

AIDS incidence in Rio Grande do Sul in older adults from 1997 to 2017: an ecological study

Incidência de AIDS em idosos do Rio Grande do Sul de 1997 a 2017: um estudo ecológico

Incidencia de SIDA en personas mayores en Rio Grande do Sul de 1997 a 2017: un estudio ecológico

<https://doi.org/10.17058/reci.v10i4.15519>

Received: 26/07/2020

Accepted: 29/10/2020


Available online: 04/10/2020


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ABSTRACT

Background and Objectives: Rio Grande do Sul (RS) is one of the Brazilian states with the highest percentage of older adults. However, despite the high rates of HIV/AIDS that have been detected in the general population, there are few scientific investigations regarding its prevalence in the older adult population. Our goal is to identify the annual incidence of AIDS in the population aged 60 or over living in the State of RS, Brazil, from 1997 to 2017, and to compare the sex differences in infection rates. **Methods:** This was a time-series ecological study. Information on annual AIDS notifications was collected on TABNET, and population data of RS was collected on TABNET and the website of the Foundation of Economy and Statistics (FEE) of RS. The annual incidence was calculated per 100,000 inhabitants. **Results:** Between 1997 and 2017, 3,697 AIDS cases in older adults were notified in RS. In the comparison between 1997 and 2017, the annual incidence of AIDS in older adults in RS increased from 3.92 to 13.71/100,000 inhabitants, and a 249.93% increase (340.49% among men and 171.50% among women). **Conclusion:** The percentage of AIDS diagnostic in RS was six times higher in older adults than in the general population. The rate for men was almost twice as high as that for women. This may be due to increased life expectancy and other factors related to sexual behavior, such as medications for erectile dysfunction and hormonal replacement, and communication technologies.

Keywords: Disease Notification. Health of Older Adults. Acquired Immunodeficiency Syndrome. Sexuality. Incidence.

RESUMO

Justificativa e Objetivos: O Rio Grande do Sul está entre os estados brasileiros com maior percentual de idosos. Mas, apesar das altas taxas de HIV/AIDS que têm sido verificadas na população geral, existem poucas investigações científicas que exploram este tema na população idosa. Assim, o objetivo deste estudo foi identificar a incidência anual de AIDS na população com 60 anos ou mais de idade, residente no estado do Rio Grande do Sul (RS), Brasil, no período de 1997 a 2017, e comparar a diferença na taxa de infecção entre os sexos. **Métodos:** Estudo

Rev. Epidemiol. Controle Infecç. Santa Cruz do Sul, 2020 Out-Dez;10(4):387-393. [ISSN 2238-3360]

Please cite this article as: PADILHA, Priscila Oliveira da Silva et al. AIDS incidence in Rio Grande do Sul in elderly from 1997 to 2017: an ecological study. Revista de Epidemiologia e Controle de Infecção, [S.L.], v. 10, n. 4, oct. 2020. ISSN 2238-3360. Available at: <<https://online.unisc.br/seer/index.php/epidemiologia/article/view/15519>>. Date accessed: 21 July 2021. doi:<https://doi.org/10.17058/reci.v10i4.15519>.



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ecológico de série temporal. As informações sobre as notificações anuais de AIDS foram coletadas no TABNET, e os dados populacionais do RS foram consultados do TABNET e do site da Fundação de Economia e Estatística (FEE) do RS. A incidência anual foi calculada por 100 mil habitantes. **Resultados:** Entre 1997 e 2017 foram notificados 3.697 casos de AIDS em idosos no RS. No comparativo entre 1997 e 2017, a incidência anual de AIDS em idosos no RS aumentou de 3,92 para 13,71/100 mil habitantes, o que configura um crescimento de 249,93% (340,49% entre homens e 171,50% entre mulheres). **Conclusão:** O percentual de diagnósticos de AIDS em idosos no RS foi seis vezes superior ao evidenciado na população geral. A taxa em homens foi quase duas vezes mais alta do que a das mulheres. Isso pode decorrer do aumento da expectativa de vida e de fatores relacionados ao comportamento sexual, como o uso de medicações para impotência e reposição hormonal e de tecnologias de comunicação.

