The impact of depression in the Brazilian private healthcare system: patient journey and economic burden study associating claim database and expert's opinion approach

O impacto da depressão no sistema de saúde privado brasileiro: estudo da jornada do paciente e da carga econômica associando banco de dados de sinistros e abordagem de opinião de especialistas

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ABSTRACT

Objective: The study aimed to describe the profile and economic burden of patients with depression from the perspective of the Brazilian Private Healthcare System (PHS). **Methods:** A two-step methodological quantitative-qualitative research design was performed: retrospective descriptive analysis of the Orizon database of patients with at least one claim of depression (F33, F38, or F39) in PHS (2013-2019) and experienced physicians perspective from an expert meeting. **Results:** 1,802 patients fulfilling the eligibility criteria counted BRL 74,978 million across the 4-year period. Over this period, nearly 60% of patients had a medical appointment (6.6 appointments per patient, on average), 61% had a psychologist, 9.8% had a psychiatrist appointment, and an average of 115.2 exams and 8.7 emergency visits per patient were performed. According to the experts, the economic impact of depression is more significant when considering the indirect costs related to productivity loss and impairment in occupational and interpersonal functioning. **Conclusion:** Identifying and diagnosing patients with depression and their real burden is challenging; even with significant costs identified in the claim database analyses in the Brazilian PHS, the real impact must be higher if indirect costs are considered. The depressive disorder should be prioritized in the Brazilian PHS to establish more adequate health policies.

RESUMO

Objetivo: *O estudo teve como objetivo descrever o perfil e a carga econômica de pacientes com depressão na perspectiva do Sistema Único de Saúde (SUS).* ***Métodos:*** *Foi realizado um projeto de pesquisa quantitativo-qualitativo metodológico em duas etapas: análise descritiva retrospectiva do banco de dados Orizon de pacientes com pelo menos uma alegação de depressão (F33, F38 ou F39) no PHS (2013-2019) e perspectiva de médicos experientes de uma reunião de especialistas.* ***Resultados:*** *1.802 pacientes que preencheram os critérios de elegibilidade totalizaram R$ 74,978 milhões no período de 4 anos. Nesse período, cerca de 60% dos pacientes tiveram consulta médica (6,6 consultas por paciente, em média), 61% tiveram psicólogo, 9,8% consulta com psiquiatra e foram realizados em média 115,2 exames e 8,7*

atendimentos de emergência por paciente . Segundo os especialistas, o impacto econômico da depressão é mais significativo quando considerados os custos indiretos relacionados à perda de produtividade e prejuízo no funcionamento ocupacional e interpessoal. **Conclusão:** *Identificar e diagnosticar pacientes com depressão e sua real carga é desafiador; mesmo com custos significativos identificados nas análises da base de sinistros do SUS brasileiro, o impacto real deve ser maior se considerados os custos indiretos. O transtorno depressivo deve ser priorizado na APS brasileira para o estabelecimento de políticas de saúde mais adequadas.*

Introduction

Major depressive disorder (MDD), also called depression, is characterized by persistent sadness and a lack of interest or pleasure in previously rewarding or enjoyable activities (World Health Organization, 2021; Li *et al.*, 2021). For receiving a depression diagnosis, the symptoms must cause the individual some clinically significant distress or impairment in some essential areas of functioning. The effects of depression can be long-lasting or recurrent and negatively affects daily activities and role functioning. It is a common psychiatric disorder with no clear etiology caused by social, psychological, and biological interaction (Li *et al.*, 2021; Fujii *et al.*, 2012).

Depression is a prevalent disease in Brazil (Andrade, 2002) associated with high societal costs and functional impairment. Because of the combination of high prevalence, early onset, persistence, and impairment of mental disorders, depression is the fourth-leading cause of the global disease burden (Lopes *et al.*, 2016; Murrie & Redding, 2012).

