Analysis of inequalities in access to healthcare in North-east Portugal

Análise das desigualdades no acesso aos cuidados de saúde no nordeste de Portugal

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Keywords
Mental health; Schizophrenia; Geographical barriers; Public health; Health systems.

Abstract

Introduction: *Healthcare accessibility stands as a multifaceted challenge, intricately woven with factors ranging from geographical location to economic status. Mental health, an indispensable aspect of overall well-being, is particularly susceptible to the inadequacies pervasive within global healthcare systems. Against this backdrop, schizophrenia emerges as a poignant example of the profound challenges faced by individuals navigating mental health disorders within healthcare systems. In the context of Portugal, while strides have been made in recognizing healthcare equity as a fundamental right, persistent regional disparities persist, underscoring the imperative for a coordinated effort to bridge these gaps. The interplay between geographical barriers and healthcare accessibility manifests as a critical determinant of health outcomes, particularly poignant in rural and remote communities where access to specialized care remains elusive.*

Objective: *This article aimed to analyse the characteristics of the schizophrenia spectrum disorder population in the Bragança district and the disparities in their healthcare access.*

Methods: *A cross-sectional, descriptive study was conducted on a sample of 274 patients provided by the Mental Health Department at the Unidade Local de Saúde Nordeste (ULSNE – Northeast Local Healthcare Unit), for sociodemographic characterization. The data were retrieved from the hospital's database. The study was approved by the Ethics Committee of the Polytechnic Institute of Bragança.*

Results: *The research enrolled 274 individuals diagnosed with schizophrenia, predominantly male (65.7%), with most falling within the 40-49 and 50-59 age brackets. Hospitalization frequency averaged 4.73 ± 6.74 instances, with men exhibiting higher rates. A significant correlation was found between medical monitoring and hospitalization frequency, particularly among patients with follow-up. Moreover, a notable discrepancy in healthcare accessibility was identified across municipalities, necessitating considerable patient travel for psychiatric consultations.*

Conclusion: *The case study examined the challenges faced by patients diagnosed with schizophrenia spectrum disorders in the Bragança district. These findings highlight the urgent need for improvements in the existing healthcare infrastructure, including the expansion of medical services in underserved areas and the implementation of innovative solutions such as telemedicine.*

Palavras-chave
Saúde mental; Esquizofrenia; Barreiras geográficas; Saúde pública, Sistemas de saúde.

Resumo

Introdução: A acessibilidade aos cuidados de saúde é um desafio multifacetado, intrinsecamente ligado a fatores que vão desde a localização geográfica ao estatuto económico. A saúde mental, uma faceta indispensável do bem-estar geral, é particularmente suscetível às insuficiências dos sistemas de saúde mundiais. Neste contexto, a esquizofrenia surge como um exemplo pungente dos profundos desafios enfrentados pelos indivíduos que lidam com perturbações de saúde mental nos sistemas de saúde. No contexto de Portugal, embora tenham sido feitos progressos no reconhecimento da equidade nos cuidados de saúde como um direito fundamental, persistem disparidades regionais, sublinhando a necessidade imperativa de um esforço coordenado para colmatar estas lacunas. A interação entre as barreiras geográficas e a acessibilidade aos cuidados de saúde manifesta-se como um determinante crítico dos resultados de saúde, particularmente pungente nas comunidades rurais e remotas onde o acesso a cuidados especializados continua a ser difícil.
Objetivo: Este artigo teve como objetivo analisar as características da população com perturbações do espectro da esquizofrenia no distrito de Bragança e as disparidades no acesso aos cuidados de saúde.
Métodos: Foi realizado um estudo transversal, descritivo, numa amostra de 274 utentes do Departamento de Saúde Mental da Unidade Local de Saúde Nordeste (ULSNE), para caraterização sociodemográfica. Os dados foram retirados da base de dados do hospital. O estudo foi aprovado pela Comissão de Ética do Instituto Politécnico de Bragança.
Resultados: A investigação envolveu 274 indivíduos com diagnóstico de esquizofrenia, predominantemente do sexo masculino (65,7%), com a maioria a situar-se nos escalões etários dos 40-49 e 50-59 anos. A frequência de internamentos foi em média de 4,73 ± 6,74 vezes, sendo que os homens apresentaram taxas mais elevadas. Verificou-se uma correlação significativa entre o acompanhamento médico e a frequência de internamentos, sobretudo entre os doentes que têm acompanhamento. Além disso, foi identificada uma discrepância notável na acessibilidade aos cuidados de saúde entre os municípios, o que obriga a deslocações consideráveis dos doentes para consultas de psiquiatria.
Conclusão: No estudo de caso, foram examinados os desafios enfrentados por pacientes diagnosticados com transtornos do espectro da esquizofrenia no distrito de Bragança. Esses achados destacam a necessidade urgente de melhorias na infraestrutura de saúde, incluindo a expansão dos serviços médicos em áreas desatendidas e a implementação de soluções inovadoras, como a telemedicina.

