Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

HEALTH SOCIAL RESPONSIBILITY

issue 1 nº 11 edition 11 year 7

afmo.emnuvens.com.br ISSN: 2674-8487 2024

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

www.afmo.emnuvens.com.br ISSN: 2674-8487 June 2024

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

www.afmo.emnuvens.com.br ISSN: 2674-8487

Editorial Board

Communication

Graphic Project Department of Communication of the FMO
Production Faculdade de Medicina de Olinda
Publishing Tito França - wtito.mobile@gmail.com

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

www.afmo.emnuvens.com.br ISSN: 2674-8487 June 2024

Summary

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

www.afmo.emnuvens.com.br ISSN: 2674-8487 June 2024

Letter to the Editor

Inácio de Barros Melo Neto

Dear editor,

In another issue of the Annals of Olinda Medical School, we are excited to confirm that the results of the investments made by the Faculdade de Medicina de Olinda (FMO) are strengthening the teaching and research. With the journal indexed and recognized by national and international bodies, our academic productions are boosted and can be read in Portuguese and English; thus, reaching the international academic community. Each issue brings new original articles, reviews of current books, and experience reports focused on social responsibility.

In this issue, we also stated the investments made in the medical training of our students, with the Institutional Scientific Initiation Program (PRODIIC - 2024) reaching 63 research projects, demonstrating the capacity of Master's and PhD professors and the proposition of relevant projects to the progress of science and the society.

In a cross-sectional way, the FMO Global Program continues to offer the opportunity to deepen in languages (focus on the English language) to enable students to develop a global mentality and local actions socially referenced in their medical practice. Currently, over 850 students are actively practicing the English language. The results of this semester showed that more than 24,000 activities were conducted on the language teaching platform, while the number of correct answers exceeded 70%. We also provide eight face-to-face English courses, each with a qualified teacher who constantly monitors approximately 100 students, making the learning process even more engaging.

Equally significant is the role of our 28 Academic Leagues from several medical specialties. They zealously fulfill our objectives of consolidating the goals related to social responsibility, as well as offering a diverse range of training actions for FMO students and those from other institutions seeking to enhance their knowledge. They achieve this through a series of education and health promotion actions aimed at users of the Unified Health System and communities in socially vulnerable areas and with limited access to quality health services.

To reinforce our social responsibility, we are celebrating the 1st year of the Instituto Maria, which offers multidisciplinary care (medical care, physiotherapy, speech therapy, occupational therapy, dentistry, psychology, psychopedagogy, physical education, music therapy, and social work) to children with Down syndrome as a fundamental principle; thus, providing conditions for the insertion of these individuals into the world of work and society and qualifying them to enjoy opportunities throughout life. Currently, we follow and support 218 children and families from 37 municipalities in the state of Pernambuco. Soon, it will become a center for research focused on this population.

In the field of teaching, we started the ultrasound service in 2024 to expand the

training of our students and provide the opportunity to be ahead of time in the field of medicine. We also resumed our mentoring program by making qualified teachers available to our students to model a training that is closely personalized to the needs of students. Let's keep working in a cohesive and qualified manner, so doctors trained by our institution can stand out in society as a consequence of technical and humanistic capacities and have solid ways for disseminating their scientific productions, such as our journal.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Potential years of life lost due to diseases of the circulatory system in a capital of Brazilian Northeast

Anos potenciais de vida perdidos por doenças do aparelho circulatório em uma capital do Nordeste brasileiro

Cristyane Nathália Gomes Mendonça[1,2] Conceição Maria de Oliveira[1,2]
Marcela Franklin Salvador de Mendonça[3]

[1] Secretaria Executiva de Vigilância em Saúde, Secretaria de Saúde do Recife. Recife, Pernambuco, Brazil.
[2] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.
[3] Secretaria de Saúde de Pernambuco. Recife, Pernambuco, Brazil.

Abstract

Aim: To estimate the potential years of life lost (PYLL) due to diseases of the circulatory system (DCS) in residents of Recife (Pernambuco). **Methods:** This descriptive study used a quantitative approach to analyze deaths from DCS among individuals aged 1 to 74 residing in Recife during 2017. Data were obtained from the Mortality Information System, and the PYLL and their rate (PYLLR) were calculated. **Results:** Deaths from DCS were concentrated in the oldest age groups: 60 to 69 (36.7% of men and 42.6% of women) and 50 to 59 (27.4% of men and 19.2% of women). Most deaths occurred among individuals of brown ethnicity (61.0%) with one to three years of education (26.0%), in hospitals (64.0%), and were attributed to ischemic heart disease (54.7%). The overall mortality rate was about twofold higher in men. In addition, the PYLLR was significantly higher in men than in women (16.27 years per 1,000 inhabitants vs. 7.37 years per 1,000 inhabitants, respectively). The age group between 60 to 64 years had the highest PYLLR (53.20 years per 1,000 inhabitants), followed by 65 to 69 (52.60 years per 1,000 inhabitants). Ischemic heart disease was the DCS with the highest PYLL, totaling 9,853 years: 6,701 lost in men (PYLLR = 9.24 years per 1,000 inhabitants) and 3,152 in women (PYLLR = 3.78 years per 1,000 inhabitants). Men were about twofold more likely to die

How to cite: Mendonça **CNG**, Oliveira **CM**, Mendonça **MFS**.
Potential years of life lost due to diseases of the circulatory system in a capital of Brazilian Northeast
An Fac Med Olinda 2024; 1(11):1 doi: https://doi.org/10.56102/afmo.2024.317

Corresponding author: Cristyane Nathália Gomes Mendonça.
E-mail: cristyane.mendonca@hotmail.com
Funding: None.
Ethics approval: CAAE nº 10394919.6.0000.5569.
Received: 11/13/2023
Approved: 03/05/2024

than women. **Conclusion:** PYLL was more pronounced in men; they were more likely to die from DCS than women.

Keywords: Chronic disease; Diseases of the circulatory system; Mortality; Potential years of life lost.

Resumo

Objetivo: Estimar os anos potenciais de vida perdidos por doenças do aparelho circulatório (DAC) de residentes no Recife, Pernambuco. **Métodos:** Estudo descritivo com abordagem quantitativa dos óbitos por DAC de residentes no Recife de 1 a 74 anos de idade, ocorridos em 2017.Os dados foram obtidos do Sistema de Informações sobre Mortalidade. Calcularam-se os anos potenciais de vida perdidos (APVP) e sua taxa. **Resultados:** No ano estudado, ocorreram 12.038 óbitos de residentes no Recife; destes, 1.363 (20,2%) foram por doença arterial coronariana. No sexo masculino, a taxa de APVP foi de 16,27 anos/1.000 habitantes. A faixa etária entre 60 e 64 anos apresentou maior taxa de APVP (53,20 anos/1.000 habitantes). O tipo de DAC que apresentou maiores APVP (9.853 anos) foram as doenças isquêmicas do coração em ambos os sexos, com 6.701 anos perdidos nos homens (taxa de APVP = 9,24 anos/1.000 habitantes) e 3.152 anos nas mulheres (taxa de APVP = 3,78 anos/1.000 habitantes). Em todos os tipos de DAC, os homens apresentaram aproximadamente duas vezes mais chances de morrer comparado às mulheres (RC = 1,8). **Conclusão:** Os APVP e as taxas de APVP são indicadores pouco utilizados para análise do padrão de mortalidade. Contudo, as informações apresentadas desses indicadores poderão servir para nortear ações que visam a promoção da saúde e a prevenção das DAC.

Palavras-chave: Anos potenciais de vida perdidos; Doença crônica; Doenças do aparelho circulatório; Mortalidade.

INTRODUCTION

Diseases of the circulatory system (DCS) are a leading cause of death among the Brazilian population, with 267,635 deaths in 1990 (29.3% of total deaths) and 424,058 deaths in 2015 (31.2% of total deaths)[1,2]. Among DCS, the most prevalent are ischemic heart disease (IHD) and cerebrovascular disease (CVD)[3].

CVD is highly neglected in Brazil and presents high incidence and mortality rates, leading to a slower epidemiologic transition compared with regions with similar socioeconomic development levels. Systemic arterial hypertension is the main risk factor for CVD, while IHD is primarily influenced by dyslipidemia, hypertension, smoking, and diabetes[4,5].

In Brazil, the risk of death from CVD and IHD varies according to sex and region. For men, the risk is similar for both diseases. On the other hand, women present more risk of death from CVD, and their IHD mortality is higher in more developed regions. In addition, the IHD mortality has increased in the Northeast and North regions while remaining unchanged in the Midwest[6].

DCS significantly impairs the quality of life and daily and work activities, and causes economic strain on families and the healthcare system, resulting in impoverishment and social harm[8]. Furthermore, studies show that DCS has elevated the number of premature deaths (30 to 69 years), contributing to a rise in years of life lost[7,8].

The potential years of life lost (PYLL) is a social and economic indicator used to analyze mortality in developed and developing countries. PYLL defines and classifies the causes and risk factors of premature death, measuring their social impact and highlighting the magnitude, vulnerability, and significance of causes of death[8].

PYLL has a greater impact on the death of younger individuals as it assumes a potential lifespan for everyone. When premature death occurs during high-productivity years, the individual does not contribute intellectually and economically to society during potential years of life, which is calculated as the difference between an established upper age limit and the age at death[9].

Calculating PYLL due to DCS is important for cardiovascular health surveillance as it helps monitor modifiable risk factors and gather healthcare service indicators[10]. Moreover, research in this area is limited and may influence preventive measures from healthcare services, particularly in Northeast Brazilian cities. Hence, this study aimed to estimate the PYLL due to DCS in residents of Recife, Pernambuco.

METHODS

This descriptive study was performed using a quantitative approach in Recife, the capital of Pernambuco. The city has an area of 218.5 km^2 and a population of 1,633,697. The primary healthcare network includes 134 Family Health Strategy units with 276 Family Health teams and 56 Community Health Agents Strategy teams; 20 Expanded Family Health Centers; 6 Integrative Practices Centers; 12 polyclinics; and 41 City Gym Centers to promote health through physical activity, leisure, and healthy eating habits[11].

The study analyzed deaths due to DCS among Recife residents aged from 1 to 74 years in 2017. Deaths of infants under one year old were excluded because infant mortality was not the focus. Additionally, deaths of individuals over 74 years old were excluded due to the upper limit of life expectancy used in the calculation method. Causes of death were classified using the 10th Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) for DCS (I00-I99), focusing on hypertension (I10-I15), ischemic heart diseases (I20-I25), and cerebrovascular diseases (I60-I69).

Data were obtained from the Mortality Information System at the Health Secretariat of Recife. All DCS deaths were analyzed based on variables extracted from the death certificate: sex, age group, ethnicity, education, marital status, location of death, and main DCS group. Descriptive analysis and statistical calculations used an estimation dataset from the Health Secretariat of

Recife for 2017, based on the 2010 population census data of the Brazilian Institute of Geography and Statistics (IBGE).

Absolute and relative frequencies, mortality rate, PYLL and PYLL rate (PYLLR), odds ratio, and p-value were calculated to characterize deaths. Statistical analysis was performed on EpiInfo (version 7.2.3.1). The odds ratio was estimated for sex differences, and the Pearson Chi-square test was used to measure trends among age groups. The Executive Secretariat of Health Surveillance provided a calculation matrix for PYLL estimation.

In this matrix, the number of deaths in each age group was multiplied by the mean of years remaining to the upper age limit of 74 years, calculated using the median age of each group. The ratio of PYLLR between men and women was determined by dividing the higher rate by the lower rate in each sex. PYLL for a specific cause of death was calculated using an adaptation of Romeder and McWhinnie's method[12]: PYLL = ∑aidi, where:

ai = years left to reach the age of 74 at death;

di = the number of deaths between ages i and i+1 years.

PYLLR was calculated using the formula PYLLR = ∑aidi x 1,000/N, where N is the number of people aged from 1 to 74 years.

RESULTS

In 2017, 12,038 residents of Recife died, of which 6,747 (56.1%) were aged from 1 to 74 years. Among these, 1,363 (20.2%) deaths were due to DCS. These deaths were concentrated in the 60 to 64 and 65 to 69 age groups (306 [36.7%] for men and 226 [42.6%] for women), followed by the 50 to 54 and 55 to 59 age groups (228 [27.3%] for men and 102 [19.2%] for women). Brown ethnicity and low education level (1 to 3 years) were predominant for both sexes (Table 1).

Table 1. Characterization of deaths from diseases of the circulatory system (DCS) in men and women by demographic variables, location of death, and type of DCS. Recife, Pernambuco, Brazil, 2017

Variables	Men		Women		Total	
	n	%	n	%	nº	%
Age group (years)*						
10 to 14	1	0.1	1	0.2	2	0.1
15 to 19	-	-	1	0.2	1	0.1
20 to 24	1	0.1	1	0.2	2	0.1
25 to 29	5	0.6	2	0.4	7	0.5
30 to 34	6	0.7	5	0.9	11	0.8
35 to 39	19	2.3	5	0.9	24	1.8
40 to 44	23	2.8	12	2.3	35	2.6
45 to 49	68	8.2	26	4.9	94	6.9

50 to 54	101	12.1	42	7.9	143	10.5
55 to 59	127	15.2	60	11.3	187	13.7
60 to 64	147	17.6	99	18.7	246	18.0
65 to 69	159	19.1	127	24.0	286	21.0
70 to 74	176	21.1	149	28.1	325	23.8
Ethnicity*						
White	258	31.0	163	30.8	421	30.9
Black	59	7.1	36	6.8	95	7.0
Brown	513	61.6	328	61.9	841	61.7
Indigenous	1	0.1	1	0.2	2	0.1
Not reported	2	0.2	2	0.4	4	0.3
Years of education						
None	66	7.9	77	14.5	143	10.5
1 to 3	217	26.1	141	26.6	358	26.3
4 to 7	185	22.2	114	21.5	299	21.9
8 to 11	208	25.0	102	19.2	310	22.7
12 or more	74	8.9	42	7.9	116	8.5
Not reported	83	10.0	54	10.2	137	10.1
Marital status						
Single	329	39.5	241	45.5	570	41.8
Married	349	41.9	132	24.9	481	35.3
Widowed	58	7.0	101	19.1	159	11.7
Divorced	65	7.8	37	7.0	102	7.5
Never married	20	2.4	6	1.1	26	1.9
Not reported	12	1.4	13	2.5	25	1.8
Location of death						
Hospital	533	64.0	376	70.9	909	66.7
Other healthcare facility estabelecimentos de saúde	81	9.7	40	7.5	121	8.9
At home	178	21.4	103	19.4	281	20.6
On the street	21	2.5	6	1.1	27	2.0
Other	20	2.4	5	0.9	25	1.8
Main DCS groups						
Ischemic heart diseases	456	54.7	286	54.0	742	54.4
Cerebrovascular diseases	294	35.3	178	33.6	472	34.6
Hypertensive diseases	83	10.0	66	12.5	149	10.9

* No deaths occurred in the 1 to 9 age range or among individuals of Asian ethnicity.

Most deaths for both sexes occurred in hospitals (66.7%), followed by at home (20.6%), and in other healthcare facilities (8.9%). Among the main DCS groups, most deaths were due to IHD (54.4%), followed by CVD (34.6%) and hypertensive diseases (10.9%) (Table 1).

The mortality rate was 85.8 deaths per 100,000 inhabitants, twofold higher in men than in

women (p = 0.00). The highest rate was in the 70 to 74 age group (929.1 per 100,000 inhabitants; Table 2). PYLLR due to DCS was 11.51 years per 1,000 inhabitants.

The PYLLR was higher in men than in women (16.27 years per 1,000 inhabitants vs. 7.37 years per 1,000 inhabitants, respectively). The highest PYLLR was in the 60 to 64 age group (53.20 years per 1,000 inhabitants), followed by the 65 to 69 age group (52.60 years per 1,000 inhabitants) (Table 2). Men had about two times more chances of dying than women (OR 1.8; p = 0.00) (Table 2).

Table 2. Absolute distribution, mortality rate, potential years of life lost rate, odds ratio, and p-value of deaths due to diseases of the circulatory system according to sex and age group. Recife, Pernambuco, Brazil, 2017

Variables	N	MR	PYLLR	OR	p-value**
Sex					
Women	530	63.6	7.37	1	-
Men	833	114.9	16.27	1.8	0.00
Age group (years)*					
10 to 14	2	1.6	0.99	2.1	0.96
15 to 19	1	0.7	0.43	1.0	-
20 to 24	2	1.3	0.71	1.8	0.86
25 to 29	7	4.7	2.24	6.2	0.05
30 to 34	11	7.9	3.41	10.6	0.00
35 to 39	24	18.9	7.18	25.2	0.00
40 to 44	35	29.3	9.67	39.1	0.00
45 to 49	94	84.9	23.77	113.2	0.00
50 to 54	143	149.9	34.48	200.0	0.00
55 to 59	187	247.6	44.57	330.3	0.00
60 to 64	246	409.2	53.20	545.8	0.00
65 to 69	286	657.5	52.60	877.0	0.00
70 to 74	325	929.1	27.87	1239.3	0.00
Total	1363	2.542.64	11.51	116.6	0.00

MR = mortality rate; PYLLR = potential years of life lost rate; OR = odds ratio;
* No deaths occurred in the 1-9 age range; **p < 0.05 = statistically significant.

The IHD was the DCS that presented the highest PYLL (9,853 years) in both sexes: 6,701 years lost among men (PYLLR = 9.24 years per 1,000 inhabitants) and 3,152 years lost among women (PYLLR = 3.78 years per 1,000 inhabitants) (Table 3). In all types of DCS, men showed about two times more chances of dying than women (Table 3).

Table 3. Absolute distribution, mortality rate, potential years of life lost, potential years of life lost rate, odds ratio, and p-value of deaths due to diseases of the circulatory system by sex and main DCS groups. Recife, Pernambuco, Brazil, 2017.

Variables	Ischemic heart diseases	Cerebrovascular diseases	Hypertensive diseases	Total
Men				
Number	456	294	83	833
MR	62.9	40.6	11.5	114.9
PYLL	6.701	3.871	1.219	11.79
PYLLR	9.24	5.34	1.68	16.27
OR	1.8	1.9	1.4	1.8
p-value	< 0.00	< 0.00	0.02	< 0.00
Women				
Number	286	178	66	530
MR	34.3	21.3	7.9	63.6
PYLL	3.152	2.251	745	6.15
PYLLR	3.78	2.70	0.89	7.37
OR	1	1	1	1
p-value*	-	-	-	-

MR = mortality rate; PYLL = potential years of life lost; PYLLR = potential years of life lost rate; OR = odds ratio; p* < 0.05 = statistically significant.

DISCUSSION

DCS-related deaths were the leading cause of death among residents of Recife, corroborating national and global scenarios[1]. The rising incidence and prevalence of these diseases in recent years are primarily due to lifestyle changes that affect risk factors, such as sedentary behavior, poor diet, diabetes, obesity, and an aging population[13].

Considering age groups, DCS-related deaths were more common in the 60 to 69 age group for women and in the 50 to 59 group for men, indicating earlier mortality in the latter. Studies from other Brazilian states[14] have shown that sex differences in DCS mortality follow global patterns, with more developed regions having lower DCS mortality rates, starting with women.

The significant decrease in age-standardized mortality among women in the Northeast and North contrasts with the reduction between sexes in the Southeast and South regions. This disparity suggests that the Northeast and North regions still experience delayed reductions of mortality rates among men due to poor economic and social development and limited access to health services[14].

Beyond age and sex differences, DCS-related deaths were more prevalent among individuals of brown ethnicity and those with low education levels (one to three years). DCSs have

resulted in over seven million deaths annually worldwide, especially in vulnerable groups (e.g., older adults and individuals with lower income and education levels)[13]. The world population is aging; therefore, new strategies under the National Senior Policy and Active Aging Policy are needed to promote quality of life in the aging population[15].

Most deaths occurred in hospitals, consistent with a study conducted in Recife[16], which reported 82.2% of deaths in hospitals and 19.5% at home. The authors observed a higher risk of in-hospital death among low-income individuals, who often face barriers to early healthcare access and are hospitalized at later stages of the disease, limiting effective care[16].

Healthcare challenges in Brazil are evident, with substantial gaps in providing medium and high-complexity services. The deterioration of the Unified Health System hampers efforts to address these morbidities, which will increase with an aging population[17].

Most DCS deaths were due to IHD, followed by CVD, aligning with other Brazilian studies[3,19]. The World Health Organization estimates that cerebrovascular accidents will be the second leading cause of death worldwide by 2030[20].

The formation of atheromas and their clinical consequences (myocardial infarction and cerebrovascular accidents) is closely associated with cardiovascular risk factors, such as hypercholesterolemia, hypertriglyceridemia, low HDL-c levels, hypertension, diabetes, and obesity[21]. Primary health care is responsible for the early prevention, diagnosis, and treatment of these complications, focusing on health promotion and disease prevention based on prevalent risk factors[13].

In the present study, the mortality rate was twofold higher in men than in women, consistent with other Brazilian studies showing increased DCS mortality rates among men[22,14].

Women tend to use health services more often, allowing for early diagnosis and treatments, which may reduce mortality[17]. The concept of hegemonic masculinity in Brazilian society promotes the idea that men should demonstrate strength, and they only seek healthcare when seriously ill, impairing their health[23].

In this study, men had a PYLLR twofold higher than women, corroborating the findings of a study conducted in Ribeirão Preto, São Paulo[24]. Research in the USA showed that after acute myocardial infarction, men lose a mean of 41.8% of their years of life, whereas women lose 10.5%, suggesting that PYLL is higher among men even in developed countries[25].

PYLL highlights the decline in socioeconomic productivity, underscoring the need to implement and improve prevention policies to reduce premature DCS deaths. This indicator measures the magnitude, vulnerability, and significance of each death, providing a new criterion for setting priorities[26].

A Canadian study highlighted the importance of using PYLL to view chronic diseases comprehensively[27]. This indicator helps assess the progress of health interventions and guide cost-ef-

fective actions to reduce premature mortality. Additionally, PYLL can enhance chronic disease surveillance, aiding in monitoring and achieving public health goals[27,28].

The highest PYLL was due to IHD in both sexes, accounting for over half of deaths, followed by CVD and hypertensive diseases. A study conducted in Brazil in 1990 and 2015 found IHD as the leading cause of cardiovascular death nationwide (excluding the Amapá state), followed by CVD[14]. This data is consistent with the epidemiologic transition in Brazil[29].

Moreover, the predominance of IHD as a cause of death may suggest better control of systolic arterial hypertension, strongly associated with CVD, compared to dyslipidemia and diabetes, which are more associated with IHD[30]. In addition, the rising prevalence of diabetes in Brazil evidences the obesity epidemic, posing a challenge to sustain the reduction of cardiovascular disease mortality in the future[14].

CONCLUSIONS

Deaths from DCS were concentrated in older age groups, brown ethnicity, and lower education levels. Most deaths occurred in hospitals, and IHD was the leading cause, followed by CVD.

The overall mortality rate was about twofold higher in men, with a PYLLR of 11.51 years per 1,000 inhabitants in the municipality. Men had a higher PYLLR than women, with the former presenting a twofold chance of death compared with the latter in al DCS.

PYLL and PYLLR are underutilized indicators for analyzing mortality patterns. However, they could inform and guide actions to promote health and prevent DCS. Health managers and researchers should conduct health diagnoses that include mortality profiles and the impact of DCS-related years of life lost, as this information is crucial for health planning and care.

CONFLICT OF INTEREST

Nothing to declare.

AUTHORS CONTRIBUTIONS

CNGM: Conceptualization, data collection, formal analysis, research, methodology, writing – original draft and text review and editing; **MFSM:** formal analysis, validation, and text revision and editing; **CMO:** Conceptualization data collection, formal analysis, research, validation, methodology, supervision, writing – original draft, text review and editing. All authors approved the final version of the text to be published.

REFERENCES

1. World Health Organization. Cardiovascular disease. 2017. Disponível em: <http://www.who.int/cardiovascular_diseases/en/> Acesso: em 01 Dez 2019.

2. Roth GA, Forouzanfar MH, Moran AE, Barber R., Nguyen G, Feigin VL et al. Demographic and epidemiologic drivers of global cardiovascular mortality. N Engl J Med. 2015;372(14):1333-41. doi: https://doi.org/10.1056/NEJMoa1406656. PMID: 25830423; PMCID: PMC4482354.

3. Mansur A de P, Favarato D. Trends in Mortality Rate from Cardiovascular Disease in Brazil, 1980-2012. Arq. Bras. Cardiol. 2016;107(1):20-25. https://doi.org/10.5935/abc.20160077

4. Lotufo PA et al. Doença cerebrovascular no Brasil de 1990 a 2015: Global Burden of Disease 2015. Rev. bras. epidemiol. 2017;20(1):129-141. https://doi.org/10.1590/1980-5497201700050011

5. Mussi FC, Teixeira JB. Fatores de risco cardiovascular, doenças isquêmicas do coração e masculinidade. Rev Cubana Enferm [Internet]. 2018;34(2).

6. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância de Doenças e Agravos Não Transmissíveis e Promoção da Saúde. Saúde Brasil Estados 2018: uma análise de situação de saúde segundo o perfil de mortalidade dos estados brasileiros e do Distrito Federal, 2018.

7. Confortin SC et al. Mortalidade prematura pelas principais doenças crônicas não transmissíveis nos estados do Brasil. Rev. Bras. Enferm. [Internet]. 2019;72(6): 1588-1594. https://doi.org/10.1590/0034-7167-2018-0701

8. Andrade SSC de A, Mello-Jorge MHP de. Mortality and potential years of life lost by road traffic injuries in Brazil, 2013. Rev Saúde Pública [Internet]. 2016;50. Available from: https://doi.org/10.1590/S1518-8787.2016050006465

9. Garcia LAA et al. Anos potenciais de vida perdidos e tendência de mortalidade na população adulta em um município do Triângulo Mineiro, 1996-2013. Medicina (Brazil). 2017;50(4):216–226. https://doi.org/10.11606/issn.2176-7262.v50i4p216-226

10. Fraga JCAXO, Corrêa ACP, Rocha RM, Silva LA, Medeiros RMK, Mozer IT. Principais Causas da Mortalidade Masculina e os Anos Potenciais de Vida Perdidos por estes Agravos. Cienc Cuid Saude. 2016;15(4):746-754.

11. RECIFE, Governo Municipal, Secretaria de Saúde do Recife, Secretaria Executiva de Coordenação Geral, Plano Municipal de Saúde 2018 - 2021 / Governo Municipal, Secretaria de Saúde do Recife, Recife. Secretaria Executiva de Coordenação Geral, Diretoria Executiva de Planejamento, Orçamento e Gestão da Informação. _ 1ª. Ed. - Secretaria de Saúde do Recife, 2018. xxx p.: - il. Disponível em: https://www2.recife.pe.gov.br/sites/default/files/plano_municipal_de_saude_2018-2021_4.pdf

12. Romeder JM, McWhinnie JR. Potential years of life lost between ages 1 and 70: an indicator of premature mortality for health planning. International Journal of Epidemiology. 1977;6:143-151. doi: https://doi.org/10.1093/ije/6.2.143. PMID: 892979.

13. Bonotto GM, Mendoza-Sassi RA, Susin LR. O. Conhecimento dos fatores de risco modificáveis para doença cardiovascular entre mulheres e seus fatores associados: um estudo de base

populacional. Ciência & Saúde Coletiva. 2016; 21(1):293–302.https://doi.org/10.1590/1413-81232015211.07232015

14. Brant LCC et al. Variações e diferenciais da mortalidade por doença cardiovascular no Brasil e em seus estados, em 1990 e 2015: estimativas do Estudo Carga Global de Doença. Revista Brasileira de Epidemiologia. 2017; 20(1):116–128. https://doi.org/10.1590/1980-5497201700050010

15. Reis CS dos, Noronha K, Wajnman S. Envelhecimento populacional e gastos com internação do SUS: uma análise realizada para o Brasil entre 2000 e 2010. *Rev. bras. estud. popul.* [online]. 2016;(33)3:591-612. http://dx.doi.org/10.20947/S0102-30982016c0007

16. Magalhães APR, Paiva SC e, Ferreira LOC, Aquino TA. A mortalidade de idosos no Recife: quando o morrer revela desigualdades. Epidemiol. Serv. Saúde [Internet]. 2011 Jun [citado 2024 Jul 03] ; 20(2): 183-192. Disponível em: http://scielo.iec.gov.br/scielo.php?script=sci_arttext&pid=S1679-49742011000200007&lng=pt. http://dx.doi.org/10.5123/S1679-49742011000200007.

17. Malta DC, Bernal RTI, Lima MG, Araújo SSC, Silva MMA, Freitas MIF, et al. Doenças crônicas não transmissíveis e a utilização de serviços de saúde: análise da Pesquisa Nacional de Saúde no Brasil. Rev Saúde Pública [Internet]. 2017; 51(1):1-10. https://doi.org/10.1590/S1518-8787.2017051000090

18. Marcucci FCI, Cabrera MAS. Morte no hospital e no domicílio: influências populacionais e das políticas de saúde em Londrina, Paraná, Brasil (1996 a 2010). Ciência & Saúde Coletiva. 2015;20(3):833-840. https://doi.org/10.1590/1413-81232015203.04302014

19. Nunes MC, Kreuser LJ, Ribeiro AL, Sousa GR, Costa HS, Botoni FA et al. Prevalence and risk factors of embolic cerebrovascular events associated with Chagas heart disease. Glob Heart. 2015;10(3):151-7. doi: https://doi.org/10.1016/j.gheart.2015.07.006. PMID: 26407510

20. World Health Organization. (WHO). Health statistics and information systems – Projections of mortality and causes of death, 2015 and 2030. [Internet]. Geneva; 2013.

21. Santos CM dos et al. Perfil lipídico e glicídico de pacientes atendidos em ambulatório e sua correlação com índices antropométricos. Revista Portuguesa de Cardiologia. 2013;32(1):35-41. http://dx.doi.org/10.1016/j.repc.2012.05.017

22. Silva LCC et al. Evolução da mortalidade por doenças do aparelho circulatório em um município mineiro. Rev Enferm Atenção Saúde [Online]. 2019;8(1):17-26. DOI: https://doi.org/10.18554/reas.v8i1.3405

23. Silva LA, Corrêa Áurea C de P, Anschau Xavier Oliveira JC, Rodrigues TC, Divino E do A. Percepções de homens trabalhadores sobre suas necessidades de saúde em um serviço universitário de saúde/ Men's workers perceptions about their health needs in a university health service. Ciênc. cuid. saúde [Internet]. 21º de março de 2016 [citado 3º de julho de 2024];15(1):133 -140. Disponível em: https://periodicos.uem.br/ojs/index.php/CiencCuidSau-

de/article/view/29321

24. Istilli PT, Teixeira CRS, Zanetti ML, Lima RAD, Pereira MCA, Ricci WZ. Avaliação da mortalidade prematura por doença crônica não transmissível. Rev Bras Enferm. 2020;73(2):e20180440. https://doi.org/10.1590/0034-7167-2018-0440

25. Jack VT. Life expectancy and years of potential life lost: useful outcome measures in cardiovascular medicine? J Am Coll Cardiol. 2015;66(6):656-8. doi: https://doi.org/10.1016/j.jacc.2015.05.073

26. Chen EW, Gomes LMX, Barbosa TL de A. Anos potenciais de vida perdidos no período de 2010 a 2015 em Foz do Iguaçu, Paraná, Brasil. Rev. Bras. de Iniciação Científica (RBIC). 2019;6(4):18-33. http://dx.doi.org/10.37689/acta-ape/2022AO011166

27. Maximova K, Rozen S, Springett J, Stachenko S. The use of potential years of life lost for monitoring premature mortality from chronic diseases: Canadian perspectives. Can J Public Health 2016;107(2):202–204. doi: https://doi.org/10.17269/cjph.107.5261

28. Moura LA et al. Anos potenciais de vida perdidos por causas externas no Rio Grande do Norte, 2003 a 2012. UNOPAR Cient Ciênc Biol Saúde, 2015;17(2):101-106.

