DOI: 10.1590/1809-2950/e23017224en

ORIGINAL RESEARCH

Comparison of low back pain prevalence in adults between pre-pandemic and pandemic periods and related biopsychosocial aspects

Comparação entre os períodos de pré-pandemia e pandemia da prevalência de dor lombar em adultos e dos aspectos biopsicossociais relacionados

Comparación entre los períodos prepandémico y pandémico de la prevalencia de dolor lumbar en adultos y los aspectos biopsicosociales relacionados

Kerolyne Soares Mayer[1], Betiane Moreira Pilling[2], Cláudia Tarragô Candotti[3]

ABSTRACT | The global health crisis resulting from the outbreak of the coronavirus (SARS-CoV-2) has led to social distancing, the repercussions of which on physical and mental health are still being assessed. This study aims to compare reported lower back pain in adults during the pre-pandemic and pandemic periods regarding intensity and frequency, as well as the risk of poor prognosis, disability, exposure to risk factors, beliefs, fears, and sitting posture in front of the computer. The sample of this retrospective study with a comparative ex post facto design consisted of 80 individuals with complaints of low back pain, divided by sex, age, height, and body mass-matched groups: 40 individuals in the pre-pandemic group (PPG) and 40 individuals in the pandemic group (PG), who were involved in university outreach projects. Data were collected using BackPEI-A, SBST, ODI, and FABQ questionnaires from 2016 to 2021. Mann–Whitney u-test and Student's *t*-test were used for group comparisons (α <0.05). Comparison between PPG and PG showed no statistically significant differences regarding impairment, frequency, intensity of pain, sitting posture in front of the computer, exposure to risk factors, risk of poor prognosis, beliefs and fears, and disability.

Keywords | COVID-19; Lower Back Pain; Adult.

RESUMO | A crise sanitária mundial, decorrente do surto de coronavírus (SARS-CoV-2), ocasionou o distanciamento social, cujas repercussões na saúde física e mental ainda estão sendo aferidas. O objetivo deste estudo foi comparar a dor lombar relatada por adultos, nos períodos de pré-pandemia e pandemia, quanto à intensidade e frequência, bem como o risco de mau prognóstico, a incapacidade, a exposição aos fatores de risco, às crenças, aos medos e à postura sentada em frente ao computador. A amostra deste estudo retrospectivo, com delineamento *ex post facto* comparativo, foi composta por 80 indivíduos com queixa de lombalgia, divididos em dois grupos pareados por sexo, idade, estatura e massa corporal: 40 indivíduos no grupo pré-pandemia (GPP) e 40 indivíduos no grupo pandemia (GP), que participavam de projetos de extensão universitária. Os dados foram coletados entre os anos de 2016 e 2021 e eram oriundos dos questionários BackPEI-A, STarT, ODI e FABQ. Os testes Mann-Whitney e teste t foram utilizados para a comparação entre os grupos (α<0,05). A comparação entre o GPP e GP não mostrou diferença estatisticamente significativa quanto ao impedimento, frequência, intensidade da dor, postura sentada em frente ao computador e exposição aos fatores de risco; risco de mau prognóstico; crenças e medos; e incapacidade.

[1]Universidade Federal do Rio Grande do Sul (UFRGS) – Porto Alegre (RS), Brazil. E-mail: kerolyne_mayer@yahoo.com.br. Orcid: 0009-0002-4127-799X
[2]Universidade Federal do Rio Grande do Sul (UFRGS) – Porto Alegre (RS), Brazil. E-mail: betianefisioterapeuta@gmail.com. Orcid: 0000-0001-6920-6283
[3]Universidade Federal do Rio Grande do Sul (UFRGS) – Porto Alegre (RS), Brazil. E-mail: claudiacandotti@gmail.com. Orcid: 0000-0002-8676-9157

Correspondence address: Betiane Moreira Pilling – Avenida Senador Salgado Filho, 8500, Lote Ah04 – Viamão (RS), Brazil – Zip Code: 94440-000 – Phone: +55 (51) 96159493 – E-mail: betianefisioterapeuta@gmail.com – Financing source: Nothing to declare – Conflict of interest: Nothing to declare – Presentation: December 9th, 2023 – Accepted for publication: February 5th, 2024 – Approved by the local Research Ethics Committee under CAAE No. 55897216.6.0000.5347.