Introduction

Healthcare accessibility is a multidimensional and complex concern.[1] According to its etymology, access is described as the act of approaching, reaching, or entering a place, as well as the right or opportunity to reach, use, or visit.[2] However, divergences and difficulties in defining healthcare access stem from the differing opinions.[1, 3] Some authors agree that access to healthcare is influenced by supply factors such as location, availability, cost, and appropriateness of services, as well as demand factors like disease burden and people's knowledge, attitudes, and self-care practices.[1, 3]

Mental health is a fundamental component of individual well-being.[4] Global healthcare systems, as well as overall mental healthcare systems, are deemed inadequate.[4] Innovative methodologies like patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs) are used to assess effectiveness from the patient's perspective.[5] The data collected aim to inform strategic decisions about health policies and ensure the quality and safety of healthcare provision.[6]

Schizophrenia is considered one of the most severe psychiatric diseases.[7] The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines schizophrenia spectrum disorders as schizophrenia, schizophreniform disorder, brief psychotic illness, schizoaffective disorder, and delusional disorder.[8] This illness is characterized by positive and negative symptoms.[9] Positive symptoms include delusions, hallucinations, and disorganized behaviour, while negative symptoms include a reduction or absence of normal behaviours such as avolition, anhedonia, or expressiveness like dulled affect and alogia.[9] People living with schizophrenia spectrum disorders usually experience worse physical health, greater social and economic disadvantage, lower life expectancy and higher mortality rates, mainly due to chronic diseases.[10, 11]

Beyond existing inequalities, in March 2020, the World Health Organization (WHO) proclaimed COVID-19 a global pandemic.[12] To control the pandemic, various measures such as lockdowns, stay-at-home orders and restrictions on movement were implemented.[13] Several governments redirected attention from non-COVID-19 care, leading to reduced access to healthcare for other diseases during this period.[13, 14] These strategies can affect patients diagnosed with schizophrenia, worsening medication adherence and vulnerability.[15] Rehabilitation programs and monitoring activities lack information.

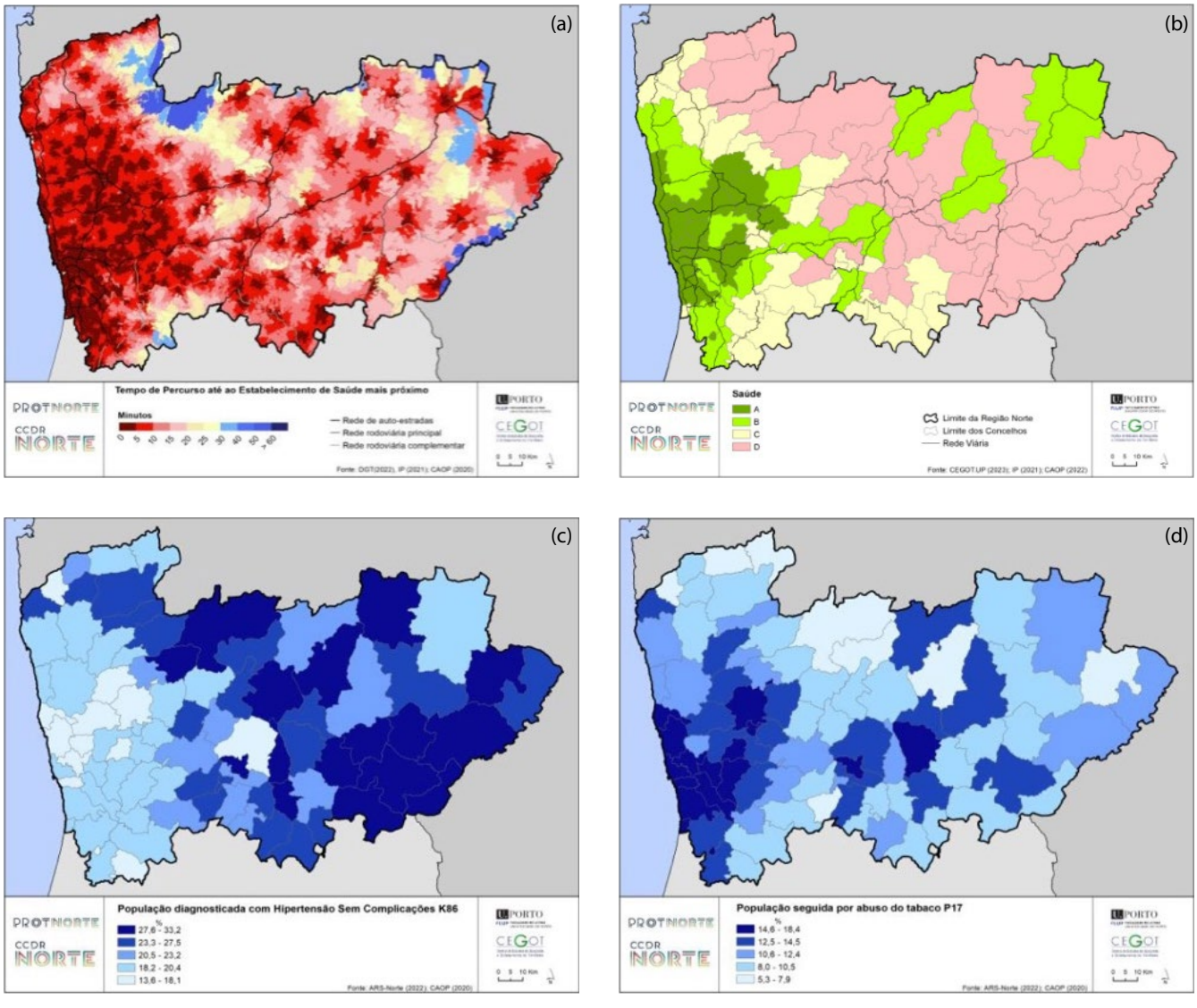
Portugal's main health policy documents address equity and access to healthcare, but a coordinated strategy to promote their achievement has not yet been

developed.[16] Portugal recognized the right to health in 1971,[17] however, the adoption and implementation of the Serviço Nacional de Saúde (SNS) occurred in 1979 along with the country's democratization.[18] The Portuguese health system comprises a public and a private sector, with the public sector being predominant.[19] The SNS theoretically offers universal coverage and is generally free of charge. Significant disparities in healthcare service accessibility persist across different regions, as well as between urban and rural areas, within Portugal.[19, 20]