Descritores: Notificação de Doenças. Saúde do Idoso. Síndrome de Imunodeficiência Adquirida. Sexualidade. Incidência

RESUMEN

Justificación y Objetivos: Rio Grande do Sul se encuentra entre los estados brasileños con el mayor porcentaje de personas mayores. Además, se han observado altas tasas de VIH/SIDA en la población general; sin embargo, hay pocas investigaciones científicas que exploren este tema. El objetivo de este estudio fue identificar la incidencia anual de SIDA en la población mayor de 60 años residente en Rio Grande do Sul, Brasil, en el periodo de 1997 a 2017, así como comparar la diferencia en la tasa de infección entre los sexos. **Métodos:** Estudio ecológico de series de tiempo. La información sobre las notificaciones anuales de SIDA se consultó en TABNET y los datos de población de ese estado se recopilaron en TABNET y en el sitio web de la Fundación de Economía y Estadística (FEE). La incidencia anual se calculó por 100 mil habitantes. **Resultados:** Entre 1997 y 2017 se reportaron 3.697 casos de SIDA en las personas mayores en este estado. En la comparación entre 1997 y 2017, la incidencia anual de SIDA en ancianos encontrada pasó de 3,92 a 13,71/100.000 habitantes, lo que representa un aumento del 249,93% (340,49% en hombres y 171,50% entre mujeres). **Conclusiones:** El porcentaje de diagnóstico de SIDA en personas mayores encontrado fue seis veces mayor al evidenciado en la población general. La tasa de los hombres fue casi el doble que la de las mujeres. Esto puede deberse al aumento de la esperanza de vida y factores relacionados con la conducta sexual, como el uso de medicamentos para la impotencia y el reemplazo hormonal y tecnologías de la comunicación.

Palabras clave: Notificación de enfermedades. Salud del anciano. Síndrome de inmunodeficiencia adquirida. Sexualidad. Incidencia

INTRODUCTION

Brazil, in recent decades, has observed a reduction in mortality caused by several communicable diseases and an increase in life expectancy.¹ This demographic transition has led to changes in the epidemiological profile of older adults, causing emerging challenges and requiring the implementation of strategies that promote healthy aging at different levels of care.² Thus, it is essential to take into account conditions that were previously less prevalent among older adults, but which have shown marked growth, such as infection by the human immunodeficiency virus (HIV) and the acquired immunodeficiency syndrome (AIDS), a disease caused by HIV.^{1,3,4}

In Brazil, the first cases of HIV/AIDS in older adults were reported in the 1980s. However, the sharp increase in infection rates and its understanding as a public health problem are contemporary phenomena. In 1996, only 2% of deaths caused by AIDS occurred in older adults, a rate that increased to 5% in 2005. Recently, a study showed that in Brazil one in ten people who die as a result of illnesses related to AIDS are over 60 years old.⁵

It is known that aging generates changes in thymic volume, reduced production of antibodies, and B and T cells, involved in inhibiting HIV replication. This could favor the progression of HIV, especially in individuals

who do not use antiretroviral therapy (ART). Besides, it is common for older adults with HIV to have other vulnerability factors, such as functional loss, worse response to ART, psychosocial problems (for example, stigma and isolation), and neurocognitive and psychiatric disorders (such as depression, among others related to mental health, especially in the severe stage of infection), which can interfere with life quality and treatment adherence.⁶

Currently, in Brazil, approximately 866 thousand people are living with HIV and Rio Grande do Sul (RS) has the second highest rate of infected people. In 2017 there were 29.4 cases for every 100 thousand inhabitants. In the same year, the infection rate in Porto Alegre was 60.8 cases for every 100 thousand inhabitants, becoming the Brazilian capital with the highest infection rate.⁷ Furthermore, RS is one of the Brazilian states with the highest percentage of infected older adults (18.6%).⁶ These data demonstrate that older adults may be in a state of striking vulnerability.