Descritores | Covid-19; Lombalgia; Adulto.

RESUMEN | La crisis sanitaria mundial, que resultó del brote de coronavirus (SARS-CoV-2), provocó el alejamiento social, cuyas repercusiones en la salud física y mental aún se están evaluando. Este estudio tuvo el objetivo de comparar el dolor lumbar relatado por adultos, en los períodos prepandémico y pandémico, en cuanto a la intensidad y frecuencia, así como el riesgo de un mal pronóstico, la discapacidad, la exposición a los factores de riesgo, las creencias, los miedos y la postura al sentarse frente a la computadora. La muestra de este estudio retrospectivo, con diseño comparativo *ex post facto*, estuvo compuesta por 80 personas que se quejaban de lumbalgia, divididas en dos grupos emparejados por sexo, edad, estatura y masa corporal: 40 personas en el grupo prepandémico (GPP) y 40 personas en el grupo pandémico (GP), que participaban en proyectos de extensión universitaria. Se recopilaron los datos entre los años 2016 y 2021 a través de los cuestionarios BackPEI-A, STarT, ODI y FABQ. Se utilizaron la prueba de Mann-Whitney y la prueba t para comparar los grupos (α<0,05). La comparación entre GPP y GP no mostró una diferencia estadísticamente significativa con respecto al impedimento, la frecuencia, la intensidad del dolor, la postura al sentarse frente a la computadora y la exposición a los factores de riesgo; riesgo de mal pronóstico; creencias y miedos; y discapacidad
Palabras clave | Covid-19; Dolor Lumbar; Adulto.

INTRODUCTION

In December 2019, a global health crisis due to the coronavirus outbreak began, which caused COVID-19. Due to the spread of the disease worldwide and to minimize the contagion by the coronavirus, emergency protective measures were implemented, such as the use of masks, the closure of public places, and social distancing/isolation.

The pandemic also caused changes in physical health, such as a decrease in the practice of physical activities and an increase in daily sitting time, caused by the closure of collective spaces for the practice of physical exercise [1]. When remaining in the sitting posture for long periods, osteomioarticular static overload of the spine occurs, a factor highly related to the development of low back pain[2]. Low back pain affects about 60% to 80% of the economically active population, in addition to being an important cause of activity limitation in workers of productive age[3]. Because it is associated with physical, psychological, and social aspects, low back pain impacts financial domains, collective participation, and functionality[4].

Given this context, it is important to conduct studies that compare the possible impacts on the health of the adult population in the pre-pandemic and pandemic periods. To assess this impact on the physical and psychosocial aspects associated with low back pain, some specific questionnaires can be used to draw a picture of changes related to low back pain.

This study aimed to compare the low back pain reported by adults, in the pre-pandemic and pandemic periods, regarding intensity and frequency, as well as the risk of poor prognosis, disability, exposure to risk factors, beliefs, fears, and sitting posture in front of the computer.

METHODOLOGY

This is a retrospective study, in which the population is composed of adults with low back pain who attend outreach projects at the university. The study was carried out in the city of Porto Alegre, from 2016 to 2021.

A sample calculation was performed in the Gpower 3.1.7 software, using the Mann-Whitney two-tailed test assuming a 0.7 effect size, a 0.05 alpha, and an 80% effect power, which resulted in a minimum sample of 70 participants, 35 per group. To participate in the study, participants had to be aged from 18 to 65 years and, during the assessments, have completed the following closed questionnaires: Back Pain and Body Posture Evaluation Instrument for Adults (BackPEI-A), STarT Back Screening Tool (SBST), Oswetry Disability Index (ODI), and Fear Avoidance Beliefs Questionnaire (FABQ). The questionnaires were answered in person in the pre-pandemic period (PPG) and online in the pandemic period (PG), due to social distancing measures.

The BackPEI-A is an instrument for assessing body posture and back and neck pain, aimed at adults[5]. Consisting of 23 questions, the instrument evaluates demographic and behavioral risk factors for low back and neck pain, in addition to the presence, intensity, and frequency of pain. For this study, BackPEI-A questions related to sitting posture in front of the computer (question 3), occurrence of back pain in the last three months (question 16), frequency of back pain (question 17), impediment caused

by back pain (question 18), and intensity of back pain (question 19) were selected. For the analysis of question 3, on the sitting posture at the computer, only the image that presents the aligned body segments was considered "adequate posture."