In 2008, Portugal initiated a national mental healthcare plan with the objective of deinstitutionalization.[21] This plan also aimed at developing mental health services in general hospitals and communities, as well as integrating psychiatric treatment at the primary care level.[21] Specialist care typically requires referral from General Practitioners (gate-keeper role), but connections between specialized services and primary care remain inadequate.[22] Despite improvements, the data suggest deficiencies in accessibility and quality of care, especially given the fact that Portugal has one of the highest prevalence rates of mental disorders in Europe.[23] The mental health system in Portugal focused primarily on inpatient care and emergency consultations, consuming over 80% of resources.[24] However, community-based services are insufficient,[24] despite the high prevalence of mental disorders in Portugal.[23]

Over time, there has been a tendency for the Portuguese population to choose urban areas to live. In 2021, 33.15% of the population lived in rural regions.[25] Geographical access significantly impacts the time it

Figure 1. Portugal characterization by disparities in geographical access: (a) accessibility to healthcare establishments, and (b) differentiated territorial issues, where regions with more diverse service supplies are referred to as A and B, and regions with vulnerable, older, and less healthy populations as C and D; demographic register of North Portugal: (c) population diagnosed with uncomplicated hypertension, and (d) population followed for tobacco abuse.



takes to reach a reference hospital (Figure 1a), with the elderly population and border communities being the most affected (Figure 1b).[26] Accessibility is critical for older societies, as traveling long distances to health services becomes increasingly difficult.[27, 28] Accessibility significantly impacts urban development and health resource planning, necessitating initiatives to improve community health.[27, 29] Geographic obstacles have a significant impact on healthcare utilization, preventative interventions, and survival rates. This results in poorer health outcomes, particularly among individuals with limited resources.[30-33] Due to geographic barriers, specialized facilities are often inaccessible or invisible to people from disadvantaged socio-economic areas, rural communities, and remote locations.[34]

Analysis of health indicators in Portugal's northern region highlights two distinct territorial profiles. Denser territories exhibit greater healthcare innovation but also present higher risk behaviours, such as tobacco and alcohol abuse and HIV-AIDS infection (Figure 1d). Conversely, lower-density territories have fewer health services and professionals but show a greater diversity of diseases and disabilities (Figure 1c).[35]

Objective

The aim of this article was to characterize the population diagnosed with schizophrenia spectrum disorders in the Bragança district, and to understand the inequalities found in their access to healthcare.

Methodology

This is a cross-sectional, descriptive study employing a quantitative approach. The data were collected from the statistical services of the Mental Health Department at the Unidade Local de Saúde Nordeste (ULSNE), for the district of Bragança. The search was conducted using the keyword "psychosis", and data were collected from 1/1/2016 to 30/11/2022. Patients over the age of 65 (due to possible cognitive deterioration), those diagnosed with bipolar disorder and drug users were excluded. The study protocol was approved by the Ethics Committee of the Polytechnic Institute of Bragança, under opinion number 65/202, issued on 29/11/2021.

Socio-demographic data, including gender, age, county of residence, personal psychiatric history (number of hospitalizations for psychosis) and medical monitoring, were collected from the clinical records. These data were used to identify the total number of individuals with schizophrenia spectrum disorders in the Bragança district, for potential participations in a clinical trial involving virtual reality for rehabilitation. Researchers ensured patients anonymity and data pseudonymization through coding, with the encryption key kept separate from the database.

The data were organized and processed in Excel spreadsheets. Statistical analyses were conducted using SPSS v. 23.0 software. A descriptive analysis was performed to characterize the sociodemographic profile of the sample. A Student's *t*-test for two independent samples was used to assess statistically significant differences in hospitalizations frequency, gender distribution, and medical team follow-up. The chi-square test was employed to examine difference in age groups frequencies between genders. A *p*-value of less than 0.05 was considered statistically significant. Normality in the population was assumed based on the central limit theorem, as no normality or homoscedasticity tests were conducted.

Results

The study comprised 278 patients diagnosed with schizophrenia spectrum disorders, with 4 excluded due to insufficient information. The final sample included 274 patients, consisting of 180 men (65.7%) and 94 women (34.3%), aged 18-64 years. The majority of the sample fell within the age ranges of 40-49 and 50-59 years. Gender disparities were evident across different age groups, as depicted in Figure 2a. However, statistical analysis, using the chi-square test, indicated that these differences were not statistically significant ($p>0.05$).