In the opposite direction of epidemiology, from a sociocultural perspective, the sexual health of older adults is a subject that is still poorly addressed, even by health professionals. Despite the advances, it is not a priority issue in research and public policies, which may have contributed to the emergence of myths, prejudices, and, eventually, lack of assistance. This situation may be

one of the causes underlying the deficient perception regarding the need for the use of preventive methods by this population.^{4,8}

In the case of older adults, there are also differences in sexual behavior between men and women, which can affect HIV/AIDS rates.⁹ Data from the 2008 report on the global AIDS epidemic show that the HIV rate in Brazilian women aged between 50 and 59 years doubled between 2000 and 2007.⁴ The increase in the number of cases occurred in all age groups of women, in a process known as "feminization of AIDS", in which the sex ratio went from 14.0 men with HIV per woman, in the 1982 to 1.7 men per woman in 2011.⁹

The growth of the older adult population in Brazil and, mainly, in RS, and the increase in HIV/AIDS rates in this population call upon the urgent development of investigations on this topic. The first step in the construction of effective public policies is the recognition of the epidemiological reality. Thus, the objective of this study was to identify the annual incidence of AIDS in the population aged 60 or over, living in the state of RS, Brazil, from 1997 to 2017, and to compare the difference in the infection rate between genders.

METHODS

This is an ecological study of time series, carried out from secondary data collected in TABNET, a public domain tab of free access that gathers data from the Notifiable Diseases Information System (SINAN) of the Informatics Department of the Brazilian National Health System (DATASUS).¹⁰ DATASUS contains information that serves as a basis for research on the health and epidemiological situation in Brazil, in addition to contributing to the development of public health programs.

The option to present the incidence of AIDS took into account that the obligation to report HIV infection was only effective in 2014, according to the Ministry of Health's Ordinance No. 1,271^{11,12}. Initially, the TABNET investigated the annual total number of AIDS notifications in the population of RS between 1997 and 2017. The year 2018 was not included in the study because the data were consolidated only up to the middle of the year, which could produce misleading analysis. Subsequently, the total number of diagnoses in individuals older than

60 years was examined and the quantification of annual diagnoses was grouped according to sex.

Next, we verified the population estimate in RS between 1997 and 2017. Since the census is carried out every 10 years, we decided to consider the population estimate in official databases that considered annual births and deaths. Thus, the population of RS between the years 1997 and 2012 was obtained from TABNET¹⁰ (data available are limited to 2012) and, from the years 2013 to 2017, from the database of the Foundation of Economics and Statistics of RS (FEE).¹³

Then, we downloaded the tables available in DATA-SUS and FEE. The data were compiled in a single spreadsheet in Excel to calculate the number of AIDS cases in older adults (aged 60 years or over) per 100 thousand inhabitants, according to the following formula (Figure 1):

$$\text{Incidence Coefficient} = \frac{\text{Number of new AIDS cases among older adults people in RS in the reference year (1997 to 2017)}}{\text{Total of older adult living in RS in the reference year (1997 to 2017)}} \times 10^5$$

Figure 1. Coefficient Calculation Formula.

For this study, we considered cases diagnosed per year and the annual incidence of AIDS in RS, but not the cumulative prevalence.

According to current legislation, surveys that use data in the public domain without identifying the participants should not be submitted to the CEP/CONEP. Thus, this study contemplates the ethical standards provided for in resolutions No. 466 of 2012 and No. 510 of 2016.

RESULTS

When comparing the years 1997 and 2017, the general population of RS shows an increase of 15.55%: the female population increased 16.69% and the male population 14.37%. In the same period, the older adult population, aged 60 years or over, grew 103.90%, an increase that was 102.58% for women and 105.65% for men (Table 1).

Table 3. Socioeconomic, epidemiological and environmental variables related to the presence of VL in the family and in the neighborhood (n=273). Itapecuru Mirim, Maranhão, Brazil, 2014.

Year	General population			Older adult population		
	Men	Woman	Total	Men	Woman	Total
1997	4 800 619	4 961 496	9 762 115	407 460	536 977	944 437
1998	4 852 037	5 015 051	9 867 088	411 211	542 167	953 378
1999	4 903 379	5 068 359	9 971 738	414 999	547 367	962 366
2000	4 994 719	5 193 079	10 187 798	454 061	611 423	1 065 484
2001	5 054 537	5 255 484	10 310 021	458 717	617 916	1 076 633
2002	5 102 733	5 305 695	10 408 428	462 557	623 176	1 085 733
2003	5 153 070	5 357 939	10 511 009	466 488	628 675	1 095 163
2004	5 203 028	5 410 228	10 613 256	470 440	634 149	1 104 589