A study in the United States estimated that direct costs comprised 47% of the MDD economic burden in 2010, 5% were suicide-related costs, and 48% were related to workplace absenteeism and presenteeism (Greenberg *et al.*, 2021; 2015). Depressive disorders accounted for 1,239 million (95% UI: 878.911-1.689.498) YLDs (years of healthy life lost due to disability) in Brazil in 2017, with a rate of 543.96 per 100,000 (95% (uncertainty interval) UI: 386.79-740.75), accounting for 5% (95% UI: 4.04-6.09) of all YLDs in the country (Bonadiman *et al.*, 2020; Naghavi, 2020). However, the real burden of the disease is difficult to estimate in Brazil due to several factors, including the depression underdiagnoses rates.

The growing burden of mental disorders demands new strategies and frameworks in healthcare systems and clinical practice to improve delivery and outcomes (Lopes *et al.*, 2016). Further research is needed to overcome literature gaps to provide high-quality information for healthcare providers and improve these patients' care. This study aimed to describe the profile of patients with depression and the economic burden on the Brazilian Private Healthcare System. A further aim of this study was to assess the attitude of expert opinion leaders regarding the current landscape of depression disorder across the private healthcare system.

Material and methods

The study included two different and complementary approaches: 1) in the first approach, we conducted a secondary data study based on patient reimbursement information from Orizon – information processes from health insurance companies to estimate the healthcare resource use and depression costs. Orizon is a Brazilian private perspective claims database with an automated billing system among its services to healthcare providers and payers. The data source used in this study included 14 health insurance companies of four segments (self-insurance, benefits management organization, and medical cooperative); 2) in the second approach, an expert meeting was conducted with five physicians with experience in the Private Healthcare System, Healthcare Provider Manager and Population Health Specialists to better understand depression management and healthcare resource use. As this study represents anonymized data and physicians' opinions, ethical approval was not required, in alignment with Brazilian ethical resolution No. 510, 2016 (Conselho Nacional de Saúde, 2016). Additionally, the consulted specialists provided their consent prior to the meeting.

Secondary data study from the Orizon database

The secondary data from the Orizon database approach included patients with depression in the inpatient setting from 01st January 2015 to 31st December 2017. Patients hospitalized with depression, considering the International Classification of Diseases, 10th revision (ICD-10) codes were selected according to the pre-defined eligibility criteria (Figure 1). Data were extracted from 01st January 2013 to 31st December 2019, considering two years before and two years after depression ICD-10 claims.
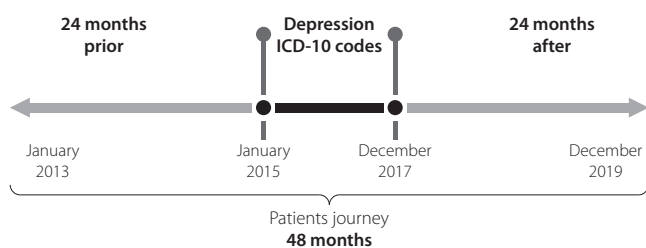
Figure 1. Summary of the study period

Data source

The data source for analyzing the cost and healthcare resource use of patients with depression was patients' reimbursement information from the Orizon database. The administrative data contain a date-stamped log of all billed items by the cost-accounting department of about 25% of Brazilian patients covered by Private Health Insurance. Considering the current framework of the private healthcare system, it is challenging to identify patients diagnosed with depression based on healthcare resource use and cost data. These resources are determined mainly by the Private Healthcare Insurer only in the inpatient setting when ICD-10 is reported in the private database. Despite this limitation, it is currently the only possible approach to capture the economic burden of depression in the Brazilian Private Healthcare System.

Patients

Patients were included in the study if they had at least one claim of depression ICD-10 codes (F33, F38, or F39) in an inpatient setting between 01st January 2013 and 31st December 2019. Patients were selected considering the ICD-10 codes: F33 (Recurrent depressive disorder), F33.0 (Recurrent depressive disorder, mild current episode), F33.1 (Recurrent depressive disorder, moderate current episode), F33.2 (Recurrent depressive disorder, severe current episode without psychotic symptoms), F33.3 (Recurrent depressive disorder, current episode severe with psychotic symptoms), F33.4 (Recurrent depressive disorder, currently in remission), F33.8 (Other recurrent depressive disorders), F33.9 (Recurrent depressive disorder, unspecified), F38 (Other moods [affective] disorders), F38.0 (Another single mood [affective] disorders), F38.1 (Another recurrent mood [affective] disorders), F38.8 (Other specified mood [affective] disorders), F39 (Unspecified mood [affective] disorder). Patients whose first claim of ICD-10 of depression was between 01st January 2015 and 31st December 2017 were included, and the date of the first claim was defined as the index date.