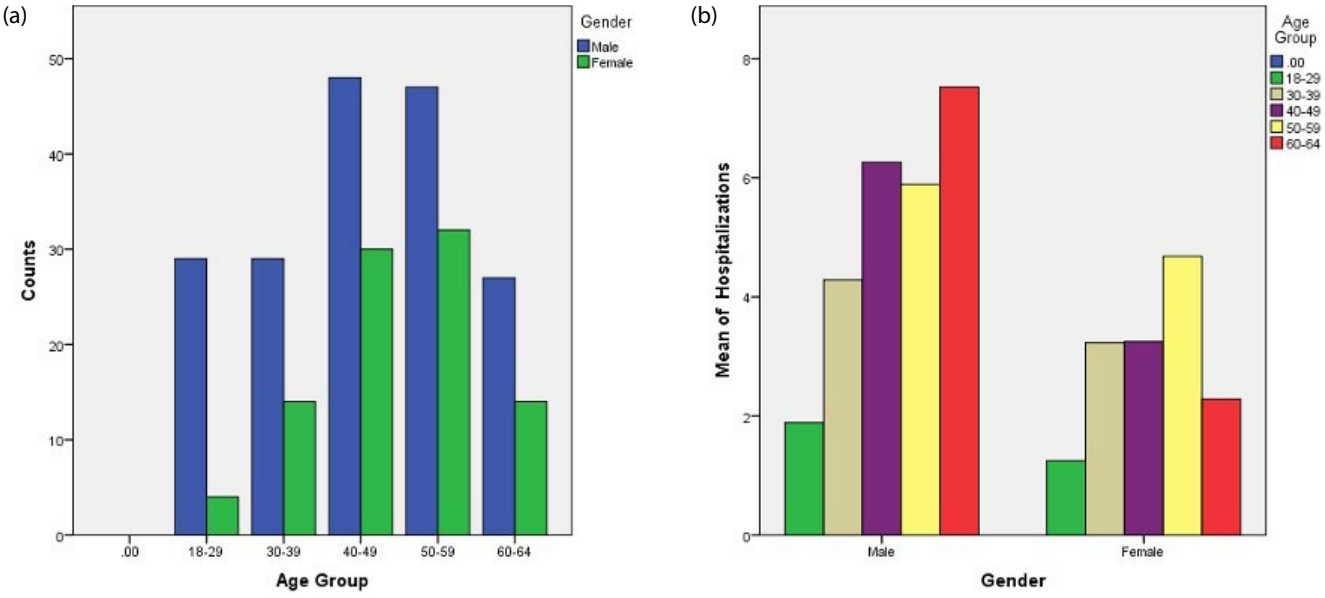
The investigation revealed that 10 individuals did not provide information regarding hospitalizations for psychosis. The mean number of hospitalizations was 4.73 ± 6.74 times, with a maximum of 39. Male patients exhibited a mean of 5.36 ± 7.10 hospitalizations, whereas female patients had a mean of 3.50 ± 5.80 hospitalizations (Table 1). These differences were statistically significant, as determined by Independent-Samples *t* Test ($p<0.05$). However, age groups did not exhibit statistically significant variations in the mean number of hospitalizations.

Table 1. Descriptive statistics of hospitalizations

	N	Average	Standard deviation	Minimum	Maximum
Male	174	5.36	7.11[b]	0	37
Female	90	3.50	5.80[a]	0	39
Total	264	4.73	6.74	0	39

According to the *t*-test for equality of means, for males and females, means followed by the same letters in the same column are not statistically different.

Figure 2. Characterization of the sample: (a) population split by age groups and gender, (b) hospitalizations split by gender and age groups.



Additionally, Figure 2b presents the average number of hospitalizations by age group and by sex. Gender was identified as the primary factor contributing to statistical disparities, as there were no significant variations in the average number of hospitalizations by age group.

This study further explored the average number of hospitalizations per municipality. Hospitalization rates ranged from 3.00 ± 2.29 to 9.20 ± 9.78 on average, with Vinhais showing the lowest average and Torre de Moncorvo the highest (Table 2).

Table 2. Distribution of patients in the Bragança district.

Municipality	Counts	% of counts	Hospitalizations	Average
Bragança	95	34.7%	91	5.00 ± 8.08
Mirandela	42	15.3%	39	4.38 ± 6.53
Carrazeda de Ansiães	5	1.8%	5	9.00 ± 7.81
Miranda do Douro	14	5.1%	13	3.46 ± 4.89
Alfândega da Fé	7	2.6%	7	6.00 ± 8.00
Vinhais	18	6.6%	17	3.00 ± 2.29
Macedo de Cavaleiros	33	12.0%	33	4.12 ± 4.92
Mogadouro	19	6.9%	19	4.26 ± 5.10
Torre de Moncorvo	11	4.0%	10	9.20 ± 9.78
Vimioso	10	3.6%	10	5.50 ± 7.00
Vila Flor	12	4.4%	12	3.17 ± 4.51
Freixo de Espada à Cinta	8	2.9%	8	4.63 ± 5.73

Furthermore, patients monitoring by medical teams was investigated to assess the relationship between hospitalizations and patient follow-up. Patients' follow-up was categorized into 'no follow-up', 'outpatient consultations', and 'prolonged hospitalization'. The analysis revealed that 62.4% of the sample underwent outpatient consultations, 33.9% had no follow-up and 3.6% experienced prolonged hospitalization. Male patients with schizophrenia spectrum disorders displayed higher percentages in these categories compared to female patients, who had lower percentages. Variations in follow-up rates were observed between males and females (Figure 3a).

Subsequently, the number of hospitalizations was compared based on whether individuals were followed up in outpatient clinic. It was found that there was a statistically significant difference in hospitalization among patients not accompanied by a medical team (Figure 3b). The other categories were rejected as they did not present a considerable percentage for the analysis.

For further understanding, patient follow-up analysis was conducted at the municipality level. Carrazeda de Ansiães and Freixo de Espada à Cinta exhibited the lowest proportion of outpatient consultations (1.5%), while Bragança (18.6%), Mirandela (9.1%), and Macedo de Cavaleiros (8%) demonstrated the highest rates. Conversely, municipalities such as Bragança, Mirandela, and Macedo de Cavaleiros had the highest percentage of non-follow-up cases, while Carrazeda de Ansiães and Alfândega da Fé had the lowest. Moreover, Mirandela, Vila Flor, and Freixo de Espada à Cinta had the highest rate of non-follow-up. The distribution of patients across the Bragança district is outlined in Table 2, highlighting disparities in the target population.

Figure 3. Characterization of monitoring: (a) monitoring split by age groups, (b) association between population monitoring and number of hospitalizations.

