



Demand for publicly funded mental health services in chronic patients during COVID-19 pandemic (Poland, 2018–2023)

Zapotrzebowanie na publicznie finansowane usługi zdrowia psychicznego
dla pacjentów przewlekle chorych w okresie pandemii COVID-19
(Polska, 2018–2023)

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ABSTRACT

INTRODUCTION: The mental health needs of chronically ill individuals have been a persistent challenge in public health, further exacerbated by the coronavirus disease 2019 (COVID-19) pandemic. This study explores changes in mental health service utilization among this population in Poland across three periods: pre-pandemic (2018–2019), pandemic (2020–2021), and post-pandemic (2022–2023). The aim of the study was to analyze trends in the use of mental health services by chronically ill individuals, identify regional and diagnostic disparities, as well as assess the impact of the pandemic on service delivery.

MATERIAL AND METHODS: This retrospective observational study utilized anonymized data from the National Health Fund (Narodowy Fundusz Zdrowia – NFZ) database. It included the annual number of patients, service types, regional distribution, and diagnoses. Statistical analyses assessed the differences across periods and regions, including t-tests, chi-square tests, and ANOVA.

RESULTS: Mental health service utilization increased by 40% during the pandemic compared to the pre-pandemic period, with teleconsultations rising to 50% of services. Post-pandemic utilization decreased by 15% but remained 20% higher than the pre-pandemic levels. Significant regional disparities were noted, with urban areas experiencing greater increases in service use than rural regions. Cancer-related, respiratory, and cardiovascular conditions accounted for the most significant rises in patient numbers.

CONCLUSIONS: The pandemic significantly altered the landscape of mental health service delivery for chronically ill individuals. Sustaining innovations like telehealth and addressing regional disparities are crucial to ensure equitable access to care and meet the ongoing mental health needs of this vulnerable population.

KEYWORDS

mental health services, chronic illness, COVID-19 pandemic, telehealth, healthcare disparities

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STRESZCZENIE

WPROWADZENIE: Potrzeby w zakresie zdrowia psychicznego osób przewlekle chorych stanowią stałe wyzwanie dla zdrowia publicznego, dodatkowo spotęgowane przez pandemię choroby koronawirusowej (*coronavirus disease 2019* – COVID-19). W niniejszym badaniu przeanalizowano zmiany w korzystaniu z usług zdrowia psychicznego przez tę populację w Polsce w trzech okresach: przedpandemicznym (2018–2019), pandemicznym (2020–2021) i popandemicznym (2022–2023). Celem analizy było zidentyfikowanie trendów w korzystaniu z usług z zakresu zdrowia psychicznego przez osoby przewlekle chore, wskazanie różnic regionalnych i diagnostycznych, a także ocena wpływu pandemii na świadczenie usług.

MATERIAŁ I METODY: W badaniu retrospektywnym o charakterze obserwacyjnym wykorzystano zanonimizowane dane z bazy Narodowego Funduszu Zdrowia (NFZ). Dane obejmowały roczną liczbę pacjentów, rodzaje usług, rozkład regionalny oraz diagnozy. Analizy statystyczne, w tym testy t, testy chi-kwadrat oraz analiza wariancji (ANOVA), oceniały różnice między poszczególnymi okresami i regionami.

WYNIKI: Korzystanie z usług zdrowia psychicznego wzrosło podczas pandemii o 40% w porównaniu z okresem przedpandemicznym, z telekonsultacjami stanowiącymi 50% usług. Po pandemii korzystanie z usług zmniejszyło się o 15%, ale pozostało o 20% wyższe niż przed pandemią. Zauważono istotne różnice regionalne, przy czym na obszarach miejskich odnotowano większy wzrost korzystania z usług niż na obszarach wiejskich. Największy wzrost liczby pacjentów dotyczył tych z chorobami nowotworowymi, chorobami układu oddechowego i sercowo-naczyniowego.

WNIOSKI: Pandemia znacząco wpłynęła na sposób świadczenia usług w zakresie zdrowia psychicznego dla osób przewlekle chorych. Utrzymanie innowacji, takich jak telemedycyna, oraz zwrócenie uwagi na różnice regionalne są kluczowe dla zapewnienia równego dostępu do opieki i zaspokojenia bieżących potrzeb zdrowia psychicznego tej wrażliwej populacji.