Exclusion criteria include patients with any claim of depression ICD-10 codes before January 2015 to guarantee no previous hospitalization; exclude patients who underwent pre-defined medication (Supplementary Table 1 – List of pre-defined drug considered as exclusion criteria) in an inpatient

setting 24 months prior to the first depression ICD-10 claim; exclude patients who are inactive for more than 24 months before and after the first ICD-10 claim (guarantee the patient is using the private system for more than 24 months prior and after the first ICD-10 claim).

Outcome

The primary outcome of the secondary data study was to describe the use of healthcare resources and associated costs for patients who experienced hospital admission related to depressive conditions between 2015 and 2017. The medical and ambulatory expenses and services used for those patients two years before and two years after depression hospitalization were analyzed. Costs and healthcare resources include exams, medical appointments, emergency room, surgeries and invasive procedures, and hospitalization.

Statistical analysis

As a secondary database descriptive study, no statistical hypothesis was intended. Only descriptive analyses were performed to describe the data and costs for all patients who experienced depression-induced hospitalization in a private setting in Brazil. Therefore, we summarized the results as absolute frequencies and percentages (%) for categorical variables and by measures of central tendency and

Table 1. Resource use and cost during 4 years of patients reporting depression ICD-10 codes in the private setting

	Total
Patient (N)	1,802
Medical appointment	
Cost	BRL 0.99 million
Total number of elective medical appointments, N	7,188
Patients with medical appointments, N (%)	1,086 (60)
Average elective medical appointments per patient	6.6
Exams	
Cost	BRL 8,4 million
Total number of exams, N	193,353
Patients performed exams, N (%)	1,678 (93)
Average exams performed per patient	115
Emergency room	
Cost	BRL 24.57 million
Total number of ER attendance	12,778
Number of patients with ER attendance, N (%)	1,467 (81)
Average ER attendance per patient	8.7

dispersion for continuous variables. Also, percentages were calculated over the number of patients with available (non--missing) data. Costs were calculated by summing all billed items. Monetary adjustments were performed for each variable type according to the inflation value for the period (2013-2019), considering the actual value (2019) based on the Orizon database. The methodology applied is internationally recognized for constructing health cost variation indexes, such as S&P Healthcare Economic Composite and Milliman Medical Index.

Expert discussion meeting

In August 2021, an expert meeting was organized to discuss the profile of patients with depression in the Brazilian Private Healthcare System and the results found in the database study. The meeting brought together five experts in depression and/or representatives of Health Insurance companies and Population Health Specialists. The meeting was conducted online with all participants and lasted three hours.

A specific material based on current literature and database outcome was developed to explore the patient journey and resource use across t depression treatment in Brazil. It contained three sections: 1) Patient profile, diagnosis, and identification; 2) Healthcare resource use; 3) Direct and indirect costs. For each section, general considerations are addressed based on a literature review, the results of the database studies, and clinical experience. A summarized description of all comments is provided below.

Results

Diagnosis and comorbidities

In the database, 1,802 patients met the eligibility criteria. Considering all patients in the private healthcare system (~9,5 million patients between 2015 and 2019), hospitalization by depression disorder represents less than 1% of the total population. The cost with these patients two years before and two years after the inpatient depression ICD-10 claim was BRL 26,713,320.51 and BRL 48,265,672.54, respectively, a sum of BRL 74,978 million across the period (Table 1).

The experts stated that one of the core issues of depression is diagnosis. Depression is commonly associated with comorbidities such as anxiety, other mental disorders, and chronic diseases or conditions leading to chronic pain. Also, they affirm that a fundamental difficulty is differentiating depression from other psychiatric illnesses or even physical diseases. Also, the ICD-10 code of comorbidities is more frequently reported than the depression code.