2005	5 316 383	5 528 619	10 845 002	479 311	646 552	1 125 863
2006	5 374 261	5 588 955	10 963 216	483 850	652 860	1 136 710
2007	5 426 874	5 653 443	11 080 317	578 641	771 653	1 350 294
2008	5 317 050	5 538 164	10 855 214	587 504	780 100	1 367 604
2009	5 344 865	5 569 177	10 914 042	609 609	807 221	1 416 830
2010	5 205 057	5 488 872	10 693 929	627 470	832 127	1 459 597
2011	5 224 336	5 508 694	10 733 030	629 278	834 535	1 463 813
2012	5 242 658	5 527 945	10 770 603	630 977	836 980	1 467 957
2013	5 388 825	5 677 702	11 066 527	710 330	935 352	1 645 682
2014	5 414 110	5 705 707	11 119 817	741 296	974 898	1 716 194
2015	5 440 822	5 734 955	11 175 777	762 493	999 676	1 762 169
2016	5 466 673	5 763 274	11 229 947	784 609	1 027 893	1 812 502
2017	5 490 567	5 789 626	11 280 193	837 952	1 087 799	1 925 751

Source: Informatics Department of the Brazilian National Health System¹⁹, Foundation of Economics and Statistics of Rio Grande do Sul¹³. Accessed in September 2019

In the comparison between 1997 and 2017, the incidence of AIDS for every 100 thousand inhabitants rose 41.65% in the general population. In 1997 there were 20.75 new cases and, in 2017, 29.40 for every 100 thousand. Among women, the increase was 67.65% (from 13.26 to 22.25/100 thousand diagnoses) and, among men, it was 29.62% (from 28.50 to 36.94/100 thousand diagnoses), according to Table 2. Considering the population growth and the rate per 100 thousand inhabitants, the diagnosis of AIDS in older adults increased 249.93% (from 3.92 to 13.71 diagnoses), being 171.50% for women (from 3.72 to 10.11 diagnoses) and 340.49% for men (from 4.17 to 18.38 diagnoses). All raw data are shown in table 2.

DISCUSSION

The main results presented here demonstrate a significant increase in the annual incidence of AIDS in older adults living in RS, especially in men. This estimate is well above the estimate found in the general population and indicates a relevant public health problem. This suggests the occurrence of profound epidemiological changes in the context of AIDS in RS.

Several explanations may be used for explaining the results found in our analysis. For instance, we can mention the expansion of access to health, resulting from the implementation of the Brazilian National Health System (SUS)¹, the availability of vaccines and medicines, and the various policies that focus on the health and protection of older adults.¹⁴ Furthermore, these factors have contributed to the increase in longevity and consequently the increase in sexual life.^{1,2} Also, other pharmaceutical advances, through drugs for erectile dysfunction and hormone replacement treatments contribute to older adults to remain sexually active.¹⁵

Another aspect that may have an impact in this scenario is the advancement of information and communication technologies, which have allowed older adults to expand their relational network. Previous research shows that older adults have increasingly used new technologies, especially social networks on the internet. This has expanded the possibilities for entertainment, contact with family and friends, and also the development of

affective or sexual relationships,¹⁶ which can increase exposure to STI risk situations.¹⁷

It is also important to consider the aspect of generational culture, which can affect the resistance of older adults to the use of condoms, reflecting on the incidence of HIV/AIDS in this population.¹⁵ This behavior is associated with ignorance of how to use them and with the fear that it will interfere with erection, in addition to having a misconception that condoms would only serve to prevent pregnancy.⁸ In this sense, the absence of the risk of pregnancy in this age group can lead women to abstain from using condoms with their partners. At the same time, after menopause, women can become more vulnerable, since vaginal tissues are more fragile and susceptible to micro-cracks, facilitating fluid infection. This corroborates studies that have pointed to sexual activity in older adults as the main pathway of disease contagion.^{15,18}

Although recent studies show that in the general population the proportional increase in women infected with HIV/AIDS is higher compared to men, it seems that in older adults there is a significant increase in the reports of AIDS development in both sexes, with a higher incidence among men. Regarding the distinction by sex, a previous survey highlighted that 78% of older men maintain an active sex life, while among older women this percentage is 24%.¹⁹ This may explain, in part, the difference in the rate increase of AIDS in the male population, when comparing the sexes. Additionally, it is important to consider that although previous investigations have shown the similarity of infidelity behaviors between the sexes, some reports indicate that the purpose of extramarital relationships can be different between men and women. This provides important clues to understand the results and also to support the development of prevention strategies.²⁰

Sexuality in older adults is also related to many stigmas. Common sense constantly leads to the mistaken perception that older adults do not have sex, which may be linked to the generalization of declining productivity to other spheres, such as the sexual sphere. The taboo is a threat to these individuals who end up having no open dialogue with their families and health professionals on the subject.^{15,21,22} The limited information on HIV/AIDS

Table 2. Annual AIDS diagnoses in the general population and older adults in Rio Grande do Sul between 1997 and 2017.