29. Schmidt MI, Duncan BB, Azevedo e Silva G, Menezes AM, Monteiro CA, Barreto SM, et al. Chronic non-communicable diseases in Brazil: burden and current challenges. Lancet. 2011;377(9781):1949-61. doi: https://doi.org/10.1016/S0140-6736(11)60135-9

30. Ribeiro, C. S. P., Cademartori, B. G., & Rocha, A. da S. R. (2016). AVALIAÇÃO DO PERFIL LIPÍDICO EM ADULTOS NO SUL DO BRASIL. Saúde (Santa Maria), 42(2), 11–19. https://doi.org/10.5902/2236583421708

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Prevalence of depressive and anxious symptoms on primary health care professionals in a city in the metropolitan region of Recife, Pernambuco

Prevalência de sintomas depressivos e ansiosos em profissionais da Atenção Primária à Saúde em um município da região metropolitana do Recife, Pernambuco

Ana Paula Rocha da Costa[1] Andrezza Soares Souto[1]
Igor Almeida de Moura Barros[1] Maria Carolina Francino Ferreira Santos[1]
Jéssica Rodrigues Correia e Sá[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Objective: To verify the prevalence of depressive and anxious symptoms in primary health care (PHC) professionals in Olinda, a city in the metropolitan region of Recife, Pernambuco, Brazil. **Methods:** This cross-sectional study included 243 PHC professionals distributed in 50 basic health units in Olinda, Pernambuco, Brazil. Data were collected between February and May 2023 using the sociodemographic characterization questionnaire, the Beck Anxiety Inventory, and the Beck Depression Inventory – II. **Results:** The study identified a prevalence of 58% of anxious symptoms, mostly classified above the mild level. The prevalence of depressive symptoms was 43.2%, with 27.6% on the light level, 13.2% on moderate, and 2.4% on severe. A significant association was observed between depressive and anxious symptoms and dissatisfaction with the structure of the basic health unit (prevalence ratio [PR] = 1.31; 95% confidence interval [95% CI] = 1.05 - 1.63), psychological abuse during working hours (PR = 1.55; 95% CI = 1.26 - 1.92), seek for psychological or psychiatric care (PR = 1.72; 95% CI = 1.21 - 2.45), and use of alcohol (PR = 2.33; 95%CI = 1.31 - 4.12) and psychotropics (PR = 2.15; CI 95% = 1.54 - 3.00) to relieve symptoms. **Conclusion:** Strategies aiming for the comprehensive care of

How to cite: Costa **APR**, Souto AS, Barros **IAM**, Santos **MCFF**, Sá **JRC**. Prevalence of depressive and anxious symptoms on primary health care professionals in a city in the metropolitan region of Recife, Pernambuco. An Fac Med Olinda 2024; 1(11):13 doi: https://doi.org/10.56102/afmo.2024.310

Corresponding author:
Ana Paula Rocha da Costa.
E-mail: anapaularochacost@gmail.com

Funding: Not applicable
Ethics approval: CAAE no. 62965222.0.0000.8033
Received: 07/06/2023
Approved: 02/07/2024

PHC professionals are needed to improve their quality of life and the assistance to the population.

Key-words: Anxiety; Depression; Mental health; Occupational health; Primary health care.

Resumo

Objetivo: Verificar a prevalência de sintomas depressivos e ansiosos em profissionais da atenção primária à saúde em um município da Região Metropolitana do Recife, Pernambuco. **Métodos:** Estudo transversal, envolvendo 243 profissionais da Atenção Primária à Saúde distribuídos em 50 Unidades Básicas de Saúde de um município da Região Metropolitana do Recife. A coleta de dados ocorreu entre fevereiro e maio de 2023 e foram aplicados 3 instrumentos: questionário de caracterização sociodemográficas, Inventário de Ansiedade de Beck e Inventário de Depressão de Beck II. **Resultados:** O estudo identificou uma prevalência de 43,2% de sintomas depressivos e 58% de sintomas ansiosos entre os entrevistados. Referente aos sintomas ansiosos, a maioria foi classificada acima do nível leve. Quanto aos sintomas depressivos, houve prevalência de 27,6% para o nível leve, 13,2% para o nível moderado e 2,4% para o nível severo. Houve associação significativa dos sintomas depressivos e ansiosos entre os trabalhadores que relataram estar insatisfeitos com a estrutura da unidade (RP= 1,31; IC 95% 1,05–1,63), que já sofreram abuso psicológico durante o expediente (RP= 1,55; IC95% 1,26–1,92), que buscaram atendimento psicológico ou psiquiátrico (RP= 1,72; IC 95% 1,21–2,45) e que fizeram uso de álcool (RP= 2,33; IC 95% 1,31–4,12) e psicofármacos (RP= 2,15; IC 95% 1,54–3,00) para aliviar sintomas. **Conclusão:** Observou-se a necessidade de estratégias direcionadas ao cuidado dos profissionais para o enfrentamento do problema que ofereçam qualidade de vida ao trabalhador e garantam a prestação de serviço e o cuidado à saúde integral da população adscrita.

Palavras-chave: Ansiedade; Atenção Primária à Saúde; Depressão**;** Saúde mental; Saúde ocupacional.

INTRODUCTION

The national basic care policy of Brazil (Ordinance No. 2,436 of 2017) considers basic care and primary health care (PHC) similar, corresponding to the main access to the Unified Health System and the communication center of the health care network. The family health strategy includes the PHC team, which comprises nurses, physicians, community health agents, nursing technicians, and dental health technicians; they are responsible for the regional population of the basic health unit (BHU). These professionals perform integrated actions in individual, family, or collective care, aiming at the promotion, prevention, and protection of health, qualified listening of patients, diagnostic and treatment of clinical conditions, actions on damage reduction, palliative care, and health surveillance.[1,2]

The PHC team executes territorialization and area mapping, including information in the system and integral care of the population, comprising admission, follow-up, and activities performed at the BHU, in the community, and at home.[1]

Occupational health is a concern due to the exposure of healthcare professionals to occupational risks. Many responsibilities and tasks, insufficient material and human resources, extended working hours, populational claims, precarious structures of health services, salary dissatisfaction, and work overload may trigger mental and physical suffering. These conditions enable the occurrence of health problems, such as anxiety and depression with different patterns, and also affect the quality of healthcare provided to the population.[3]

Anxiety is a state of mental, emotional, behavioural, social, and physical perturbation, defined as a long-term anticipation of negative episodes that may occur during uncertainty, existential threats, or possible and real hazards. Meanwhile, depression is a humour alteration that conducts actions and modifies the notion of self, causing the perception of difficulties and uncertainties as tragedies.[4] This context contributes to the disease process of PHC professionals, increasing mental health issues and exposure to stress, insomnia, difficulty concentrating, and factors that impair functionality and quality of life.[5]

Actions of occupational health in the Unified Health System promote and protect the PHC professionals through the surveillance of risks in the environment and work conditions, health problems, and organization and assistance to workers. Occupational health encompasses integrative diagnosis, treatment, and rehabilitation, as well as studying and intervening in the relations between work and health to promote quality of life.[6]

Knowing the psycho-emotional conditions that influence daily lives of healthcare professionals allows changes in the working context, respecting the national policies of occupational health. Thus, fostering the need to understand risk factors for mental diseases targets the strengthening of the health care of workers.[6] Therefore, this study aimed to verify the prevalence of depressive and anxious symptoms in PHC professionals in a city in the metropolitan region of Recife, Pernambuco, Brazil.

METHODS

This cross-sectional study included PHC professionals from Olinda, a city in the metropolitan region of Recife, Pernambuco, Brazil.

The sample calculation used the formula of the finite population for epidemiological studies (level of confidence of 95% and error power of 5%), resulting in 243 PHC professionals collected between February and May of 2023.

Interviews occurred during visits to 50 BHU, with a previous presentation of the study aims and an invitation to participate when available. PHC professionals were guided on data confidentiality and signed the informed consent form, followed by data collection in a private room.

PHC professionals included physicians, nurses, dentists, pharmacy technicians, dental health assistants, nursing technicians, and community health agents (CHA) who answered ques-

tionnaires. Exclusion criteria were PHC professionals aged under 18 years, on vacation or leave during data collection, or who did not answer questionnaires.

Previously validated instruments were used, such as a questionnaire on sociodemographic characteristics and lifestyle of professionals developed by the researchers, the Beck Anxiety Inventory (BAI), and the Beck Depression Inventory-II (BDI-II).[7,8]

The BAI (21 questions) assesses emotions from the last week and measures the intensity of anxiety symptoms with excellent internal consistency and test-retest reliability[7,8]. Answers are classified into four levels: no, light, moderate, or severe. The BDI-II measures the intensity of depression (21 questions) using scores from zero to three, assessing depressive (lack of hope, cognitive deficits, irritability, culpability, and punishment emotions) and physical symptoms (weakness, weight loss, and libido decrease). The BDI-II was validated in Brazil and assessed depressive symptoms of the Brazilian population.[7,8]

Data were organized in a spreadsheet (Excel software) and validated by the Epi-Info program (version 3.5.4). Statistical analysis was performed using the program STATA - Statistical Package for Social Sciences (IBM Corp., CA, EUA), version 13.0, with descriptive statistics (absolute and relative frequencies, and percentages) and correlation tests (Pearson Qui-square). The association between sociodemographic characteristics and lifestyle with anxious and depressive symptoms was estimated using the prevalence ratio (PR). A significance level ≤ 5% (0.05) for a 95% confidence interval (CI) was considered.

RESULTS

A total of 243 PHC professionals participated in the study, including 22 (9.0%) physicians, 25 (10.3%) nurses, 10 (4.1%) dentists, 3 (1.2%) pharmacy technicians, 12 (4.9%) dental health assistants, 21 (8.6%) nursing technicians, and 150 (61.7%) CHA.

The sociodemographic characteristics showed more PHC professionals aged ≥ 50 years (54.3%). Most were female (84.8%), catholic (39.1%), with brown skin (63.0%), and with a monthly income of ≤ R$ 3033.00 (65.8%). Most PHC professionals had high school (76.5%), worked more than five years in a BHU (82.3%), and were unsatisfied with its structure (56.8%). In the last six months, 63.0% suffered psychological abuse during working hours; 24.7% sought psychological or psychiatric care; 14.0% used alcohol, and 33.3% used psychotropics to relieve depressive and anxious symptoms. PHC professionals practiced self-care (72.0%), 67.5% spent less than 40 minutes on the work route, 69.5% did not use public transport to get to work, and 87.6% did not live alone.

The prevalence of anxiety and depression symptoms was 58.0% and 43.2%, respectively. Regarding anxiety symptoms, 102 (42.0%) PHC professionals presented the minimum level, and most (58.0%) had light (25.9%), moderate (16.9%), and severe (15.2%) levels. Depression levels

presented a prevalence of light (27.6%), moderate (13.2%), and severe (2.4%), and according to BDI-II, 56.8% of PHC professionals were not depressed (Table 1).

Table 1. Anxiety and depression levels of PHC professionals. Olinda, Pernambuco, Brazil, 2023

Classification	N = 243	(%)
BAI		
Minimum level	102	42.0
Light anxiety	63	25.9
Moderate anxiety	41	16.9
Severe anxiety	37	15.2
BDI-II		
Not depressed	138	56.8
Light depression	67	27.6
Moderate to severe depression	32	13.2
Severe depression	6	2.4

BAI: Back Anxiety Depression; BDI-II: Back Depression Inventory-II.

The association between sociodemographic variables and anxiety and depression levels is shown in Tables 2 and 3, respectively. The BAI score was grouped into “light to severe anxiety” and “minimum anxiety”, and BDI-II was divided into “light to severe depression” and “not depressed”.

Table 2. Association between sociodemographic variables and lifestyle with anxiety levels. Olinda, Pernambuco, Brazil, 2023

		BAI			
Variables	**N = 243 n (%)**	**Light to severe anxiety**	**Minimum anxiety**	**PR (95% CI)**	**p-value***
Age (years)					
25 – 49	111 (45.68)	66 (46.80)	41 (44.10)	1.06 (0.78 - 1.43)	0.678
≥ 50	132 (54.32)	75 (53.20)	57 (55.90)	1.00	
Gender					
Female	206 (84.77)	121 (85.80)	85 (83.30)	1.10 (0.74 - 1.64)	0.613
Male	35 (14.40)	19 (13.50)	16 (15.70)	1.00	
Transgender male	2 (0.82)	1 (0.70)	1 (0.80)	1.21 (0.29 - 4.90)	
Religion					
No	23 (9.50)	12 (8.50)	11 (10.80)	0.86 (0.54 - 1.36)	0.550
Yes	220 (90.50)	129 (91.50)	91 (89.20)	1.00	

Skin color[a]					
Not white	201 (82.70)	117 (83.00)	84 (82.30)	1.00 (0.67 - 1.51)	0.239
White	38 (15.60)	22 (16.60)	16 (15.70)	1.00	
Educational level					
High school	186 (76.50)	118 (83.70)	68 (66.70)	1.63 (1.22 - 2.17)	0.002
Higher education	57 (23.50)	23 (16.30)	34 (33.30)	1.00	
Monthly income (R$)					
≤ 3033.00	160 (65.80)	100 (70.90)	60 (58.80)	1.340 (1.02 - 1.80)	0.045
> 3033.00	83 (34.20)	41 (29.10)	42 (41.20)	1.00	
Work years in BHU					
≥ 5	200 (82.30)	115 (81.60)	85 (83.30)	1.01	
< 5	43 (17.70)	26 (18.40)	17 (16.70)	0.93 (0.62 - 1.39)	0.721
Satisfaction with the structure of the BHU					
Unsatisfied	138 (56.80)	89 (63.10)	49 (48.00)	1.42 (1.05 - 1.90)	0.019
Satisfied	105 (43.20)	52 (36.90)	53 (52.00)	1.00	
Suffered psychological abuse during working hours					
Yes	153 (63.00)	103 (73.00)	50 (49.00)	1.76 (1.32 - 2.35)	< 0.001
No	90 (37.00)	38 (27.00)	52 (51.00)	1.00	
Sought psychological or psychiatric care in the last six months					
Yes	60 (24.70)	47 (33.30)	13 (12.80)	2.24 (1.35 - 3.71)	< 0.001
No	183 (75.30)	94 (66.70)	89 (87.20)	1.00	
Used alcohol to relieve depressive and anxious symptoms					
Yes	34 (14.00)	25 (23.80)	9 (6.50)	2.33 (1.31 - 4.12)	< 0.001
No	209 (86.00)	80 (76.20)	129 (93.50)	1.00	
Used psychotropics to relieve depressive and anxious symptoms					
Yes	81 (33.30)	55 (52.40)	26 (18.80)	2.150 (1.54 - 3.00)	< 0.001
No	162 (66.70)	50 (47.60)	112 (81.20)	1.00	
Practice of self-care					
Yes	175 (72.00)	73 (69.50)	102 (73.90)	1.00	
No	68 (28.00)	32 (30.50)	36 (26.10)	1.10 (0.85 - 1.42)	0.450
Mean travel time to work (minutes)					
≥ 40	79 (32.50)	39 (37.10)	40 (29.00)	1.18 (0.91 - 1.51)	0.179
< 40	164 (67.50)	66 (62.90)	98 (71.00)	1.00	
Use of public transport to get to work					
Yes	74 (30.50)	44 (31.20)	30 (29.40)	1.050 (0.75 - 1.45)	0.764
No	164 (69.50)	97 (68.80)	72 (70.60)	1.0	
Did not live alone					
Yes	213 (87.60)	92 (87.60)	121 (87.70)		
No	30 (12.40)	13 (12.40)	17 (12.30)	1.00 (0.71 - 1.40)	0.988

a: Four lost values (two refused to answer and two did not know)
BAI: Back Anxiety Inventory; CI: confidence interval; PR: prevalence ratio; BHU: basic health unit.
* Fisher's correlation coefficient

A significative association ($p < 0.05$, $PR > 1$) was observed for light to severe anxious symptoms in PHC professionals with high school (83.7%), monthly income ≤ R$ 3033.00 (70.9%), dissatisfaction with the BHU structure (63.1%), psychological abuse during working hours (73%), seek for psychological or psychiatric care (33.3%), and use of alcohol (23.8%) and psychotropics (52.4%) to relieve depressive and anxious symptoms. In addition, the use of alcohol and psychotropics (52.4%) to relieve depressive and anxious symptoms showed a prevalence of 2.33- and 2.15-fold to develop anxious symptoms, respectively.

Table 3. Association between sociodemographic variables and depression levels. Olinda, Pernambuco, Brazil, 2023

		BDI-II			
Variables	**N = 243 n (%)**	**Light to severe depression**	**Not depressed**	**PR (95% CI)**	**p-value***
Age (years)					
25 – 49	111 (45.68)	47 (44.80)	64 (46.40)	0.97 (0.78 - 1.21	0.802
≥ 50	132 (54.32)	58 (55.20)	74 (53.60)	1.00	
Gender					
Female	206 (84.77)	90 (85.70)	116 (84.00)	1.01 (0.74 - 138.00)	0.462
Male	35 (14.40)	15 (14.30)	20 (14.50)	1.00	
Transgender	2 (0.82)	0 (0.00)	2 (1.45)	1.77 (1.57 - 2.00)	
Religion					
No	23 (9.50)	10 (9.50)	13 (9.40)	1.00 (0.68 - 1.46)	0.978
Yes	220 (90.50)	95 (90.50)	125 (90.60)	1.00	
Skin color[a]					
Not white	201 (82.70)	92 (87.60)	109 (79.00)	1.26 (0.98 - 1.62)	0.242
White	38 (156.00)	12 (11.40)	26 (18.80)	1.01	
Educational level					
High school	186 (76.50)	84 (80.00)	102 (73.90)	1.15 (0.90 - 1.46)	0.267
Higher education	57 (23.50)	21 (20.00)	36 (26.10)	1.00	
Monthly income (R$)					
≤ 3033.00	160 (65.80)	69 (65.70)	91 (65.90)	1.00	
> 3033.00	83 (34.20)	36 (34.30)	47 (34.10)	0.99 (0.78 - 1.25)	0.970
Work years in PHC					
≥ 5	200 (82.30)	82 (78.10)	118 (85.50)	1.00	
< 5	43 (17.70)	23 (21.90)	20 (14.50)	0.78 (0.56 - 1.10)	0.134

Satisfaction with UBS structure					
Unsatisfied	138 (56.80)	69 (65.70)	69 (50.00)	1.31 (1.05 - 1.63)	0.014
Satisfied	105 (43.20)	36 (34.30)	69 (50.00)	1.00	
Suffered psychological abuse during working hours					
Yes	153 (63.00)	81 (77.10)	72 (52.20)	1.55 (1.26 - 1.92)	< 0.001
No	90 (37.00)	24 (22.90)	66 (47.80)	1.00	
Sought psychological or psychiatric care in the last six months					
Yes	60 (24.70)	38 (36.19)	22 (15.90)	1.72 (1.21 - 2.45)	< 0.001
No	183 (75.30)	67 (63.81)	116 (84.10)	1.00	
Used alcohol to relieve depressive and anxious symptoms					
Yes	34 (14.00)	25 (23.80)	9 (6.50)	2.33 (1.31 - 4.12)	< 0.001
No	209 (86.00)	80 (76.20)	129 (93.50)	1.00	
Used psychotropics to relieve depressive and anxious symptoms					
Yes	81 (33.30)	55 (52.40)	26 (18.80)	2.15 (1.54 - 3.00)	< 0.001
No	162 (66.70)	50 (47.60)	112 (81.20)	1.00	
Practice of self-care					
Yes	175 (72.00)	73 (69.50)	102 (73.90)	1.00	
No	68 (28.00)	32 (30.50)	36 (26.10)	1.10 (0.85 - 1.42)	0.450
Average travel time to work (in minutes)					
≥ 40	79 (32.50)	39 (37.10)	40 (29.00)	1.18 (0.91 - 1.51)	0.179
< 40	164 (67.50)	66 (62.90)	98 (71.00)	1.00	
Uses public transport to get to work					
Yes	74 (30.50)	30 (28.60)	44 (31.90)	1.00	
No	164 (69.50)	75 (71.40)	94 (68.10)	0.93 (0.74 - 1.17)	0.578
Does not live alone					
Yes	213 (87.60)	92 (87.60)	121 (87.70)	1.00	
No	30 (12.40)	13 (12.40)	17 (12.32)	1.00 (0.71 - 1.40)	0.988

a: Four lost values (two refused to answer and two did not know)

BDI-II: Back Depression Inventory-II; CI: confidence interval; PR: prevalence ratio; PHC: primary health care.

* Fisher's correlation coefficient

The association was statistically significant between depressive symptoms and dissatisfaction with the BHU structure (PR = 1.31; 95% CI = 1.05 - 1.63), psychological abuse during working hours (PR = 1.55; 95% CI = 1.26 - 1.92), seek for psychological or psychiatric care (PR = 1.72; 95% CI = 1.21 - 2.45), and use of alcohol (PR = 2.33; 95% CI = 1.31 - 4.12) and psychotropics (PR = 2.15; 95% CI = 1.54 - 3.00) to relieve depressive and anxious symptoms.

DISCUSSION

This study observed a prevalence of depressive and anxious symptoms among PHC pro-

fessionals of 58.0% and 43.2%, respectively. Brazilian studies performed on different care strategies showed a significant prevalence of anxiety and depression in health professionals, highlighting the increasing pattern of this health issue in recent years.[3,4,9,10]

Light (25.9%), moderate (16.9%), and severe (15.2%) anxiety levels were demonstrated in PHC professionals, corresponding to the majority (58%) of the sample. In comparison, a study[0] conducted in São Paulo with 173 professionals of a PHC team showed that 45.3% of them had anxiety (25.0% light, 9.9% moderate, and 10.5% severe). During the last decade, the prevalence of anxious symptoms increased among PHC professionals, especially on moderate and severe levels, evidencing concerns about mental diseases in occupational health.

Regarding depressive symptoms, PHC professionals demonstrated 27.6% light, 13.2% moderate, and 2.4% severe levels, summing 43.2% of the sample. However, 56.8% were not classified with depressive symptoms based on the BDI-II score. In a study with a similar sample, depression was identified in 41.0% of the professionals (28.9% light and 12.1% moderate).[10]

The significant association with different sociodemographic variables and symptoms of anxiety and depression indicated that mental suffering is increasing in PHC professionals. Significant associations were observed between light to severe anxiety symptoms and high school educational level with monthly income, psychological abuse, dissatisfaction with the workplace, alcohol and psychotropics use, and seek for psychological or psychiatric care, which evidences anxiety symptoms as not random and more frequent. Pressure in the workplace, biological sex, dysregulated sleep, and civil status showed an association with anxiety. Depression was associated with work department, employment relationship, role, age, and skin color.[10,9]

Regarding the age group and mental diseases, 54.32% were aged > 50 years, of which 84.4% were female, contributing to an increased prevalence of depressive and anxious symptoms. Thus, the PR was not associated compared with other genders. Studies with larger samples identified a higher chance of anxious symptoms in females due to social and cultural factors, gender inequality, caring labour beyond work, and more openness to express emotions compared with males.[11]

In the present study, 14.0% and 33.3% of PHC professionals used psychotropics and alcohol, respectively. Previous studies evidenced the influence of depression, anxiety, stress, and chronic fatigue in the use of these substances for symptom relief. Intrinsic and extrinsic factors to work may be associated with psychotropic use. The same study demonstrated anxious and depressive symptoms in PHC professionals, indicating a correlation already observed.[5]

The association between light to severe anxiety symptoms in PHC professionals with high school was significant, representing 83.7%. The 150 CHA (61.7%) were the majority (> 50%) and the most affected by anxiety and depressive symptoms. Moreover, higher education professionals showed lower impacts, corroborating the literature. A study with 4749 professionals observed

32.0% of CHA and a prevalence of psychiatric conditions of 18.4% compared with 10.0% of professionals with higher education.[3] Besides the lower educational level, the increased work requirement and mechanical, biological, physiological, and mental workload could overload CHA, impacting mental health. This context may explain the difference in emotional levels observed between professional categories. Findings also suggest that professionals with higher education may have greater resilience, which leads to lower emotional exhaustion.[10,11,12]

The income and educational level showed an association with anxiety symptoms. Although they varied according to professional category, PHC professionals with high school (83.7%) and a monthly income of ≤ R$ 3033.00 (70.9%) demonstrated an increased prevalence of anxiety. These findings indicate the negative impact on mental health of PHC professionals and contradict the study that observed increased depression in professionals with lower income and educational level.[13]

Regarding psychological and psychiatric care, only 24.7% of PHC professionals sought assistance in the last six months, a percentage lower than professionals with high education (33.3%). These findings corroborate the psychological abuse during working hours suffered by 63.0,% of which 73.0% had a high school educational level since they were more susceptible to disrespect and oppression in the workplace. Each professional category has a work dynamic with psychological, physical, and emotional demands, validating the need for psychological or psychiatric care for mental diseases.[14]

PHC professionals accept challenges and tasks while performing their assigned activities and unexpected demands. Moreover, a dissatisfaction of 56.8% was demonstrated with the structure of the BHU, suggesting an influence of the lack of resources and materials in the severity of depressive an anxious symptom.

A Canadian study of 2021[15] also indicated that psychosocial abuse and long work hours increased the risk of depressive and anxious symptoms. The present study showed that 83.3% of PHC professionals working in the BHU over five years had a minimum level of anxiety, and 78.1% had light to severe depression, indicating the association of the exposure time to increased physical and emotional exhaustion.

Considering health as an integral physical, mental, and social well-being state and not only the lack of diseases,[16] the comprehension of a culture in formulating and providing professional care is fundamental. Therefore, national campaigns of awareness and support for mental health of PHC professionals and assistance of trained professionals should be considered to reduce depression and anxiety symptoms. In addition, self-care practices may improve quality of life, according to a study[17] with nursing professionals on the effects of meditation at the beginning of the daily routine at work, which strengthened positive mental states to cope with work-related stress.

CONCLUSIONS

The present study identified depressive and anxious symptoms in PHC professionals. Lower income and educational level, dissatisfaction in the workplace, and those who suffered psychological abuse during working hours were demonstrated to increase the prevalence of depressive and anxious symptoms.

Moreover, findings enable the development of strategies to recognize and approach depressive and anxious symptoms in PHC professionals. The promotion of a culture of care and support with mental health services and self-care programs may foster well-being and quality of care, improving the quality of life of PHC professionals and their assistance to the population.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

CONTRIBUTIONS BY AUTHORS

APRC: Formulation of ideas, elaboration of objectives and comprehensive objectives of research, preparation and creation, writing of the initial draft and critical review, comments, and full article review. **ASS**: Formulation of ideas, elaboration of objectives and comprehensive objectives of research, data collection, preparation, and creation, writing initial draft and critical review, comments, and review. **IAMB**: Formulation of ideas, elaboration of objectives and comprehensive objectives of research, data collection, preparation and creation of methods, conclusion, reference review, and adjustments on discussion and abstract. **MCFFS**: Formulation of ideas, elaboration of objectives and comprehensive objectives of research, data collection, preparation and creation of discussion, conclusion, references review, and full article review. **JRCS**: Application of statistical, math, computational techniques, and other formal techniques to analyse or summarize study data, supervision and orientation for planning and executing research activities, and critical review, commentary, and full article review.

REFERENCES

1. Ministério da Saúde. Portaria Nº 2.436 de 21 de setembro de 2017. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes para a organização da Atenção Básica, no âmbito do Sistema Único de Saúde (SUS) [Internet]. Brasília, DF: MS; 2017 [Acessado 20 Mai 2023]. Disponível em: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prt2436_22_09_2017.html

2. Ministério da Saúde. Estratégia Saúde da Família [Internet]. Brasília, DF: MS; 2022 [Acessado 20 mai 2023]. Disponível em: https://www.gov.br/saude/pt-br/acesso-a-informacao/acoes-e-programas/estrategia-saude-da-familia/estrategia-saude-da-familia

3. Dilélio, AS et al. Prevalência de transtornos psiquiátricos menores em trabalhadores da atenção

primária à saúde das regiões Sul e Nordeste do Brasil. Cadernos de Saúde Pública [internet]. 2012 [Acessado 14 Maio 2022];28(3):503-514. Disponível em: https://doi.org/10.1590/S0102-311X2012000300011

4. Abreu LA, Oliveira MR, Silveira LC, Corrêa KS. Rastreio de Sintomas de Depressão, Ansiedade e Estresse em Fisioterapeutas durante a Pandemia do Covid 19. Revista Movimenta [Internet]. 2021 [Acessado 15 Maio 2022];14(1):107–19. Disponível em: https://search.ebscohost.com/login.aspx?direct=true&db=foh&AN=150484859&lang=pt-br&site=ehost-live

5. Bertussi VC, Junqueira MAB, Giuliani CD, Calçado RM, Miranda FJ, Santos MA, et al. Substâncias psicoativas e saúde mental em profissionais de enfermagem da Estratégia Saúde da Família. Rev. Eletr. Enf. [Internet]. 2018 [acessado em: 12 maio 2022];20:v20a21. Disponível em: https://doi.org/10.5216/ree.v20.47820.

6. Ministério da Saúde. Portaria de Consolidação n. 2, de 28 de setembro de 2017. Anexo XV. Consolidação das normas sobre as políticas de saúde do Sistema Único de Saúde (SUS) [Internet]. Brasília, DF: MS; 2017 [Acessado 20 Mai 2023]. Disponível em: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prc0002_03_10_2017.html

7. Karino CA, Laros JA. Ansiedade em situações de prova: evidências de validade de duas escalas. Psico-USF [Internet]. 2014 [Acessado 20 Mai 2023];19(1):23–36. Disponível em: https://doi.org/10.1590/S1413-82712014000100004

8. J Cunha. Manual da versão em português das Escalas Beck; São Paulo: Casa do Psicólogo Livraria e Escritora; 2001.

9. Garcia CA, Ferracioli JA, Zajankauskas AE, Dias NC. Depressão em médicos da Estratégia de Saúde da Família no município de Itajaí/SC. Rev Bras Med Fam Comunidade [Internet]. 2018 [citado 4 de julho de 2023];13(40):1-12. Disponível em: https://rbmfc.org.br/rbmfc/article/view/1641

10. Julio RS, Lourenção LG, Oliveira SM, Farias DH, Gazetta CE. Prevalência de ansiedade e depressão em trabalhadores da Atenção Primária à Saúde. Cadernos Brasileiros de Terapia Ocupacional [Internet]. 2022 [citado 4º de julho de 2023];30:e2997. Disponível em: https://doi.org/10.1590/2526-8910.ctoAO22712997

11. Oliveira FE, Trezena S, Dias VO, Martelli H, Martelli DR. Common mental disorders in Primary Health Care professionals during the COVID-19 pandemic period: a cross-sectional study in the Northern health macro-region of Minas Gerais state, Brazil, 2021. Epidemiol Serv Saúde [Internet]. 2021 [acessado 4 de julho de 2023];32(1):e2022432. Available from: https://doi.org/10.1590/S2237-96222023000100012

12. Oliveira WA, Cardoso EA, Silva JL, Santos MA. Impactos psicológicos e ocupacionais das sucessivas ondas recentes de pandemias em profissionais da saúde: revisão integrativa e lições aprendidas. Estudos de Psicologia (Campinas) [Internet]. 2020 [acessado 4 de julho de 2023];37,e200066. Disponível em: http://dx.doi.org/10.1590/1982-0275202037e200066

13. Cunha RV, Bastos GA, Duca GF. Prevalência de depressão e fatores associados em comunidade de baixa renda de Porto Alegre, Rio Grande do Sul. Rev bras epidemiol [Internet]. 2012 [acessado 4 de julho de 2023];15(2):346–354. Disponível em: https://doi.org/10.1590/S1415-790X2012000200012

14. Santos PW, Costa MA, Pinto RG, Franco KS, Coelho RF, Santos YM, et al. Análise da ansiedade e do estresse laboral em profissionais da Atenção Primária à Saúde. RSD [Internet]. 2021 [acessado 4 de julho de 2023];10(6):e26210615763. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/15763

15. Plouffe RA, Nazarov A, Forchuk CA, Gargala D, Deda E, Le T, et al. Impacts of morally distressing experiences on the mental health of Canadian health care workers during the COVID-19 pandemic. Eur J Psychotraumatol [Internet]. 2021 [acessado 4 de julho de 2023];12(1):1984667. Disponível em: http://dx.doi.org/10.1080/20008198.2021.1984667

16. Segre M, Ferraz FC. O conceito de saúde. Rev Saúde Pública [Internet]. 1997 [acessado 4 de julho de 2023];31(5):538–42. Disponível em: https://doi.org/10.1590/S0034-89101997000600016

17. Farre AG, Santana IT, Santos MP, Barbosa YO, Rocha HM. Efeitos de práticas e programas de meditação com profissionais da enfermagem: uma revisão integrativa. Revista Recien [Internet]. 2021 [citado 4 de julho de 2023];11(36):551-63. Disponível em: https://www.recien.com.br/index.php/Recien/article/view/539

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Relationship between myocardial perfusion scintigraphy and workload for identifying patients at high risk for myocardial ischemia

Relação entre cintilografia de perfusão miocárdica e carga de trabalho na identificação de pacientes com alto risco para isquemia miocárdica

Giovanna Sherly de Sá Guedes Marins[1] Fernando Augusto Pacífico[1]
Dolly Brandão Lages[1] Michelle Alves de Farias[1]
Mário Cruz Couto[1] Liliam de Souza Santos[1] Eduardo Lins Paixão[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

The stress and rest myocardial perfusion scintigraphy (MPS) measures the workload achieved using metabolic equivalents (METs) and verifies the presence of ischemic changes in electrocardiographic exams. Thus, this study aimed to evaluate these variables and identify which ones would be useful in identifying patients with severe myocardial ischemia. This cross-sectional retrospective study analyzed 2,388 medical records of patients who had been referred for MPS; they were recruited using non-probabilistic convenience sampling. The patients were divided into two groups according to the METs achieved, and the prevalence of severe ischemia was measured using the Wackers-Liu software. A total of 506 patients achieved 10 METs without electrocardiographic changes in the ST segment during stress; they were classified as group B. Of these, 0.4% presented severe myocardial ischemia. Patients from group A did not reach 10 METs (n = 515 patients) and presented ischemic electrocardiographic changes in the ST segment; 3.6% of them presented severe myocardial ischemia, which was significantly different ($p < 0.0002$). These findings highlight that patients presenting ischemic electrocardiographic changes in the stress phase with a workload <10 METs were 9-fold more likely to have severe myocardial ischemia than those who achieved ≥10 METs without ischemic electrocardiographic

How to cite: Marins **GSSG**, Pacífico **FA**, Lages **DB**, Farias **MA**, Couto **MC**, Santos **LS** et al. Relationship between myocardial perfusion scintigraphy and workload for identifying patients at high risk for myocardial ischemia. An Fac Med Olinda 2024; 1(11):26 doi: https://doi.org/10.56102/afmo.2024.307

Corresponding author:
Giovanna Sherly de Sá Guedes Marins.
E-mail: giovannasherly@outlook.com
Funding: none.
Ethics approval: CAAE nº 65605922.1.0000.8033
Received: 06/20/2023
Approved: 11/14/2023

changes. Therefore, a workload that reaches ≥10 METs without electrocardiographic changes compatible with ischemia may be a good predictor for the absence of severe myocardial ischemia in MPS.