The burden of illness is difficult to measure from the Private Healthcare Insurer's perspective since the patient with depression is mainly identified when hospitalized. Although hospitalization related to depression represents a severe and/or refractory stage of the disease, particularly in patients presenting suicide risk, the economic impact might be relatively low since the main costs are related to drugs, healthcare professional fees, and hospital administration. Additionally, hospitalization for depressive disorder is commonly characterized by short or medium-term. Experts say the economic impact is more significant when considering the indirect costs of lost productivity and impairment in occupational and interpersonal functioning.

Medical follow-up and adherence to treatment

The number of patients with at least one medical appointment was 1,086 (60%), and the total number of medical appointments was 7,188 during the study period, with 6.6 per patient, on average (Table 1). The total cost of medical appointments of patients with at least one claim of depression ICD-10 was BRL 0,99 million in the 4-year period.

There is no initiative or program to enhance access and information about the relevance of treating depression disease from the Private Healthcare Insurer side. The speech analysis showed the patient is mainly responsible for seeking healthcare services and treatment in the private healthcare system. Other common barriers to accessing mental healthcare include lack of familiar support, lack of funding, limited communication between the healthcare professional and the patient, and gaps in referring care among professionals.

Psychiatric care

The psychiatrist was the database's most frequent medical specialty, with 1,421 medical appointments used by 177 patients (Table 2). Around 90,1% of patients showed no psychiatrist medical appointment during the follow-up period. Orthopedist was the second most sought medical specialty, with 685 appointments, followed by ophthalmologist (579), cardiologist (319), and gynecologist (234) (Table 3).

From the expert opinion, the lack of awareness and delay in the patient's entrance into psychiatric care might result from the stigma. Thus, it is usual that other specialties, such as gynecologists, endocrinologists, and cardiologists, diagnose and/or treat depression. General practitioners have difficulties in diagnosing, estimating the severity, and treating depression because most of them lack the appropriate training and diagnostic expertise to recognize and/or effectively treat depressive disease.

In general, the current framework of reimbursement creates barriers to appropriate care. Lacking adequate numbers and distribution of psychiatrists in private settings over the country prevents easy access to proper treatment. Professionals are generally concentrated in large urban areas, and too many professionals are unavailable to patients covered under Private Healthcare Insurers due to the low reimbursement rates. Additionally, the experts reveal insufficient

Table 2. Total number of medical appointments per medical specialist during 4 years of patients reporting depression ICD-10 codes in the private setting

	Total number of medical appointments	Ranking
Medical Specialist		
Psychiatrist	1,421	1st
Orthopedist	685	2nd
Ophthalmologist	579	3rd
Cardiologist	319	4th
Gynecologist	234	5th
Non-medical Specialist		
Psychologist	10,654	1st
Physical therapist	2,378	2nd
Nutritionist	441	3rd
Speech therapist	181	4th
Occupational therapist	130	5th

Table 3. Number of patients with medical specialist and non-medical specialist appointments according to the medical specialist during 4 years of patients reporting depression ICD-10 codes in the private setting

	Total number of patients with medical appointments	Ranking
Medical Specialist		
Psychiatrist	177	3rd
Orthopedist	305	2nd
Ophthalmologist	364	1st
Cardiologist	119	4th
Gynecologist	138	5th
Non-medical Specialist		
Psychologist	658	1st
Physical therapist	261	2nd
Nutritionist	154	3rd
Speech therapist	37	4th
Occupational therapist	5	5th

interaction between psychologists and psychiatrists, compromising the care and intensifying problems of patients with depression in several ways.

Psychologists and multidisciplinary care

Phycologist was the most used non-medical specialty, with 658 patients with a total of 10,654 appointments in a 4-year

period, followed by physiotherapy (261), nutritionist (441), speech therapy (181), and occupational therapy (130) (Table 3).