This instrument also presents an overall scoring system that involves only questions related to risk factors (questions 1, 2, 3, 6, 7, 8, 10,13, 14 and 15). The overall score is obtained by adding all points (maximum of ten points). The higher the score, the lower the exposure to pain risk factors. In questions 1, 2, 3, 6 and 14, the appropriate postures received one point and the other zero. In questions 7, 10 and 13, there were zero negative and one positive answers. In question 8, the affirmative answer received one point and negative answer received zero. In question 15, the category of seven to nine hours of sleep received one point and the other zero.

The SBST tool evaluates the risk of poor prognosis of people with low back pain, classifying them into low, medium and high risk with nine questions [6]. These questions are divided into two subscales and address physical and psychosocial issues associated with pain. Questions 1 to 4 are related to physical factors and Questions 5 to 9 are related to psychosocial factors. Questions 1 to 8 present two options for answers: "agree" (one point) and "disagree" (zero point). Question 9 has five answer options: "not at all, slightly or moderately" (zero point) and "very much or extremely" (one point). If the total score rages from zero to three points, there is "low risk"; if greater than three, one must consider the score of the psychosocial subscale (Questions 5 to 9). If the score of this subscale is ≤3 points, there is "medium risk" and if it is >3 points, there is "high risk".

The ODI questionnaire is used to assess low back pain-associated disability and is divided into 11 questions, only the first 10 of which are scored. The questions assess the disabling effects of low back pain on activities of daily living (ADLs)[7]. The first question of the ODI assesses pain intensity and the following nine address the disabling effect of this pain on ADLs. The maximum ODI score is 50 points, and the rating ranges from "minimal disability" to "maximal disability." Results are interpreted as follows: from 0% to 20% (minimal disability); from 21% to 40% (moderate disability); from 41% to 60% (severe disability); from 61% to 80% (crippled); and from 81% to 100% (maximal disability).

The FABQ is an instrument composed of 16 questions, being subdivided into two scales: FABQpa (physical activities) and FABQw (work activities). It is used to assess the beliefs and fears of individuals with low back pain in relation to work and physical activities[8]. The FABQpa subscale corresponds to Questions 1 to 5 and FABQw corresponds to Questions 6 to 16. The score for each question ranges from zero (strongly disagree) to six (strongly agree). The FABpa scores from zero to 24 (Questions 2, 3, 4 and 5) and FABQw scores from zero to 42 (Questions 6, 7, 9, 10, 11, 12 and 15). The higher the final score on the subscales, the greater the belief and fear that physical activity and/or occupational activity worsens the individual's pain.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS 20.0) program, using descriptive and inferential statistics. For inferential analysis, the Shapiro-Wilk test was initially performed to evaluate the normality of the variables and the Levene test to evaluate the homogeneity of the variances. Student's t-test was used to compare the pre-pandemic group (PPG) and pandemic group (PG) in relation to body mass and height. For the other comparisons between groups, the Mann-Whitney test was used. A 0.05 significance level was adopted in the tests.

RESULTS

The PPG sample was composed of 29 women and 11 men and the PG was composed of 34 women and six men (Table 1). The groups were matched for sex, age, body mass and height, so there was no statistically significant difference between the groups for the sample characterization variables.

Table 1. Characterization of the anthropometric and sociodemographic profile of the participants in the pre-pandemic and pandemic groups

Characteristic	PPG (n=40)	PG (n=40)	p-value
Female	29 (72.5%)	34 (85%)	
Male	11 (27.5%)	6 (15%)	
Age (years)	33.4* (19–63)**	33* (20–62)**	0.531##
Body mass (kg)	69.8* (43.5–118)**	70.7* (45–108)**	0.776#

(continues)

Table 1. Continuation

Characteristic	PPG (n=40)	PG (n=40)	p-value
Height (cm)	166.6* (145–185)**	165* (153–85)**	0.519#
Retired	1 (2.5%)	3 (7.5%)	
Health professional	4 (10%)	2 (5%)	
Student	18 (45%)	16 (40%)	
Other	17 (42.5%)	19 (47.5%)	
Practice of regular physical activity	22 (66.6%)	26 (65%)	

PPG: Pre-pandemic group; PG: Pandemic group; *Mean; **Minimum and Maximum; #Student's t-test; ##Mann-Whitney test.