Keywords: Coronary artery disease, Ischemia, Metabolic equivalent, Radionuclide imaging.

Resumo

Durante a realização da cintilografia de perfusão miocárdica (CPM) de estresse e repouso, é medida a carga de trabalho alcançada, definida pelos equivalentes metabólicos (METs), e verificada a presença de alterações isquêmicas nos exames eletrocardiográficos. O objetivo deste estudo foi avaliar essas variáveis e identificar quais seriam úteis na identificação dos pacientes com isquemia miocárdica severa. Para tanto, foi realizado um estudo do tipo transversal, observacional e retrospectivo, com amostragem do tipo não probabilístico por conveniência, feito por meio da análise de 2.388 prontuários cujos pacientes haviam sido encaminhados para realização de CPM. Os pacientes foram divididos em dois grupos de acordo com os METs alcançados, e foram comparadas as prevalências de isquemia severa aferida pelo software Wackers-Liu. Dos 2.388 prontuários, 506 atingiram 10 METs sem alterações eletrocardiográficas do segmento ST no estresse, os quais foram enquadrados no grupo B; desses, 0,4% (2/506) apresentou isquemia severa. Os 515 pacientes do grupo A não alcançaram 10 METs e apresentaram, simultaneamente, alterações eletrocardiográficas isquêmicas do segmento ST; 3,6% (19/515) deles evidenciaram isquemia severa, diferença estatisticamente significante (p < 0,0002). Com base nesses achados, conclui-se que, na presença de alterações eletrocardiográficas isquêmicas na fase de estresse com carga de trabalho < 10 METs, a probabilidade de isquemia miocárdica severa é nove vezes maior em comparação aos que alcançaram ≥ 10 METs sem alterações eletrocardiográficas isquêmicas. Desse modo, uma carga de trabalho que alcança ≥ 10 METs sem alterações eletrocardiográficas compatíveis com isquemia pode ser um bom preditor para ausência de isquemia severa na CPM.

Palavras-chave: Cintilografia; Equivalente metabólico; Isquemia; Doença da artéria coronariana.

INTRODUCTION

Myocardial perfusion scintigraphy (MPS) is a noninvasive test that can demonstrate abnormalities in myocardial perfusion. Thus, this test is important to assess the cardiovascular function of patients with suspected coronary artery disease (CAD).[1]

During cardiopulmonary exercise testing, metabolic equivalents (METs) measure the capacity of the heart to cope with physical effort.[2] This capacity, also known as exercise capacity, is one of the most important measures obtained in an exercise test. One MET is the amount of oxygen consumption needed at rest and is equivalent to 3.5 ml of oxygen per kilogram of body weight per minute for a young adult.[3] The measurement of METs is a practical and easily understandable procedure that is included in the final report of an exercise test.[4] Moreover, this variable

is considered a powerful predictor of cardiovascular events in the general population, with better results observed in patients who achieve high workloads

An accurate risk stratification is crucial in patients with known or suspected CAD for proper management and to improve prognosis.[5] Exercise electrocardiogram (ECG) and stress echocardiography are widely used tools for risk stratification in stable CAD. Additionally, exercise capacity, which can be assessed during stress echocardiography, is an established predictor of mortality.[5]

Therefore, the present study aimed to analyze the relationship between workload achieved in METs during MPS and the risk of developing severe myocardial ischemia.

METHODS

This cross-sectional and retrospective study with non-probabilistic convenience sampling was conducted from March to April 2023, using the database of the nuclear medicine laboratory of a hospital in the metropolitan region of Recife, Pernambuco. A total of 2.388 medical records were analyzed, considering random patients with or without known CAD treated from 2006 to 2007 who underwent MPS with technetium sestamibi 99mTc.

Inclusion criteria comprised patients aged between 20 and 85 years who achieved more than 85% of their maximum predicted heart rate for their age. Those unable to perform a physical stress test and underwent pharmacological stress testing, who did not reach 85% of their maximum predicted heart rate for their age, or who were below 20 or over 85 years were excluded.

The patients were divided into two groups (A or B) according to the intensity of workload (in METs) achieved during the ergometric test and by the electrocardiographic changes found in the ST segment. Group A included patients who achieved a workload < 10 METs and presented electrocardiographic changes, while group B included those who achieved a workload ≥ 10 METs and did not present electrocardiographic changes. The Bruce protocol was used in the ergometric test to evaluate the workload.[2]

Patients who achieved a workload < 10 METs and did not present electrocardiographic changes or those who achieved a workload ≥ 10 METs and presented electrocardiographic changes were not included in the analysis.

The Wackers-Liu software for quantitative analysis of myocardial perfusion assessed the prevalence of ischemia, which was considered severe when it presented an ischemic area larger than 10% of the affected left ventricle.

Data were tabulated and processed by the Predictive Analytics Software for Microcomputers (PASW® Statistics; version 17.0). Initially, a descriptive analysis was performed, and the results were presented as absolute frequency, expected frequencies, total percentage, and adjusted residual. The Chi-Square test of independence was applied to verify the association between variables. The established precision level was 5%, the confidence level was 95%, and the

maximum variability was 0.5.

RESULTS

The mean age of the patients was 58 years (20 to 85 years) for both groups. Considering sex, the mean age was 59 (22 to 84 years) for women and 57 years (23 to 84 years) for men. The distribution by sex was 43.29% women (N = 1,034) and 56.71% men (N = 1,354).

Considering patients who reached 10 METs, 285 were excluded due to ST segment electrocardiographic changes, and the remaining 506 were included in group B for analysis; 0.4% of them presented severe myocardial ischemia. Among those who did not reach 10 METs, 1,082 were excluded because they did not present ST segment electrocardiographic changes, resulting in 515 patients included in group A; 3.6% of them presented severe myocardial ischemia, which was a value 9-fold higher than the group B (Table 1).

Table 1. Distribution of the risk of developing severe myocardial ischemia according to the workload achieved (METs) in the cardiopulmonary exercise testing and electrocardiographic changes

Workload achieved and ECG changes	**Severe myocardial ischemia**		Total
	Absence	Presence	
METs < 10 with ECG changes			
Absolute frequency	496	19	515
Expected frequency	504.4	10.6	515
Total percentage	48,6%	1,9%	50.4%
Adjusted residue	-3.7	3.7	
METs ≥ 10 without ECG changes			
Absolute frequency	504	2	506
Expected frequency	495.6	10.4	506
Total percentage	49.4%	0.2%	49.6%
Adjusted residue	3.7	-3.7	
Total			
Absolute frequency	1000	21	1021
Expected frequency	1000	21	1021
Adjusted residue	97.9%	2.1%	100.0%

Metabolic equivalents (METs), electrocardiogram (ECG) Chi-Square test value = 13.748, $p < 0.001$.

A table was constructed with data on the presence of severe myocardial ischemia according to workload achieved to assess the association between the workload and the risk of developing severe myocardial ischemia. Then, the Chi-square test was used to evaluate whether the distributions were significantly different.

The assumptions of the test were met, including that the expected frequency in each cell of the table should be greater than five. The calculated value for the Chi-square test of independence was 13.748 ($p < 0.001$), suggesting that the risk of developing severe myocardial ischemia was significantly higher among patients from group A than those from group B. The Chi-square test of independence revealed an association between the workload achieved and the risk of developing severe myocardial ischemia [$X2(2) = 13.748$; $p < 0.001$)].

DISCUSSION

The Brazilian guideline for cardiovascular rehabilitation suggests the stratification of patients clinical risk, considering clinical decompensation, intervention or cardiovascular event, exercise capacity (METs), signs and symptoms of myocardial ischemia defined as an ischemic threshold, symptomatology, and other clinical characteristics.[6] Patients who achieved functional capacity < 5 METs were classified as high clinical risk (functional classes III and IV); those who achieved 5 to 7 METs were of intermediate clinical risk (functional classes I and II); and low-risk patients achieved > 7 METs without any symptomatology.[6]

Patients who achieved 10 METs have demonstrated an excellent prognosis with low rates of cardiovascular events and low prevalence of severe left ventricular ischemia, regardless of peak exercise heart rate.[5] Although the exercise load and heart rate are directly correlated, the maximum achievable heart rate decreases with age and varies among individuals of the same age.[7] On the other hand, patients who did not achieve 10 METs may be more likely to be classified as high risk, as they would initially fall into the high clinical risk category and often require drug adjustments, reevaluations, and possible interventions (revascularizations or other procedures).[6]

Exercise stress testing verifies the ST segment depression and also provides valuable diagnostic and prognostic information[4], including exercise capacity, chronotropic response, heart rate recovery, and blood pressure response.[4] Still, one of the most important parameters is the exercise capacity assessed in METs.[4]

Studies showed that besides the presence of electrocardiographic changes on the ECG, the time these changes take to return to baseline levels may influence the prognosis.[8] Patients who showed a quick return of the ST segment had fewer high-risk findings than those with a longer return time.[8]

In the face of all stratification, diagnosis, and prognosis alternatives, protocols have been created to improve the selection of patients for MPS, protecting them from unnecessary radiation exposure and reducing costs.[5] Therefore, a stepwise diagnostic method may be cost-effective. No further testing will be needed when the symptom-limited exercise ECG (step 1) is normal[7], as patients with intermediate to high clinical risk for arterial disease achieving ≥ 10 METs without ischemic changes in the ECG are less likely to develop severe ischemia.[9] However, when the

exercise ECG is positive, an MPS (step 2) is required to address the issue of a false-positive exercise ECG.[7] With this modification, a substantial number of low-probability patients will not require MPS.[7]

CONCLUSION

In the presence of ischemic electrocardiographic changes during stress with a workload <10 METs, the probability of severe myocardial ischemia was 9-fold higher than those who achieved ≥ 10 METs without ischemic electrocardiographic changes. Therefore, a workload ≥10 METs without electrocardiographic changes (ST segment) may be a good predictor for the absence of severe myocardial. The use of METs in performing cardiac perfusion imaging in randomly selected patients, regardless of the presence of CAD, sex, and age, was a good predictor of severe myocardial ischemia.

The study may allow for a better understanding of how the exercise capacity of the heart is related to myocardial perfusion. Also, the results evidenced the importance of a well-performed exercise test in cardiovascular risk stratification. This test spares patients from undergoing further testing, reducing costs and exposure to radiation in other exams that are routinely requested in healthcare services.

Last, prognostic information is important for more effective patient management. Moreover, the ergometric test is a cheap, feasible, reproducible, and accurate test for risk stratification and for assessing the relationship between workload and ischemic changes in the electrocardiogram.

CONFLICT OF INTERESTS

Nothing to declare

AUTHOR CONTRIBUTIONS

GSSGM: Writing - original writing, Writing - review and editing; **FAP**: Data curation, Formal Analysis, Methodology, Supervision, Writing - original writing, Writing - revision and editing; **DBL**: Writing - original writing, Writing - review and editing; **MAF**: Writing - original writing, Writing - review and editing; **MCC**: Writing - original writing, Writing - revision and editing; **LSS**: Writing - original writing, Writing - revision and editing; **ELP**: Conceptualization, Data curation, Investigation, Methodology, Project management, Resources, Supervision, Original writing, Writing – revision and editing.

REFERENCES

1. Beller GA, Heede RC. SPECT imaging for detecting coronary artery disease and determining prognosis by noninvasive assessment of myocardial perfusion and myocardial viability. J Cardiovasc Transl Res. 2011;4(4):416-424. doi: https://doi.org/10.1007/s12265-011-9290-2
2. Padala SK, Ghatak A, Padala S, Katten DM, Polk DM, Heller GV. Cardiovascular risk stratification in diabetic patients following stress single-photon emission-computed tomography myocardial perfusion imaging: the impact of achieved exercise level. J Nucl Cardiol. 2014;21(6):1132-1143. doi: https://doi.org/10.1007/s12350-014-9986-1
3. Sharma K, Kohli P, Gulati M. An update on exercise stress testing. Curr Probl Cardiol. 2012;37(5):177-202. doi: https://doi.org/10.1016/j.cpcardiol.2011.11.004
4. Petretta M. Rise and fall, and provisional rebirth of exercise stress testing at the dawn of the third millennium. J Nucl Cardiol. 2021; 28(5):2067-2071. doi: https://doi.org/10.1007/s12350-019-01967-7
5. Peclat TR, de Souza ACDAH, Souza VF, et al. The additional prognostic value of myocardial perfusion SPECT in patients with known coronary artery disease with high exercise capacity. J Nucl Cardiol. 2021;28(5):2056-2066. doi: https://doi.org/10.1007/s12350-019-01960-0
6. Carvalho T, Milani M, Ferraz AS, et al. Brazilian Cardiovascular Rehabilitation Guideline - 2020 [published correction appears in Arq Bras Cardiol. 2021 Aug;117(2):423]. Diretriz Brasileira de Reabilitação Cardiovascular – 2020 [published correction appears in Arq Bras Cardiol. 2021 Aug;117(2):423]. Arq Bras Cardiol. 2020;114(5):943-987. doi: https://doi.org/10.36660/abc.20200407
7. Wackers FJ. Customized exercise testing. J Am Coll Cardiol. 2009;54(6):546-548. doi: https://doi.org/10.1016/j.jacc.2009.04.044
8. Rich JD, Chen S, Ward RP. Comparison of high risk stress myocardial perfusion imaging findings in men with rapid versus prolonged recovery of ST-segment depression after exercise stress testing. Am J Cardiol. 2010;105(10):1361-1364. doi: https://doi.org/10.1016/j.amjcard.2009.12.061
9. Bourque JM, Holland BH, Watson DD, Beller GA. Achieving an exercise workload of > or = 10 metabolic equivalents predicts a very low risk of inducible ischemia: does myocardial perfusion imaging have a role?. J Am Coll Cardiol. 2009;54(6):538-545. doi: https://doi.org/10.1016/j.jacc.2009.04.042

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

The meaning of being hypertensive from the experience of users accompanied by the Family Health Strategy

O significado de ser hipertenso a partir da experiência de usuários acompanhados pela Estratégia de Saúde da Família

Flávia Souza Rosa Brandão[1] Maria Natália Barros Lopes da Cruz Baggio[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Objective: This study aimed to understand the meaning of being hypertensive from the perspective of users regarding the diagnosis and treatment of systemic arterial hypertension (SAH). **Methods:** This qualitative study included 12 patients with SAH accompanied by a Family Health team. Data collection occurred using interviews with questions related to the objective of the study. The interviews were fully transcribed and subjected to content analysis in the thematic mode. **Results:** Patients were mostly female, aged between 40 and 60 years, married, with an income of up to one minimum wage, and up to eight years of education. In the thematic analysis, the main axes were identified as the experience of being hypertensive and reception and health care. The patients did not know the meaning of having SAH, as well as its consequences and severity. They believe that changes in routine after diagnosis linked to healthy eating influenced the reduction of the symptoms. In addition, reception contributed to the organization of care based on the identification of the needs of the patients through the involvement of the health team, users, and family members. **Conclusion:** The study showed that the perception of users about the experience of being hypertensive is related to the lack of knowledge about the disease and its forms of treatment, highlighting the need to strengthen the reception in basic health units and the development of actions to promote health and improve the quality of life of this population.

Keywords: Chronic diseases; Family Health Strategy; Primary health care; Systemic arterial hypertension.

How to cite: Brandão **FSR**, Baggio **MNLC**. The meaning of being hypertensive from the experience of users accompanied by the Family Health Strategy. An Fac Med Olinda 2024; 1(11):33 doi: https://doi.org/10.56102/afmo.2024.308

Corresponding author:
Flávia Souza Rosa Brandão.
E-mail: fsrbrandao@hotmail.com
Funding: not applicable
Ethics approval: CAAE No. 62289922.9.0000.8033
Received: 06/29/2023
Approved: 02/21/2024

Resumo

Objetivo: Compreender o significado de ser hipertenso a partir do sentido dado pelos pacientes ao diagnóstico e tratamento para hipertensão arterial sistêmica. **Métodos:** Estudo de abordagem qualitativa, realizado com 12 hipertensos, acompanhados por uma equipe de Saúde da Família. A coleta de dados ocorreu por meio de entrevista com questões norteadoras direcionadas para o objetivo do estudo. As entrevistas foram gravadas, transcritas e submetidas à análise de conteúdo na modalidade temática. **Resultados:** Os participantes do estudo eram, na maioria, do sexo feminino, entre 40 e 60 anos de idade, casados, com renda de até um salário mínimo e com até oito anos de estudo. Na análise temática das entrevistas, foram identificados como eixos principais a experiência de ser hipertenso e acolhimento e atenção à saúde. Foi notório que os participantes não sabiam ao certo o significado de ser portador de hipertensão arterial sistêmica, assim como suas consequências e gravidade. Eles acreditavam que mudanças na rotina após o diagnóstico atreladas à alimentação saudável tinham influência na minimização dos sintomas. Foi identificado que o acolhimento contribui para a organização do processo de cuidado a partir da identificação das necessidades do paciente, por meio do envolvimento da equipe de saúde, usuários e familiares. **Conclusão:** O estudo evidenciou que a percepção dos usuários sobre a experiência de ser hipertenso está relacionada à falta de conhecimento sobre a doença e suas formas de tratamento, sendo importantes fortelecer o acolhimento nas Unidades Básicas de Saúde e desenvolver ações de promoção da saúde e melhoria da qualidade de vida dessa população.

Palavras-chave: Atenção Primária à Saúde; Doenças crônicas; Estratégia de Saúde da Família; Hipertensão arterial sistêmica.

INTRODUCTION

The Family Health Strategy (FHS) is considered an expansion and qualification strategy that aims to strengthen primary health care (PHC) using health promotion and disease prevention actions, favoring the quality of life of patients, families, and communities[1]. Although the FHS enables the user to access the Brazilian Unified Health System (SUS), gaps need to be improved to enhance the quality and resolvability of public health services[2].

In PHC, chronic non-communicable diseases (NCDs) represent a major public health problem and one of the main causes for seeking health services[3,4]. Among them is systemic arterial hypertension (SAH), a chronic disease characterized by high blood pressure caused by genetic, environmental, and lifestyle factors. SAH is one of the main causes of morbidity and mortality, and it is a basic disease for other comorbidities, such as atherosclerosis, stroke, and cardiovascular diseases[5,6].

In Brazil, SAH affects more than 30 million people, with a higher prevalence in older adults[5]. Social determinants strongly contribute to this increased prevalence, including social inequalities, differences in access to goods and services, low education, and misinformation[7,8]. The increase

of patients with SAH in the country should be considered relevant, as this pathology increases the demand for health services, generating high costs for health systems[5].

Cases of SAH are recommended to be treated in PHC, requiring the service to be resolute and effective. Thus, patients with SAH must access the basic health units (BHU) to improve their quality of care and follow-up, ensuring diagnosis, treatment, and care by the multidisciplinary team to promote greater adherence and treatment control[8,11,12].

The FHS plays an important role in monitoring SAH, contributing to the awareness of patients and their families about coping with this disease[11,12]. Thus, new management measures are important to improve health teams and adequately elaborate clinical, therapeutic, and educational intervention strategies for patients with SAH[5].

Studies on this theme are essential to guide healthcare professionals on attitudes and strategies for dealing with these patients. Therefore, this study aimed to understand the meaning of being hypertensive based on the perspective of patients regarding the diagnosis and treatment of SAH.

METHODS

This qualitative study was conducted in a BHU (Olinda, Pernambuco), which is comprised of two family health teams that accompany 12,000 patients registered in a community that presents areas of difficult access and lack of basic sanitation. The population has low purchasing power, and the main income comes from the social programs of the federal government.

This study included 12 patients with SAH who were monitored by the family health team and whose diagnosis was recorded in the medical record; selection was performed using simple random sampling. The inclusion criteria encompassed patients with SAH registered in the medical record, aged ≥ 18 years, who were followed up for at least six months by the BHU. Those residing outside the BHU coverage area were excluded.

Data collection was conducted by the researchers from November to December of 2022 using a semi-structured script divided into two parts: the first included sociodemographic characterization (age, sex, marital status, skin color, income, and years of education), lifestyle (smoking, alcohol consumption, and other drug intake), and clinical aspects (pathologies and comorbidities). The second part included questions directed to the objective of the study, based on the two main axes: “The experience of being hypertensive” and “Reception and health care”.

To ensure the anonymity of the patients, they were named by the letter U (user) followed by the number of the order in which they were interviewed. The interviews were recorded using a digital recorder, lasted around 30 minutes, and were conducted in a place provided by BHU. Then, they were transcribed and submitted to the content analysis formulated by Laurence Bardin, divided into three phases: pre-analysis, exploration of the material, and treatment of the results[13,14].

The study was approved by the research ethics committee of the Faculty of Medicine of Olinda, according to Resolution 466/2012 of the National Health Council. All patients signed the informed consent form.

RESULTS

Patients were mostly female (n = 11), aged between 40 and 60 years (n = 7), white (n = 7), married (n = 9), with an income of up to one minimum wage (n = 5), and up to eight years of education. Regarding clinical characteristics and lifestyle, some patients presented diabetes mellitus (DM) (n = 3), Parkinson's disease (n = 1), dyslipidemia (n = 1), labyrinthitis (n = 1), consumed alcohol (n = 5), and none of the patients smoked or used illicit drugs.

Considering Axis 1 (i.e., the experience of being hypertensive), three sub-axis were identified: signs and symptoms that led to the diagnosis of SAH, the feeling of what it is like to have SAH, and changes in routine after the diagnosis of SAH. In Axis 2 (i.e., reception and health care), the three following sub-axis were identified: reception, access, and difficulties encountered, which refer to the health team and the health care network available to these users.

Axis 1: The experience of being hypertensive

According to the report of the patients, the following signs and symptoms led to the diagnosis of SAH:

"I was feeling many headaches in the back of the neck and eagerness to vomit." (U3)

"I went to see my son at the BHU, and he had high blood pressure." (U4)

"I had a headache, thirst for vomit, and pallor." (U5)

"I had many headaches and looked for the health unit." (U8)

"I had a headache and looked for urgency."(U11)

The feeling of what it is like to have SAH:

"Not a very good thing, no." (U3)

"I think it is genetic." (U5).

"I do not know how to explain." (U7)

"Being hypertensive is bad." (U8)

"Being hypertensive is a disease." (U10)

"To be hypertensive is to be attentive." (U11)

"Being hypertensive is not good." (U12)

Changes in routine after the diagnosis of SAH:

"I changed my role at work, and I try to take care of food." (U1)

"I have improved my symptoms, although I am still having a headache." (U2)

"My diet has become more regulated, with less salt and carbohydrates." (U3)

"I do not drink anymore, and I do not eat salty food anymore." (U5)

"A lot has changed." (U6)

"It has changed practically nothing, just the routine of the medication." (U8)

"I no longer have headaches." (U10)

"I became more careful." (U12)

Axis 2: Reception and health care

Regarding the access, reception, and health care provided by the multidisciplinary team, the patients mentioned:

"I cannot make an appointment with a nutritionist to prescript my diet." (U8)

"I received guidance to diet, lose weight, and go for walks." (U9).

"I use the medication according to the medical prescription." (U10)

"I received guidance to avoid salt and carbohydrate and do physical activity." (U11)

"I was referred to the cardiologist." (U12)

Regarding the difficulties encountered throughout the process, the patients reported:

"I do not have difficulties in taking the medications." (U1)

"I take walks sporadically." (U2)

"I do not participate in the groups on my health unit." (U3)

"The doctor gave me food I cannot afford." (U6)

"I did not receive any kind of nutritional guidance." (U12)

DISCUSSION

Considering the results, most patients with SAH interviewed were female, married, and self-declared white. The presence of other comorbidities was also identified, such as DM, Parkinson's disease, dyslipidemia, and labyrinthitis. Although black people have a greater predisposition to SAH, most patients in this study were white. Studies conducted in other Brazilian states highlight the predominance of care for women, as they perceive their health problems more than men and seek more health services[5,17,18,19].

The low level of education and income identified by the patients may hinder treatment adherence, as well as the perception of the care received by the FHS team and the understanding of morbidity and mortality of the disease. As the therapeutic complexity increases, the patient needs more complex cognitive skills to understand the treatment and its adherence[15,14,18].

Regarding the experience of being hypertensive (Axis 1), the patients clearly did not know for sure the meaning of the disease or its consequences and severity[15]. They believed that changes in routine after the diagnosis of SAH linked to healthy eating influenced the reduction of symptoms. In this context, In this context, previous studies observed a lack of knowledge about the disease and its treatments. The authors emphasized that the correct use of medication, adequate nutrition, and practice of physical activities could reduce symptoms[15,16].

The patients believed medication was enough to control SAH; however, only pharmacological treatment is not effective for controlling this disease. Strategies that include weight control, dietary re-education, reduction in alcohol consumption, smoking cessation, and physical activity contribute to the control and treatment of SAH, and reduce the risk of cardiovascular diseases[14,15,23].

A study conducted in the Northeast of Brazil presented similar results, showing that health education is fundamental for treatment adherence and lifestyle changes, as knowledge of the disease improves the behavior of patients with SAH[20]. Adherence to treatment can be defined as the behavior of patients throughout the treatment presented by the health team, aiming to prevent complications and improve quality of life[21].

The presence of family members or close people to compose a support network for patients with NCDs is essential because continuous care is needed for greater treatment effectiveness. Monitoring blood pressure levels, correcting the use of medications, providing adequate nutrition, and practicing physical activities are also needed[7].

Regarding reception and health care (Axis 2), continued care is needed for patients with SAH, involving the multidisciplinary health team as co-responsible for the people living in the territory covered by the BHU. From this perspective, reception is a light technology in health that helps the organization of care, emphasizing that healthcare professionals need to conduct it with resoluteness and accountability[14,16]. The environment in which patients are inserted is also important, as well as respecting the specificities of each patient and their need for service and demand[23].

In the Unified Health System (UHS), reception permeates the approach to the user, which is a space of first listening with the identification of the needs of the patients, guiding and directing them to solve their problems[20]. This process is included in the objectives of the National Humanization Policy and can promote practices of healthcare professionals to meet the needs of users in PHC[22,23].

Thus, the care of patients with SAH in the daily life of the FHS covers a representative demand that requires proper reception and health care since SAH is a highly prevalent disease that reduces the quality of life[20]. The main purpose of monitoring patients with SAH is to control the disease and prevent secondary complications, requiring the participation of the health team, the patient, and their family[11,21].

The turnover of healthcare professionals is associated with insufficient quantity, and their qualifications to work in PHC hinder the work of the FHS[20,21]. Thus, changes are needed in the meaning of individual consultations and the incorporation of health promotion, prevention, recovery, and rehabilitation actions in UHS. Expanding access to information and creating participatory strategies for health promotion and disease prevention is essential for strengthening the link between users and healthcare professionals[12].

CONCLUSION

The study highlighted that the perception of the users about the experience of being hypertensive is linked to the lack of knowledge about the disease and its forms of treatment. The proper use of medication, adequate nutrition, and the practice of physical activities directly influence the reduction and control of SAH symptoms.

Given the above, strengthening the dialogue between healthcare professionals and users is crucial to improve their monitoring and reception. Patients must be informed about the risk factors, treatment, and possible complications related to SAH using actions to promote health and improve quality of life.

CONFLICTS OF INTEREST

Nothing to declare.

CONTRIBUTIONS OF THE AUTHORS

FSRB: Conceptualization, Data curation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, and Writing – review and editing. **MNBLCB:** Research and Resources.

REFERENCES

1. Brasil, Ministério da Saúde. Portaria nº 2.436 de 21 de setembro de 2017: Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes para a organização da Atenção Básica, no âmbito do Sistema Único de Saúde (SUS). Brasília: 2017. Available at: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prt2436_22_09_2017.html.
2. Oliveira ACD, Giacomin KC, Santos WJ, Firmo JOA. A percepção do usuário idoso sobre o acesso e a qualidade da Atenção Primária à Saúde. Rev Bras Med Fam Comunidade. Rio de Janeiro, 2022 Jan-Dez; 17(44):2363. DOI: https://doi.org/10.5712/rbmfc17(44)2363.
3. Brasil, Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Diretrizes para o cuidado das pessoas com doenças crônicas nas redes de atenção à saúde e nas linhas de cuidado prioritárias. Brasília: Ministério da Saúde, 2013. Available at: http://bvsms.saude.gov.br/bvs/publicacoes/diretrizes%20_cuidado_pessoas%20_doencas_cronicas.pdf.

4. Brasil, Ministério da. Portaria nº 483 de 1º de abril de 2014: Redefine a Rede de Atenção à Saúde das Pessoas com Doenças Crônicas no âmbito do Sistema Único de Saúde (SUS) e estabelece diretrizes para a organização das suas linhas de cuidado. Brasília: 2014. Available at: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0483_01_04_2014.html.

5. Oliveira JRA, Santos Filho MAA, Santos MJMN, Militão TO, Santana AGC. Fatores de risco para baixa adesão ao tratamento farmacológico de hipertensão arterial sistêmica na Atenção Primária à Saúde. REAS/EJCH. 2021 jan; 13(1). DOI: https://doi.org/10.25248/reas.e5514.2021.

6. Silva CA, Rocha RC, Bueno SLO, Fontes SLF, Leão VD, Marinho NA, Giacomet M. Hipertensão arterial sistêmica na Atenção Básica de Saúde. SAÚDE & CIÊNCIA EM AÇÃO. 2018 jan/jul; 4(1).