Year	General population						Older adult population					
	Cases in men	Rate per 100000 people	Cases in women	Rate per 100000 people	Total cases in general population	Rate per 100000 people	Cases in older men	Rate per 100000 people	Cases in older women	Rate per 100000 people	Total cases in general population	Rate per 100000 people
1997	1 368	28.50	658	13.26	2 026	20.75	17	4.17	20	3.72	37	3.92
1998	1 861	38.36	906	18.07	2 767	28.04	46	11.19	17	3.14	63	6.61
1999	1 629	33.22	891	17.58	2 520	25.27	32	7.71	17	3.11	49	5.09
2000	2 032	40.68	1 213	23.36	3 245	31.85	44	9.69	32	5.23	76	7.13
2001	2 094	41.43	1 409	26.81	3 503	33.98	54	11.77	37	5.99	91	8.45
2002	2 452	48.05	1 856	34.98	4 308	41.39	68	14.70	48	7.70	116	10.68
2003	2 543	49.35	1 892	35.31	4 435	42.19	65	13.93	44	7.00	109	9.95
2004	2 296	44.13	1 711	31.63	4 007	37.75	83	17.64	44	6.94	127	11.50
2005	2 198	41.34	1 803	32.61	4 001	36.89	81	16.90	43	6.65	124	11.01
2006	2 376	44.21	1 917	34.30	4 293	39.16	93	19.22	65	9.96	158	13.90
2007	2 782	51.26	2 329	41.20	5 111	46.13	99	17.11	74	9.59	173	12.81
2008	2 679	50.39	2 236	40.37	4 915	45.28	118	20.08	91	11.67	209	15.28
2009	2 508	46.92	2 161	38.80	4 669	42.78	123	20.18	108	13.38	231	16.30
2010	2 605	50.05	1 950	35.53	4 555	42.59	129	20.56	106	12.74	235	16.10
2011	2 597	49.71	2 084	37.83	4 681	43.61	146	23.20	103	12.34	249	17.01
2012	2 597	49.54	2 108	38.13	4 705	43.68	158	25.04	119	14.22	277	18.87
2013	2 713	50.34	1 993	35.10	4 706	42.52	165	23.23	136	14.54	301	18.29
2014	2 594	47.91	1 836	32.18	4 430	39.84	177	23.88	118	12.10	295	17.19
2015	3 960	35.43	2 334	42.90	1 626	28.35	137	17.97	113	11.30	250	14.19
2016	3 643	32.44	2 176	39.80	1 467	25.45	170	21.67	114	11.09	284	15.67
2017	3 316	29.40	2 028	36.94	1 288	22.25	154	18.38	110	10.11	264	13.71

Source: Informatics Department of the Brazilian National Health System¹⁰, Foundation of Economics and Statistics of Rio Grande do Sul¹¹. Accessed in September 2019.

makes older adults more exposed to situations of risk of sexually transmitted infections. Besides, family members and health professionals (especially from outside the specialized health care network) tend not to address the issue with this population, as they disregard the sexuality of older adults.^{4,8}

This whole scenario is aggravated by the lack of prevention policies. Currently, campaigns are still primarily aimed at specific populations, such as youth and young adults.²³ The lack of information available for older adults makes this population less aware of the disease, risks, and methods of protection.^{15,21,22}

Furthermore, the process of diagnosing HIV in older adults is also a challenge, since individuals in this age group are often subject to multiple pathologies. Thus, late diagnosis may occur, causing delays or complications in antiretroviral treatment.²⁴ It is

relatively common for the diagnosis to occur only in specialized services, since the professionals of primary health care themselves may not be aware of this reality.^{15,21,22} Improvements in the training of professionals in the Basic Health Units and the implementation of preventive actions could increase the early detection of HIV in older patients.^{21,22}