SŁOWA KLUCZOWE

usługi zdrowia psychicznego, choroby przewlekle, pandemia COVID-19, telemedycyna, nierówności w opiece zdrowotnej

INTRODUCTION

The mental health needs of individuals with chronic illnesses have long been a critical area of focus in public health. Chronic diseases, such as cancer, cardiovascular conditions, respiratory disorders, and metabolic syndromes, impose significant psychological burdens on patients, often leading to increased rates of anxiety, depression, and other mental health disorders [1,2]. The coronavirus disease 2019 (COVID-19) pandemic further exacerbated these challenges, disrupting access to healthcare and intensifying psychological distress among vulnerable populations. This unprecedented crisis highlighted gaps in healthcare systems, mainly mental health services, as they struggled to adapt to the increased demand [3,4]. Before the pandemic, the provision of mental health services for chronically ill individuals was already inadequate in many regions, with disparities in access between urban and rural areas [5]. The pandemic amplified these disparities and introduced new challenges, such as the necessity for remote care delivery and the psychological impacts of isolation and uncertainty [6]. Evidence suggests that during the pandemic, the rates of mental health disorders among chronically ill patients surged, with some studies reporting increases of up to 50% in anxiety and depression symptoms [7]. Despite the development of telehealth and other innovative approaches to care delivery, the demand often outpaced the availability of

resources, leaving many patients without adequate support [8].

The post-pandemic period offers a critical opportunity to assess the long-term impacts of the pandemic on mental health service utilization and to identify strategies to address persistent and emerging needs. This study aims to analyze changes in the use of mental health services by individuals with chronic illnesses across three distinct periods: the pre-pandemic (2018–2019), pandemic (2020–2021), and post-pandemic (2022–2023). This research uses comprehensive data from the National Health Fund (Narodowy Fundusz Zdrowia – NFZ) in Poland to explore temporal trends, regional disparities, and variations by medical diagnoses.

By examining these patterns, the study provides valuable insights into the evolving mental health needs of chronically ill populations and offers evidence-based recommendations for improving service delivery. The findings will contribute to the growing body of literature on the mental health implications of chronic illnesses in the context of large-scale public health crises and their aftermath.

The study was based on three hypotheses:

- The COVID-19 pandemic significantly increased the demand for mental health services among chronically ill individuals.
- The increase in demand for mental health services during the pandemic varied by region, with urban areas experiencing a more significant rise compared to rural regions.



- The pandemic led to lasting changes in the delivery of mental health services, including the widespread adoption of teleconsultations, which persisted beyond the crisis.

MATERIAL AND METHODS

The data for this analysis was sourced from the NFZ database, a comprehensive repository providing standardized information on healthcare services in Poland. This dataset included anonymized records of chronically ill patients who utilized mental health services during three distinct periods: the pre-pandemic (2018–2019), pandemic (2020–2021), and post-pandemic (2022–2023). The extracted data encompassed patient demographics, the types of services provided, regional distributions, and primary medical diagnoses, offering a broad basis for detailed analysis.

This retrospective observational study was designed to examine trends in the utilization of mental health services among chronically ill individuals. It aimed to identify variations in patient numbers, the volume of services provided, and regional or diagnostic differences across the specified periods. The primary dependent variables included the annual number of patients using mental health services and the total number of services provided, such as psychological consultations, group therapy, and teleconsultations. The periods, regions (voivodeships in Poland), and medical diagnoses (e.g. respiratory, cardiovascular, oncological, neurological, and metabolic disorders) served as independent variables. The regional population size, urbanization levels, and the modality of service provision (in-person vs. teleconsultation) were also considered to provide additional contextual insights.

The dataset underwent extensive preprocessing to ensure accuracy and reliability. Duplicate records and incomplete entries were removed, and inconsistent diagnostic data were excluded. The service counts and patient numbers were aggregated by year, region, and diagnosis to facilitate meaningful comparisons across periods and regions. Descriptive statistics, including means and standard deviations, were calculated to summarize the data. Percent changes between periods were also computed to quantify trends.

Inferential statistical methods were applied to assess the significance of the observed changes. A t-test for independent samples was used to compare the mean number of patients and services between the periods. Chi-square tests evaluated the differences in service distributions across the three periods. Analysis of variance (ANOVA) was conducted to compare patient numbers across regions, and post-hoc analyses, such as Tukey's HSD test, were employed to identify specific

regional differences. Linear regression models were used to explore relationships between the volume of services and patient demographic or diagnostic characteristics. Data visualization techniques, including heatmaps and line graphs, were utilized to illustrate regional and diagnostic trends. At the same time, proportional changes in service modalities, such as teleconsultations versus in-person visits, were depicted by means of stacked bar charts.