7. Brasil. Ministério da Saúde. Estratégias para o cuidado da pessoa com doença crônica: hipertensão arterial sistêmica. Secretaria de Atenção à Saúde, Departamento de Atenção Básica. – Brasília: 2013. Available at: https://bvsms.saude.gov.br/bvs/publicacoes/estrategias_cuidado_pessoa_doenca_cronica.pdf.

8. Santos ALS, Andrade CJN, Santos MS, Neto MFS, Porto TD. Percepção de usuários com diabetes acerca da assistência recebida na atenção primária à saúde. Rev. APS. 2018 abr/jun; 21(2): 251 - 258. DOI: https://doi.org/10.34019/1809-8363.2018.v21.16042.

9. Camargo PNN, Tenani CF, Bulgareli JV, Guerra LM, Silva RP, Batista MJ. Estudo qualitativo da percepção de usuários hipertensos e diabéticos sobre saúde na Atenção Primária. Rev Ciênc Med. 2021;30:e215047. DOI: https://doi.org/10.24220/2318-0897v30e2021a5047.

10. Oliveira ACD, Giacomin KC, Santos WJ, Firmo JOA. A percepção do usuário idoso sobre o acesso e a qualidade da Atenção Primária à Saúde. Rev Bras Med Fam Comunidade. Rio de Janeiro, 2022 Jan-Dez; 17(44):2363. DOI: https://doi.org/10.5712/rbmfc17(44)2363.

11. Saez MO, Facchini LA, Tomasi E. Avaliação da satisfação de usuários da Atenção Básica portadores de hipertensão e diabetes. APS em Revista Vol. 1, n. 3, p. 206/221 Set/Dez – 2019. DOI: https://doi.org/10.14295/aps.v1i3.49.

12. Pavan IP, Baptista ASL, Rosa CP, Cabral DS, Bittencourt F, Silva SA. Satisfação do usuário com os serviços de saúde de atenção básica: percepção masculina. Cienc Cuid Saude 2020;19. DOI: https://doi.org/10.4025/cienccuidsaude.v19i0.46760.

13. Bardin L. Análise do conteúdo. Lisboa (PT): Edições 70; 2011.

14. Sousa JR, Santos SCM. Análise de conteúdo em pesquisa qualitativa: modo de pensar e de fazer. Pesquisa e Debate em Educação. Juiz de Fora, 2020 Jul-Dez; 10 (2):1396 – 1416. DOI: https://doi.org/10.34019/2237-9444.2020.v10.31559.

15. Santos CS, Pol-Fachin L. Adesão e percepção de pacientes hipertensos atendidos pela Estratégia da Saúde da Família sobre o tratamento e controle da doença. Research, Society and Development, v. 11, n. 16, e469111637452, 2022. DOI: http://dx.doi.org/10.33448/rsd-

-v11i16.37452

16. Batista Ferro G, Victória Barbosa Flexa C, Lucas Farias Lima I, do Socorro Maciel Quaresma M, Moraes de Moraes T. Adesão ao tratamento da hipertensão arterial sistêmica na Atenção Primária à Saúde: uma revisão integrativa de literatura: Adherence to the treatment of systemic arterial hypertension in Primary Health Care: an integrative literature review. Rev. Saúde Col. UEFS [Internet]. 13º de setembro de 2023;13(2):e7615. Disponível em: https://periodicos.uefs.br/index.php/saudecoletiva/article/view/7615

17. Sarno F, Bittencourt CA, Oliveira SA. Perfil de pacientes com hipertensão arterial e/ou diabetes mellitus de unidades de Atenção Primária à Saúde. einstein (São Paulo). 2020;18:eAO4483. http://dx.doi.org/10.31744/einstein_journal/2020AO4483

18. Carvalho TR, Ribeiro LC. Associação entre letramento funcional em saúde e adesão ao tratamento medicamentoso da hipertensão arterial sistêmica na atenção primária à saúde. Rev. APS. 2020; out./dez.; 23 (4). DOI: https://doi.org/10.34019/1809-8363.2020.v23.16894.

19. Negrão MLB, et al. Sala de espera: potencial para a aprendizagem de pessoas com hipertensão arterial. Rev. Bras. Enferm. 71 (6); Nov-Dec 2018. DOI: https://doi.org/10.1590/0034-7167-2017-0696

20. Silva Filho JA, Cunha MC, Santos RL, Victor IAB, Vieira RB, Oliveira IMM. Percepção dos Pacientes Hipertensos sobre o Acolhimento na Atenção Primária à Saúde. Id on Line Rev. Mult. Psic. V.12, N. 40. 2018. DOI: https://doi.org/10.14295/idonline.v12i40.1157.

21. Kremer, C. M. S., Gomes, M. F. P., Santos, M. S., Carvalho, V. C. dos S., Lazarini, C. A., & Fracolli, L. A. (2022). Percepção de Hipertensos e Diabéticos sobre a Adesão ao Tratamento Farmacológico e Não Farmacológico. aúde m edes, 8(2), 131–143. https://doi.org/10.18310/2446-4813.2022v8n2p131-143

22. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Política Nacional de Humanização. Atenção Básica / Ministério da Saúde, Secretaria de Atenção à Saúde, Política Nacional de Humanização. Brasília: Ministério da Saúde, 2014. Available at: http://bvsms.saude.gov.br/bvs/publicacoes/caderno_humanizasus_atencao_basica_v2_1ed.pdf.

23. Nóbrega TF, Sousa MNA. Papel do Médico de Família e Comunidade no Manejo da Hipertensão Arterial na Atenção Primaria à Saúde. Id on Line Rev. Mult. Edição eletrônica V.14 N. 54 p. 419-426 Fevereiro/2021. DOI: https://doi.org/10.14295/idonline.v15i54.2998.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Angioarchitecture of the middle meningeal artery in human skulls: a morphometric study

Angioarquitetura da artéria meníngea média em cabeças ósseas humanas: um estudo morfométrico

Ismael Felipe Gonçalves Galvão[1] Fernando Augusto Pacífico[1]
Bruna Laryssa Santos Borges Machado[1] Isabella Cristina Oliveira Pacheco[1]
Luciana Larissa Rodrigues dos Santos Queiroz[1] Renata Cristinny de Farias Campina[2]
Olávio Campos Júnior[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.
[2] Universidade Federal de Pernambuco. Recife, Pernambuco, Brazil.

Abstract

Introduction: The middle meningeal artery (MMA) is clinically and surgically relevant, and knowledge regarding its angioarchitecture is essential in various procedures. However, literature lacks studies exploring its morphometric aspects. **Objectives:** This study aimed to analyze the MMA sulci morphometry using a digital approach. **Method:** Thirty-five skulls with a complete visualization of the MMA sulcus were selected. From this, the length of the main trunk and parietal and frontal branches, the inter-branch angle, and the diameter of the foramen spinosum were measured bilaterally using the ImageJ® software. **Results:** Morphometric data showed no differences in the morphometry of the main trunk and parietal branch according to laterality. On the other hand, the length of the frontal branch was higher on the right side of the skulls. No differences were observed in the measurements of the foramen spinosum and the inter-branch angle. **Conclusion:** Digital methods for morphometric analysis of the MMA offer advantages in terms of precision and speed in obtaining data. Also, the MMA exhibits few bilateral morphometric variations that should be considered for planning surgical procedures and as a basis for future analyses.

Keywords: Anatomy, Cerebral arteries, Clinical relevance.

Corresponding author:
Fernando Augusto Pacífico.
E-mail: fapacifico@outlook.com
Funding: None
Ethics approval: nº 5.689.062
Received: 07/06/2023
Approved: 02/07/2024

How to cite: Galvão **IFG**, Pacífico **FA**, Machado **BLSB**, Pacheco **ICO**, Queiroz **LLRS**, Campina **RCF** et al. Angioarchitecture of the middle meningeal artery in human skulls: a morphometric study. An Fac Med Olinda 2024; 1(11):42 doi: https://doi.org/10.56102/afmo.2024.311

Resumo

Introdução: A artéria meníngea média (AMM) possui grande relevância clínica e cirúrgica, e o conhecimento da sua angioarquitetura é importante em vários procedimentos, no entanto, é evidente a escassez de estudos sobre seus aspectos morfométricos. **Objetivos:** O presente estudo objetivou analisar a morfometria dos sulcos da AMM por meio de uma abordagem digital. **Método:** Foram selecionadas 35 cabeças ósseas por permitirem a visualização completa do sulco da AMM, das quais foram medidos os comprimentos do tronco principal, dos ramos parietal e frontal, o ângulo inter-ramos e o diâmetro do forame espinhoso bilateralmente com o auxílio do *software* ImageJ®. **Resultados:** Os dados morfométricos foram facilmente obtidos e não foram observadas diferenças na morfometria bilateral do tronco principal e do ramo parietal, no entanto, o comprimento do ramo frontal foi maior no antímero direito. Também não foram encontradas diferenças nas medidas do forame espinhoso e do ângulo inter-ramos. **Conclusão:** Métodos digitais de análise morfométrica da AMM são vantajosos em termos de precisão e rapidez na obtenção de dados. Por outro lado, a AMM apresenta poucas variações morfométricas bilateralmente, representando importantes achados que devem ser observados cuidadosamente no planejamento de procedimentos cirúrgicos e servir de base para futuras análises.

Palavras-chave: Anatomia; Artérias cerebrais; Relevância clínica.

INTRODUCTION

The middle meningeal artery (MMA) is the main human dural artery. Its origin and course may vary according to the embryological development of the stapedial system, internal carotid artery, ophthalmic artery, trigeminal artery, and inferolateral trunk[1]. In most cases, the MMA originates from the internal maxillary artery, enters the middle cranial fossa through the foramen spinosum, laterally crosses the bone crest, and curves anteriorly above the greater sphenoid wing[2].

The embryological origin and intimate relationship of the MMA with the cranial vault confer clinical and surgical relevance[3]. Studies regarding the morphological aspects reported its complex development from the stapedial system, present in embryonic development, as the origin of a large number of anatomical variations[1,4].

The MMA is vulnerable to head trauma and may lead to pseudoaneurysms and bleeding due to the unique anatomical characteristics and proximity to the temporal bone. In addition, this artery is likely involved in mechanisms regarding chronic headaches associated with arterial vasodilation or neurogenic inflammation[5]. Knowledge of the MMA angioarchitecture is also important in several procedures, such as devascularization of dura mater tumors and epidural hematomas, and in understanding clinical conditions (e.g., migraine)[4,6]. In this context, a morphometric analysis may provide unique information regarding the size, location, and geometric characteristics of MMA that may help elucidate surgical and radiological approaches[7,8].

Despite studies addressing the morphological and embryological aspects of the MMA,

literature still lacks information regarding its morphometry[4,6]. Therefore, the present study aimed to provide new findings about the MMA by investigating its angioarchitecture in human cadaveric skulls using an innovative approach. We presented a morphometric analysis as a function of laterality and the possible relationships of these aspects with clinical-surgical implications.

METHOD

This cross-sectional study evaluated 100 human skulls from the anatomical collection of the Department of Anatomy at a higher education institution. The 35 selected heads were analyzed using millimeter scales to standardize measurements and calibrate the software. Then, the images were obtained using a Finepix S4800 digital camera (Fujifilm Corp., Tokyo, Japan) and transferred to a microcomputer for analysis using the ImageJ® software (version 1.46r 2012). From this, calculations determined the length of the main trunk, frontal branch, and parietal branch, the angle between the frontal and parietal branches (inter-branches), and the diameter of the foramen spinosum (Figure 1).

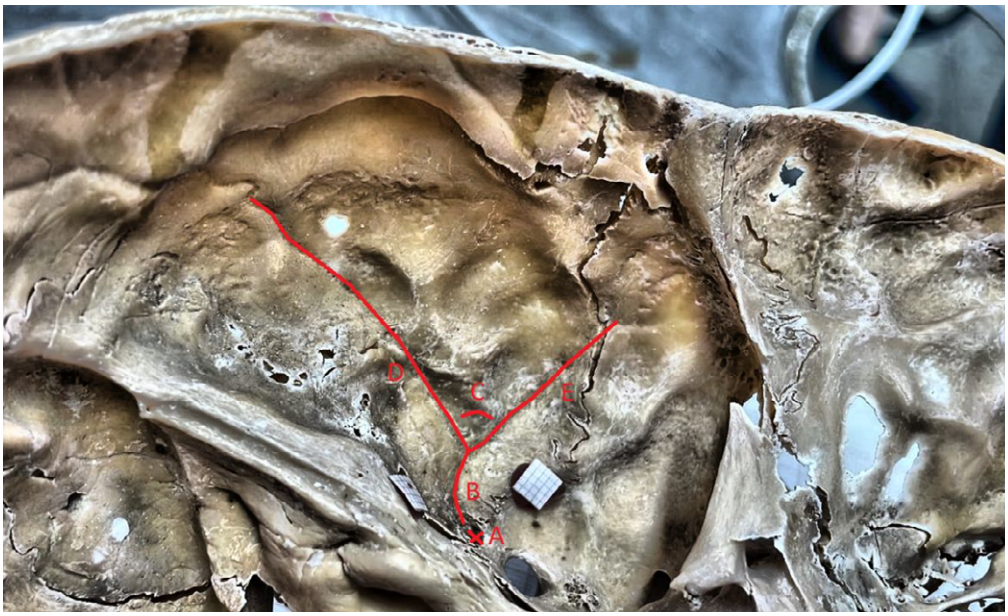


Figure 1. Internal view of the skull base showing the five measurements taken bilaterally: (A) diameter of the spinous foramen, (B) length of the main trunk, (C) angle between the frontal and parietal branches (inter-branches), (D) length of the parietal branch, and (E) length of the frontal branch.

Statistical analysis was performed using the SPSS® software (IBM Corp, Chicago, USA). Normality was verified using the Kolmogorov-Smirnov test, while data were compared using the Wilcoxon test. Measures of central tendency (mean, minimum, and maximum) and dispersion (standard deviation) were used to present non-normal data. All tests used $p < 0.05$ as significance level.

RESULTS

The present study used a pioneering digital approach to evaluate the MMA sulcus of 100 skulls. The morphometric evaluation was performed in the right (RA) and left (LA) antimeres of 35 skulls, as presented in Table 1. The remaining samples were considered losses due to damages or the inability to visualize the artery sulci bilaterally.

Table 1. Morphometric data of the middle meningeal artery in humans measured on the right and left antimeres.

Variables	RA	LA	p-value
Main trunk (mm)	14.58 ± 9.52 (3.1 - 53.5)	16.01 ± 12.18 (4,9 - 59,3)	0.87
Parietal branch (mm)	28.98 ± 17.89 (8.3 - 80.4)	30.38 ± 17.24 (11.8 - 67.7)	0.74
Frontal branch (mm)	26.83 ± 16.67 (9.60 - 87.40)	29.89 ± 12.77 (10.5 - 68.7)	0.01**
Inter-branch angle (°)	89.66 ± 16.83 (91.0 - 122.0)	85.91 ± 24.64 (22.0 - 126.0)	0.70
Foramen spinosum (mm)	2.14 ± 0.40 (1.50 - 3.10)	2.15 ± 0.44 (1.10 - 3.0)	0.77

Values represent mean ± standard deviations; median (minimum-maximum).
Wilcoxon test: p ≤ 0.05 (*), p ≤ 0.01 (**); RA: Right antimere; LA: Left antimere.

No differences were observed in the length of the main trunk (RA: 14.58 ± 9.52 mm and LA: 16.01 ± 12.18 mm, p = 0.870) and parietal branch (RA: 28.98 ± 17.89 mm and LA: 30.38 ± 17.24 mm, p = 0.743). However, the length of the left frontal branch was significantly greater than the right frontal branch (29.89 ± 12.77 mm and 26.83 ± 16.67 mm, respectively, p = 0.011). Last, no differences were found in the diameter of the foramen spinosum (RA: 2.14 ± 0.40 mm and LA: 2.15 ± 0.44 mm, p = 0 .771) and the angle between the frontal and parietal branches (RA: 89.66 ± 16.83º and LA: 85.91 ± 24.64º, p = 0 .700).

DISCUSSION

Aragón-Sánchez et al.[9] discussed the use of the ImageJ® software as a morphometric study tool, highlighted its efficiency and ease of use for measuring structures, and demonstrated excellent reliability by using an inter-rater model and 95% confidence intervals.

From this perspective, Tobin et al.[10] studied the implementation of a new automated morphometric analysis to study peripheral nerves based on the ImageJ® software. They did not observe a statistically significant difference (p > 0.05) between manual measurements and the new method using the software and concluded that the new approach had advantages, such as great-

er convenience, time efficiency, precision, and lower operator error or bias[10]. In our study, this tool promoted an efficient and reliable measurement of structures consistent with literature[9,10].

The MMA sulcus was present bilaterally in all skulls evaluated, consistent with conventional descriptions in textbooks[11]. Using an innovative approach, the observations in this study revealed that the MMA did not present variations in the length of the main trunk, parietal branch, and diameter of the foramen spinosum or inter-branch angle between sides.

Few studies addressed the morphometric aspects of the MMA and the correlations between its vascular anatomy and intrinsic and anthropometric factors of the individuals[12]. The middle fossa and its variations may offer a suitable surgical route to deal with injuries at the anterior and posterior cranial fossae junction. Thus, understanding anatomical landmarks and their variations is fundamental for effectively managing these injuries and avoiding disabling complications[13]. Also, this information is essential to predict the arterial involvement in fractures on the affected side of the skull.

The length of the main trunk of the MMA did not vary according to laterality, corroborating with previous studies[4,6]. On the other hand, Silva et al.[6] and Honnegowda et al.[4] observed bilateral variations in the length of the parietal branch, which were not observed in the present study, possibly due to differences in the sample, population, or method used between studies. Furthermore, we identified a bilateral difference in the length of the frontal branch, supporting the findings observed by Silva et al.[6]. Although other factors may also be involved, the complex embryological origin is the central thesis explaining these anatomical variations[14].

The MMA is phylogenetically the most recent intracranial artery, with evolution and development closely related to the development of the cerebral lobes[15]. Its emergence is also closely related to the stapedial system, which is present in the first weeks of fetal development and degenerates around the tenth week[1,16]. Therefore, this artery is susceptible to anatomical variations and anastomoses and has great relevance for pathologies[1, 17.]

Some differences found in cranial irrigation may elucidate the variations in the frontal branch identified in the present study. According to Eisová et al.[18], the macroscopic patterns of meningeal vessels with brachycephalic and mesocephalic neurocranial proportions are not influenced bilaterally by the sex or shape of the skull in modern European adult populations. However, the MMA is more dominant in the anterior endocranial regions[18], which suggests greater angiogenic activities and may lead to variations in the length of the frontal branch. More studies are needed to clarify these characteristics.

Although a pioneering study suggested that MMA was more developed in the right antimere, the authors did not provide a quantitative assessment to support these conclusions[19]. Asymmetries in the path of these vessels are subtle and may be associated with cerebral asymmetries,

causing different distributions in intracranial pressure[18]. Nevertheless, the study reported a lack of experimental research supporting or contradicting this hypothesis[19].

This study did not observe morphometric differences in the diameter of the spinosum foramen according to the laterality. This foramen is an important anatomical landmark for cranial fossa surgeries due to its neurovascular structures and may present significant differences according to laterality[14, 20]. Biloria e Silva et al.[12] observed a mean foramen diameter between 1.8 and 2.8 mm, according to the laterality and sex of the individual, similar to the value found in the present study (2.0 mm).

The evaluation of the angle formed by the frontal and parietal branches of the MMA did not present morphometric differences bilaterally, corroborating the observations of previous studies[4,6,20]. In these cases, blood flow is inversely proportional to the angle formed by the vessels, increasing the possibility of dilation of the arterial wall and, consequently, the risk of aneurysm formation[21].Despite this clinical importance, literature lacks morphometric studies regarding the angle formed by the MMA branches.

From this perspective, Ye et al.[21] observed positive relationships between vessel angles and the formation and rupture of aneurysms. The vessel angles may also be a predictive factor for these conditions. Another example is the reduction in the angle formed by the MMA and internal maxillary artery, which may increase the complexity of endovascular procedures and hamper the use of the guidewire and catheter[22]. Therefore, studying the angles formed by cerebral vessels is relevant for pathologies and during procedures, such as embolization[21,22].

Last, the bilateral morphometric study of the MMA sulci in 35 skulls represents a great innovation and contribution. In this sense, more studies with larger sample sizes are needed to expand the knowledge about the MMA morphometric characteristics, confirm findings, and improve the understanding of variations in the development of the MMA branches in healthy adults.

CONCLUSION

The values obtained in the measurements were efficient. Also, imaging processing using software was essential for studying cranial osteology and establishing specific morphometric patterns of the MMA. The main trunk, the parietal branch, the diameter of the foramen spinosum, and the inter-branch angle of the MMA did not vary bilaterally. However, the frontal branch exhibited variations in length according to antimerism. Last, neurosurgeons must be aware of this variation during surgical procedures in the middle cranial fossa.

CONFLICTS OF INTEREST

Nothing to declare

AUTHOR CONTRIBUTIONS

IFGG: Conceptualization, data curation, data analysis, research, methodology, development, software implementation and testing, data validation and experiments, writing original manuscript, review, and editing. **FAP:** Conceptualization, data curation, data analysis, research, methodology, project administration, supervision, validation of data and experiments, data presentation design and writing original manuscript, review, and editing. **BLSBM:** Search. **ICOP:** Search. **LLRSQ:** Search. **RCFC:** Supervision, methodology, provision of tools. **OCJ:** conceptualization, data curation, research, methodology, project administration, software implementation and testing, supervision, validation of data and experiments, data presentation design, review, and editing.

REFERENCES

1. Bonasia S, Smajda S, Ciccio G, Robert T. Middle meningeal artery: Anatomy and variations. Vol. 41, Am J Neuroradiol.; 2020. p. 1777–85. doi: https://doi.org/10.3174/ajnr.A6739
2. Fantoni M, Eliezer M, Serrano F, et al. High frequency of ophthalmic origin of the middle meningeal artery in chronic subdural hematoma. Neuroradiology. 2020 May 1;62(5):639–44. doi: https://doi.org/10.1007/s00234-020-02363-6
3. Navarro-Orozco D, Sánchez-Manso JC. Neuroanatomy, Middle Cerebral Artery. 2023 Jul 24. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 30252258.
4. Honnegowda TM, Dineshan V, Kumar A. Morphometry of organization of middle meningeal artery through the analysis of bony canal in human's skull: A clinico-anatomical and embryological insight. J Craniovertebr Junction Spine. 2019 Apr-Jun;10(2):127-130. doi: https://doi.org/10.4103/jcvjs.JCVJS_45_19.
5. Sant'Anna MAF, Luciano LL, Chaves PHS, et al. Anatomy of the Middle Meningeal Artery. Arq Bras Neurocir: Brazilian Neurosurgery. 2021 Dec 3;40(04):e339–48. doi: https://doi.org/10.1055/s-0041-1733863
6. da Silva TH, Ellwanger JH, da Rosa Silva HT, et al. Morphometric Analysis of the Middle Meningeal Artery Organization in Humans—Embryological Considerations. J Neurol Surg B Skull Base. 2013 Jan 22;74(02):108–12. doi: https://doi.org/10.1055/s-0033-1333615
7. Gijsen FJH, Vis B, Barrett HE, et al. Morphometric and Mechanical Analyses of Calcifications and Fibrous Plaque Tissue in Carotid Arteries for Plaque Rupture Risk Assessment. IEEE Trans Biomed Eng. 2021 Apr;68(4):1429–38. doi: https://doi.org/10.1109/TBME.2020.3038038
8. Yagoub SME, Taib AA, Mansouri MY, Elfakhri A, Abdalla MA. Anatomical Variations, Parameters, and Morphometric Evaluation of Renal Arteries by Using Computerized Tomography Angiography. Int. J. Clin. Ski. 2022 Oct 29;16(10):265. DOI:10.37532/1753-0431.2022.16(1

0).265

9. Aragón-Sánchez J, Quintana-Marrero Y, Aragón-Hernández C, Hernández-Herero MJ. ImageJ: A Free, Easy, and Reliable Method to Measure Leg Ulcers Using Digital Pictures. Int J Low Extrem Wounds 2017;16(4):269-273. doi: https://doi.org/10.1177/1534734617744951
10. Tobin CA, Wang Z, Zhang LL, et al. A new computerized morphometric analysis for peripheral nerve study. J Reconstr Microsurg. 2014;30(2):75-82. doi: https://doi.org/10.1055/s-0033-1354738
11. Standring S, Ellis H, Healy JC, Johnson D. Gray's anatomy. 39th ed. London: Elsevier Churchill Livingstone; 2005. p. 442p.
12. Biloria E Silva Y, Hirota VB, Augusto V, et al. Contribuição ao estudo morfológico dos sulcos da artéria meníngea média em crânios humanos cadavéricos. RMS. 2023;5(1):20–31.
13. Maina R, Ducati A, Lanzino G. The middle cranial fossa: Morphometric study and surgical considerations. Skull Base. 2007 Nov;17(6):395–404. doi: https://doi.org/10.1055/s-2007-991117
14. Galvão IFG, Pacífico FA. Angioarquitetura da artéria meníngea média. Anais da Faculdade de Medicina de Olinda. 2022 Dec 22;1(7):34–41. doi: https://doi.org/10.56102/afmo.2022.178
15. Pallavi., Priyanka R, Sinha BK. A Morphometric Assessment of the Anatomical Variations in Branching Pattern of Middle Cerebral Artery: An Observational Study. International Journal of Toxicological and Pharmacological Research [Internet]. 2022;12(6):138–42.
16. Natali AL, Reddy V, Leo JT. Neuroanatomy, Middle Meningeal Arteries. In: StatPearls. Treasure Island (FL): StatPearls Publishing; October 24, 2022. PMID: 30137830
17. Kumar S, Mishra NK. Middle meningeal artery arising from the basilar artery: report of a case and its probable embryological mechanism. J Neurointerv Surg. 2012;4(1):43-44. doi: https://doi.org/10.1136/jnis.2010.004465
18. Eisová S, Píšová H, Velemínský P, Bruner E. Normal craniovascular variation in two modern European adult populations. J Anat. 2019;235(4):765-782. doi: https://doi.org/10.1111/joa.13019
19. Saban R. Image of the human fossil brain: endocranial casts and meningeal vessels in young and adult subjects . In: Jean-Pierre Changeux, Jean Chavaillon, editors. Origins of the human brain. Oxford: Clarendon Press.; 1995. p. 11–38. doi: https://doi.org/10.1093/acprof:oso/9780198523901.001.0001
20. Ellwanger J, Campos D. Abnormality of the Foramen Spinosum due to a Variation in the Trajectory of the Middle Meningeal Artery: A Case Report in Human. J Neurol Surg Rep. 2013 May 23;74(02):073–6. doi: https://doi.org/10.1055/s-0033-1347901
21. Ye J, Zheng P, Hassan M, et al. Relationship of the angle between the A1 and A2 segments of the anterior cerebral artery with formation and rupture of anterior communicating artery aneurysm. J Neurol Sci. 2017;375:170-174. doi: https://doi.org/10.1016/j.jns.2017.01.062
22. Ji T, Hou K, Li C, Yu J. Imaging features of internal maxillary artery and extracranial middle

meningeal artery and their relationships on head CTA. Neuroradiol J. 2021 Dec 27;34(6):629–41. doi: https://doi.org/10.1177/19714009211019380

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Impact of human papillomavirus vaccine on cases of cervical cancer in young women from Pernambuco state

Impacto da vacina contra o papilomavírus humano nos casos de câncer no colo do útero em mulheres jovens do estado de Pernambuco

José Kaellyson Barbosa dos Santos Oliveira[1] Joyce Nobre Tavares[1]
Leila Maria Carlos Teixeira[1] Maria Clara Silva Rocha[1] Sarah Oliveira Porto[1]
José Lancart de Lima[2] Conceição Maria de Oliveira[1,3]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.
[2] Secretaria Executiva de Vigilância em Saúde e Atenção Primária, Diretoria Geral de Informações Epidemiológicas, Secretaria Estadual de Saúde de Pernambuco. Recife, Pernambuco, Brazil.
[3] Secretaria Executiva de Vigilância em Saúde, Secretaria de Saúde do Recife. Recife, Pernambuco, Brazil.

Abstract

Objective: To describe the impact of the human papillomavirus (HPV) vaccine on cases of cervical cancer in women aged 15 to 24 years residing in Pernambuco (Brazil), comparing the periods of 2006 – 2013 with 2015 – 2022. **Methods:** This retrospective descriptive cross-sectional study compared cases of cervical cancer before (first period = 2006 – 2013) and after (second period = 2015 – 2022) implementation of the HPV vaccine in Brazil and analyzed the number of doses administered between 2014 and 2022. Data were obtained from the Brazilian Cancer Information System (SISCAN), Cervical Cancer Information System (SISCOLO), and National Immunization Program Information System (SI-PNI). **Results:** After excluding 2014, 55 cases of cervical cancer (mean = 3.4 cases/year, standard deviation = 1.9 cases) were registered between 2006 and 2022. Of the 39 cases from the first period, 46.2% were invasive squamous cell carcinoma, and 41.0% were invasive adenocarcinoma. Of the 16 cases from the second period, most (62.5%) were invasive squamous cell carcinoma. A reduction of 59% was observed in cases from the first to second period, mainly in the

How to cite: Oliveira **JKBS**, Tavares **JN**, Teixeira **LMC**, Rocha **MCS**, Porto **SO**, Lima **JL**, et al. Impact of human papillomavirus vaccine on cases of cervical cancer in young women from Pernambuco state. An Fac Med Olinda 2024; 1(11):51 doi: https://doi.org/10.56102/afmo.2024.298

Corresponding author:
Sarah Oliveira Porto.
E-mail: sarinha.o.porto@gmail.com
Funding: Programa de Desenvolvimento Institucional de Iniciação Científica (PRODIIC), Faculdade de Medicina de Olinda.
Ethics approval: Not applicable.
Received: 06/06/2023.
Approved: 03/21/2024.

age group from 15 to 19 years (83.3%) and of invasive adenocarcinoma (75%). The number of administered doses of the vaccine also decreased, especially in 2016 and from 2020 (i.e., during the COVID-19 pandemic). **Conclusion:** This study demonstrated the importance of vaccination against HPV and its association with the decrease in cases of cervical cancer in young women. However, the effects of the HPV vaccine on the population should be assessed over a longer period since it was implemented in 2014 in Brazil.

Keywords: Cervical cancer; Epidemiology; Human papillomavirus; Vaccination.

Resumo

Objetivo: Descrever o impacto da vacina contra o papilomavírus humano nos casos de câncer cervical em mulheres de 15 a 24 anos, residentes em Pernambuco, comparando os períodos de 2006 a 2013 e 2015 a 2022. **Métodos**: Trata-se de um estudo descritivo retrospectivo, de corte transversal, comparando o número de casos de câncer cervical antes (intervalo 1 = 2006 a 2013) e após (intervalo 2 = 2015 a 2022) a implementação da vacina contra o papilomavírus humano no Brasil e a quantidade de doses aplicadas entre 2014 e 2022. Os dados foram obtidos do Sistema de Informação de Câncer, do Sistema de Informação de Câncer de Colo de Útero e do Sistema de Informação do Programa Nacional de Imunização. **Resultados:** Foram registrados 55 casos desse câncer entre 2006 e 2022, excluindo-se o ano de 2014, com média de 3,4 ± 1,9 casos/ano. No intervalo 1 (39 casos), 46,2% foram do carcinoma epidermóide invasivo e 41,0%, do adenocarcinoma invasor. No intervalo 2 (16 casos), a maioria (62,5%) também foi do carcinoma epidermóide invasivo. Comparando-se os intervalos, houve redução de 59%, sendo maior na faixa etária de 15 a 19 anos (83,3%) e no adenocarcinoma invasor (75%). Também houve queda nas doses da vacina aplicadas, destacando-se 2016 e a partir de 2020, ano de início da pandemia da covid-19. **Conclusão:** Este estudo denota a importância da vacinação contra o papilomavírus humano e sua associação com a diminuição dos casos de câncer cervical em mulheres jovens. É necessário maior tempo para avaliação dos efeitos desse imunizante na população, pois ele só foi implementado no Brasil em 2014.