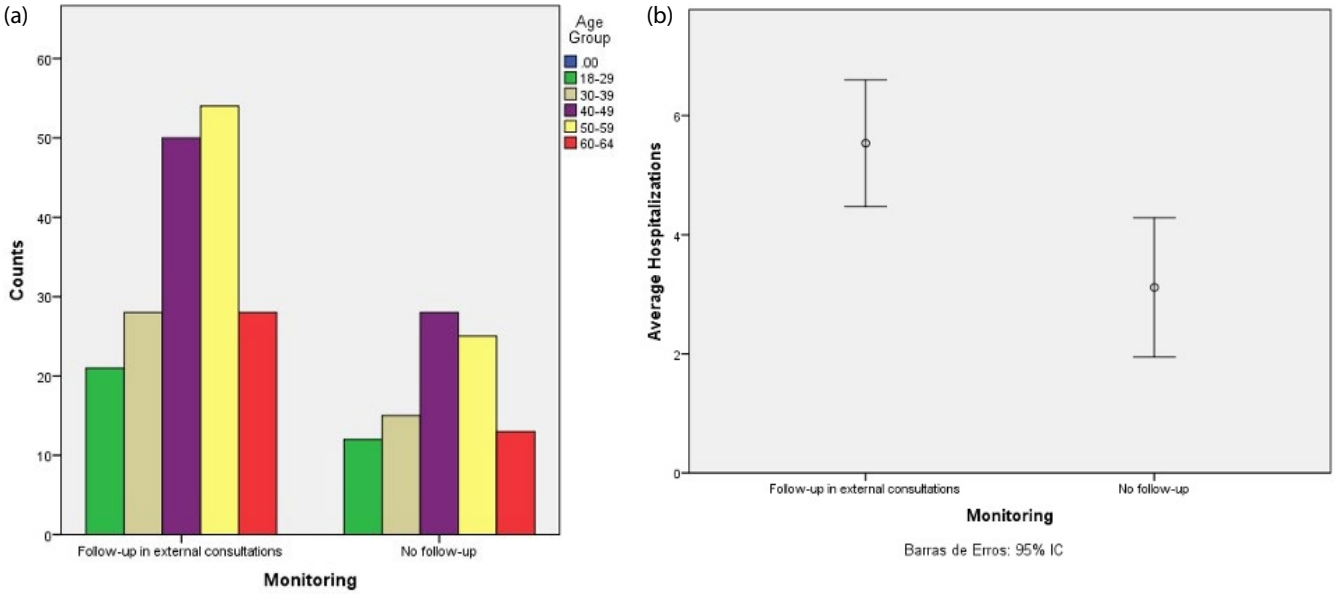


Table 3 illustrates the absence of psychiatric appointments for certain patients within their residential areas. This underscores the presence of unequal access to healthcare services across the municipalities of Bragança district, with 32.1% of patients needing to travel distances ranging from 17.7 km to 97.3 km for monitoring purposes.

Table 3. Distribution of monitoring and consultation location in the Bragança district

Municipality	Follow--up	No follow--up	No follow--up rate	Consultation location	Distance (km)	Time
Bragança	18.6 %	12.0 %	35%	-	-	-
Mirandela	9.1 %	6.2 %	40.4%	-	-	-
Carrazeda de Ansiães	1.5 %	0.4 %	20%	-	-	-
Miranda do Douro	3.6 %	1.1 %	21.4%	Bragança	97.3	1h 7 min
Alfândega da Fé	2.2 %	0.4 %	14.2%	Torre de Moncorvo	33.8	30 min
Vinhais	4.7 %	1.8 %	27.7%	Bragança	42.7	51 min
Macedo de Cavaleiros	8.0 %	3.6 %	30.3%	-	-	-
Mogadouro	4.4 %	2.6 %	36.8%	Bragança	74.3	1h 9 min
Torre de Moncorvo	2.9 %	1.1 %	27.3%	-	-	-
Vimioso	2.9 %	0.7 %	20%	Bragança	46.8	42 min
Vila Flor	2.6 %	1.8 %	41.7%	Carrazeda de Ansiães	17.7	17 min
Freixo de Espada à Cinta	1.5 %	1.5 %	50%	Torre de Moncorvo	39.8	40 min

Discussion

The Unidade Local de Saúde do Nordeste (ULSNE) in Portugal provides healthcare across the entire district of Bragança, covering an extensive area of 6,608 km². Despite its small population of approximately 123,000 people, this area poses challenges in terms of accessibility, especially for the predominantly elderly and impoverished population. The ULSNE Mental Health Department offers emergency services, acute inpatient care, long-term patient units, and outpatient consultations in various locations, including Bragança, Mirandela, Macedo de Cavaleiros, Torre de Moncorvo and Carrazeda de Ansiães (Figure 4). Recently, partial

Figure 4. Bragança district, adapted from[36]

hospitalization and a community health team were introduced for the southern part of the district.

This study aimed to explore the demographic characteristics of schizophrenia spectrum disorder patients in the Bragança district, identify differences in treatment outcomes, particularly concerning those not receiving treatment, and identify the main challenges they face in accessing mental health services. For this purpose, all cases with diagnoses compatible with the spectrum were collected, and a careful evaluation of these data was conducted.

Initially, it was evident that the sample is predominantly male (n=180), with the remaining (n=94) being females. This finding has gained increasing support, and some authors propose a ratio of the incidence rate of schizophrenia spectrum disorders between men and women of 1 to 70.[7]

When analyzing by age, it was observed that the most represented age group in the sample is 40-49 and 50-59, which can be attributed to the notable ageing of the population at the national level, especially in the interior north. Comparing the distribution by age group and gender, it was concluded that there is a prevalence of males in all the age groups presented, however, in the age group between 20 to 30, this discrepancy is alleviated. This difference may be due to the maximum age at which men and women experience their first psychotic episode, which occurs between the early and mid-20s for males and the late 20s for women. (8) Thus, the disparities found between the male and female age groups are due to gender and not the age group itself.