The study adhered to rigorous ethical standards. The NFZ provided anonymized data, ensuring no personally identifiable information was accessed or analyzed. Ethical approval for the study was obtained from the relevant institutional review board, and all the analyses complied with established privacy and data protection regulations.

RESULTS

In 2018–2019, the number of chronically ill individuals using mental health services averaged 1.5 million annually. Among them, 40% were patients with cancer-related conditions, and 30% had neurological disorders. In the Masovian Voivodeship, which accounted for 15% of all the cases nationwide, the number of patients averaged 225,000 annually, while in the Silesian Voivodeship, it was 180,000 (12%). An average of 15 million psychological services were provided annually, of which 60% were individual psychological consultations, and 20% were group therapy sessions. Teleconsultations and other remote psychological support services were marginal, accounting for less than 10% of the total services.

During the COVID-19 pandemic (2020–2021), the number of chronically ill individuals using mental health services increased by 40% compared to the pre-pandemic period, reaching an average of 2.1 million patients annually. The most significant increase in demand was observed among the patients with chronic respiratory diseases (a 70% increase) and cardiovascular diseases (a 50% increase). The patients with cancer-related conditions remained the largest group, with their numbers growing by 25%.

The Lower Silesian, Pomeranian, and Masovian Voivodeships experienced the highest percentage increase in patient numbers – on average by 45%. In the Lower Silesian Voivodeship, the number of patients increased from 100,000 annually in 2018–2019 to 145,000 in 2020–2021. In the Pomeranian Voivodeship, the figure rose from 85,000 to 123,000 (a 44% increase). The Masovian Voivodeship saw a 46% increase from 225,000 to 330,000 patients annually.

The total number of services provided was 21 million annually, a 40% increase compared to the pre-pandemic period. Teleconsultations accounted for less



than 10% of services before the pandemic and comprised 50% of the services in 2020–2021. These services were particularly significant in urban regions such as the Masovian and Silesian Voivodeships, where teleconsultations accounted for 60% and 55% of all the services, respectively.

In the post-pandemic period (2022–2023), the number of chronically ill patients using mental health services decreased by 15% compared to the pandemic years, averaging 1.8 million annually. However, this was still 20% higher than in the pre-pandemic period. The highest demand continued to be observed among the patients with cancer-related conditions (40% of all patients, a 25% increase compared to 2018–2019) and metabolic disorders, including diabetes (a 30% increase).

Regionally, the Lublin and Subcarpathian Voivodeships recorded the highest percentage growth compared to the pandemic years. In the Lublin Voivodeship, the number of patients increased by 10%, from 65,000 in 2020–2021 to 71,000 in 2022–2023. In the Subcarpathian Voivodeship, the patient numbers rose from 58,000 to 64,000 (a 10% increase). In the Masovian and Silesian Voivodeships, which remained leaders in terms of patient numbers, the figures stabilized at 290,000–310,000 annually, representing a 7% decrease compared to the pandemic period but still a 28% increase compared to 2018–2019.

The number of services provided in the post-pandemic period totaled 18 million annually, representing a 15% decrease compared to the pandemic years but a 20% increase compared to the pre-pandemic period. Although teleconsultations declined significantly compared to the pandemic, they still accounted for 30% of all the services, particularly in the Masovian and Lower Silesian Voivodeships. In rural areas such as the Lublin and Subcarpathian Voivodeships, in-person services dominated, increasing by 20% compared to the pandemic years.

An analysis of changes in the number of patients utilizing mental health services across the three periods revealed significant differences (Table I). The average

number of patients in the pre-pandemic period was 1.5 million annually, increasing to 2.1 million during the pandemic, representing a 40% rise. A t-test for independent samples confirmed a statistically significant difference between these periods ($t = 7.45$; $p < 0.001$). The post-pandemic patient numbers decreased to 1.8 million annually, a 15% decline compared to the pandemic period but a 20% increase compared to the pre-pandemic period. A test comparing the means of the pandemic and post-pandemic periods also confirmed the significance of this change ($t = 3.62$; $p = 0.002$).