Palavras-chave: Câncer de colo uterino; Epidemiologia; Papilomavírus humano; Vacinação.

INTRODUCTION

Cervical cancer is the third most prevalent malignant neoplasm among Brazilian women, resulting in high mortality rates in the country.[1] According to the National Cancer Institute, it is a disordered replication of the epithelium in the organ, histologically subdivided into squamous cell carcinoma and adenocarcinoma and classified as *in situ* or invasive.[2]

The human papillomavirus (HPV) has been recognized as one of the main risk factors for cervical cancer, with subtypes 16 and 18 being the most recurrently involved in the pathophysiology of this neoplasm.[3] Also, external factors (e.g., early onset of sexual activity, sexual risk behavior, multiple sexual partners, history of genital warts, immunosuppression, smoking habit,

and presence of other sexually transmitted infections [STI]) can contribute to its pathogenesis.[4,5] Cervical cancer is often asymptomatic or presents few symptoms, leading to delayed medical attendance in its early stages due to evasion of the immune system.[6]

The Brazilian Ministry of Health (MS) established that cervical cancer screening should begin at 25 years old for women who have already started sexual activity until 64 years old.[7] Also, the MS adopted the HPV vaccination in 2014 as part of the National Immunization Program (PNI), aiming to reduce the prevalence of cervical cancer. Thus, boys and girls aged 9 to 14 years and those aged 9 to 45 years with clinical conditions favoring immunosuppression can receive the quadrivalent vaccine free of charge through the Brazilian Unified Health System (SUS). Moreover, the MS included victims of sexual violence aged 9 to 45 years not previously immunized against HPV in the vaccination group in August 2023.[8,9]

In this context, the World Health Organization recommends that HPV vaccination should achieve 90% coverage among children and adolescents aged 9 to 14 years. However, Brazil has not been able to meet this goal in recent years due to various factors, such as a lack of knowledge and trust in the benefits of the vaccine and spread of fake news, which intensified in 2020 due to the COVID-19 pandemic. As a result, the number of administered doses reduced for vaccines offered by the PNI for HPV and other infections.[10,11]

Robust evidence have shown the efficacy of the HPV vaccine in preventing cervical cancer. For example, clinical trials showed that the quadrivalent vaccine had 95% efficacy against persistent infections from HPV 16 and 18 subtypes and lesions related to high-grade cervical intraepithelial neoplasia (CIN).[12-15] Also, the vaccine provided sustained protection against low-grade lesions related to HPV 6, 11, 16, and 18 subtypes and an 83% reduction in the burden of the disease for up to 42 months of follow-up.[14] Subsequent studies in countries where vaccination began years before its implementation in Brazil showed a 93% reduction in genital warts among vaccinated women aged 21 years and 72.6% reduction among those aged 21 to 29 years.[15-17]

In this sense, the HPV vaccine should be adopted in global immunization programs targeting girls and boys (preferably before the onset of sexual activity) to achieve widespread vaccine coverage, reduce morbidity and mortality from HPV-related diseases, and improve global public health. Thus, this study aimed to describe the impact of the HPV vaccine on cases of cervical cancer in women aged 15 to 24 years residing in the state of Pernambuco (Brazil), comparing the periods of 2006 – 2013 with 2015 – 2022.

METHODS

This retrospective descriptive cross-sectional study was based on data available in the Department of Informatics of SUS (DATASUS) platform. The study used secondary data on cervical cancer and the absolute number of doses administered of the quadrivalent HPV vaccine, focusing on the state of Pernambuco, Brazil.

Data on cases of cervical cancer by year of diagnosis, age group, and histological type were obtained from the Brazilian Cancer Information System (SISCAN) and Cervical Cancer Information System (SISCOLO). The type and number of doses administered of the quadrivalent HPV vaccine per year were extracted from the PNI Information System (SI-PNI). However, data on HPV vaccine coverage specifically for the state of Pernambuco were not found in the SI-PNI.

Study population and reference period

Inclusion criteria

Data of women aged 15 to 24 years diagnosed with cervical cancer were included in the study to represent the population group that should have already been immunized against HPV, considering that the vaccine was implemented in Brazil in 2014 for girls aged 11 to 13 years. Therefore, women should be between 19 and 21 years old in 2022. However, DATASUS only provides aggregated data for age groups of 15 – 19 and 20 – 24 years.

The number of cases of cervical cancer was analyzed from 2006 to 2022, divided into two periods to compare its distribution by age group and histological type: before (first period; 2006 – 2013) and after the vaccine implementation (second period; 2015 – 2022). Also, data on administered doses of the quadrivalent HPV vaccine in Pernambuco were analyzed in girls aged from 11 to 13 years in 2014 and 9 to 14 years between 2015 and 2022.

Exclusion criteria

Cases of cervical cancer recorded in 2014 were excluded from the comparative analysis by age group and histological type since this was the year of HPV vaccine implementation in Brazil. Also, cases with pre-malignant lesions (CIN 1 and CIN 2) and *in situ* squamous cell carcinoma (CIN 3) were not included in the study since these histological types were not found in DATASUS classifications.

Data were extracted from the Tabnet and exported to Microsoft Excel® (version 2021). Descriptive analyses were expressed as absolute and relative frequency and mean and standard deviation (SD).

The present study used secondary data without identifying women, which are aggregated and freely accessible in official databases on the internet. Thus, it followed the National Health Council Resolution no. 466 (reiterated by Resolution no. 510) and did not need the approval of a research ethics committee.

RESULTS

After excluding cases of cervical cancer in 2014, 55 cases (mean = 3.4 cases/year; SD = 1.9 cases) were registered in women aged 15 to 24 years in Pernambuco from 2006 to 2022. Of these, 39 cases (mean = 4.9 cases/year; SD = 2.1 cases) were registered in the first period

(2006–2013) and 16 (mean = 2 cases/year; SD = 1.7 cases) in the second period (2015–2022), indicating a 59% reduction in the number of cases (Figure 1 and Table 1).

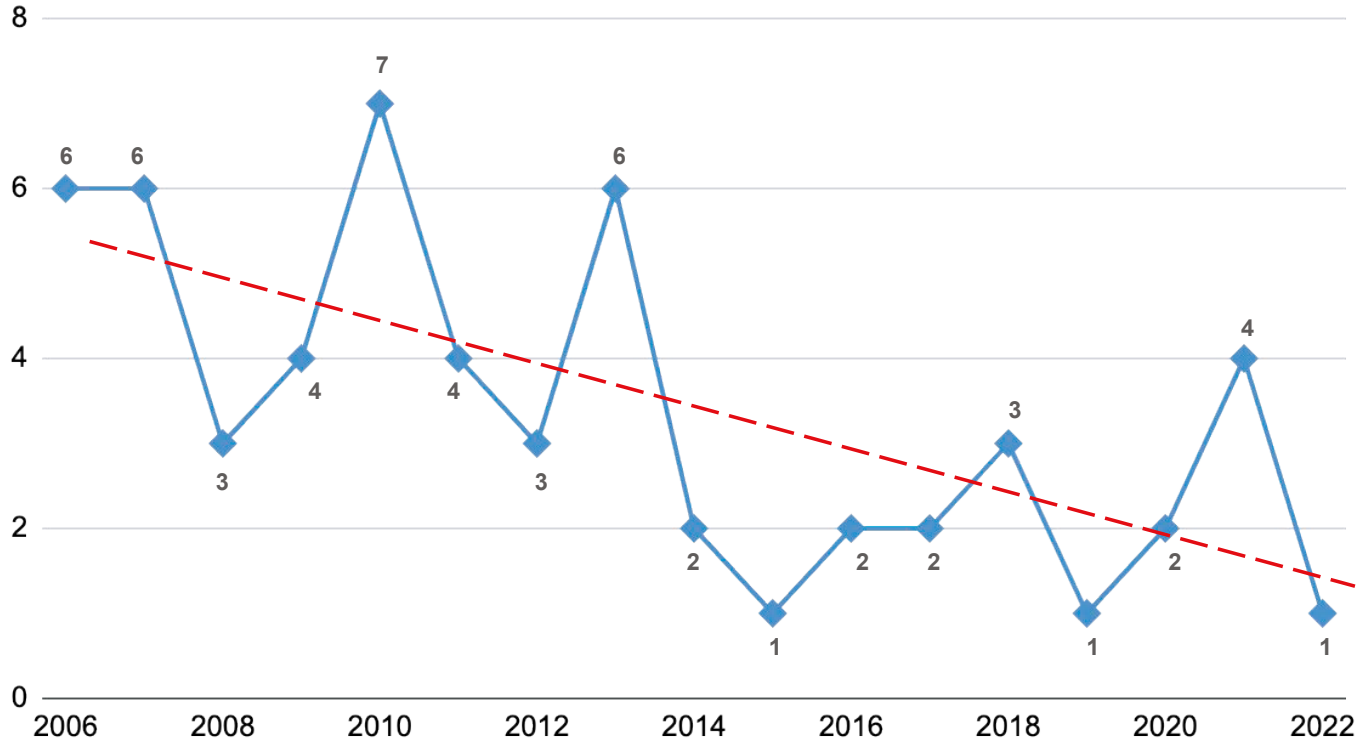


Figure 1. Number of cases of cervical cancer in women aged 15 to 24 years in the state of Pernambuco between 2006 and 2022.

Regarding the age groups, most cases occurred in women aged 20 to 24 years in both periods (Table 1). Of the cases registered in the first period, 18 (46.2%) were invasive squamous cell carcinoma, 16 (41.0%) were invasive adenocarcinoma, and 5 (12.8%) were *in situ* adenocarcinoma. Most cases (10; 62.5%) in the second period were invasive squamous cell carcinoma, four (25.0%) were invasive adenocarcinoma, and two (12.5%) were *in situ* adenocarcinoma (Table 1).

Table 1. Distribution of cases of cervical cancer in women aged 15 to 24 years by age group and histological type in the state of Pernambuco in the first (2006 – 2013) and second periods (2015 – 2022)

Variables	First period		Second period		Variation
	Nº	%	Nº	%	%
Age group					
15 – 19 years	12	30.8	2	12.5	83.3 ↓
20 – 24 years	27	69.2	14	87.5	48.1 ↓
Histological type					
Invasive squamous cell carcinoma	18	46.2	10	62.5	44.4 ↓
In situ adenocarcinoma	5	12.8	2	12.5	60.0 ↓
Invasive adenocarcinoma	16	41.0	4	25.0	75.0 ↓
Total	**39**	**100.0**	**16**	**100.0**	**59.0** ↓

Regarding variation in cases of cervical cancer comparing both periods, the age group of 15 to 19 years presented an 83.3% reduction, while the age group of 20 to 24 years presented a 48.1% reduction in the second period. Also, invasive adenocarcinoma presented the greatest reduction (75%), followed by *in situ* adenocarcinoma (60%) and invasive squamous cell carcinoma (44.4%) (Table 1).

The number and type of administered doses of HPV vaccine reduced in the second period. In 2014 (i.e., HPV vaccine implementation), 361,167 doses were administered in Pernambuco: 237,885 as first, 123,228 as second, and 54 as third dose. The same pattern was observed in 2015, whereas 2016 presented almost 64% reduction in the number of administered doses compared with 2014. Although 2017 presented a slight increase, 2018 and 2019 presented a reduction in the number of doses administered per year. From 2020, this reduction became evident, decreasing from about 116,000 to 82,000 doses in 2022, and the number of women receiving the second and third doses also decreased (Figure 2).

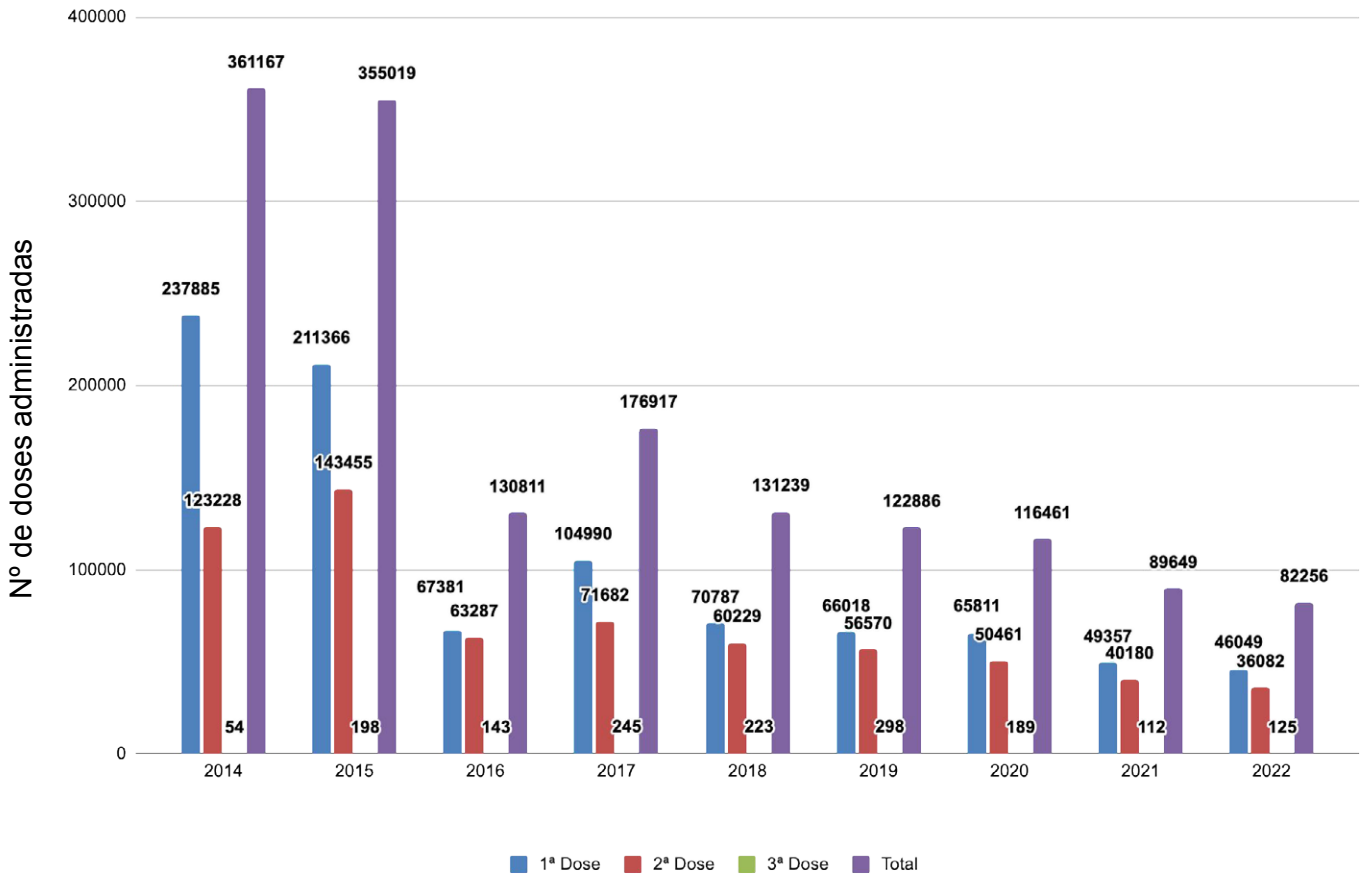


Figure 2. Number of first, second, and third doses of the quadrivalent HPV vaccine administered in girls aged 9 to 14 years in the state of Pernambuco between 2014 and 2022.

DISCUSSION

The cases of cervical cancer among women aged 15 to 24 years reduced after the implementation of the HPV vaccine in Pernambuco, corroborating other studies analyzing the same topic.[18-20] This reduction occurred since HPV vaccines are highly immunogenic and can protect individuals against CIN 2 or worse grades, which are mainly related to HPV 16 and 18 subtypes. Thus, these vaccines decreased viral prevalence and persistence.[21, 22] This information was consistent with observational studies conducted in the United Kingdom, China, and Denmark, which have demonstrated that the HPV vaccine provided immunity, even if partial.[18,23,24]

Among the studied age group, women aged 20 to 24 years were the most affected by cervical cancer, possibly due to the prolonged exposure to the virus and natural course of the disease, which occurs slowly and progressively.[6,25] The greatest reduction in cases occurred in the age group of 15 to 19 years, possibly due to the sustained protection provided by the vaccine (especially in younger women) since antibody levels are increased in this age group. Also, the vaccine administration before the onset of sexual activity increases its efficacy since these girls

were not exposed to the pathogen. Nonetheless, the vaccine protects all women, including those with active sexual lives.[26-28]

Among the histological types of cervical cancer, cases of invasive adenocarcinoma showed the greatest reduction after the implementation of the HPV vaccine. However, no scientific evidence was found regarding the relationship of the HPV vaccine with this histological type.

The number of administered doses of the HPV vaccine has remarkably reduced since 2016, possibly due to the change in vaccination strategy. Initially, vaccinations were conducted in schools due to the partnership between the MS and Ministry of Education,[22] surpassing the established coverage for the first dose in 2014. From 2015, vaccination campaigns were removed from schools and limited to basic health units, decreasing the number of vaccines administered, especially for the second and third doses.[9, 22] Also, the Brazilian population has a cultural taboo that vaccination against STI induces early onset of sexual activity, resulting in the non-adherence of several social groups to certain vaccines and reducing some vaccination coverage.[9,29]

The number of administered doses of HPV vaccine significantly reduced from 2020 to 2022, possibly due to the reduction of all vaccination coverages during this period, primarily caused by the COVID-19 pandemic. This failure may be mainly due to anti-vaccine movements that have emerged, spreading fake news and discrediting the effectiveness of vaccines.[10,30]

This study highlighted the importance of HPV vaccination and its association with the reduction of cases of cervical cancer in young women in the state of Pernambuco. Although the HPV vaccine has already proven to be effective, its effects on the general population should be evaluated over a longer period since this vaccine was introduced only in 2014 in Brazil.[18] Also, the complete HPV vaccination does not replace health promotion and prevention actions, such as condom use, cytology tests, and serological tests for other STI.[23] Thus, the combination of HPV vaccine and screening tests provides additional protection to women regarding the development of genital neoplasms through primary (i.e., avoiding virus infection) and secondary prevention (i.e., early detection of cervical lesions).

CONFLICTS OF INTEREST

Nothing to declare

AUTHORS CONTRIBUTIONS

LMCT and **MCSR:** study conception, data design, and article writing; **SOP, JKBSO**, and **JNT**: data analysis and interpretation and article writing; **CMO** and **JLL**: critical review of the article and approval of the version to be published.

REFERENCES

1. Brasil. Ministério da Saúde. Instituto Nacional de Câncer - INCA. Dados e Números sobre Câncer do Colo do Útero - Relatório Anual 2022 [Internet]. [acessado em 09 Out 2023]. Disponível em: https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/dados_e_numeros_colo_22setembro2022.pdf.
2. Brasil. Ministério da Saúde. Instituto Nacional de Câncer - INCA. Conceito e magnitude do câncer do colo do útero [Internet]. [acessado em 17 Mar 2023]. Disponível em: https://www.gov.br/inca/pt-br/assuntos/gestor-e-profissional-de-saude/controle-do-cancer-do-colo-do-utero/conceito-e-magnitude.
3. Stolnicu S, Hoang L, Soslow RA. Recent advances in invasive adenocarcinoma of the cervix. Virchows Archiv European Journal of Patology. 2019 Jun; 475(5):537-49. https://doi.org/10.1007/s00428-019-02601-0.
4. Almeida CM, Souza AN, Bezerra RS, Lima FL, Izabel TD. Principais fatores de risco associados ao desenvolvimento do câncer de colo do útero, com ênfase para o Papilomavírus humano (HPV): um estudo de revisão. Research, Society and Development. 2021 Jan; 10(1):e19810111634. https://doi.org/10.33448/rsd-v10i1.11634.
5. Abreu MNS, Soares AD, Ramos DAO, Soares FV, Nunes Filho G, Valadão AF, et al. Conhecimento e percepção sobre o HPV na população com mais de 18 anos da cidade de Ipatinga, MG, Brasil. Ciência e Saúde Coletiva. 2018 Mar; 23(3):849-60. https://doi.org/10.1590/1413-81232018233.00102016.
6. Silva LG, Andrade GO, Leonhardt V, Bezerra MLR. A importância da prevenção do câncer do colo do útero: revisão integrativa. Research, Society and Development. 2021 Dez; 10(15):e533101523334. https://doi.org/10.33448/rsd-v10i15.23334.
7. Brasil. Ministério da Saúde. Instituto Nacional de Câncer José Alencar Gomes da Silva. Parâmetros técnicos para o rastreamento do câncer do colo do útero. Rio de Janeiro: INCA, 2019.
8. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde e Ambiente. Departamento de Imunização e Doenças Imunopreveníveis. Nota Técnica Nº 63/2023-CGICI/DPNI/SVSA/MS. Trata da inclusão de vítimas de violência sexual como grupo prioritário para vacinação contra o HPV, para pessoas de nove a 45 anos de idade, ainda não vacinados contra HPV [internet]. 2023 [acessado em 02 Out 2023]. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/notas-tecnicas/2023/nota-tecnica-63-2023-cgici-dpni-svsa-ms.pdf.
9. Costa BS, Guimarães C, Morais CR, Caixeta CR, Cunha EP, Caetano GM, et al. Uma revisão bibliográfica acerca da vacina contra o HPV e seus desafios / A bibliography review about the HPV vaccine and its challenges. Brazilian Journal of Health Review. 2022 Abr; 5(2):6392-404. https://doi.org/10.34119/bjhrv5n2-212.

10. Cavalcante RL, Damasceno HC, Silva Júnior AF, Pinheiro MD. Impacto da pandemia por COVID-19 na imunização da vacina contra o Papilomavírus Humano entre crianças e adolescentes de 9 a 14 anos na região do Xingu - Pará. Research, Society and Development. 2021 Abr; 10(4):e36310413987. https://doi.org/10.33448/rsd-v10i4.13987.

11. Lopes RJ, Simão RD, Turkiewicz M, Plewka J. Análise da vacinação contra o HPV no Brasil frente as metas implementadas até 2030 pela Organização Mundial da Saúde. Research, Society and Development. 2023 Abr; 12(4):e20212440845. https://doi.org/10.33448/rsd-v12i4.40845.

12. Oliveira IE, Coelho ME, Saud MH, Peixer CM, Rocha MD, Braga RG, et al. A eficácia das vacinas disponíveis contra o HPV: uma revisão de literatura. Brazilian Journal of Development. 2023 Jul; 9(7):22330-41. https://doi.org/10.34117/bjdv9n7-080.

13. Wang R, Pan W, Jin L, Huang W, Li Y, Wu D, et al. Human papillomavirus vaccine against cervical cancer: opportunity and challenge. Cancer Letters. 2020 Fev; 471:88-102. https://doi.org/10.1016/j.canlet.2019.11.039.

14. Santos CGJ, Dias GMJ. Vacinação pública contra o papilomavírus humano no Brasil. Revista Médica de Minas Gerais. 2018 Jun; 28:e-1982. https://doi.org/10.5935/2238-3182.20180004.

15. Zou Z, Fairley CK, Ong JJ, Hocking J, Canfell K, Ma X, et al. Domestic HPV vaccine price and economic returns for cervical cancer prevention in China: a cost-effectiveness analysis. The Lancet Public Health. 2020 Out; 8(10):e1335-e1344. https://doi.org/10.1016/s2214-109x(20)30277-1.

16. Joshi S, Anantharaman D, Muwonge R, Bhatla N, Panicker G, Butt J, et al. Evaluation of immune response to single dose of quadrivalent HPV vaccine at 10-year post-vaccination. Vaccine. 2023 Jan; 4;41(1):236-245. https://doi.org/10.1016/j.vaccine.2022.11.044.

17. Simms KT, Hanley SJ, Smith MA, Keane A, Canfell K. Impact of HPV vaccine hesitancy on cervical cancer in Japan: a modelling study. The Lancet Public Health. 2020 Abr; 5(4):e223-e234. https://doi.org/10.1016/s2468-2667(20)30010-4.

18. Falcaro M, Castañon A, Ndlela B, Checchi M, Soldan K, Lopez-Bernal J, et al. The effects of the national HPV vaccination programme in England, UK, on cervical cancer and grade 3 cervical intraepithelial neoplasia incidence: a register-based observational study. The Lancet Public Health. 2021 Dez; 398(10316):2084-92. https://doi.org/10.1016/S0140-6736(21)02178-4.

19. Silva Filho PS, Morais TF, Cruz ES, Castro RM, Borges ER, Aleluia RG, et al. O uso da vacina contra o vírus HPV e suas principais relações com o câncer do colo do útero. Research, Society and Development. 2020 Set; 9(9):e729997574. https://doi.org/10.33448/rsd-v9i9.7574.

20. Kamolratanakul S, Pitisuttithum P. Human Papillomavirus Vaccine Efficacy and Effectiveness against Cancer. Vaccines. 2021 Nov; 9(12):1413–3. https://doi.org/10.3390/vaccines9121413.

21. Francelino AO, Da Silva JA, Araújo MD, Lyra MM, Brito VV, Fidelis AA, et al. A imunoterapia com uso da vacinação contra o HPV na prevenção do câncer de colo de útero: uma revisão

sistemática / HPV vaccine immunotherapy for cervical cancer prevention: a systematic review. Brazilian Journal of Development. 2022 Mar; 8(3):17371-95. https://doi.org/10.34117/bjdv8n3-124.

22. Cardial MF, Roteli-Martins CM, Naud P, Fridman FZ. Papilomavírus humano (HPV). Femina [internet]. 2019 Fev; 47(2):94-100. [acessado em 02 Out 2023]; Disponível em: https://docs.bvsalud.org/biblioref/2019/12/1046496/femina-2019-472-94-100.pdf.

23. Lynge E, Thamsborg L, Larsen LG, Christensen J, Johansen T, Hariri J, et al. Prevalência de papilomavírus humano de alto risco após vacinação contra HPV na Dinamarca. International Journal of Câncer. 2020 Jun; 147:3446-3452. https://doi.org/10.1002/ijc.33157.

24. Wei L, Xie X, Liu J, Qiao Y, Zhao F, Wu T, et al. Elimination of Cervical Cancer: Challenges Promoting the HPV Vaccine in China. Indian Journal of Gynecologic Oncology. 2021 Jun; 19(3):51. https://doi.org/10.1007/s40944-021-00536-6.

25. Carvalho NS, Silva RJ C, Val IC, Bazzo ML, Silveira MF. Protocolo brasileiro para infecções sexualmente transmissíveis 2020: infecção pelo papilomavírus humano (HPV). Epidemiologia e Serviços de Saúde. 2021 Mar; 30(spe1):1-10. https://doi.org/10.1590/S1679-4974202100014.esp1.

26. Schwarz TF, Huang LM, Valencia A, Panzer F, Chiu CH, Decreux A, et al. A ten-year study of immunogenicity and safety of the AS04-HPV-16/18 vaccine in adolescent girls aged 10-14 years. Humman Vaccines Immunotherapeutics. 2019 Jul; 15(7-8):1970-79. https://doi.org/10.1080/21645515.2019.1625644.

27. Sankaranarayanan R, Joshi S, Muwonge R, Esmy PO, Basu P, Prabhu PR, et al. Can a single dose of human papillomavirus (HPV) vaccine prevent cervical cancer? Early findings from an Indian study. Vaccine. 2018 Ago; 36(32):4783–91. https://doi.org/10.1016/j.vaccine.2018.02.087.

28. Costa BSR, Guimarães C, Morais CR, Caixeta CR, Cunha EP, Caetano GMG, et al. Uma revisão bibliográfica acerca da vacina contra o HPV e seus desafios / A bibliography review about the HPV vaccine and its challenges. Brazilian Journal of Health Review. 2022 Abr; 5(2):6392-404.a https://doi.org/10.34119/bjhrv5n2-212.

29. Oliveira MSF, Sorpreso ICE, Zuchelo LTS, Silva ATM, Gomes JM, Silva BKR, et al. Knowledge and acceptability of HPV vaccine among HPV-vaccinated and unvaccinated adolescents at Western Amazon. Revista da Associação Médica Brasileira. 2020 Ago; 66(8):1062–9. https://doi.org/10.1590/1806-9282.66.8.1062.

30. Ryan G, Gilbert PA, Ashida S, Charlton ME, Scherer A, Askelson NM. Challenges to adolescent HPV vaccination and implementation of evidence-based interventions to promote vaccine uptake during the COVID-19 pandemic: “HPV is probably not at the top of our list”. Preventing Chronic Disease. 2022 Mar; 19:E15. https://doi.org/10.5888/pcd19.210378.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Frequency of symptoms in patients with suspected hyperprolactinemia admitted to a private psychiatric clinic in Recife

Frequência dos sintomas em pacientes com suspeita de hiperprolactinemia internados em uma clínica psiquiátrica particular em Recife

Emilly Kelly Paiva Damasceno[1] Gabriel José Paiva Aldeman[1]
Andréia Veras Gonçalves[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Objective: To investigate the symptoms of patients with suspected hyperprolactinemia admitted to a private psychiatric clinic in Recife. Methods: This cross-sectional and descriptive study used non-probabilistic sampling and collected data from January to March 2023 using an in-person questionnaire. Participants undergoing clinical rehabilitation for antipsychotic therapy were assessed for the presence of hyperprolactinemia. We consulted medical records to collect data on the medications in use. Data was collected using Excel 2010 and SPSS version 22.0. **Results**: A total of 51 hospitalized patients aged between 16 and 87 years (SD ± 18.3) were included. Approximately 25% of the participants reported symptomatology commonly associated with hyperprolactinemia, including gynecomastia (53.8%), impaired libido (38.5%), and galactorrhea (7.7%). The medications biperiden hydrochloride and quetiapine hemifumarate were the most prevalent among patients who had complaints of gynecomastia. In contrast, quetiapine hemifumarate, zolpidem hemitartrate, and alprazolam were most frequently used by those reporting impaired libido. **Conclusions:** This study verified the prevalence of symptoms associated with hyperprolactinemia in patients using antipsychotics admitted to a psychiatric clinic.

Keywords: Antipsychotropic drugs; Hyperprolactinemia; Macroprolactinemia; Psychiatric patients.

How to cite: Damasceno **EKP**, Aldeman **GJP**, Gonçalves **AV**. Frequency of symptoms in patients with suspected hyperprolactinemia admitted to a private psychiatric clinic in Recife. An Fac Med Olinda 2024; 1(11):62 doi: https://doi.org/10.56102/afmo.2024.305

Corresponding author:
Emilly Kelly Paiva Damasceno.
E-mail: e-millykelly@hotmail.com

Funding: Programa de Desenvolvimento Institucional de Iniciação Científica (PRODIIC), Faculdade de Medicina de Olinda.
Ethics approval: CAAE No. 62091722.8.0000.8033
Received: 06/20/2023
Approved: 04/03/2024

Resumo

Objetivo: Investigar os sintomas de pacientes com suspeita de hiperprolactinemia internados em uma clínica psiquiátrica privada em Recife. **Métodos**: Trata-se de um estudo transversal e descritivo, com amostragem do tipo não probabilístico, realizado por meio de um questionário aplicado presencialmente em contato com os pacientes no período de janeiro a março de 2023, visando delinear o panorama da presença de hiperprolactinemia em pacientes que fazem uso de terapia antipsicótica no período de reabilitação clínica. Além disso, foram selecionados os prontuários de cada paciente para a coleta das medicações que estavam em uso. Foram utilizados os programas Excel 2010 e SPSS versão 22.0 para construção do questionário e tabulação dos dados coletados respectivamente. **Resultados**: Foram avaliados 51 pacientes internados durante o período de avaliação, com idades que variavam de 16 a 87 anos (DP ± 18,3). Em relação à sintomatologia comumente encontrada em pacientes com hiperprolactinemia, observaram-se queixas em 25,4% da população alvo, que relataram ginecomastia (53,8%), seguido de comprometimento da libido (38,5%) e galactorreia (7,7%). Dentre as medicações, o cloridrato de biperideno e hemifumarato de quetiapina foram as mais prevalentes entre os pacientes que apresentavam queixas de ginecomastia, enquanto o hemifumarato de quetiapina, hemitartarato de zolpidem e alprazolam foram as mais encontradas em uso pelo grupo que apresentou comprometimento da libido. **Conclusões**: Este estudo verificou a prevalência dos sintomas associados à hiperprolactinemia em pacientes que fazem uso de antipsicóticos internados em uma clínica psiquiátrica.