Upon analyzing hospitalization data, a notable pattern emerges wherein men aged 60-64 exhibited a higher frequency of hospitalizations. Additionally, it becomes evident that individuals under medical supervision experienced the highest rate of hospitalization. This trend could potentially stem from the absence of alternative responses for these patients in cases of decompensation during the data collection period, leading to hospitalization as the primary recourse. The discontinuation rate among patients lacking follow-up stood at 33.9%, notably peaking within the 40-49 age bracket. Existing literature indicates a range of dropout rates for psychiatric patients spanning from 14% to 64%.[37] The unique nature of these conditions poses challenges in sustaining prolonged follow-up, particularly when it is solely clinic-based.[38]

Adherence to treatment is intricately associated with factors such as patient satisfaction, continuity of care, and perceived treatment necessity. Conversely, non-adherence correlates with the chronicity of illness, complex treatment regimens, adverse side effects, and impaired social functioning. Additionally, non-adherence has been correlated with cognitive impairment, depression, substance abuse, deficient discharge planning or post-treatment environments, compromised therapeutic alliances, and insufficient family support.[39]

In the studied population, multiple factors may contribute to the observed dropout phenomenon, including emigration, socio-economic variables such as unemployment rates, and the presence of seasonal laborers in the region.[40] Bragança, as a district, exhibits a significant emigrant population, predominantly returning to their places of origin during the summer months before subsequently relocating to their employment destinations, thereby bypassing psychiatric care within the district. Furthermore, the district harbours seasonal workers, particularly engaged in agricultural activities such as grape harvesting, apple, and olive picking, primarily concentrated in the southern region. However, the absence of corroborative data presents a limitation to this proposed hypothesis.

Conversely, the initial onset of symptoms typically manifests around the age of 20, with a notable proportion of affected individuals concurrently pursuing university education. Following the initial episode, patients typically receive inpatient treatment and subsequently undergo outpatient psychiatric follow-up within their residential vicinity. This scenario may elucidate the lack of follow-up observed among certain young individuals from Bragança and Mirandela.

Patients' non-adherence to treatments can also stem from the influence of stigma.[41] The fear of being judged or discriminated against due to the stigma surrounding mental illnesses can deter individuals from seeking help or adhering to treatment plans.[42] Stigma can influence treatment adherence by making patients feeling ashamed or discouraged, reducing these patients' opportunities in all areas of life.[43]

Furthermore, family stigma significantly impacts treatment adherence. When family members experience stigma, they may avoid discussing the illness openly, seeking support, or encouraging the patient to follow treatment plans.[44] This can lead to inadequate treatment adherence and compromised outcomes. Additionally, stigma can weaken the patient's support network within the family, negatively affecting treatment. Lack of open communication and

trust within the family can further hinder treatment adherence, making it difficult to discuss symptoms, medication adherence, and coping strategies.[45] Addressing family stigma is therefore crucial for promoting better treatment adherence and improved outcomes for patients.

Moreover, a proportion of patients do not have access to psychiatric appointments within their residential vicinity. Specifically, 32.1% of patients within the district are required to travel distances ranging from 17.7 km to 97.3 km to access monitoring services. These distances underscore the limited availability of local medical resources, thereby highlighting unequal access to healthcare services across the municipalities of Bragança. Furthermore, the necessity for extensive travel may exacerbate patient non-adherence and contribute to inferior health outcomes.[46]

Despite rigorous efforts to delineate the primary barriers to accessing healthcare services, it is imperative to acknowledge certain methodological limitations inherent in this study. Specifically, the lack of detailed data pertaining to the socioeconomic status of participants represents a notable gap, given its significant influence on healthcare accessibility. Moreover, the absence of investigation into transportation initiatives aimed at facilitating patients' attendance at appointments limits the comprehensive understanding of the factors impacting treatment continuity. However, amidst these acknowledged limitations, it is pertinent to underscore the recent introduction of a partial hospitalization unit and a community health team within the Bragança region. These interventions hold promise in enhancing patient follow-up and mitigating treatment discontinuation rates. Moving forward, comparative studies are warranted to robustly evaluate the efficacy of these initiatives, thereby furnishing valuable insights to inform evidence-based clinical practices and mental health policy formulation geared towards community well-being.

The ULSNE Mental Health Department has implemented a partial hospitalization unit and a community health team, allowing for more frequent monitoring compared to traditional outpatient clinic care, while still maintaining patients' connections to their social and familial networks. Conducting a post-implementation comparative study of these facilities would be prudent to evaluate their impact. Additionally, future research should prioritize gaining a deeper understanding of the specific barriers to accessing mental health services in the Bragança region. Innovative strategies to promote treatment adherence and enhance patient outcomes are also warranted. Furthermore, fostering interdisciplinary collaboration among mental health professionals, primary care physicians, and social workers is essential for ensuring a comprehensive and effective approach to managing mental disorders, thereby improving the overall well-being of the community.

Conclusion

In Portugal, despite progress in recognizing equity in healthcare as a fundamental right, regional disparities persist, underscoring the imperative need for a coordinated effort to address these gaps. The interaction between geographical barriers and healthcare accessibility emerges as a critical determinant of health outcomes, particularly poignant in rural and remote communities where access to specialized care remains challenging.

The case study examined the challenges faced by patients diagnosed with schizophrenia spectrum disorders in the district of Bragança, Portugal. These findings highlight the urgent need for improvements in healthcare infrastructure, including the expansion of medical services in underserved areas and the implementation of innovative solutions such as telemedicine. Additionally, they underscore the importance of strategies to mitigate barriers to accessing mental healthcare in the region, considering factors such as migration, socioeconomic conditions, and the presence of seasonal workers.

Despite study limitations, such as the lack of specific data on participants' socioeconomic status and information on transportation initiatives to facilitate healthcare access, the results emphasize the need for targeted interventions to improve access and treatment continuity for patients with schizophrenia in Bragança.

Data Confidentiality

The authors declare having followed the protocols in use at their working centre regarding patients' data publication.

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Conflicts of Interest

The authors declare no conflict of interest.