When comparing the results of the BackPEI-A questionnaire regarding the hindrance to perform ADLs, pain intensity and frequency, and sitting posture in front of the computer, no statistically significant differences were found between PPG and PG (Table 2). As for the hindrance related to ADLs caused by low back pain, the results show that there was a prevalence of the presence of positive responses to the impediment in both PPG (57.5%) and PG (52.5%). Regarding the frequency of low back pain, the PPG and PG groups showed similar results, with a predominance of pain three times per week.

Regarding the comparison of the BackPEI-A index, which provides the degree of exposure to pain risk factors, it is clear that there was an increase in exposure to risk factors during the pandemic (Table 2), with a 4.6 index (SD±2.0) for the PPG and 4.1 (SD±1.7) for the PG, with no statistically significant difference between them (p=0.273).

Table 2. Comparison between pre-pandemic and pandemic groups regarding the impediment to perform daily activities due to back pain, the frequency and intensity of back pain and the sitting posture adopted in daily life, evaluated by the BackPEI-A questionnaire

BackPEI-A Questionnaire	PPG (n=40)	PG (n=40)	p-value
Impediment due to back pain			
Yes	23 (57.5%)	21 (52.5%)	
No.	17 (42.5%)	18 (45%)	0.726*
Does not know	0 (0%)	1 (2.5%)	
Frequency of back pain			
Once per month	9 (22.5%)	7 (17.5%)	
Once per week	8 (20%)	13 (32.5%)	
Trice per week	21 (52.5%)	18 (45%)	0.755*
Only once	1 (2.5%)	0 (0%)	
Does not know	1 (2.5%)	2 (5%)	
Sitting Posture			
Adequate	7 (17.5%)	7 (17.5%)	1*
Inadequate	33 (82.5%)	33 (82.5%)	
Pain intensity (average)	5.77 (SD±1.7)	6.15 (SD±1.8)	
BackPEI-A General Index (mean)	4.6 (SD±2.0)	4.1 (SD±1.7)	0.273*

PPG: Pre-pandemic group; PG: Pandemic group; * Mann-Whitney test; SD: standard deviation; BackPEI-A: Back Pain and Body Posture Evaluation Instrument for Adults.

In the comparison between the risk of poor prognosis of people with low back pain, via SBST, the results were similar between the groups (Table 3). The prevalence of low risk of poor prognosis was found in both PPG (92.5%) and PG (95%). Regarding disability index associated with low back pain, via the ODI questionnaire (Table 3), there was an increase in participants without disability during the pandemic (PPG with 52.5% and PG with 67.5%).

Table 3. Comparison between pre-pandemic and pandemic groups regarding risk of poor prognosis of individuals with low back pain and regarding disability index related to low back pain

SBST and ODI Questionnaires	PPG (n=40)	PG (n=40)	P value
Risk of poor prognosis (SBST)			
Low	37 (92.5%)	38 (95%)	
Medium	2 (5%)	2 (5%)	0.188*
High	1 (2.5%)	0 (0%)	
Disability Index (ODI)			
No disability	21 (52.5%)	27 (67.5%)	
Moderate disability	18 (45%)	12 (30%)	0.630*
Severe disability	1 (2.5%)	1 (2.5%)	

PPG: Pre-pandemic group; PG: Pandemic group; * Mann-Whitney test; SD: standard deviation; SBST: STarT Back Screening Tool; ODI: Oswetry Disability Index.

The analysis of the FABQpa results questionnaire (Table 4) showed that participants in the PPG and PG, at both moments of the study (pre-pandemic and pandemic), had no indicators of beliefs and fears related to physical activity, representing 67.5% and 72.5%, respectively. When comparing the FABQw responses to the beliefs and fears of individuals with low back pain in relation to work activities, the results were also similar in both groups (Table 4).