Palavras-chave: Fármacos antipsicotrópicos; Hiperprolactinemia; Macroprolactinemia; Pacientes psiquiátricos.

INTRODUCTION

High serum prolactin (PRL) concentrations may be found in patients with or without symptoms of hyperprolactinemia (HPRL). However, the prevalence rates and degrees of severity of HPRL may differ based on the affinity of antipsychotic drugs for type 2 dopaminergic receptors, different penetration across the blood-brain barrier, and modulation of monoamines other than dopamine.[1]

Although numerous types of drugs can cause hormonal imbalance, the use of drugs that interfere with the neuroendocrine mechanisms is the most commonly associated with the hyperprolactinemic state. More specifically, antipsychotics are commonly associated with HPRL and can interfere with the functioning of the reproductive, endocrine, and metabolic systems.[2]

Most of these drugs are used by specialists in the neuropsychiatric field, including antidepressants, H2 antagonists, opioids, estrogens, and antipsychotics, used for treating schizophrenia and bipolar disorder.[3,4] Furthermore, dopamine is the main inhibitory factor related to the PRL release and acts on binding D2 and D4 receptors in pituitary lactotrophs, which leads to a negative regulation of the PRL gene expression.[5] Because the drugs inhibit dopamine, the PRL release is intensified. Therefore, each drug has a specific mechanism to inhibit dopamine. For ex-

ample, heroin and morphine inhibit the central production of dopamine. In contrast, reserpine and methyldopa cause central depletion of its stocks, and monoamine oxidase inhibitors, cocaine, and amphetamine can inhibit dopamine reuptake.[6,7]

Among patients with psychiatric disorders, the hypersecretion of PRL may be related to two aspects. First, to the antagonist effect to dopamine receptors caused by the conventional antipsychotics (chlorpromazine, butaperazine, thiethylperazine, promethazine, haloperidol, risperidone, pimozide, molindone); and second, to the inhibition of dopamine reuptake caused by antidepressants (buspirone, fluoxetine, paroxetine, tricyclic antidepressants, sulpiride).[8] Therefore, elevated prolactin concentrations are usually found in patients with psychiatric diagnoses because these medications are often part of the treatment for psychiatric conditions.[3,9,10]

PRL is a heterogeneous hormone that can be found in circulation in different ways according to its molecular weight. The main circulating form is the monomeric type with 23kDa molecular weight (mPRL). When found in serum, larger isoforms, such as the covalently linked dimer, are around 45 to 60 kDa ("big PRL"). Lastly, the larger polymeric form is 150-170 kDa ("big-big" PRL), also known as macroprolactin (MPRL). These components can be dosed by the simple and rapid method of precipitation of polyethylene glycol, and an abnormal detection suggests greater attention to the management of antipsychotic-induced HPRL. In turn, MRPL screening is recommended in asymptomatic patients or with unknown etiology.[1,5]

Short-term clinical manifestations of HPRL include sexual dysfunction, infertility, amenorrhea, gynecomastia, and/or galactorrhea. The long-term ones encompass increased risk of osteoporosis, cardiovascular diseases, increased weight gain, and leptin insensitivity. The symptoms of HPRL may impair the physical health of patients undergoing psychotropic therapy, especially when they are not mentioned in consultations and doctors may underestimate their prevalence. Focusing only on short-term effects induced by HPRL, such as amenorrhea or sexual impairment, can contribute to neglecting the long-term effects.[2] Thus, this study aimed to investigate the symptoms of patients with suspected HPRL admitted to a private psychiatric clinic in Recife.

METHODS

This cross-sectional and descriptive study analyzed epidemiological data derived from a psychiatric clinic located in Recife, Pernambuco. We employed a non-probabilistic cluster sampling method.

We employed a non-probabilistic cluster sampling method. The medical records of patients treated from January to March 2023 were initially selected. Before proceeding with data collection, all patients were informed about the project and signed the informed consent form.

Inclusion and exclusion criteria ensured the adequacy of the participants to the scope of the research. We included hospitalized patients with psychiatric diagnoses who were under med-

ical follow-up and antipsychotic therapy. Patients whose clinical information was not available in the medical records were excluded from the study.

Data was collected using a questionnaire developed by the authors, which is yet to be validated. This questionnaire was applied in person and collected demographic information (gender and age of patients), in addition to the type of antipsychotic treatment and the main symptoms associated with hyperprolactinemia (galactorrhea, mild/oligomenorrhea, libido impairment, gynecomastia, and erectile dysfunction).

The questionnaire was carefully designed using the Microsoft® Word for Microsoft 365 MSO program (Version 2211 Build 16.0.15831.20098) 32 bits to address the relevant aspects of the research.

Data was exported to SPSS version 22.0 (IBM SPSS Statistics Inc., Somers, NY, USA) and Microsoft® Excel 2010 for analysis. The software were used to calculate and analyze the variables and extract meaningful insights.

RESULTS

The research analyzed the medical records of 51 hospitalized patients aged 16 to 87 years (SD ± 18.3). Of these, 60.8% were men, and 39.2% were women.

Most participants were over 60 years, representing 29.4% of the total, followed by participants in the 40- to 49-year-old group, representing 21.6% of the total. Therefore, the most prevalent group analyzed by this study included older adults, as shown in Table 1.

Table 1. Characterization of the sample

Age group	Male		Female		Total	
	n	%	n	%	n	%
Under 18	3	**9.7**	0	**0.0**	3	5.9
18 to 29	2	**6.5**	2	**10.0**	4	7.8
30 to 39	9	**29.0**	1	**5.0**	10	19.6
40 to 49	6	**19.4**	5	**25.0**	11	21.6
50 to 59	3	**9.7**	5	**25.0**	8	**15.7**
60 or above	8	**25.8**	7	**35.0**	15	29.4
Total	31	**60.8**	20	**39.2**	51	**100.0**

Regarding the clinical assessment, 13 participants reported symptoms related to hormonal changes. Of these, 7.7% complained of galactorrhea, 0% presented oligomenorrhea or amenorrhea, 38.5% reported impaired libido, 53.8% of patients complained of gynecomastia, and 0% reported complaints of erectile dysfunction, as shown in Table 2.

Table 2. Clinical symptoms reported by participants

Clinical Manifestations	Male		Female		Total	
	n	%	n	%	n	%
Galactorrhoea	1	**10**	0	-	1	**7.7**
Amenorrhea/Oligomenorrhea*	0	**-**	0	-	0	**-**
Impaired libido	2	**20**	3	**100**	5	**38.5**
Gynecomastia	7	**70**	0	-	7	**53.8**
Erectile dysfunction**	0	**-**	0	-	0	**-**
Total	10	**77.00**	3	**23,0**	13	**100**

*only considered the female group in this variable.
**only males are considered in this variable.

Fourteen different types of medications were retrieved from the medical records, as shown in Table 3. Quietapine hemifumarate and biperiden hydrochloride were the most frequently used, being used by 60.0% and 52.7% of participants. In turn, phenobarbital, diazepam, and chlorpromazine appeared to be less used.

Table 3. Medications in use by participants

Medications	Masculino	Feminino	Total	n%
Risperidone	14	5	19	34.5
Olazanpine	9	5	14	25.5
Chlorpromazine	1	-	1	1.8
Venlafaxine	1	3	4	7.3
Phenobarbital	-	1	1	1.8
Flurazepam	18	7	25	45.5
Diazepam	-	1	1	1.8
Biperiden Hydrochloride	23	6	29	52.7
Levomepromazine	11	4	15	27.3
Haloperidol	6	2	8	14.5
Zolpidem Hemitartrate	19	9	28	50.9
Quietapine Hemifumarate	21	12	33	60.0
Alprazolam	8	1	9	16.4
Escitalopram Oxalate	1	1	2	3,6

Biperiden hydrochloride and quetiapine hemifumarate were the most prevalent medications among patients reporting gynecomastia. The group with impaired libido mostly used quetiapine hemifumarate, zolpidem hemitartrate, and alprazolam.

DISCUSSION

Hyperprolactinemia in patients using antipsychotic drugs is a common side effect observed at the expense of traditional treatment options. Health professionals in charge should carefully implement and manage antipsychotics in the clinical practice, prioritizing dose reduction, discontinuation of the therapy, or preferring antipsychotics with lower risks of HPRL.[11] However, drug tapering can be associated with a high risk of relapse in patients being treated for psychiatric illness. Therefore, the combined participation of psychiatrists and endocrinologists is essential to the provision of patient-centered care.[5]

The increase in PRL is related to the body site at which these drugs work, i.e., antagonist to the dopamine receptor, inhibiting dopamine reuptake, or depleting the dopamine and leading to HPRL. Antipsychotics are divided into first-generation (FGAs) and second-generation classes, and their primary indication is for treating psychotic disorders, specifically schizophrenia.[12] Studies[13,14] confirm that untreated schizophrenic patients did not have high PRL, which was present in those under treatment. Therefore, the high PRL levels observed in patients with schizophrenia under treatment with antipsychotics are not related to the disease itself but to the drug side effects.[14]

Montgomery[14] investigated the prevalence of HPRL in patients with schizophrenia and observed its presence in 71% of patients treated with first-generation antipsychotics (> 18.4 ng/ml for men, > 26 ng/ml for women, with a mean PRL level of 42.1 ng/ml). In line with this study, symptoms such as gynecomastia and libido impairment were frequently found in patients using neuroleptics. Those symptoms were found in 92.3% of the patients participating in the research who reported the symptoms. The medications most associated with symptoms were risperidone, which acts as FGAs, as well as quetiapine hemitartrate (a new generation antipsychotic), and zolpidem hemifumarate (a non-benzodiazepine sedative-hypnotic). The symptoms reported by the participants of this study are consistent with previous studies[3,4]. Decreased libido, erectile dysfunction, decreased sperm production, infertility, gynecomastia, and galactorrhea can occur as short-term consequences of HPRL[4,7]. Long-term symptoms can also occur, including the enhanced risk of decreased bone mineral density.[15]

Although HPRL is commonly associated with the use of antipsychotics, the intensity of PRL elevation differs according to the medication class. For example, the use of FGAs are associated to elevations about two to three times the reference values. In turn, second-generation antipsychotics may potentially increase PRL and include amisulpride, risperidone, and paliperidone in

up to 80-90% of women.[16] In this sense, many physicians had to accept HPRL as one of the side effects of traditional antipsychotic therapy. However, this can change with the emergence of the new generation of prolactin-sparing antipsychotics, such as clozapine, olanzapine, ziprasidone, and aripiprazole. Moreover, selective mesolimbic and mesocortical dopamine blockers may also contribute to preventing antipsychotic-induced HPRL.[17]

Physiologically, prolactin acts on the development of the mammary glands in pregnancy and milk production during lactation. However, prolactin hypersecretion by the adenohypophysis can cause neuroendocrine and metabolic disorders. HPRL can lead to ovular dysfunction due to the insufficient release of progesterone from the corpus luteum, which shortens the luteal phase of the ovarian cycle and may cause infertility. Oligomenorrhea or amenorrhea can also be stimulated by the abnormal feedback in the hypothalamic-pituitary-ovarian axis as a response to an increase in prolactin levels up to 50-100 ng/mL.[18,19]

Individuals chronically treated with antipsychotics that are not regularly monitored have a prolonged state of HPRL. Such a state generates a chronic suppression of GnRH, which can lead to hypoestrogenism in women and hypogonadism in men. Consequently, they are at greater risk of developing osteoporosis due to loss of control between bone maintenance and remodeling.[15,20]

Hypogonadotropic hypogonadism in men due to HPRL can manifest as reduced libido, erectile dysfunction, gynecomastia, impaired spermatogenesis, and galactorrhea and has been discussed in the literature. These individuals may also present secondary changes, including anemia, decreased energy, and loss of muscle mass.[1]

In the presence of HPRL symptoms, discontinuing the antipsychotic is a possibility. However, relapse and worsening of psychosis may occur. Therefore, the severity of HPRL symptoms should always be evaluated before medication discontinuation to ensure effective decision-making with less stress for the individual.[21,22]

CONCLUSION

The presence of symptomatic hormonal changes associated with HPRL is common among patients under treatment with first and second-generation antipsychotics, specifically risperidone, quetiapine hemifumarate, zolpidem hemitartrate, and biperiden hydrochloride. Although some studies point to the presence of endocrine and sexual symptoms associated with HPRL, further studies are needed to clarify the long-term consequences of continued pharmacological therapy. Careful investigations are necessary to early detect the hyperprolactinemic state and appropriately manage their care, leading to a better quality of life. Therefore, the relationship between the hyperprolactinemic state and the psyche must be monitored by medical professionals.

CONFLICT OF INTEREST

Nothing to declare.

CONTRIBUIÇÕES DOS AUTORES:

EKPD: Conceptualization, data analysis, manuscript preparation, writing, discussion of results, project administration, resources, validation, writing of the original draft, review, and editing; **GJPA:** Conceptualization, data collection, data analysis, methodology, manuscript preparation, writing, resources, review and editing; **GVA:** Conceptualization, manuscript preparation, data analysis, discussion of results, project administration, review and editing.

REFERENCES

1. Samperi I, Lithgow K, Karavitaki N. Hyperprolactinaemia. J Clin Med. 2019; 13;8(12):2203. doi: https://doi.org/10.3390/jcm8122203.
2. Lu Z, Sun Y, Zhang Y, Chen Y, Guo L, Liao Y, Kang Z, et al. Pharmacological treatment strategies for antipsychotic-induced hyperprolactinemia: a systematic review and network meta-analysis. Transl Psychiatry. 2022 Jul 5; 12(1):267. doi: https://doi.org/10.1038/s41398-022-02027-4.
3. Brand BA, Haveman YRA, de Beer F, de Boer JN, Dazzan P, Sommer IEC. Antipsychotic medication for women with schizophrenia spectrum disorders. Psychol Med. 2022 Mar; 52(4):649-663. doi: https://doi.org/10.1017/S0033291721004591.
4. Ruljancic N, Bakliza A, Vuk Pisk S, Geres N, Matic K, Ivezic E, et al. Antipsychotics-induced hyperprolactinemia and screening for macroprolactin. Biochem Med (Zagreb). 2020; 31(1): 1-8. doi: https://doi.org/10.11613/BM.2021.010707.
5. Rizzo LFL, Mana DL, Serra HA, Danilowicz K. Hyperprolactinemia associated with psychiatric disorders. Medicina (B Aires). 2020; 80(6):670-680. PMID: 33254112.
6. Nahas EAP, Nahás-Neto J, Pontes A, Dias R, Fernandes CE. Estados hiperprolactinêmicos: inter-relações com o psiquismo. Arch Clin Psychiatry (São Paulo). 2006; 33(2). doi: https://doi.org/10.1590/S0101-60832006000200006.
7. Serri O, Chik CL, Ur E, Ezzat S. Diagnosis and management of hyperprolactinemia. CMAJ. 2003; 16;169(6): 575-81. PMID: 12975226; PMCID: PMC191295.
8. Vilar L, Vilar CF, Lyra R, Freitas MDC. Pitfalls in the Diagnostic Evaluation of Hyperprolactinemia. Neuroendocrinology. 2019; 109(1): 7-19. doi: https://doi.org/10.1159/000499694.
9. Llácer JMB, Hortelano AM, Albelda BR. Hyperprolactinemia in psychotic patients treated in monotherapy with long-acting injectable antipsychotics. Int J Psychiatry Clin Pract. 2019 Sep; 23(3):189-193. doi: https://doi.org/10.1080/13651501.2019.1576905.
10. Barata PC, Santos MJ, Melo JC, Maia T. Olanzapine-Induced Hyperprolactinemia: Two Case Reports. Front Pharmacol. 2019 Jul 29; 10:846. doi: https://doi.org/10.3389/fphar.2019.00846.

11. Rusgis MM, Alabbasi AY, Nelson LA. Guidance on the treatment of antipsychotic-induced hyperprolactinemia when switching the antipsychotic is not an option. Am J Health Syst Pharm. 2021 May 6; 78(10):862-871. doi: https://doi.org/10.1093/ajhp/zxab065.

12. Aringhieri S, Carli M, Kolachalam S, Verdesca V, Cini E, Rossi M, McCormick PJ, et al. Molecular targets of atypical antipsychotics: From mechanism of action to clinical differences. Pharmacol Ther. 2018 Dec; 192:20-41. doi: https://doi.org/10.1016/j.pharmthera.2018.06.012.

13. Peuskens J, Pani L, Detraux J, De Hert M. The effects of novel and newly approved antipsychotics on serum prolactin levels: a comprehensive review. CNS Drugs. 2014; 28(5): 421-53. doi: https://doi.org/10.1007/s40263-014-0157-3.

14. Montgomery J, Winterbottom E, Jessani M, Kohegyi E, Fulmer J, Seamonds B, et al. Prevalência de hiperprolactinemia na esquizofrenia: associação com tratamento antipsicótico típico e atípico. J Clin Psychiatry. 2004; 65(11): 1491-8. doi: https://doi.org/10.4088/jcp.v65n1108.

15. di Filippo L, Doga M, Resmini E, Giustina A. Hyperprolactinemia and bone. Pituitary. 2020 Jun; 23(3):314-321. doi: https://doi.org/10.1007/s11102-020-01041-3.

16. Bushe C, Shaw M, Peveler RC. Uma revisão da associação entre o uso de antipsicóticos e hiperprolactinemia. J Psychopharmacol. 2008; 22 (2 suplementos) : 46-55. doi: https://doi.org/10.1177/0269881107088435

17. Haddad PM, Wieck A. Hiperprolactinemia induzida por antipsicóticos: mecanismos, características clínicas e manejo. Drogas. 2004; 64(20):2291-314. doi: https://doi.org/10.2165/00003495-200464200-00003.

18. Edinoff AN, Silverblatt NS, Vervaeke HE, Horton CC, Girma E, Kaye AD, Kaye A, et al. Hyperprolactinemia, clinical considerations, and infertility in women on antipsychotic medications. Psychopharmacol Bull. 2021 Mar; 16;51(2):131-148. PMID: 34092827. PMCID: PMC8146565.

19. Yoshida K, Takeuchi H. Dose-dependent effects of antipsychotics on efficacy and adverse effects in schizophrenia. Behav Brain Res. 2021 Mar 26; 402:113098. https://doi.org/10.1016/j.bbr.2020.113098.

20. González-Rodríguez A, Labad J, Seeman MV. Antipsychotic-induced Hyperprolactinemia in aging populations: prevalence, implications, prevention and management. Prog Neuropsychopharmacol Biol Psychiatry. 2020 Jul 13; 101:109941. doi: https://doi.org/10.1016/j.pnpbp.2020.109941.

21. Rusgis MM, Alabbasi AY, Nelson LA. Guidance on the treatment of antipsychotic-induced hyperprolactinemia when switching the antipsychotic is not an option. Am J Health Syst Pharm. 2021 May 6; 78(10):862-871. doi: https://doi.org/10.1093/ajhp/zxab065.

22. Pisk SV, Matić K, Gereš N, Ivezić E, Ruljančić N, Filipčić I. Hyperprolactinemia - side effect or part of the illness. Psychiatr Danub. 2019 Jun; 31(Suppl 2):148-152. PMID: 31158115.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Prevalence of Polycystic Ovary Syndrome in a gynecology outpatient clinic in the city of Olinda, Pernambuco, from 2018 to 2020

Prevalência da Síndrome do Ovário Policístico em um ambulatório de ginecologia da cidade de Olinda, Pernambuco, no período entre 2018 e 2020

Myllena Alves Rodrigues[1] Suellen Nunes de Oliveira[1]
Amanda Fontes Rego[1] Lorena Magale Dantas[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Aim: To analyze the prevalence of Polycystic Ovary Syndrome (PCOS) in women treated at the gynecology outpatient clinic in the city of Olinda. **Methods:** This cross-sectional study used the medical records of patients with PCOS. **Results:** The prevalence of PCOS was 9.84%, with menstrual changes as the predominant form of presentation (52.0%), followed by ultrasound changes (23.0%), and hyperandrogenism-related symptoms (hirsutism [13.0%] and oily skin or presence or acne [7.0%]). **Conclusion:** This study verified a relevant number of PCOS in the studied context. Menstrual changes, ultrasound changes, and hyperandrogenism-related symptoms were the most frequently observed clinical and imaging manifestations in this population.

Keywords: Gynecology; Oligomenorrhea; Prevalence; Polycystic Ovary Syndrome.

Corresponding author:
Myllena Alves Rodrigues.
E-mail: myllenarodrigues.mr@gmail.com
Funding: None.
Research Ethics Committee (CAAE): nº 5.746.372
Received: 06/20/2023
Approved: 08/04/2023

How to cite: Rodrigues **MA**, Oliveira **SN**, Rego **AF**, Dantas **LM**. Prevalence of Polycystic Ovary Syndrome in a gynecology outpatient clinic in the city of Olinda, Pernambuco, from 2018 to 2020. An Fac Med Olinda 2024; 1(11):71 doi: https://doi.org/10.56102/afmo.2024.306

Resumo

Objetivo: Analisar a prevalência da SÍndrome dos Ovários Policísticos (SOP) em mulheres assistidas no ambulatório de ginecologia da cidade de Olinda. **Métodos:** A pesquisa detém um caráter transversal e observacional, tendo como cenário os prontuários das pacientes com SOP. **Resultados:** A prevalência de SOP no ambulatório de ginecologia foi de 9,84%, sendo identificadas como forma de apresentação predominante as alterações menstruais (52%), seguidas de alterações ultrassonográficas (23%) e de hiperandrogenismo, das quais 13% foram relacionadas ao hirsutismo e 7%, à oleosidade da pele/presença de acne. **Conclusão:** Esse estudo verificou um quantitativo relevante de SOP no contexto estudado. As alterações menstruais, ultrassonográficas e relacionadas ao hiperandrogenismo foram as manifestações clínicas e radiológicas mais observadas nessa população.

Palavras-chave: Ginecologia; Oligomenorreia; Prevalência; Síndrome dos Ovários Policísticos.

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a complex and multifactorial endocrine-metabolic disorder that affects women starting from menarche. This condition was first named the Stein-Leventhal syndrome by the American gynecologists Irving Freiler Stein and Michael Leventhal in the 1930s and was later renamed PCOS in the 1960s[1]. Every year, 2 million new cases of PCOS are diagnosed in the Brazilian female population[2].

The clinical, laboratory, and ultrasound manifestations of PCOS were characterized in the Rotterdam Consensus (2003), which is the most widely disclosed worldwide. The PCOS diagnosis is described as the presence of two out of the following criteria: menstrual changes (e.g., oligomenorrhea), clinical or laboratory hyperandrogenism (or both), and ultrasound changes (e.g., presence of ovarian microcysts). Furthermore, other etiologies of hyperandrogenism and anovulation should be excluded, such as Cushing syndrome, hyperprolactinemia, thyroid disorder, ovarian or adrenal cancer, and the use of androgenic products[3,7,10].

Reproductive, metabolic, and cardiovascular consequences can be analyzed based on the different characteristics presented in the clinical condition. Thus, four phenotypes of PCOS were created based on the Rotterdam criteria: A (oligo-ovulation or anovulation, hyperandrogenism, and polycystic ovaries); B (oligo-ovulation or anovulation and hyperandrogenism); C (polycystic ovaries and hyperandrogenism); and D (oligo-ovulation or anovulation and polycystic ovaries). Phenotypes A and B presented greater reproductive and metabolic repercussions than the others; of these, phenotype D is the least severe in terms of cardiometabolic risk[3,5,8].

The PCOS also presents clinical and psychosocial repercussions. Clinical hyperandrogenism may impair the psychological condition and quality of life of women. Furthermore, this syndrome may have long-term negative impacts, such as insulin resistance progressing to type

II diabetes mellitus, metabolic syndrome, and interference with female fertility[4,6,9]. Despite the significant number of PCOS cases, evidence on its prevalence in Brazil are scarce. Considering the need to conduct novel data collection, this study aimed to analyze the prevalence of PCOS in women receiving care at the gynecology outpatient clinic in the city of Olinda.

METHODOLOGY

This cross-sectional study analyzed the PCOS cases and their particularities in the gynecology outpatient clinic in the city of Olinda-PE from 2018 to 2020.

The study population comprised women between menarche and menopause who presented PCOS symptoms. Therefore, inclusion criteria encompassed women between 16 and 50 years old diagnosed with PCOS according to the Rotterdam criteria. Exclusion criteria considered women under 16 and over 50 years old or with clinical conditions (Cushing syndrome, hyperprolactinemia, thyroid disorder, ovarian or adrenal cancer, use of androgenic products, fibroids, and endometriosis) that could cause oligomenorrhea, amenorrhea, or hyperandrogenism.

Data were analyzed using the medical records of the patients, which were plotted in an Excel 2010® spreadsheet, following a stratification of the sample data. The study variables were age range, gynecological and obstetric history, clinical manifestations associated with PCOS, and the Rotterdam criteria. Then, the analysis occurred using equations that allowed the development of graphs and tables correlating with the prevalence of PCOS. In addition, a descriptive statistical analysis of the ages of the patients was performed using the miniWebtool software (https://miniwebtool.com/), a digital data operation tool.

RESULTS AND DISCUSSIONS

The present study analyzed 620 medical records; 61 patients (9.84%) presented PCOS. The mean age of the sample was 27.20 years (SD = 5.84) years.

Table 1. Age of the included patients.

Age (years)	N	%
18 – 25	26	42.63
26 – 33	23	37.70
34 – 41	11	18.03
Unreported	1	1.64

Campos et al.[11] included 2,458 women aged between 15 and 45 years who were equally divided into a group with a PCOS diagnosis and a control group (without PCOS) (n = 1,229 each); the mean age was 28.05 years. Conversely, Anjos et al.[1] evaluated students from Santa Maria College and found a mean age of 21.60 years. Therefore, the composition of the target population

in each study may have influenced the age difference.

Among the patients with PCOS, 40.98% (n = 25) did not have children, and 31.15% (n = 19) reported having children. Also, 14.75% (n = 9) did not inform the gestational status, and 13.12% (n = 8) reported one or more miscarriages.

Table 2. Gestational status among study patients.

Have children	N	%
Yes	19	31.15
No	25	40.98
Had miscarriages	8	13.12
Unreported	9	14.75

The criteria established for PCOS should match two out of three of the following characteristics: menstrual changes (e.g., oligomenorrhea), clinical or laboratory hyperandrogenism (or both), and ultrasound changes (e.g., presence of ovarian microcysts)[8].

According to the Rotterdam criteria, 57.40% (n = 35) presented one, 31.1% (n = 19) presented two, and 6.6% (n = 4) presented the three characteristics. Among the patients included, 4.9% (n = 3) arrived at the outpatient clinic with a previous PCOS diagnosis without reporting active manifestations and used contraceptives.

The diagnostic hypothesis raised to most patients was based on clinical criteria since the absence of laboratory or imaging criteria (or both) was noted in the first consultation. In addition, the difficulty in data acquisition was related to the non-adherence to follow-up appointments, hindering the results of the present study.

Table 3. Rotterdam criteria presented by the patients included.

Rotterdam criteria	N	%
Presence of one criterion	35	57.4
Presence of two criterion	19	31.1
Presence of three criterion	4	6.6
Previous diagnosis without clinical manifestations	3	4.9

Among the clinical and imaging manifestations, 52.0% (n = 47) of patients reported menstrual changes, 23.0% (n = 21) the presence of ovarian microcysts in the ultrasound image, 20.0% (n = 18) mentioned hyperandrogenism-related symptoms, such as hirsutism (13.0%; n = 12) and oily skin or acne (or both) (7.0%; n = 6), and 5.0% (n = 4) were infertile.

Table 4. Clinical and imaging manifestations reported by the patients with PCOS.

Clinical manifestations	N	%
Menstrual changes	47	52%
Hirsutism	12	13%
Oily skin or acne (or both)	6	7%
Presence of ovarian microcysts (ultrasound image)	21	23%
Infertility	4	5%

N: number of participants.

In Anjos et al.[1] study, the prevalence of PCOS was 24.0%. Among the most prevalent clinical manifestations, menstrual changes accounted for 91.6%, followed by hyperandrogenism-related symptoms: oily skin (75.0%), acne (66.6%), and hirsutism (33.3%). Although the most observed clinical manifestation was similar to the present study, the second most recurrent was different between studies; Anjos et al.[1] evidenced oily skin, while the present study found ultrasound changes. Moreover, Campos et al.[11] found that 55.7% of the sample presented menstrual changes.

CONCLUSION

In the studied context, the prevalence of PCOS was about 10%. Menstrual changes, ultrasound changes, and hyperandrogenism-related symptoms were the most frequently observed clinical and imaging manifestations in this population.

CONFLICT OF INTERESTS

Nothing to declare

ACKNOWLEDGMENT

To the Institutional Development and Scientific Initiation Program (PRODIIC) of the Faculdade de Medicina de Olinda.

AUTHOR CONTRIBUTIONS

MAR, SNO e AFR: Data curation, Formal analysis, Methodology, Supervision, Writing - original writing, Writing - review and editing**; LMD**: Conceptualization, Data curation, Investigation, Methodology, Project management, Resources, Supervision, Writing - original writing, Writing - reviewing and editing.

REFERENCES

1. Anjos EG dos, Eduardo GN, Figueiredo KBCL, Brito SA, Lucena GTS. Prevalence of polycystic ovary syndrome in a higher education institution in the city of Cajazeiras - PB. RSD [Internet].

2021Apr.24;10(4):e58310414412. Available from: https://rsdjournal.org/index.php/rsd/article/view/14412

2. Santos TM, Dourado KF, De Andrade MIS. Efeitos da suplementação de selênio nos parâmetros glicêmicos da síndrome do ovário policístico: revisão sistemática e metanálise. Rev. Cont. Saúde. [Internet]. 30 de junho de 2020 [citado 15 de maio de 2022];20(38):113-21. Disponível em https://www.revistas.unijui.edu.br/index.php/contextoesaude/article/view/9734. DOI: https://doi.org/10.21527/2176-7114.2020.38.113-121.

3. Federação Brasileira das Associações de Ginecologia e Obstetrícia (FEBRASGO). Protocolo Síndrome dos ovários policísticos. n27. São Paulo: FEBRASGO; 2021.

4. Cavalcante, IS, et al. Síndrome dos ovários policísticos: aspectos clínicos e impactos na saúde da mulher. Research, Society and Development: Health Sciences [Internet]. 2021 Feb 14 [cited 2022 May 1];10 DOI https://doi.org/10.33448/rsd-v10i2.12398. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/12398.

5. Passos EP, Martins-Costa, Sérgio H, Magalhães, José A, et al. Rotinas em Ginecologia. Artmed Editora; 2023.

6. Fernandes CE. Tratado de Ginecologia Febrasgo. 1ed. Rio de Janeiro: Elsevier; 2019.

7. Salazar Carranza, L. A., Ayala Esparza, V. A., Martínez Mora, S. F., & Cruz Villegas, J. A. (2022). Ovarios poliquísticos y síndrome de ovario poliquísticos. RECIMUNDO, 6(1), 117-124. https://doi.org/10.26820/recimundo/6.(1).ene.2022.117-124

8. Vilar, L. Endocrinologia clínica. 7ed. Rio de Janeiro: Guanabara Koogan, 2021.

9. Alves MLS, Donne RDD, Romano RM, Romano MA. Polycystic ovary syndrome (PCOS), pathophysiology and treatment, a review. RSD [Internet]. 2022Jul.20 [cited 2023Nov.21];11(9):e25111932469. Available from: https://rsdjournal.org/index.php/rsd/article/view/32469. DOI: https://doi.org/10.33448/rsd-v11i9.32469

10. Cremonez L de SC, Siqueira EC de. Uma abordagem geral da Síndrome dos Ovários Policísticos: revisão de literatura. REAS [Internet]. 24set.2022 [citado 21nov.2023];15(9):e10908. Available from: https://acervomais.com.br/index.php/saude/article/view/10908. DOI: https://doi.org/10.25248/reas.e10908.2022.