From the group perspective, a multidisciplinary approach is recommended with immediate access to specialist management, especially in severe psychiatric symptoms. The experts emphasize the importance of an effective psychiatrist-patient and psychiatrist-psychologist relationship throughout treatment. A simultaneous and continuous psychotherapeutic support program is essential and recommended when a psychiatrist accordingly refers patients to a psychologist or, if necessary, other non-medical professionals. However, several patients receive no care, and a trained mental health professional sees a low percentage of those who do receive care. The interface between physical healthcare providers and non-medical specialists is generally weak, and interdisciplinary care is rare. The segregated difficulty of behavioral health services to share information and knowledge across the inpatient and outpatient settings leads to suboptimal outcomes.

Exams

The total number and cost of laboratory tests were 193,353 claims and BRL8,43 million, respectively. The average number of laboratory tests was 115,2 per patient, and 93% had at least one exam during the 4-year period (Table 1). The top 10 exams and a group of exams are listed in Supplementary Tables 2 and 3, respectively.

For further understanding, physicians were also asked about exams and procedures usually needed during screening, diagnosis and/or follow-up of depressed patients. The physicians reported no specific images or lab tests to assess or diagnose depression disease.

Emergency room

The number of emergency room visits reported by the study population was 12,778 attendances, totaling 1,467 patients (8.7 visits per patient, on average). The total emergency room cost was BRL 24,57 million in a 4-year period (Table 1).

Expert opinion summarized that patients seek emergency room, referring to signs and symptoms commonly related to comorbidities and not to depressive disorder. Eventually, the depressive condition might be reported by the patient during emergency room attendance. and it could be by the report of the anti-depressive medication use or a previous diagnosis. However, it is unusual for the patient looking for emergency attendance searching for treatment or diagnosis of depressive disorders.

Discussion

The present study combined the private claim database (Orizon) with an expert meeting to explore the patient profile,

healthcare resource use, and costs of patients with depression in the Brazilian Private Healthcare System over 4 year-period: 2 years before and 2 years after reporting hospital admission due to depressive episodes. Although not all medical and non-medical appointments, exams, and emergency rooms identified in the present study can be directly associated with depression disease management, a substantial amount and resources uses were observed with these patients.

Depression is recognized as the leading cause of disability worldwide and a driver of healthcare costs (Greenberg *et al.*, 2021). Still, information about the prevalence and economic burden of depressive disorders is limited in Brazil, especially in the private setting. Despite the prevalence of depression worldwide, we found a low number of patients with depression ICD-10 in the private healthcare system. Experts comment that usually, low-risk patients do not require hospitalizations, while the severe and refractory/resistant patients might need inpatient stays. Accordingly, a French nationwide claims database demonstrated that around 5% of patients with an episode of resistant depression had a history of hospitalization (Bosco-Lévy *et al.*, 2021). This factor comes together with the low number of depression patients in the Orizon database.

In the present study, experts summarized that the challenges in obtaining depression´s epidemiology and economic data begin in identifying and diagnosing such patients, especially in fragmented frameworks such as the private healthcare system. Previously published studies showed that approximately 30%-50% of mental disorders cases, including depressive disorders, are underdiagnosed in primary care and other general medical care in Brazil (Bonadiman *et al.*, 2020) and reinforced that most general practitioners have difficulties diagnosing and treating depression (Reddy, 2010). It is essential to mention that many patients with depression are associated with people suffering from a combination of other comorbidities, with a wide range of neuropsychiatric and non-neuropsychiatric signs and symptoms. Thus, it is safe to say that depression is often present together with other mental disorders (Mimura, 2001), difficulting the segregation between depression and the associated illness and their respective costs. From a payer perspective, the depression burden is underreported since the comorbidities are usually reported as the primary claim.

Other barriers to effective depression care and diagnosis include the lack of specialized medical care, as mentioned by experts and observed in the Orizon database outcomes – a lower number of patients with psychologist appointments (36.5%) and even fewer (9.8%) with psychiatrist appointments in Private Healthcare Insurer. In 2015, a national survey indicated that specialists ranged from one psychiatrist for every 15,000 people in Southeast Brazil to one psychiatrist for more than 80,000 people in the North region of Brazil (Lopes *et al.*, 2016). