyslipidemia and 2.5% of diabetes15. However, the population analyzed presented an age profile different from that expected by the average prison population, being predominantly over 30 years of age15.

There is a variety in the literature regarding the prevalence of NCDs in prison. This may occur due to age differences in the profiles studied, individual qualities of the penitentiaries, or even underdiagnosis. On the other hand, the current literature agrees on

the fact that the inmate population is at higher risk of developing NCDs and more exposure to risk factors compared to the general population16, 17, 18.

Regarding the use of illicit drugs in the present study, a prevalence of 37.68% was observed. Fazel et al.[19] In their systematic review, they reviewed the world literature on the prevalence of illicit substance and alcohol use. With an analysis of 18,388 inmates in 10 countries, an average of around 30% of illicit drug use in male penitentiaries was observed, with studies ranging from 10 to 61%[19]. There is a prevalence similar to that found in the literature and also heterogeneity regarding this data.

The Cardiovascular Prevention Guideline of the Brazilian Society of Cardiology includes the use of illicit drugs as a relevant risk factor for the development of hypertension and other cardiac pathologies20, as well as the literature already demonstrates the use of these substances as an important cause of drug-induced secondary arterial hypertension21. However, no statistical relevance was demonstrated in the association between the use of illicit drugs and the diagnosis of SAH in this population studied.

Regarding the use of illicit drugs and diagnosis of dyslipidemia, no statistical relevance was demonstrated, nor were any studies found in the literature that associate the use of illicit drugs with the development of dyslipidemia specifically. However, there is several evidences associating these substances with various cardiovascular diseases, metabolic syndrome, and cardiovascular risk , which makes an association implicit22, 23, 24.

Although the present study did not identify a statistically significant relationship between illicit drug abuse and the prevalence of diabetes, it is important to highlight that the current literature points to an association between substance use and increased risk of metabolic conditions, including diabetes25. Individuals who abuse substances, especially opioids, may be more vulnerable to metabolic syndrome and dysfunctions related to glucose homeostasis, due to drug-induced cell damage25. Substances such as cannabis, hallucinogens, opioids, and stimulants have been implicated in the worsening of glycemic control, suggesting that the use of these drugs may aggravate the metabolic status in people with diabetes25.

It should be noted that in the search for an association between illicit drug use and NCDs, our results do not corroborate this evidence, which can be attributed to factors such as sample size, data variability, or differences in the characteristics of the population studied. More research is needed to further explore this relationship and understand the possible mechanisms involved.

CONCLUSION

Although the study identified a low prevalence of systemic arterial hypertension (SAH), diabetes mellitus (DM), and dyslipidemia in the prison population analyzed, it is important to recognize that these individuals are at high risk of developing these conditions. The high prevalence of illicit drug use among the prison population may be related to a higher risk of developing chronic diseases. The use of substances can lead to metabolic and behavioral changes that favor the appearance of NCDs. The combination of factors such as lack of access to adequate medical care and the harsh environment intensifies this risk. In addition, there is a significant gap in the literature on the health of the prison population, especially in Brazil. The lack of studies on health conditions in prisons, epidemiological analysis, and disease prevalence emphasizes the need for more research and specific public health strategies to address these issues effectively.

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