11. Campos PC, Faciroli F, Andrade YFA, Souza MLR de. Prevalência de sintomas associados à síndrome do ovário policístico:. RBONE [Internet]. 3º de julho de 2022 [citado 16º de junho de 2023];15(94):390-02. Disponível em: http://www.rbone.com.br/index.php/rbone/article/view/1714

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Original Article

Analysis of the risk factors that interfere in the health of shellfish gatherers on a beach on the south coast of Pernambuco

Análise dos fatores de riscos sanitários que interferem na saúde das marisqueiras em uma praia do litoral sul de Pernambuco

Larissa Souza Penalva[1] Monic Alves de Lima[1]
Morgana Vital de Araújo[1] Karoline Albuquerque Farias[1]
Albert Eduardo Martins[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Objective: To collect and analyze data on health risk factors and their problems in shellfish gatherers on a beach on the south coast of Pernambuco. **Methods:** This cross-sectional study was conducted with data from a face-to-face questionnaire applied to shellfish gatherers between October 2022 and March 2023. Data were analyzed using the Excel 2021 software. In addition, we performed a qualitative and quantitative analysis of fecal coliforms (totals and *Escherichia coli)* from the Maracaípe river and the local supply network, both using the multiple tube method. **Results:** The shellfish gatherers were evaluated regarding their health condition: 60.00% reported symptoms, such as diarrhea, nausea, and vomiting, which correlated with parasitosis or bacteriosis; of these, 44.44% cleaned food only with water. In the analysis of the water, the coliform group was present in the Maracaípe river, inferring that the samples did not meet the potability standards established by the Ordinance GM/MS No. 888 of May 4, 2021, which defines the standards of potability of water for human consumption. **Conclusion:** Shellfish gatherers are subjected to precarious conditions of basic sanitation and health services and are still at risk of waterborne diseases as they consume the water and shellfish collected.

Keywords: Neglected diseases; Parasitic diseases; Health risk; Environment.

How to cite: Penalva **LS**, Lima **MA**, Araújo **MV,** Farias **KA**, Martins **AE.** Análise dos fatores de riscos sanitários que interferem na saúde das marisqueiras em uma praia do litoral sul de Pernambuco. An Fac Med Olinda 2024; 1(11):77
doi: https://doi.org/10.56102/afmo.2024.302

Corresponding author:
Larissa Souza Penalva
E-mail: larissapenalva@hotmail.com
Funding: None.
Research Ethics Committee (CAAE): 43998421.0.0000.8033 e 61821422.3.0000.8033.
Received: 06/19/2023
Approved: 11/13/2023

Resumo

Objetivo: Coletar e analisar dados sobre os fatores de riscos sanitários e seus agravos nas marisqueiras de uma praia do litoral sul de Pernambuco. **Métodos:** Foi realizado um estudo descritivo transversal com dados de um questionário presencial aplicado em mulheres marisqueiras, entre outubro de 2022 e março de 2023, e analisados pelo programa Excel 2021. Foi realizada a análise de água qualitativa e quantitativa dos coliformes fecais, totais e *Escherichia coli* do rio Maracaípe e da rede de abastecimento local, ambos pelo método de Múltiplos Tubos. **Resultados:** Foram avaliadas pescadoras artesanais quanto a sua condição de saúde, dentre as quais 60% referem sintomas como diarreia, náusea e vômito correlacionados a parasitose/bacteriose; destas, 44,44% realizam a higienização dos alimentos apenas com água. Na análise da água, revelou-se a presença do grupo coliformes no rio Maracaípe, inferindo que as amostras não atendem aos padrões estabelecidos pela legislação vigente conforme a portaria GM/MS Nº 888 de 04 de maio de 2021, que define os padrões de potabilidade de água para consumo humano. **Conclusão:** O estudo verificou que as marisqueiras se encontram em condições precárias de saneamento básico, carência de serviços de assistência à saúde e há ainda risco de doenças de transmissão de veiculação hídrica visto que a água e os mariscos coletados são ingeridos pela população.

Palavras-chave: Doenças negligenciadas; Doenças parasitárias; Impacto ambiental; Risco sanitário.

INTRODUCTION

According to data from the Brazilian Ministry of Fisheries and Agriculture, about one million artisanal fishermen are registered, whose work results in 45.00% of annual fish production. In addition, the Northeast is the largest producer of fish, accounting for 31.70% of national production[1]. Studies have documented a visible gender and social division of labor in artisanal fishing, in which men practice deep-sea fishing, and women take care of land-based tasks; the latter represents 50.00% of the total workers with shellfish harvesting activities operating in all phases of product handling (i.e., from collection to commercialization)[2].

Within this context, the shellfish gatherers emerged, who were historically conditioned to master the art of cooking[3]. Thus, artisanal fishing became important to these women since this work increased their family income and subsistence. The Maracaípe river, the location of shellfish harvesting activity conducted by these women, is practically urban, facilitating the presence of fecal or thermotolerant coliforms associated with the poor sanitary conditions in this area, which can directly affect the health of this population[4].

Escherichia coli is among the main etiological agents identified in outbreaks of foodborne diseases in Brazil. The *Escherichia coli* infection is typically transmitted by consuming contaminated water or food, such as undercooked meat products and raw milk. Thus, its presence indicates fecal contamination, probably due to a lack of hygiene during food handling or the use of

contaminated water (or both)[5]. In addition, the increasing prevalence of multidrug-resistant coliforms is concerning since it makes antibiotic therapy fail in many cases[6].

Other microorganisms that can be transmitted to humans via the fecal-oral route include *Cryptosporidium* spp. and *Giardia* spp. In 2016, 4,786 foodborne and waterborne outbreaks were reported in Europe, of which 0.40% were due to parasites *Cryptosporidium*, *Giardia*, and *Trichinella*[7]. However, this number may be underestimated due to the large number of outbreaks caused by an unknown agent (36.00%). Contaminated water to wash fruit and vegetables and poor hygiene conditions during food processing or preparation may be among the causative agents. Therefore, shellfish gatherers are exposed to constant sanitary risks, and they are part of a less favored social group, being victims of a lack of health care and social invisibility[8].

The health conditions of shellfish gatherers highlight a more precarious situation than the urban population because of the deficiency in the area of environmental sanitation, which is one of the most important social determinants of health[9]. In this context, this study aimed to evaluate the health indicators of shellfish gatherers by the application of questionnaires and analyzing total coliforms, thermotolerant coliforms, and *Escherichia coli* in the water of the Maracaípe river and the local supply source.

METHOD

This cross-sectional study used data from questionnaires applied in person and the collection occurred between October 2022 and March 2023. The questionnaires were designed based on the epidemiological discussion and risk factors related to the context of the shellfish gatherers, and the sample acquisition process was probabilistic. The questionnaire included questions about the socioeconomic characteristics, sanitary conditions, health status, and access to primary health services among the shellfish gatherers of Maracaípe/Porto de Galinhas.

The participants were invited to participate in the study spontaneously after the explanation of the research topic. Those who agreed to participate signed the informed consent form. The inclusion criteria considered women shellfish gatherers aged over 18 years.

The data were calculated and tabulated considering valid responses from the collected information no information was lost. Researchers applied 44 questionnaires, and the results were presented as tables and graphs with their respective absolute frequencies. The analysis of the obtained data was organized and performed using Word 2020 and Excel 2021 softwares.

Two 500mL samples of water were collected: one from the Maracaípe river and the other from the local watter supply. Samples were analyzed using the multiple tubes methodology, following the Consolidation Ordinance No. 5 of the Ministry of Health (MS) from October 3, 2017[10].

RESULTS

The study involved women who worked as shellfish gatherers; their mean age was from 20 to 29 years (42.20%), and most were brown (53.30%). Regarding educational level, the predominant category was incomplete elementary education (35.56%); most (97.77%) had an income of up to 1 minimum wage, and 40.00% had more than four children (Table 1).

Most (51.11%) shellfish gatherers reported walking barefoot all day, and about 20.00% did not have a sewage system in their households. Moreover, 60.00% have heard of good food hygiene practices, but 44.44% of them cleaned food using only water or water and soap (24.44%) (Table 1).

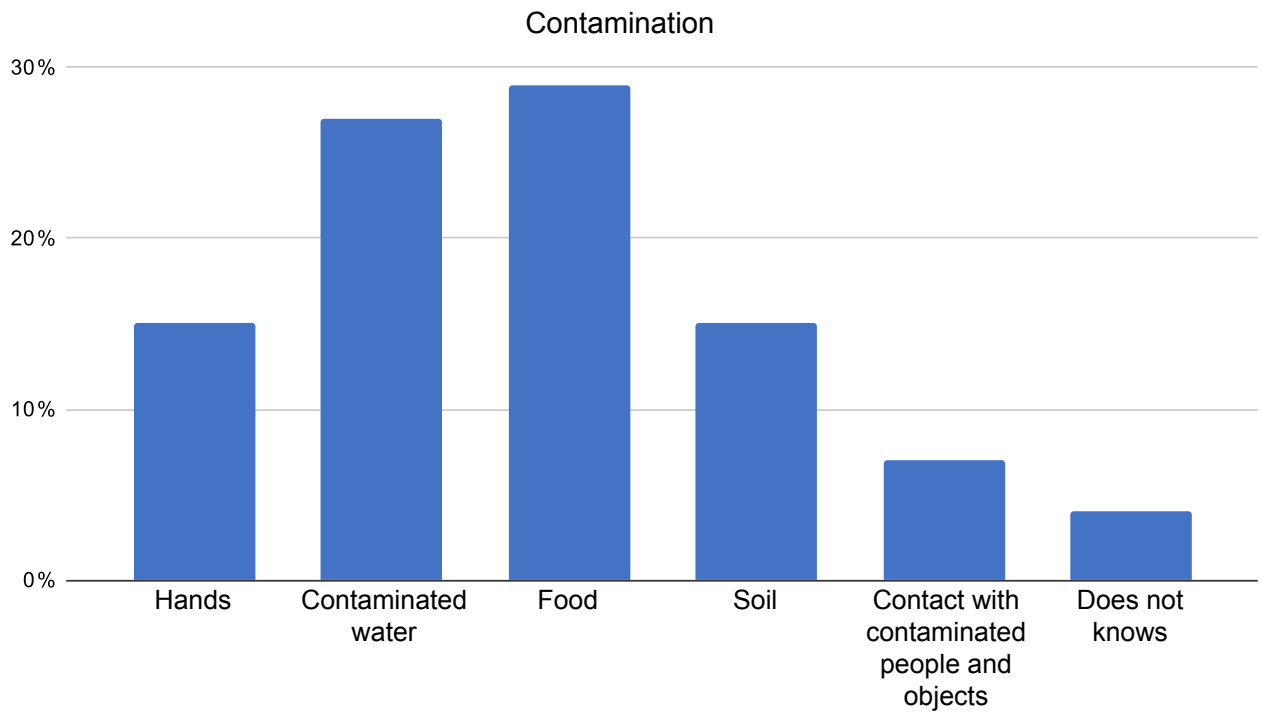
Table 1. Sociodemographic data and health and sanitary conditions of shellfish gatherers - Ipojuca, Pernambuco, Brazil, 2023

AGE	**N**	**%Total**
20–29	19	42,22%
30–39	12	26,67%
40–49	9	20,00%
50–59	5	11,11%
SKIN COLOR		**%Total**
Brown	24	53,33%
Black	13	28,89%
White	6	13,33%
Yellow	2	4,44%
EDUCATION LEVEL		**%Total**
Elementary school incomplete	16	35,56%
Complete elementary school	2	4,44%
High school complete	14	31,11%
High school incomplete	7	15,56%
Never studied	6	13,33%
NUMBER OF CHILDREN		**%Total**
0	3	6,67%
1	6	13,33%
2	9	20,00%
3	9	20,00%
≥4	18	40,00%
INCOME		**%Total**
= 1 minimum wage	44	97,77%
> 1 minimum wage	1	2,20%
SANITARY SEWAGE		**%Total**
Yes	36	80,00%
No	9	20,00%

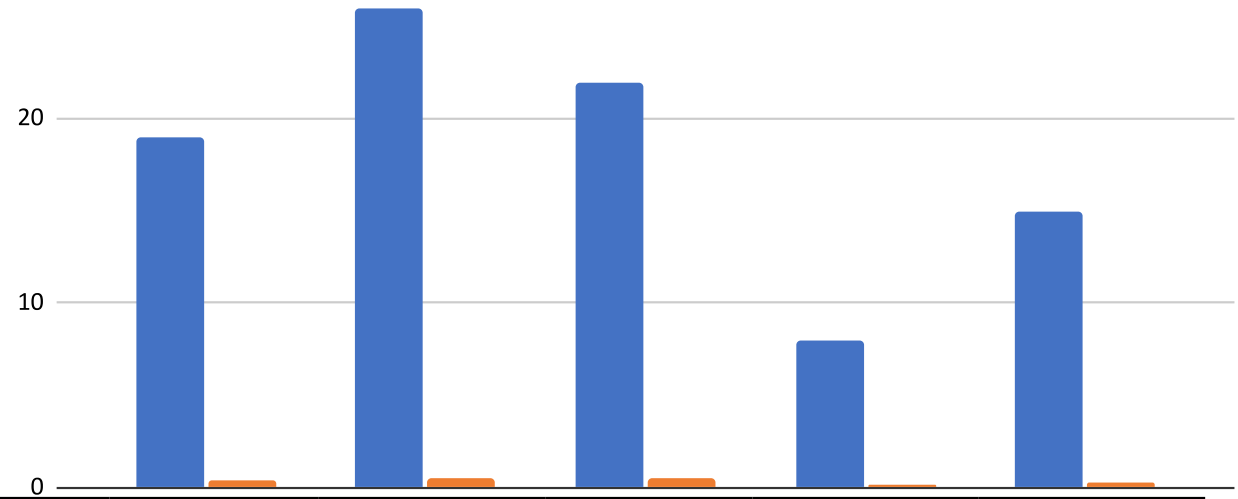
WALK BAREFOOT		**%Total**
Yes	23	51,11%
No	22	48,89%
UNDERSTANDS FOOD HYGIENE		**%Total**
Yes	27	60,00%
No	18	40,00%
HOW TO SANITIZE FOOD		**%Total**
Water	20	44,44%
Soap and water	11	24,44%
Bleack	14	31,11%
CONTACT WITH PARASITOSIS OR BACTERIOSIS		**%Total**
Yes	30	66,67%
No	15	33,33%
SYMPTOMS OF PARASITOSIS OR BACTERIOSIS		**%Total**
Diarrhea, nausea, and fever	27	60%
Does not know	18	40%
ACCESSIBILITY TO HEALTH SERVICES		**%Total**
Good	4	8,89%
Fair	9	20,00%
Unsatisfactory	25	55,56%
Non-existent	7	
NUMBER OF MEDICAL APPOINTMENTS		**%Total**
Every month	16	35,56%
1 to 2 times a year	12	26,67%
Only in emergencies	17	37,78

Hence, a significant portion of the participants reported knowing the means of transmission of parasites or bacterial diseases: most mentioned contact with contaminated water and food, and few referred to contaminated soil and contact with contaminated people and objects (Figure 1).

Most participants (66.67%) had contact with any parasitic or bacterial disease, but most were not diagnosed by a doctor, and 55.56% reported unsatisfactory access to the health system. Furthermore, 60.00% of shellfish gatherers reported symptoms associated with parasitosis or bacteriosis, such as diarrhea, nausea, and vomiting (Table 1). Also, 37.78% of the participants had medical appointments only in emergencies (Table 1).



Regarding treatment, Participants reported having treated possible parasitosis or bacteriosis with a “single dose”, referring to “Albendazole”, or having treated it with teas, homemade oral rehydration solution, and “mangaba milk” (57.68%) (Figure 2).



	“Single dose”	Tea, herbs and “mangaba milk”	Prescribed by the doctor	Neighbor or friend taught	I know how to treat
N	19	26	22	8	15
T (%)	42.22%	57.68%	48.88%	17.77%	33.33%

Figure 2. Answers of the shellfish gatherers on knowledge of parasitosis or bacteriosis treatment. Ipojuca, Pernambuco, Brazil, 2023

Considering the contact with possible sources of parasitic contamination, the water was analyzed. All samples from the Maracaípe river revealed the presence of the coliform group using qualitative and quantitative analysis (Table 2).

The quantitative result of the analysis was expressed as the most probable number (MPN) of microorganisms, and the test estimated the density of viable microorganisms present in the sample, revealing a result of more than 23 in 100 milliliters. Thus, the samples did not meet the potability standards of water for human consumption, considering the GM/MH Ordinance No. 888 of May 4, 2021.

Table 2. Analysis of water samples collected from the Maracaípe river and the Piped Network. Ipojuca, Pernambuco, Brazil, 2023

ANALYZED CONTENT	QUALITATIVE RESULTS	QUANTITATIVE RESULTS
Total coliforms **(river)**	Presence in 100/mL	> 23NMP/100mL
Thermotolerant coliforms **(river)**	Presence in 100/mL	> 23NMP/100mL
*Escherichia coli (**river)***	Presence in 100/mL	> 23NMP/100mL
Total coliforms **(plumbed network)**	Presence in 100/mL	<1,1NMP/100mL
Thermotolerant coliforms **(plumbed network)**	Presence in 100/mL	<1,1NMP/100mL
Escherichia coli **(rlumbed network)**	Presence in 100/mL	<1,1NMP/100mL

NMP = most probable number.

The main water samples met the standards established by current legislation in accordance with GM/MH Ordinance No. 888 of May 4, 2021, revealing the absence of the coliform group in qualitative and quantitative analysis (Table 2).

DISCUSSION

The present study leads to a discussion on the analysis of public policies in Maracaípe, PE, especially regarding the improvement in access of shellfish gatherers to an efficient primary healthcare policy. Most of these women were young, earned low salaries, and had a low educational level. These data corroborate the literature, which shows that most shellfish gatherers started working as shellfish gatherers in childhood, had a family income of less than one minimum wage, and worked a mean of 40 hours a week without ever having a formal job. These findings corroborate our results, in which most participants were between 20 and 29 years old and started working in childhood[11,12].

Men are likely to be fishermen or boatmen in fishing communities. Historically, women

have come to be recognized as shellfish gatherers; however, they also did the art of fishing. Thus, women have to work in extracting, preparing, and selling shellfish. In addition, studies showed that shellfish gatherers have a triple workload, performing in fishing activities, domestic work, and being caregivers for children, men, and older people in their families[13,14].

This study showed that the shellfish gatherers of Maracaípe (Pernambuco) have been living in precarious sanitary conditions, with open-air garbage, no sewage system, and little instruction in hygiene measures, which are important for disease prevention. These findings corroborate the literature that evidences precarious working conditions, such as physical overload and precarious healthcare conditions for people working in inhospitable and polluted fishing areas[15].

The workloads present in the work process of shellfish gatherers involve weight overload, long working hours, unhealthy postures, and repetitive movements. They also work in contact with waters contaminated by industrial pollution, pesticides, and other agents. Understanding this work in the health-disease process and the social determinants surrounding the lives of these workers allows the understanding of the vulnerability and precarious working conditions in which they are inserted[15,16].

Water for human consumption is for ingestion, food preparation and production, and personal hygiene, regardless of its origin. Thus, this water must meet potability standards to avoid risks to human health. Among the parameters for evaluating potability, the legislation establishes the presence of total and thermotolerant coliforms(preferably *Escherichia coli*) and the count of heterotrophic bacteria[17].

The present study found that the water consumed by the shellfish gatherers presented high levels of microbiological contamination (i.e., the presence of total coliforms, fecal coliforms, and *Escherichia coli)*. However, the water distributed by the *Companhia Pernambucana de Saneamento* (COMPESA) was within the potability standards required byOrdinance 888/2021 of the Ministry of Health[10,18].

The ingestion of untreated or contaminated water may cause several diseases because of the presence of pathogenic microorganisms. According to the World Health Organization, many of these diseases cause acute diarrhea, leading to dehydration. This disease ranks ninth among causes of death worldwide and is the second leading cause of death in children under five years, resulting in 361,000 deaths per year in this age group. In addition, most acute diarrhea cases (80.00%) are the result of drinking water that is unfit for consumption[19].

The consumption of unsuitable water where the basic sanitation system is precarious or absent, and hygiene practices are scarce directly affects the lives of the population[20]. Although the analysis of COMPESA water was within parameters, the water of the Maracaípe river, where shellfish gatherers work, is also used for human consumption; therefore, its contamination can directly affect the health of the population. However, the population is not instructed on these

risks, according to the questions about local healthcare[17]. In this context, guidance on alternative methods for household water treatment (e.g., chlorination and filtration) can be provided by cleaning the reservoir periodically and adding two drops of sodium hypochlorite/L (concentration of 2.50%); the water can be ingested after 30 minutes. This simple measure is effective in reducing total bacteria, total coliforms, and thermotolerant coliforms.

Furthermore, parasites, protozoa, and bacteria are often isolated from fish, shrimp, bivalve mollusks, and crabs. Although these animals are part of the human diet, they can be pathogenic to humans[20], including the shellfish gatherers who use fishing for sale and consumption. Moratal et al.[21] identified the presence of protozoan parasites *Cryptosporidium* spp., *Giardia* duodenalis, and *Toxoplasma gondii* in aquatic environments contaminating shellfish, which presents a new potential risk of protozoan infections transmitted by the consumption of marine animals. These parasites can cause diarrhea, weight loss, and poor food absorption, and affect the liver, heart, intestines, and brain. These health consequences bring socioeconomic losses to the population.

Pena and Gomez[22] evidenced that the epidemiological data on shellfish gatherers are scarce, and their work-related diseases are underreported, making it unfeasible to conduct actions aimed at these women.

The results of this study show that these women, who depend on shellfish fishing, need more public health policies to cover this territory effectively. Therefore, the results provide support for the discussion on primary care coverage in Maracaípe, as well as managers and researchers. Full health coverage for this population is only possible with government funding that makes it possible to offer access to health comprehensively and efficiently, increase the number of teams in local primary care, and conduct the activities inherent in the health system.

CONCLUSION

The present study allows us to infer that the shellfish gatherers of Maracaípe live in precarious conditions of basic sanitation and lack healthcare services based on the needs of the community, including actions to promote, prevent, and treat parasitic diseases.

In addition, the Maracaípe river was contaminated with fecal and total coliforms and *Escherichia coli*. This result is in disagreement with the microbiological standards established by Brazilian legislation for human consumption, which may lead to the transmission of waterborne diseases and the contamination of shellfish used for consumption, directly contributing to the morbidity of this population.

CONFLICT OF INTEREST

Nothing to declare

ACKNOWLEDGMENT

To the Institutional Development and Scientific Initiation Program (PRODIIC) of the Faculdade de Medicina de Olinda.

AUTHOR CONTRIBUTIONS:

LSP: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project management, Resources, Validation, Writing - original draft. **MAL and MVA:** Conceptualization, Data curation, Investigation, Methodology, Resources, Validation, Writing - revision and editing. **KAF:** Data curation, Formal analysis, Methodology, Resources, Writing - review and editing. **AEM:** Conceptualization, Data curation, Writing - original draft, Project management, Resources, Supervision, Writing - review and editing. All authors approved the final version.

REFERENCES

1. Ministério Da Integração e do Desenvolvimento Regional (Br). Pescadores artesanais: conheça o trabalho desses profissionais que vivem da pesca e mantêm uma relação de carinho com a natureza. [Internet]. [Brasília]: Governo Federal (BR); 2022 [cited 2022 Jul 27]. Available from: https://www.gov.br/dnocs/pt-br/assuntos/noticias/pescadores-artesanais-conheca-o-trabalho-desses-profissionais-que-vivem-da-pesca-e-mantem-uma-relacao-de-carinho-com-a-natureza.
2. Jesus RS, Prost C. Importância da atividade artesanal de mariscagem para as populações nos municípios de Madre de Deus e Saubara, Bahia. Revista GEOUSP - Espaço e Tempo. 2011;15(3):123-37. doi: https://doi.org/10.11606/issn.2179-0892.geousp.2011.74236.
3. Ferreira J, Wayne L. *A* cozinha das mulheres: de espaço de domesticação ao de empoderamento a partir de saberes e fazeres culinários. Revista Espacialidades. 2018;13(1):1-25.
4. Gondim GREJ. Análise exploratória dos diferentes impactos antropogênicos nos estuários de Pernambuco. Dissertação [Mestrado em Biometria e Estatística Aplicada]. Recife: Universidade Federal Rural de Pernambuco, Recife, 2015. 108p.
5. Silva JN, Baliza MD, Freitas F, Cruz ES, Camilo VMA, Silva IMM. Genotypical characterization of thermotolerant coliforms isolated from food produced by a Solidarity Economic Venture of Bahia (Brazil). Braz J Biol. 2021; 81(1):189-194. doi: https://doi.org/10.1590/1519-6984.226833.
6. Mishra M, Arukha AP, Patel AK, Behera N, Mohanta TK, Yadav D. Multi-Drug Resistant Coliform: Water Sanitary Standards and Health Hazards. Front Pharmacol. 2018; 9(311):1-8. doi: https://doi.org/10.3389/fphar.2018.00311.
7. Rousseau A, La Carbona S, Dumètre A, Robertson LJ, Gargala G, Escotte-Binet S, et al. Assessing viability and infectivity of foodborne and waterborne stages (cysts/oocysts) of Giardia duodenalis, Cryptosporidium spp., and Toxoplasma gondii: a review of methods. Parasite.

2018;25:14. doi: https://doi.org/10.1051/parasite/2018009.

8. Fundação Oswaldo Cruz (BR). Saúde das populações vulneráveis [Internet]. [Mato Grosso do Sul]: Fiocruz; [2023?] [cited 2023 Jul 27]. Available from: https://www.matogrossodosul.fiocruz.br/areas-tematicas/saude-das-populacoes-vulneraveis.
9. Ministério da Saúde (Br). Política Nacional de Saúde Integral das Populações do Campo e da Floresta. [Internet]. [Brasília]: Ministério da Saúde (BR); 2013. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/politica_nacional_saude_populacoes_campo.pdf.
10. Ministério da Saúde (Brasil). Portaria MS/GM 2914/2011. Portaria de consolidação N° 5, de 28 de setembro de 2017: Consolidação das normas sobre as ações e os serviços de saúde do Sistema Único de Saúde. [Internet]. Brasília: Ministério da Saúde; 2017. 856 p. [cited 2017 Sep 28]. Available from: http://portalsinan.saude.gov.br/images/documentos/Legislacoes/Portaria_Consolidacao_5_28_SETEMBRO_2017.pdf.
11. Lopes IBS, Bezerra MGV, Silva LRC, Andrade NSM, Carneiro FF, Pessoa VM. Saúde das trabalhadoras da pesca artesanal: cenários desconhecidos do Sistema Único de Saúde (SUS). Rev. bras. saúde ocup. 2021;46:1-8. doi: https://doi.org/10.1590/2317-6369000028719.
12. Silva LRC, Pessoa VM, Carneiro FF, Andrade NSM, Meireles AJA. Derramamento de petróleo no litoral brasileiro: (in)visibilidade de saberes e descaso com a vida de marisqueiras. Ciênc. Saúde Colet. 2021;26(12):6027-36. doi: https://doi.org/10.1590/1413-812320212612.15172021.
13. Gago, V. A potência feminista, ou o desejo de transformar tudo. Editora Elefante; 2020.
14. Sacramento EC. Da diáspora negra ao território das águas: ancestralidade e protagonismo de mulheres na comunidade pesqueira e quilombola. [Monografia]. Conceição de Salinas-BA: Universidade de Brasília; 2019. 187 f.
15. Nascimento, AMS. A relação trabalho-saúde das marisqueiras na atividade da pesca artesanal: revisão integrativa da literatura. [Monografia]. Recife: Universidade Federal de Pernambuco; 2022. 75 f.
16. Ministério da Saúde (Brasil), Departamento de Vigilância em Saúde Ambiental e Saúde do Trabalhador (DSAST). Nota informativa Nº 5/2018-DSAST/SVS/MS de 30 de janeiro de 2018. Informa sobre as principais demandas de vigilância em saúde de trabalhadoras e trabalhadores da pesca artesanal e recomenda ações. Brasília: Ministério da Saúde; 2018. 4 p.
17. Gomes, MF. Análise microbiológica de água de torneiras residenciais no município de Serra Talhada-PE. [Monografia]. Serra Talhada: Universidade Federal Rural de Pernambuco; 2019. 49 f.
18. Organização Pan-Americana de Saúde (OPAS/OMS). OPAS/OMS participa de debates sobre água e saúde em fórum mundial. [cited 2018 mar 20]. Disponível em: https://www.paho.org/pt/noticias/20-3-2018-opasoms-participa-debates-sobre-agua-e-saude-em-forum-mundial

19. Morais MS, Moreira DAS, Santos JTLA, Oliveira AP, Salgado RL. Avaliação microbiológica de fontes de água de escolas públicas e privadas da cidade de Santa Rita (PB). Eng. sanit. ambient. 2018;23(3):431-35. doi: https://doi.org/10.1590/S1413-41522018159099.

20. Santiago JAS, Araújo PFR, Santiago AP, Carvalho FCT, Vieira RHSF. Bactérias patogênicas relacionadas à ingestão de pescados- revisão. Arquivos de Ciência do Mar. 2013;46(2):92-103.

21. Moratal S, Dea-Ayuela MA, Cardells J, Marco-Hirs NM, Puigcercós S, Lizana V, et al. Potential Risk of Three Zoonotic Protozoa (Cryptosporidium spp., Giardia duodenalis, and Toxoplasma gondii) Transmission from Fish Consumptionv. *Foods.* 2020; 9(12):1-19. doi: https://doi.org/10.3390/foods9121913.

22. Pena PGL, Gomez CM. Saúde dos pescadores artesanais e desafios para a Vigilância em Saúde do Trabalhador. Ciênc. Saúde Colet. 2014;19(12):4689-98. doi: https://doi.org/10.1590/1413-812320141912.13162014.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Case Report

Vulvar lesion is not always a Sexually Transmitted Infection: report of a case of vulvar hidradenoma papilliferum

Úlcera vulvar, nem sempre uma Infecção Sexualmente Transmissível: relato de um caso de hidroadenoma papilífero vulvar

Fernando Augusto Pacífico[1] Luciana Maria Queiroz de Oliveira Borges[1]
Ismael Felipe Gonçalves Galvão[1] Joanna Pimentel de Vasconcelos[1]
Ana Cláudia Pimentel de Vasconcelos[2] Angelina Farias Maia[3]
Petrus Augusto Dornelas Câmara[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.
[2] Hospital da Polícia Militar de Pernambuco. Recife, Pernambuco, Brazil.
[3] Hospital das Clínicas. Universidade Federal de Pernambuco. Recife, Pernambuco, Brazil.

Abstract

Vulvar hidradenoma papilliferum is a benign and rare cutaneous cancer of the apocrine sweat glands that commonly appears in the anogenital region of women of reproductive age between 25 and 40 years old. Its diagnosis may be difficult, sometimes being confused with Bartholin's gland cysts, Fordyce's angiokeratomas, and vulvar endometriosis, among other malignant vulvar lesions. Thus, the present study aimed to report the clinical picture, diagnosis, and treatment of a case of vulvar HP, highlighting the importance of differential diagnosis in vulvar lesions.

Keywords: Vulva diseases; Sexually Transmitted Infections; Ulcer

Corresponding author:
Fernando Augusto Pacífico.
E-mail: fapacifico@outlook.com
Funding: None
Research Ethics Committee: nº 6.036.993
Received: 04/08/2023
Approved: 05/03/2024

How to cite: Pacífico **AP**, Borges **LMQO**, Galvão **IFG**, Vasconcelos **JP**, Vasconcelos **ACP**, Maia **AF**, et al. Vulvar lesion is not always a sexually transmitted infection: report of a case of vulvar hidradenoma papilliferum. An Fac Med Olinda 2024; 1(11):89 doi: https://doi.org/10.56102/afmo.2024.314

Resumo

O hidradenoma papilífero vulvar é uma neoplasia cutânea benigna e rara das glândulas sudoríparas apócrinas que comumente surge na região anogenital de mulheres em idade reprodutiva, entre 25 e 40 anos. Seu diagnóstico clínico pode ser difícil, sendo às vezes confundido com cistos da glândula de *Bartholin*, angioqueratomas de *Fordyce*, endometriose vulvar, dentre outras lesões vulvares malignas. O presente estudo relatou o quadro clínico, diagnóstico e tratamento de um caso de hidradenoma papilífero vulvar em paciente de 47 anos do sexo feminino. Nesse quadro, notou-se a importância dessa lesão como diagnóstico diferencial nas úlceras genitais crônicas.