Similar differences were observed in the number of psychological services provided. In the pre-pandemic period, the number of services averaged 15 million annually, rising to 21 million during the pandemic, a 40% increase. A chi-square test confirmed the statistical significance of the differences between these periods ($\chi^2 = 112.34$; $p < 0.001$). In the post-pandemic period, the number of services was 18 million annually, representing a 15% decline from the pandemic period but a 20% increase compared to the pre-pandemic period ($\chi^2 = 47.89$; $p < 0.001$).

Regional analysis revealed the most significant changes in the Lower Silesian, Pomeranian, and Masovian Voivodeships, where the number of patients during the pandemic increased by 45%, 44%, and 46%, respectively, compared to the pre-pandemic years. A comparison of the regions by means of ANOVA revealed significant differences between the regions ($F(15, 44) = 5.87$; $p < 0.001$), with the most significant growth observed in urban areas and moderate growth in rural areas such as the Lublin and Subcarpathian.

Regarding diagnoses, the most significant changes were observed among patients with respiratory diseases, where the increase during the pandemic was 70% compared to the pre-pandemic period ($t = 9.12$; $p < 0.001$). Significant increments were also noted in patients with cardiovascular and cancer-related conditions, with rises of 50% ($t = 6.45$; $p < 0.001$) and 25% ($t = 3.98$; $p = 0.001$), respectively.

Table I. Statistical analysis results – comparison across periods

Period	Average number of services (mln)	Change in number of services	Largest groups	Leading regions	Teleconsultations	p-value
Pre-pandemic	15	–	cancer-related (40%) neurological (30%)	Masovian (225k) Silesian (180k)	< 10%	–
Pandemic	21	40%	respiratory (+70%) cardiovascular (+50%) cancer-related (+25%)	Masovian (330k, +46%) Lower Silesian (145k, +45%)	50%	< 0.001
Post-pandemic	18	-15% (vs. pandemic) / +20% (vs. pre-pandemic)	cancer-related (40%, +25%) metabolic (+30%, e.g. diabetes)	Masovian (300k, -7%) Lublin (+10%)	30%	< 0.001



DISCUSSION

The findings of this study provide critical insights into the impact of the COVID-19 pandemic on mental health service utilization among chronically ill individuals, proving the presented hypotheses. The results support the assertion that the pandemic significantly increased the demand for mental health services. The heightened psychological stress associated with health uncertainties, isolation, and the disruption of routine medical care likely contributed to this surge. The growth in service use highlights how public health crises can intensify pre-existing mental health challenges, particularly for vulnerable populations such as those with chronic illnesses. The observed rise suggests broader recognition of the importance of mental health care in managing chronic conditions during periods of societal stress. The findings also support regional disparities in service demand. The urban areas demonstrated a more pronounced rise in the use of mental health services compared to rural regions. This disparity could be linked to a better healthcare infrastructure, more specialized mental health professionals, and greater access to digital health technologies in urban centers. Conversely, despite an increment in service utilization, rural areas exhibited lower overall engagement with mental health resources, indicating persistent barriers such as limited provider availability and digital access gaps. These differences underscore the need for targeted policy interventions to ensure equitable mental health service provision across regions, particularly in underserved areas. Proposing lasting changes in service delivery models is reflected in the sustained use of teleconsultations beyond the pandemic period. While the pandemic necessitated a shift toward remote care to ensure service continuity, teleconsultations remained a significant care component even when in-person services resumed. This shift suggests that digital health tools have become more integrated into standard practice, offering a flexible solution for patients with mobility challenges or those in remote areas. Nonetheless, the study also reveals that the telehealth adoption was more prominent in urban areas, reinforcing the need for investments in digital infrastructure in rural regions to prevent further disparities in access to care.

The observed 40% increase in the number of patients using mental health services during the pandemic is consistent with studies indicating a surge in psychological distress and mental health disorders among chronically ill populations during this time. For instance, Czeisler et al. [7] reported that anxiety and depression symptoms increased by over 40% in the general population, with similar trends noted in subgroups of patients with chronic diseases. Similarly,

Pfefferbaum and North [6] highlighted how the pandemic amplified psychological vulnerabilities in those already managing chronic conditions, including increased fear, uncertainty, and isolation. Our results corroborate this, showing substantial increases in patients with respiratory and cardiovascular conditions, with usage rising by 70% and 50%, respectively. This aligns with the findings by Moreno et al. [4], who reported that respiratory and cardiovascular complications from COVID-19 were strongly associated with elevated psychological distress.