Table 4. Comparison between PPG and PG regarding the indicators of beliefs and fears related to physical activity and work activity

FABQ Questionnaire	PPG (n=40)	PG (n=40)	P value
FABQpa			
Presence of indicators	13 (32.5%)	11 (27.5%)	0.628*
Absence of indicators	27 (67.5%)	29 (72.5%)	
FABQw			
Presence of indicators	0 (0%)	2 (5%)	0.155*
Absence of indicators	40 (100%)	38 (95%)	

PPG: Pre-pandemic group; PG: Pandemic group; * Mann-Whitney test; SD: standard deviation; FABQpa: Fear Avoidance Beliefs Questionnaire physical activities subscale; FABQw: Fear Avoidance Beliefs Questionnaire work activities subscale.

DISCUSSION

With the social isolation imposed in 2020 and 2021, the life routine and leisure habits of the adult population underwent changes[9]. To the best of our knowledge, few studies have sought to compare the biopsychosocial aspects related to low back pain in relation to the pre-pandemic and pandemic periods. In this study, this comparison showed no differences in pain intensity and frequency, impediment to perform ADLs, risk of poor prognosis, disability, degree of exposure to risk factors for pain, beliefs and fears, and sitting posture in front of the computer. In 2022, Leles[10] showed that despite the isolation measures caused by the pandemic, the use of virtual rehabilitation for chronic low back pain provided improvements for intensity, disability, and self-efficacy to deal with pain variables.

When comparing the maintenance of training and eating habits in competitive and non-competitive judo athletes during the COVID-19 pandemic, Ramos and Menezes[11] showed that people with the habit of taking care of their health and practicing physical activity maintained the same habit during the pandemic period. The study also identified that competitors, more accustomed to training, remained physically more active than non-competitors during the pandemic.

As a result of social isolation, free time for leisure activities at home increased, also fostering the growth of practices related to the use of the internet, such as watching livestreams; access to social media; use of smartphones and computers as indicated by Montenegro et al.[12]. Although gyms and public spaces for leisure have been closed, interest in exercising at home has increased, according to a study by Maciel and Lima[13], which verified the growth in the number of downloads of mobile apps for physical activity at home during the pandemic. According to data for 2022 from Agência Brasil[14], 95% of people aged 19 to 25 years accessed the internet in 2021, an age group similar to this study that presents an average of 33 years of age. The increase in downloads of apps aimed at physical activity may explain the levels of health care during the pandemic.

People who propose to participate in university projects are more willing to invest time in health-related care, as participation in these environments demands time, willingness, and commitment[15]. According to data collected by the Industry Social Service (SESI) in 2023, 52% of Brazilians do not practice physical activity regularly. However, we found that only 33.3% of the PPG participants and 35% of the PG did not have the habit of practicing physical activity regularly (Table 1). The difference between the results found by the different studies confirms the bias that our sample had previous interest in performing physical activities above the expected in the general population. Still, despite the social distance and closure of public places for the practice of physical activity, the modalities of health management via exercise-guiding mobile apps and virtual health services made it possible to maintain the same levels of health between PPG and PG.

A survey carried out in 2022 by Santos, Machado and Dias[16], composed of 121 participants, identified the increase in low back pain in university students aged 18 to 30 years in the pandemic period, with the increase in pain related to the intense use of technological devices, the position adopted in work activities, and to sedentary lifestyle. Participants were integrated into the study with an online questionnaire shared via social networks, which enabled a more representative data collection, without the bias of participants showing prior interest in health care. Moreover, the performance of physical exercise during the COVID-19 pandemic had repercussions on the maintenance of the health and well-being of this public, demonstrating that it is a preventive factor for osteomioarticular pain[16].

CONCLUSION

The results indicate no differences in the intensity and frequency of low back pain reported by adults before and during the COVID-19 pandemic, as well as no differences in the impediment to perform ADLs, risk of poor prognosis, disability, degree of exposure to risk factors for pain, beliefs and fears, and sitting posture in front of the computer. While the circumstances of the

pandemic have influenced the population's living and health patterns, the impacts on low back pain seems to have been mitigated by a combination of factors, including the increasing use of virtual health and individuals' prior predisposition to healthcare.