References

1. Gulliford M, Figueroa-Munoz J, Morgan M, Hughes D, Gibson B, Beech R, *et al.* What does 'access to health care' mean? J Health Serv Res Policy. 2002 Jul 1; 7(3): 186-8.
2. The Canadian Oxford Dictionary. Oxford University Press; 2004.
3. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav. 1995 Mar; 36(1): 1-10.
4. Saxena S, Sharan P. Mental health resources and services. International Encyclopedia of Public Health. 2008; 418-30.
5. Trujols J, Portella MJ, Iraurgi I, Campins MJ, Siñol N, Cobos JPDL. Patient--reported outcome measures: Are they patient-generated, patient-centred or patient-valued? Journal of Mental Health [Internet]. 2013 Dec [cited 2024 Mar 27]; 22(6): 555-62. Available from: https://www.tandfonline.com/doi/abs/10.3109/09638237.2012.734653.
6. Health at a Glance 2021. 2021 Nov 9 [cited 2023 May 17]; Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a--glance-2021_ae3016b9-en.
7. Jauhar S, Johnstone M, McKenna PJ. Schizophrenia. The Lancet. 2022 Jan 29; 399(10323): 473-86.
8. American Psychiatric Association., American Psychiatric Association. DSM-5 Task Force. Diagnostic and statistical manual of mental disorders : DSM-5. American Psychiatric Association; 2013. 947 pp.
9. Correll CU, Schooler NR. Negative Symptoms in Schizophrenia: A Review and Clinical Guide for Recognition, Assessment, and Treatment. 2020 [cited 2023 May 17]; Available from: http://doi.org/10.2147/NDT.S225643.
10. Hjorthøj C, Stürup AE, McGrath JJ, Nordentoft M. Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta--analysis. Lancet Psychiatry [Internet]. 2017 Apr 1 [cited 2023 Jun 3]; 4(4): 295-301. Available from: https://pubmed.ncbi.nlm.nih.gov/28237639/.
11. Liu NH, Daumit GL, Dua T, Aquila R, Charlson F, Cuijpers P, *et al.* Excess mortality in persons with severe mental disorders: a multilevel intervention framework and priorities for clinical practice, policy and research agendas. World Psychiatry [Internet]. 2017 Feb 1 [cited 2023 Jun 3]; 16(1): 30-40. Available from: https://pubmed.ncbi.nlm.nih.gov/28127922/.
12. WHO Director-General's opening remarks at the media briefing on COVID-19 – 11 March 2020 [Internet]. [cited 2023 May 30]. Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s--opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020.
13. Roy CM, Brennan Bollman E, Carson LM, Northrop AJ, Jackson EF, Moresky RT. Assessing the indirect effects of COVID-19 on healthcare delivery, utilization and health outcomes: a scoping review. Eur J Public Health [Internet]. 2021 Jun 1 [cited 2023 May 30]; 31(3): 634-40. Available from: https://pubmed.ncbi.nlm.nih.gov/33755130/.
14. Abedi V, Olulana O, Avula V, Chaudhary D, Khan A, Shahjouei S, *et al.* Racial, Economic, and Health Inequality and COVID-19 Infection in the United States. J Racial Ethn Health Disparities [Internet]. 2021 Jun 1 [cited 2023 May 31]; 8(3): 732-42. Available from: https://pubmed.ncbi.nlm.nih.gov/32875535/.
15. Chutiyami M, Cheong AMY, Salihu D, Bello UM, Ndwiga D, Maharaj R, *et al.* COVID-19 Pandemic and Overall Mental Health of Healthcare Professionals Globally: A Meta-Review of Systematic Reviews. Front Psychiatry. 2022 Jan 17; 12.
16. Furtado C, Pereira J. Equidade e Acesso aos Cuidados de Saúde. [cited 2024 Mar 8]; Available from: https://www.researchgate.net/publication/268414998.
17. Monteiro BR, Pisco AMSA, Candoso F, Bastos S, Reis M. Cuidados primários em saúde em Portugal: 10 anos de contratualização com os serviços de saúde na Região de Lisboa. Cien Saude Colet [Internet]. 2017 [cited 2023 Jun 7]; 22(3): 725-36. Available from: https://www.scielo.br/j/csc/a/94Q9MzYZFwp7mRhMC4pnVBc/abstract/?lang=pt.
18. Barros P, Gomes J-P. Os Sistemas Nacionais de Saúde da União Europeia, Principais Modelos de Gestão Hospitalar e Eficiência no Sistema Hospitalar Português. Universidade NOVA de Lisboa. 2002 Jan.
19. de Almeida Simoes J, Augusto GF, Fronteira I, Hernandez-Quevedo C. Portugal: Health System Review. Health Syst Transit. 2017 Mar; 19(2): 1-184.
20. Baeten R, Spasova S, Vanhercke B, Coster S. Inequalities in Access to Healthcare. A study of National Policies 2018. European Commission: Brussels. 2018.
21. Presidência do Conselho de Ministros. Resolução do Conselho de Ministros n° 49/2008. Diário da República, 47/2008 2008 pp. 1395-409.
22. Comissão Técnica de Acompanhamento da Reforma da Saúde Mental. Relatório da Avaliação do Plano Nacional de Saúde Mental 2007-2016 e propostas prioritárias para a extensão a 2020. Portugal; 2017.
23. Caldas de Almeida J, Xavier M. Estudo epidemiológico nacional de saúde mental [Internet]. [Lisboa]: Universidade Nova de Lisboa; 2013 [cited 2024 Apr 1]. Available from: https://catalogo.ensp.unl.pt/cgi-bin/koha/opac-detail.pl?biblionumber=15774.
24. Joint Action on Mental Health, Well-Being. Towards community-based and socially inclusive mental health care: situation analysis and recommendations for action. Reykjavík: Joint Action on Mental Health and Well-Being. 2015.
25. Portugal – Rural Population – 2023 Data 2024 Forecast 1960-2021 Historical [Internet]. [cited 2023 May 15]. Available from: https://tradingeconomics.com/portugal/rural-population-percent-of-total-population-wb-data.html.
26. Costa C, Tenedório JA, Santana P. Disparities in geographical access to hospitals in Portugal. ISPRS Int J Geoinf. 2020 Oct 1; 9(10).
27. Wu HC, Tseng MH. Evaluating Disparities in Elderly Community Care Resources: Using a Geographic Accessibility and Inequality Index. International Journal of Environmental Research and Public Health 2018, Vol 15, Page 1353 [Internet]. 2018 Jun 27 [cited 2023 May 12]; 15(7): 1353. Available from: https://www.mdpi.com/1660-4601/15/7/1353/htm.
28. Doetsch J, Pilot E, Santana P, Krafft T. Potential barriers in healthcare access of the elderly population influenced by the economic crisis and the troika agreement: A qualitative case study in Lisbon, Portugal. Int J Equity Health [Internet]. 2017 Oct 25 [cited 2023 May 11]; 16(1): 1-17. Available from: https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-017-0679-7.
29. Frew R, Higgs G, Harding J, Langford M. Investigating geospatial data usability from a health geography perspective using sensitivity analysis: The example of potential accessibility to primary healthcare. J Transp Health. 2017 Sep 1; 6: 128-42.
30. Hsia RYJ, Shen YC. Rising closures of hospital trauma centers disproportionately burden vulnerable populations. Health Aff (Millwood) [Internet]. 2011 Oct [cited 2023 May 11]; 30(10): 1912-20. Available from: https://pubmed.ncbi.nlm.nih.gov/21976335/.
31. Bissonnette L, Wilson K, Bell S, Shah TI. Neighbourhoods and potential access to health care: The role of spatial and aspatial factors. Health Place. 2012 Jul 1; 18(4): 841-53.
32. Kelly C, Hulme C, Farragher T, Clarke G. Are differences in travel time or distance to healthcare for adults in global north countries associated with an impact on health outcomes? A systematic review. BMJ Open [Internet]. 2016 Nov 1 [cited 2023 May 11]; 6(11): e013059. Available from: https://bmjopen.bmj.com/content/6/11/e013059.
33. Neutens T. Accessibility, equity and health care: review and research directions for transport geographers. J Transp Geogr. 2015 Feb 1; 43: 14-27.