Even after diagnosis, several other elements must be taken into account. Despite the therapeutic advances that hinder the progression of HIV, older adults diagnosed with HIV/AIDS may be affected to the extent of having difficulties in the organization of their lives and their social and emotional relationships. This is because the diagnosis is accompanied by stigmas, suffering, judgment, and sadness.²⁵ Many older adults, after being diagnosed with HIV/AIDS, prefer to remain silent about the disease, for

several reasons such as fear of pejorative judgments and fear of an eventual overload in the assistance provided by family members.²⁶ That is why social support networks play an important role so older adults do not feel abandoned, do not suffer prejudice and have support in living with the disease through a network of family and friends.¹⁵ In this context, health professionals must be aware of the biological and psychosocial problems common to infection and develop strategies for welcoming, understanding, rehabilitating, facilitating, preventing, and promoting the health of older adults.^{15,21,22}

After discussing the results, it should be noted that this study has some limitations, such as the database used. Research in different databases can lead to conclusions different from those highlighted here. For example, the HIV/AIDS Epidemiological Bulletin 2017, produced by the State Department of Health of RS, points out 71 diagnoses of the disease in individuals over 60 years of age in 2017. On the other hand, TABNET data, originating from SINAN, from the Ministry of Health, which were used in this study, report 266 occurrences in the same year. This is a significant difference, in the order of 275%, which may be due to the delay in notifications.

It is well documented in the literature that the disease notification systems in Brazil, despite certain advances, have a set of problems of different nature²⁷ For instance, compulsory reporting of HIV was only effective in 2014, which justifies our choice to focus the analysis on the AIDS incidence, the advanced stage of the disease. Also, SINAN allows notifications of HIV/AIDS to be released by health agencies up to three years after diagnosis, which can cause a difference in numbers depending on when data on TABNET is retrieved. This variation over time hinders a more precise analysis linked to the longitudinal chronology of the data. To reduce this limitation, in this study the total number of notifications was compiled only by the year of diagnosis.

Another limitation is the underreporting of HIV/AIDS, that is, the lack of knowledge about the real number of the diagnosed cases by epidemiological surveillance. In addition to causing an incorrect estimate of the magnitude and burden of the epidemic, leads to an insufficient allocation of actions and resources to deal with it. Previous studies indicate that the epidemiological situation is perhaps even more serious. This may occur due to the existence of undetected cases, in cases when there are no detectable symptoms and health professionals do not request testing.²⁷

As it is an ecological study, we are not able to identify the subjects individually to assess risk factors, and carrying out this assessment in future research could present relevant contributions. Additional analyzes may be performed to corroborate or reject the hypotheses and conclusions presented here based on the interpretation of the raw data. We suggest cohort and longitudinal studies to better map the course of the infection and the evolution of the disease in different age groups. Also, an evaluation at the national level, distinguishing the other states of the federation to better understand differences

and similarities in relation to the data obtained in this research would allow further developments regarding this discussion.

Finally, in the last twenty years, there has been a significant increase in the incidence of AIDS in older adults in RS, which indicates the high exposure of this population to the development of the disease, reflecting vulnerabilities in terms of public health. Although it is considered that the increase in AIDS cases in older adults may be partially linked to the increase in this population, it is possible that many of these individuals already had the virus, receiving late diagnoses. In addition to the chronology of contagion, the rate of AIDS diagnosis per 100 thousand people, when compared to the general population, indicates a relevant public health problem. It is essential, then, the performance of public health agents through prevention and improvement programs in the dissemination of information about HIV/AIDS for older adults and their families. Thus, health and social assistance strategies must be integrated to meet the physical, psychological, and social needs of older adults, especially considering the emerging demands. Therefore, we emphasize the importance of developing psychoeducational and interventional strategies as a fundamental tool in the composition of preventive and therapeutic actions involving sexuality and sexually transmitted infections in older adults. The progression of the disease in this population is a public health issue, and facing it must include coordinated efforts from different fields of knowledge.

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AUTHORS' CONTRIBUTIONS

Priscila Oliveira da Silva Padilha, Juliana Nichterwitz Scherer e Felipe Ornell contributed to the conception, design, analysis, and writing of the article.

Helena Ferreira Moura, Lisia von Diemen, Joana Correa de Magalhães Narvaez, contributed to the planning, design, review, and final approval of the article.

All authors have approved the final version that will be published and are responsible for all aspects of the work, including ensuring its accuracy and integrity.