REFERENCES

1. Oliveira VV, Rocha MR, Lisboa RS, Alves SS. Impactos do isolamento social na prática de exercícios físicos durante a pandemia por coronavírus. Gepnews. 2021;5(5):95-8. doi: 10.34119/BJHRV4N1-294
2. Makhsous M, Lin F, Hendrix RW, Hepler M, Zhang LQ. Sitting with adjustable ischial and back supports: Biomechanical changes. Spine. 2003;28(11):1113-21. doi: 10.1097/01.BRS.0000068243.63203.A8
3. Vigatto R, Alexandre NMC, Correa Filho HR. Development of a Brazilian Portuguese Version of the Oswestry Disability Index: Cross-Cultural Adaptation, Reliability, and Validity. Spine. 2007;32(4):481-6. doi: 10.1097/01.brs.0000255075.11496.47
4. Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, et al. What low back pain is and why we need to pay attention. Lancet. 2018;391(10137):2356-7. doi: 10.1016/S0140-6736(18)30480-X
5. Candotti CT, Detogni Schmit EF, Pivotto LR, Raupp EG, Noll M, et al. Back pain and body posture evaluation instrument for adults: expansion and reproducibility. Pain Manag Nurs. 2018;19(4):415-23. doi: 10.1016/j.pmn.2017.10.005
6. Pelaio BPM. Versão Brasileira do STarT Back Screening Tool – tradução, adaptação transcultural, confiabilidade e validade de construto [Dissertação de Mestrado]. São Paulo: Universidade de São Paulo, 2014. doi: 10.11606/D.17.2014.tde-18122014-115402
7. Vigatto R, Alexandre NM, Correa Filho HR. Development of a Brazilian Portuguese version of the Oswestry Disability Index: cross-cultural adaptation, reliability, and validity. Spine. 2007;32(4):481-6. doi: 10.1097/01.brs.0000255075.11496.47
8. Abreu AM, Faria CDCM, Cardoso SMV, Teixeira-Salmela LF. Versão brasileira do Fear Avoidance Beliefs Questionnaire. Cad Saúde Pública. 2008;24(3):615-23. doi: 10.1590/S0102-311X2008000300015
9. Ribeiro OCF, Santana GJ, Tengan EYM, Silva LWM, Nicolas EA. Impacts of the covid-19 Pandemic on Adult and Elderly. Licere. 2020;23(3):391-428. doi: 10.35699/2447-6218.2020.25456
10. Leles AS. Telerreabilitação no tratamento da dor lombar crônica na atenção primária: relato de caso [Trabalho de Conclusão de Curso]. Fortaleza: Universidade Federal do Ceará; 2022 [cited 2024 10 3]. Available from: https://repositorio.ufc.br/bitstream/riufc/63864/2/2022_tcc_asleles.pdf
11. Ramos CE, Menezes NT. Comparação da manutenção de hábitos de treinamento e alimentares em atletas competitivos e não competitivos de judô durante a pandemia [Trabalho de Conclusão de Curso]. Brasília, DF: Centro Universitário de Brasília; 2020 [cited 2024 10 3]. Available from: https://repositorio.uniceub.br/jspui/bitstream/prefix/14624/1/CAROLYNA%20ESTRELA.pdf
12. Montenegro GM, Queiroz BS, Dias MC. Leisure in Times of Social Distance: Impacts of the covid-19 Pandemic on Leisure Activities of University Students in the City of Macapá (AP). Licere. 2020;23(3):1-26. doi: 10.35699/2447-6218.2020.24785
13. Maciel EDS, Lima LP. O uso de aplicativos para prática de atividade física em casa durante a pandemia da covid-19. CPAQV. 2021;13(1):1-10. doi: 10.36692/v13n1-8
14. Campos AC. Quase 85% das pessoas de 10 anos ou mais acessam a internet no Brasil. Agência Brasil. 2022 [cited 2024 10 03]. Available from: https://agenciabrasil.ebc.com.br/geral/noticia/2022-09/quase-85-das-pessoas-de-10-anos-ou-mais-acessam-internet-no-brasil
15. Conselho Nacional de Saúde (BR). Resolução CNS nº 466/2012. Aprova as diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos e revoga as Resoluções CNS nos. 196/96, 303/2000 e 404/2008. Diário Oficial da União. 2013 06 13 [cited 2024 10 03]. Available from: https://www.inca.gov.br/publicacoes/legislacao/resolucao-cns-466-12
16. Santos PLMD, Machado AH, Dias GADS. Análise da incidência de dores em estudantes no período de pandemia da COVID-19. Acervo Saúde. 2022;15(12):205-9. doi: 10.25248/reas.e11515.2022