34. Fayet Y, Coindre JM, Dalban C, Gouin F, De Pinieux G, Farsi F, *et al.* Geographical Accessibility of the Referral Networks in France. Intermediate Results from the IGéAS Research Program. Int J Environ Res Public Health [Internet]. 2018 Oct 10 [cited 2023 May 11]; 15(10). Available from: https://pubmed.ncbi.nlm.nih.gov/30308955/.

35. Governo Regional de Portugal. PROTNORTE - Programa Regional de Ordenamento do Território [Internet]. 2023 [cited 2023 Jun 14]. Available from: https://www.ccdr-n.pt/pagina/prot-norte.

36. Lopes G. Mensageiro de Bragança [Internet]. [cited 2023 Jul 19]. Available from: https://www.agenealogia.com/portugal/braganca_distrito/braganca_distrito_mapa.htm.

37. Reneses B, Muñoz E, López-Ibor JJ. Factors predicting drop-out in community mental health centres. World Psychiatry [Internet]. 2009 [cited 2023 Nov 23]; 8(3): 173-7. Available from: https://pubmed.ncbi.nlm.nih.gov/19812755/.

38. Mojtabai R, Fochtmann L, Chang SW, Kotov R, Craig TJ, Bromet E. Unmet Need for Mental Health Care in Schizophrenia: An Overview of Literature and New Data From a First-Admission Study. Schizophr Bull. 2009 Jul 1; 35(4): 679-95.

39. Goff DC, Hill M, Freudenreich O. Strategies for Improving Treatment Adherence in Schizophrenia and Schizoaffective Disorder. J Clin Psychiatry. 2010 Dec; 71(suppl 2): 20-6.

40. Febrer BB. Necesidades reales de personas con esquizofrenia: un estudo cualitativo. [Alacant]: Universidad de Alicante; 2012.

41. Gaber NM, Wadie NA. Perceived Self-Stigma, Adherence to Treatment and Discontinuation of Medication among Schizophrenic Patients. World Journal of Nursing Sciences. 2016; 2(3): 61-70.

42. Shrivastava A, Johnston ME, Thakar M, Shrivastava S, Sarkhel G, Sunita I, *et al.* Impact and Origin of Stigma and Discrimination in Schizophrenia: Patient Perceptions. Stigma Res Action. 2011 Feb 28; 1(1).

43. Corrigan PW, Markowitz FE, Watson AC. Structural levels of mental illness stigma and discrimination. Schizophr Bull [Internet]. 2004 [cited 2024 Apr 26]; 30(3): 481-91. Available from: https://pubmed.ncbi.nlm.nih.gov/15631241/.

44. Adhikari SR. Stigma in Mental Illness: Relative's Perspective. Journal of Psychiatrists' Association of Nepal. 2015 Apr 1; 3(2): 37-42.

45. Ociskova M, Prasko J, Holubova M, Latalova K, Sollar T, Zatkova M, *et al.* Self-stigma in patients with schizophrenia: Impact and management. Neuro Endocrinol Lett. 2023 Sep 29; 44(6): 368-83.

46. Kelly C, Hulme C, Farragher T, Clarke G. Are differences in travel time or distance to healthcare for adults in global north countries associated with an impact on health outcomes? A systematic review. BMJ Open. 2016 Nov 24; 6(11): e013059.