Palavras-chave: Doenças da vulva; Infecções Sexualmente Transmissíveis; Úlcera.

INTRODUCTION

Several diseases can cause vulvar lesions, including classic sexually transmitted infections, such as primary syphilis, lymphogranuloma venereum, donovanosis, and chancroid, as well as genital herpes simplex. Other diseases that may be sexually transmitted are American cutaneous leishmaniasis and cutaneous tuberculosis. Traumatic erosions and cancers should also be considered as differential diagnoses[1-3].

Vulvar hidradenoma papilliferum (HP) is a benign and rare cutaneous cancer of the apocrine sweat glands. It commonly appears in the anogenital region of women of reproductive-age between 25 and 40 years old[4,5], mostly in white people[6,7]. The vulvar HP is often located on the labia majora of the vulva, followed by the labia minora[4,5,8,9], and it is histologically characterized by the presence of a cystic cavity with papillae lined by apocrine secretory epithelium[4,8].

Clinically, vulvar HP appears as a single, slow-growing lesion that is nodular, firm, well-defined, and has a color similar to the surrounding skin. This disease is mostly asymptomatic; however, somes cases may present itching, pain, bleeding, or ulceration[5-8]. Furthermore, symptoms may be exacerbated during menstruation due to the presence of estrogen and progesterone receptors on tumor cells[4,6].

Clinical diagnosis may be difficult, sometimes confused with Bartholin's, *Fordyce's angiokeratomas*, and vulvar endometriosis, among other malignant vulvar lesions[4,9].

Considering the rarity of this lesion, the present study aimed to report the clinical picture, diagnosis, and treatment of a case of vulvar HP, highlighting the importance of differential diagnosis in vulvar lesions.

CASE REPORT

Patient, 47 years old, female, discovered an asymptomatic vulvar lesion about three months ago during her session of pelvic physiotherapy. She went to a gynecologist, who suspected a syphilitic lesion. Since syphilis is considered a sexually transmitted infection, this suspicion made her embarrassed, impaired her psyche, and created difficulties in her marital relationship. Despite the negative serology, the gynecologist advised her to do dark-field research using material collected by scraping and insisted on repeating the tests. The former test caused great discomfort in the patients.

The patient reached a colposcopist friend, who performed a colposcopy and suggested excision of the lesion, an approach also adopted by the dermatologist who participated in the case. However, the gynecologist had an opposite opinion and suggested an incisional biopsy associated with curettage due to abnormal uterine bleeding. The colposcopist referred her to the Colposcopy and Lower Genital Tract Sector of the Clinics Hospital of UFPE, where the sector coordinator also recommended excising the lesion.

The patient had healthy habits (e.g., cycling and swimming), reported having hypercholesterolemia, and had COVID. She denied dyspareunia and sinusorrhagia and reported decreased libido for two years. She used oral hormonal contraceptives for about five years, menarche at age 12, and cycles 5 to 6 for 30 days. She also denied dysmenorrhea, smoking, and alcohol consumption, and adhered to a vegan diet. The patient reported an aunt with breast cancer, a grandfather with rectal cancer, a father with leukemia, type 2 diabetes, and heart disease, and a great-grandmother with breast cancer.

Physical examination reported a eutrophic, closed vulva and gynecoid hairiness. A single 2.5 cm diameter lesion was detected on the inner surface of the labrum majora and right interlabial groove, presenting a clean bottom and regular edges without atypical vascularization. The lesion was excised using an elliptical excision with a safety margin to ensure free margins (Figure 1), respecting the aesthetic. Infiltration was performed using local anesthetic, strict hemostasis, and suturing with tiny gauge threads. The review conducted seven days later showed an excellent state of healing.

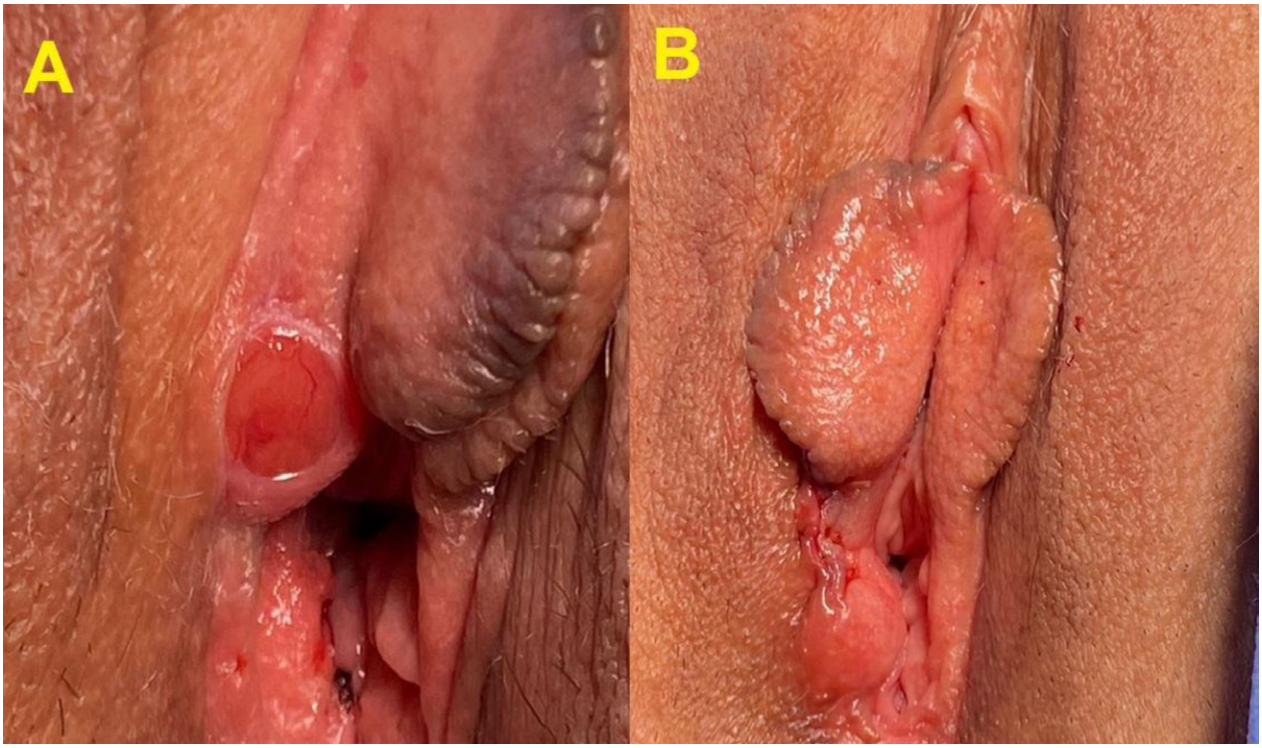


Figure 1. Vulvar hidradenoma papilliferum. **A:** Pre-surgical appearance of the vulva: a single lesion measuring 2.5 cm in diameter, with a clean bottom and regular edges without atypical vascularization, located on the inner surface of the labia majora and the right interlabial groove. **B:** Post-surgical appearance of the vulva: after excision of the lesion using elliptical excision with a safety margin to ensure free margins.

A histopathological study described the material macroscopically as an irregular tissue fragment measuring 2.5 x 1.2 x 1.0 cm, with an elastic consistency and brownish color. The compact cutting surface was the same color. Under microscopy, the proliferation of elongated, branching tubules covered by typical columnar cells with apocrine secretory activity formed the nodular skin lesion. The anatomopathological diagnosis was vulvar HP (Figure 2).

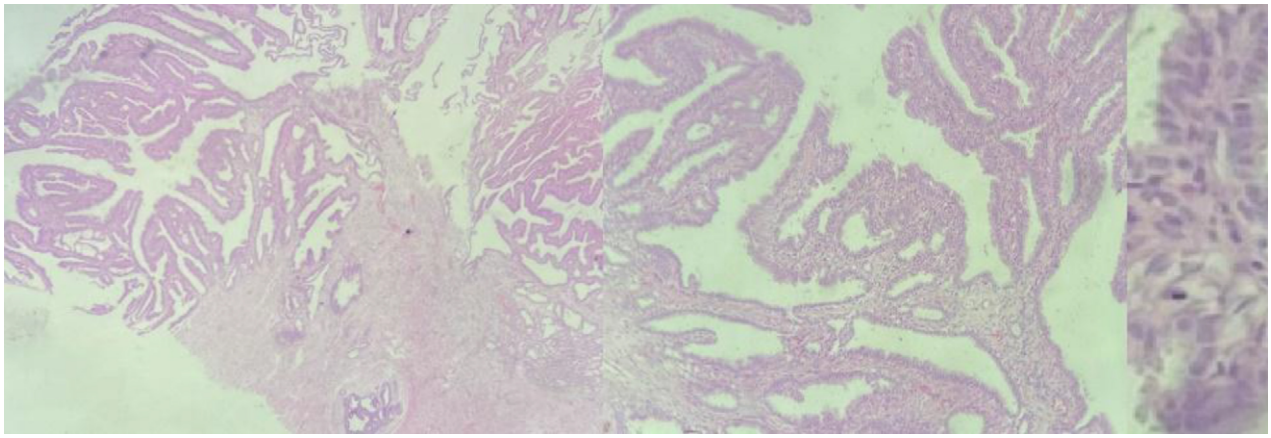


Figure 2. Vulvar hidradenoma papilliferum. **A:** In the lower magnification image, a cancer with adenomatous hyperplasia, with the presence of glands exhibiting papillary projections, can be observed. **B:** At a higher magnification, besides the papillae with supporting vascular fibro conjunctive axis glandular areas, some of which have a cystic appearance can be observed. **C:** At greater magnification, the linings of the papillae and glands are composed of two layers of cells (double-layered lining), the innermost composed of tall columnar secretory cells, with eosinophilic cytoplasm, with small nuclei and round, with apocrine differentiation, and a more superficial layer of squamous myoepithelial cells. Both cells do not present atypia and mitotic figures, characterizing a benign cancer.

DISCUSSION

The present report of chronic vulvar lesions would include the most frequent diagnosis: primary syphilis, chancroid, and donovanosis, requiring detailed diagnostic investigation, which includes possible HIV associations.

This investigation can be conducted using serological tests for syphilis and HIV, as well as a biopsy of the lesion[1]. This case had syphilis as the initial suspicion; however, all serological tests were negative. Despite the results, the patient was advised to do dark-field research, requiring collecting material by scraping and retesting. Vulvar cancers should also be considered a differential diagnosis of lesions in the vulvar region.

A histopathological study of the vulvar region identified glands that resemble breast tissue, called anogenital mammary glands (AMG). Although they have similarities with eccrine and apocrine glands, AMG differs due to the epithelium type and the presence of estrogen and progesterone receptors. The expression of these receptors explains why HP is reported only after puberty and the preference for females. Several lesions in the genital region are considered derived from AMG, including vulvar HP[4-6].

Vulvar HP is a benign cutaneous cancer that originates in the apocrine sweat glands and generally affects women of reproductive age, as seen in the case discussed. Although HP is asymptomatic, the disease may be associated with itching, burning, pain, or bleeding[4-6].

The differential diagnosis includes the evaluation of conditions, such as apocrine tubular adenoma, bartholinitis, syringocystadenoma papillary, pyogenic granuloma, vestibular mucous cyst, vulvar endometriosis, Fordyce angiokeratoma, apocrine hydrocystoma, and fibroadenoma[4-6]. The definitive diagnosis of vulvar lesions always uses anatomopathological analysis. Therefore, any unknown lesion on the vulva should undergo a biopsy, as conducted in this report. The vulvar biopsy must use Keyes dermatological punch to reach deep into the subcutaneous tissue and obtain an adequate sample. The biopsy can be incisional or excisional, depending on the need to remove the entire lesion[4-6].

The proper way to treat vulvar HP is with a complete local excision of the tumor, which is usually curative. This report excised the lesion via elliptical excision with a safety margin. A risk of recurrence exists if the lesion is not completely removed. The prognosis is excellent, and the evolution of patient is good; however, the possibility of malignancy should be considered. Thus, a follow-up is advised after surgery to check for infections related to vulvar HP in sexually active women[4-6].

Last, vulvar HP as a differential diagnosis in chronic genital lesions is important as it requires adequate diagnostic investigation to establish the correct treatment, obtain a cure, and avoid unneeded psychological discomfort for the patient.

CONFLICT OF INTERESTS

Nothing to declare

AUTHOR CONTRIBUTIONS

FAP: research preparation, schedule preparation, literature survey, data collection and analysis, writing the article, correction the writing of the article, approval of the final version, and article submission and procedures ; **LMQOB**: histopathological analysis, writing the article, correction of the writing of the article, and approval of the final version; **IFGG**: collaborating researcher, writing the article, editing the article and approving the final version; **JPV**: writing the article, correcting the article and approving the final version; **ACPV**: writing the article, correcting the writing of the article and approving the final version; **AFM**: correcting the writing of the article and approval of the final version; **PADC**: correcting the writing of the article and approval of the final version.

REFERENCES

1. Roett MA. Genital ulcers: differential diagnosis and management. Am Fam Physician. 2020 Mar 15;101(6):355-361. PMID: 32163252.
2. Workowski KA, Bachmann LH, Chan PA, Johnston CM, Muzny CA, Park I, Reno H, Zenilman JM, Bolan GA. Sexually transmitted infections treatment guidelines, 2021. MMWR Recomm Rep. 2021 Jul 23;70(4):1-187. http://doi.org/10.15585/mmwr.rr7004a1. PMID: 34292926. PMCID: PMC8344968.
3. Ahmed J, Rawre J, Dhawan N, Dudani P, Khanna N, Dhawan B. Genital ulcer disease: A review. J Family Med Prim Care. 2022 Aug;11(8):4255-4262. http://doi.org/10.4103/jfmpc.jfmpc_2111_21. PMID: 36352984; PMCID: PMC9638565.
4. Villatoro AR, et al. Hidroadenoma papilífero de vulva, a propósito de una serie de casos. Progresos de obstetricia y ginecología: revista oficial de la Sociedad Española de Ginecología y Obstetricia. 2022, 65(5): 187-190.
5. Ávila DM, et al. Hidradenoma papilífero vulvar. Anales Médicos de la Asociación Médica del Centro Médico ABC, 2015, 60(2): 125-128.
6. Romero ASJ, Torres E, Espinosa JDE. Hidradenoma papilífero de la vulva: reporte de caso. Dermatología Cosmética, Médica y Quirúrgica. 2021, 19(2): 138-141.
7. Delgadillo AA et al. Hidradenoma papilífero vulvar. Presentación de un caso y revisión de la bibliografía. Dermatología Cosmética, Médica y Quirúrgica. 2021, 19(2): 160-163.
8. Vázquez-Velo JA, Terán ARL, Vega-Memije ME. Hidradenoma papilífero. Reporte de dos casos y revisión de la bibliografía. Ginecología y Obstetricia de México. 2013, 81(7).
9. Saunders NA, Welch KC, Haefner HK, Rasmussen C, Margesson L. Vulvar ulcers: an algorithm to assist with diagnosis and treatment. J Low Genit Tract Dis. 2023 Oct 30. http://doi.org/10.1097/LGT.0000000000000776. PMID: 37906578.

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Experience Report

Educational actions for prevention and control of tuberculosis: an experience report

Ações educativas para prevenção e controle da tuberculose: um relato de experiência

Flávia Souza Rosa Brandão[1] Cynthia Galvão Inácio[1]
Eduarda Lima de Amorim Gomes[1] Francisco Gustavo Carneiro Medeiros[1]
Suellen Pâmala Salgueiro de Aquino[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Abstract

Tuberculosis is an infectious disease transmitted by the bacterium *Mycobacterium tuberculosis,* which mainly affects the lungs. This study reports the experience of medical students in developing and implementing actions to prevent and control tuberculosis in partnership with the School Health Program. This experience enabled students to understand the problems caused by the increased number of cases of tuberculosis in the community, essential to implement health education actions to prevent and control this disease. In this sense, students realized the importance of coordination between health teams and schools in the territory covered by basic health units to strengthen the fight against social vulnerabilities.

Keywords: Primary health care; Health education; Health promotion; Tuberculosis.

Corresponding author:
Flávia Souza Rosa Brandão.
E-mail: fsrbrandao@hotmail.com
Funding: None.
Ethics approval: Not applicable
Received: 11/22/2023
Approved: 02/21/2024

How to cite: Brandão **FSR**, Inácio **CG**, Gomes **ELA**, Medeiros **FGC**, Aquino **SPS**. Educational actions for prevention and control of tuberculosis: an experience report. An Fac Med Olinda 2024; 1(11):96 doi: https://doi.org/10.56102/afmo.2024.332

Resumo

A tuberculose é uma doença infecciosa transmitida pela bactéria *Mycobacterium tuberculosis*, que acomete principalmente os pulmões. O estudo relata a experiência de estudantes de medicina na elaboração e execução de ações para prevenção e controle da tuberculose em parceria com o Programa Saúde na Escola. Essa vivência possibilitou aos estudantes a compreensão dos problemas ocasionados pelo aumento dos casos de tuberculose na comunidade, sendo imprescindível a realização de ações de educação em saúde com medidas de prevenção e controle dessa patologia. Dessa forma, os estudantes perceberam a importância da articulação entre equipes de saúde e escolas do território de abrangência das Unidades Básicas de Saúde, a fim de fortalecer o enfrentamento das vulnerabilidades sociais.

Palavras-chaves: Atenção Primária à Saúde; Educação em saúde; Promoção da saúde; Tuberculose.

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*, also known as Koch's bacillus. This disease affects mainly the lungs, but also involves other organs and systems. The extrapulmonary form of TB is frequent in people with HIV, especially those with compromised immune systems[1]. In 2020, TB affected an average of 9.9 million people worldwide, resulting in 1.3 million deaths among those without HIV infection. Until 2019, TB was the leading cause of death from a single infectious agent, but it was surpassed by COVID-19 in 2020[2].

In Brazil, the diagnosis of TB is conducted according to the Guidelines for TB Control and subdivided into clinical, differential, bacteriological, imaging, histopathological, and other diagnostic tests. Laboratory diagnosis of TB is essential for detecting new cases and treatment control. Therefore, clinical evaluation is also important for TB diagnosis, while chest X-rays are recommended as complementary diagnosis[3].

In this context, according to TABNET/DATASUS data[4,5], Olinda is the fifth most representative municipality in Pernambuco according to the number of cases of TB over the past 10 years. This indicates that the disease prevalence in the area is high and that many basic health units (BHU) face difficulties in controlling the emergence and spread of the infection.

This situation aligns with studies that demonstrated a slow decline of cases of TB and its variation according to the human development index, sociocultural aspects, political structure, organization of health services, and the continuity of National Tuberculosis Control Programs. Studies also indicated that the northeast region presented one of the highest infection and mortality rates from the disease despite the greater primary health care (PHC)[6] coverage.

Besides individual care, PHC must develop community strategies integrated with health surveillance actions. This collaboration helps health professionals recognize the particularities of the territory, the determinants and conditions of individual and collective health, health risk situations, and the local context of the areas covered by family health and primary care teams to improve their effectiveness in combating and controlling TB[2].

Considering the diverse work processes and life contexts of populations at higher risk of illness within each territory, it is essential to direct actions that contribute to the planning of strategies for health promotion, protection, prevention, and control of risks, harms, and diseases. These strategies can be implemented in partnership with the School Health Program (SHP)[2,7].

The SHP aims to permanently integrate and coordinate education and health to improve the quality of life for the Brazilian population. This program also contributes to student development via actions of health promotion, prevention, and care; thus, addressing the vulnerabilities that compromise the development of children and adolescents in the public education system[7].

The guidelines that lead this program especially aim for social control, integration and coordination of health and public education systems, interdisciplinarity, and intersectorality. This is achieved by integrating knowledge and social participation and expanding actions and knowledge exchange between different professions, aiming at a comprehensive health care for children[7,8].

In this context and based on local epidemiological data, the need for coordination between family health teams and schools within the BHU territory is evident. Based on this proposal, the use of new teaching and learning tools may facilitate addressing health vulnerabilities, enabling school development, respecting local realities, and improving the autonomy of children, parents, the school community, and society[8,9].

Therefore, the monitoring and follow-up of cases of TB are part of PHC actions, which, along with the detection of the disease, diagnosis, and treatment, constitute part of the comprehensive and longitudinal care for people with TB and their families. This study aimed to describe the experience of medical students in developing and implementing TB prevention actions in partnership with the SHP.

METHODS

This descriptive and narrative study was conducted according to the problem-based methodology and using the five stages represented in the Maguerez Arch[10]. This methodology allowed students to develop activities according to the reality in which they were inserted, providing the planning of interventions to minimize the problem.

The activities were proposed during theoretical-practical sessions at a BHU in a municipality of the metropolitan region of Recife, Pernambuco. During this experience, students identified increased cases of TB within the BHU territory.

After monitoring and recognizing the notified cases of TB, students had the opportunity to plan activities to be developed in collaboration with the family health teams. During the planning phase, interventions were conducted in partnership with the SHP, involving the municipal school located within the BHU territory, as some children had been diagnosed with TB. The actions were conducted at an elementary school with an average of 100 children.

EXPERIENCE REPORT

The experience at the BHU allowed students to understand the problems caused by the increase in cases of TB and the presence of cases among children enrolled in the school located within the BHU territory.

Therefore, meetings were held between the health team, students, and school professionals to plan actions focused on this topic and establish a partnership with the SHP.

The main idea was to provide health education actions for children, school professionals, parents, and guardians using self-explanatory materials and activities involving TB prevention and control measures.

Activities were conducted in groups using interactive presentations on the topic (banners and leaflets prepared by the students) that covered signs and symptoms, prevention measures, and disease control. One strategy used with children was the demonstration of the correct handwashing technique. Afterward, children had the opportunity to practice with guidance and assistance of students.

Considering that handwashing is a simple preventive measure against various infectious diseases, children should be encouraged to practice it as a strategy for disease prevention and health promotion[11,12].

The school is a space for learning, knowledge construction, and personal growth that has an important role in promoting health education. Health promotion in schools involves not only children but also professionals and the community[11,12].

FINAL CONSIDERATIONS

Implementing actions for TB prevention via SHP was important for the community assisted by the BHU. These actions allowed the dissemination of important information about TB prevention and control measures, directly contributing to reducing new cases.

Therefore, students experienced the importance of coordination between health teams and schools within the BHU territory, considering that the proposed actions should be based on a participatory pedagogical practice with a transformative health education approach, which facilitates addressing social vulnerabilities.

CONFLICT OF INTEREST

Nothing to declare.

AUTHOR CONTRIBUTION

FSRB: Conceptualization; Methodology; Resources; Supervision; Validation; Visualization; Writing – original draft and Writing – review and editing. **ELAG, SPSA, and FGCM:** Resources; Visualization. **CGI:** Conceptualization; Methodology; Resources; Visualization; Writing – original draft and Writing – review and editing.

REFERENCES

1. Yoshimura FK, Borstel GCCV, Zaura C, Marcelino VMR, Garcia ICM, Nunes PLP, Ceranto D de CFB. Tuberculose: revisão de literatura/ Tuberculosis: a review of the literature. Braz. J. Hea. Rev. [Internet]. 2021;4(3). Available from: https://ojs.brazilianjournals.com.br/ojs/index.php/BJHR/article/view/32080.
2. Secretaria de Saúde do Estado de Porto Alegre. Guia Tuberculose na Atenção Primária à Saúde (APS). Versão Novembro, Porto Alegre; 2022. Disponível em: https://www.cevs.rs.gov.br/upload/arquivos/202211/24113735-guia-tuberculose-versao-final-nov-2022-1.pdf.
3. World Health organization (WHO). Global tuberculosis report 2021. Geneva: WHO, 2021. Disponível em: https://www.who.int/publications/i/item/9789240037021.
4. Ministério da Saúde; Secretaria de Vigilância em Saúde; Departamento de Vigilância das Doenças Transmissíveis. Manual de recomendações para o controle da tuberculose no Brasil. Brasília: Ministério da Saúde, 2019. P.364. Disponível em: https://sbpt.org.br/portal/wp-content/uploads/2019/06/manual_recomendacoes_tb_2ed_atualizada_8maio19.pdf.
5 Secretaria de Saúde do Estado de Pernambuco. Cadernos de Informações em Saúde de Pernambuco, 2021. [Internet]. Recife: Secretaria de Saúde do Estado de Pernambuco; c2021. Brasil. Disponível em: https://portal.saude.pe.gov.br/aplicativo/secretaria/cadernos-de-informacoes-em-saude.
6. Ministério da Saúde. Banco de dados do Sistema único de Saúde – DATASUS. Brasil. Disponível em: https://datasus.saude.gov.br/informacoes-de-saude-tabnet/
7. Cortez AO, Melo AC de, Neves L de O, Resende KA, Camargos P. Tuberculosis in Brazil: one country, multiple realities. J bras pneumol [Internet]. 2021; v.47(2). DOI: https://doi.org/10.36416/1806-3756/e20200119.
8. Brasil. Decreto nº 6.286, de 5 de dezembro de 2007. Institui o Programa Saúde na Escola - PSE e dá outras providências. Diário Oficial da União, 5 Dez 2007; Seção 1.
9. Sales LV, Almeida SB. Intersetorialidade na promoção da saúde escolar: um estudo do Programa Saúde na Escola. Saúde em Debate [Internet]. 2018, v. 42, n. spe4, pp. 120-133.

DOI: https://doi.org/10.1590/0103-11042018S409.

10. Villardi ML, Cyrino EG, Berbel NAN. A problematização em educação em Saúde: percepções dos professores tutores e alunos. [recurso eletrônico]. 1.ed. – São Paulo: Cultura Acadêmica, 2015. Disponível em: http://objdigital.bn.br/acervo_digital/livros_eletronicos/unesp/bndigital0178.pdf

11. Bitencort AC, Dostatni AM, Almeida AS, et al. Promovendo educação em saúde: Da lavagem das mãos à prevenção de doenças transmissíveis. Portal institucional UFPEL [Internet]. 2021. Disponível: https://institucional.ufpel.edu.br/projetos/id/u513.

12. Santos GR, Nichetti BT, Shimada MK, Cunha P, Wolff F de M, Reifur L. A promoção da saúde através do ensino da lavagem das mãos em escola pública de Araucária, no Paraná. Extensão em foco [Internet]. 2021. DOI: http://dx.doi.org/10.5380/ef.v0i22.71773

Anais da Faculdade de Medicina de Olinda
Annals of Olinda Medical School

afmo.emnuvens.com.br ISSN: 2674-8487 Critical Review

Critical Review

By:
Mário Cruz Couto[1] Fernando Augusto Pacífico[1]

[1] Faculdade de Medicina de Olinda. Olinda, Pernambuco, Brazil.

Arantes ACQ. Pra vida toda valer a pena viver: pequeno manual para envelhecer com alegria. 1st ed. Rio de Janeiro: Sextante; 2021.

Have you ever stopped to reflect on how you are preparing your luggage for the presumed journey of old age? Long journeys require systematization, as does our uncertain and probable future as human beings. The book *Pra Vida Toda Valer a Pena Viver* leads us to reflect on what we have put in our suitcases to use during what could be our only and last journey: old age.

Dr. Ana Cláudia de Lima Quintana Arantes is a doctor who graduated from the University of São Paulo (USP) in 1993 and has a Residency in Geriatrics at the Hospital das Clínicas of the Faculty of Medicine of USP (1997). She has a Postgraduate degree in Psychology – Grief Interventions from the *4 Estações Instituto de Psicologia* and a specialization in palliative care from the University of Oxford and the Pallium Institute (2008). In addition, she is a founding member of the *Casa do Cuidar - Prática e Ensino em Cuidados Paliativos*, where she coordinates training courses in palliative care. As a writer, she has released books, such as *A Morte é Um Dia Que Vale a Pena Viver* (2016), *Histórias Lindas de Morrer* (2020), and *Pra Vida Toda Valer a Pena Viver* (2021), among others. Since 2015, she has taught classes, lectures, and workshops on aging, compassionate communication, and conversations about death.

Pra Vida Toda Valer a Pena Viver is divided into nine parts that present different segments, such as embracing aging, mourning, losses, family relationships, and death. The metaphor of the Sahara desert

Corresponding author:
Fernando Augusto Pacífico.
E-mail: fapacifico@outlook.com
Funding: Not applicable.
Research Ethics Committee (CAAE): Not applicable.
Received: 08/17/2023
Approved: 04/10/2024

guides the discourse of the book: an analogy created by the author to symbolize our old age. In this allegory, the author and the reader conduct the following imagery exercise: initially, they assume that they are 40 years old and that they will definitively move to the Sahara in 30 years, and the only way not to embark on this journey is to die before the stipulated deadline. When the day of the expected trip arrives, both embark on their destination. A few hours after disembarking in the desert, several difficulties are experienced by various complaints, such as unbearable morning heat and nighttime cold, thirst, winds, sandstorms, and sunstroke. The reader may even want or think about going back, realizing that living like this until their last breath will make this journey very painful. However, as previously agreed, the trip does not have a return ticket, forcing travelers to deal with all the difficulties imposed by the desert.

From this perspective, Dr. Ana Cláudia explains to readers that the trip to the desert must be pragmatically organized, bearing in mind that we, readers and future travelers, must use the decades of preparation to pack our bags and take the needed luggage to live with our old age. Using experiences, narratives, paraphrases, and studies, she manages to impact her readers on the importance of health promotion and care in line with the social and family support network as a way of guaranteeing, or at least slowing down, an aging experience with sufficient physical and emotional health for the stay in the desert. The author skillfully uses accessible and, at the same time, striking rhetoric to evidence the multiple possibilities of aging.

If we do not die in a way that does not respect the life expectancy stipulated in our country (76.2 years [IBGE 2023]), we will certainly grow old. Considering this information, how can we not prepare for this occasion? For Ana Cláudia, it is unacceptable to arrive in the desert without sunscreen, clothing, food, water, and equipment. The hardships that old age has the potential to bring do not care about social class or race; therefore, difficult times await you if you lack planning. In this way, the author proposes some pillars to start building a good, happy old age full of desire and courage to live. According to her, old age is a process that has the potential to limit physical health and involves losses of people, movement, and freedoms. Thus, active participation in the process and decisions is needed, as well as avoiding behaving passively and waiting to be a victim of time.

In this sense, embracing aging, taking care of the body and mind, polishing relationships, learning to lose, living with grief, cultivating good memories, recognizing and treating pain, finding meaning in existence, and making peace with the time of dying after getting older are chapters that Ana Cláudia brings together “to raise awareness about the finiteness of life so that all people have the right to a dignified death” and tries to “shed light on the happy period”, making it possible to enjoy existence, not just survive. Despite everything, she brings hope of a phase of life full of encouragement, with perspectives and big and small happiness. All of this is possible as long as we start our preparation now without wasting a single minute. *Pra Vida Toda Valer a Pena Viver* brings, besides the daily guidelines, such as regular physical exercise and good nutrition, the

value of our long-term relationships, strengthening bonds, and memory exercises, among other activities that help us overcome illnesses of the body, mind, and soul.

The book is full of important reflections that expand the mentality about aging, a topic that is relegated, sometimes even untouched, by a considerable portion of the population. The ideas and insights that appear can be applied to different audiences, regardless of age group. Therefore, it is possible, plausible, and needed to build old age from youth without denying the transformations inherent to aging and fruits of time without giving up well-being and joy, with independence and vitality, even with the experiences of losses, whatever they may be because life is worth living after all.

Despite not being a strictly theoretical book, *Pra Vida Toda Valer a Pena Viver: Pequeno Manual para Envelhecer com Alegria* offers excellent practical and reflective contributions on aging. Ana Cláudia de Lima Quintana Arantes, with her professional background in geriatrics and palliative care, presents valuable perspectives and advice, making the work an enriching source for those seeking concrete and meaningful guidance for the journey of old age.