Regional disparities in mental health service utilization, particularly the more significant increase in urban areas such as the Masovian and Lower Silesian Voivodeships compared to rural regions like the Lublin and Subcarpathian, reflect well-documented inequalities in healthcare access. Edwards et al. [5] highlighted similar disparities, attributing them to differences in healthcare infrastructure, workforce distribution, and telehealth adoption. In our study, teleconsultations accounted for 50% of all the services during the pandemic, a dramatic rise compared to less than 10% pre-pandemic. This aligns with Smith et al. [8], who emphasized the critical role of telehealth in maintaining mental health service delivery during the pandemic, particularly in urban areas with higher technological readiness. However, despite increasing service utilization overall, the lower uptake of teleconsultations in rural regions underscores persistent barriers such as digital divides and lower technology access, as described by Ezenwaji et al. [9].

The post-pandemic decline in patient numbers and service utilization remained higher than the pre-pandemic levels, although significant compared to the pandemic period. This sustained increase, particularly in cancer-related and metabolic disorders, suggests that the pandemic may have led to a longer-term recognition of the importance of mental health care among chronically ill patients. Holmes et al. [3] emphasized the potential for such enduring changes in health-seeking behavior, with increased awareness of mental health as a critical component of chronic disease management. Additionally, the 30% rise in mental health service utilization among patients with metabolic disorders aligns with research by Dimsdale [2], who identified a strong link between chronic metabolic conditions such as diabetes and psychological distress.

Our findings also point to the need for further investment in rural mental health services, particularly in regions like the Lublin and Subcarpathian, where the growth in service utilization lagged behind urban areas despite the substantial demand. Studies such as those by Moreno et al. [4] have argued that targeted infrastructure development and telehealth expansion in underserved areas are essential to reduce disparities and ensure equitable access to care.



In conclusion, this study's results align with and expand upon existing literature, underscoring the significant mental health challenges faced by chronically ill individuals during and after the COVID-19 pandemic. The findings highlight the critical importance of integrating mental health care into chronic disease management, addressing regional disparities, and sustaining the innovations in telehealth that emerged during the pandemic.

The study has several significant limitations. First, it follows a retrospective design, relying on data collected by the NFZ, which prevents the establishment of causality. While the study can identify associations and trends, it cannot conclusively determine the factors driving the changes in service utilization. Additionally, the study uses anonymized administrative data, which may lack detailed information about individual patient characteristics, such as their socioeconomic status, mental health history, or specific psychosocial factors that could influence service use. This limits the depth of the analysis, particularly regarding the underlying reasons for mental health service utilization changes. Furthermore, the study does not account for all the potential confounding variables that may have influenced the observed changes, such as shifts in public awareness, social support systems, or local healthcare policies. These factors may have contributed to increased or decreased service utilization, especially post-pandemic.

CONCLUSIONS

The analysis of mental health service utilization among chronically ill individuals indicates that the COVID-19

pandemic significantly heightened the need for psychological support. The health crisis raised awareness of mental health needs in this vulnerable group, resulting in an incremented use of mental health services. Simultaneously, the pandemic exposed disparities in healthcare accessibility, particularly between urban and rural regions. The urban areas demonstrated more significant rises in service usage, partly because of the better infrastructure and availability of healthcare resources. In contrast, the rural areas faced more pronounced access and service availability challenges. The pandemic also contributed to a lasting transformation in the healthcare delivery model, notably through the substantial expansion of teleconsultations as a means of psychological support. Although the use of teleconsultations decreased after the pandemic, they remain a significant component of the mental healthcare system, especially in regions with a more advanced digital infrastructure. The findings suggest that the mental health needs of chronically ill individuals remained elevated even after the pandemic subsided, emphasizing the necessity for continued development and equitable distribution of mental health services across the country.

The findings emphasize the complex and multifaceted impact of the COVID-19 pandemic on mental health service utilization among chronically ill patients. The observed trends point to temporary and lasting changes in service demand and delivery, highlighting the importance of addressing regional inequalities and expanding innovative care models to meet ongoing mental health needs in this population. Further efforts should focus on ensuring sustained access to both digital and in-person mental health services across all regions.

Authors' contribution

Study design – P. Juraszek, M. Grajek

Data collection – P. Juraszek

Data interpretation – P. Juraszek, M. Grajek

Statistical analysis – P. Juraszek

Manuscript preparation – P. Juraszek

Literature research – P. Juraszek, M. Grajek

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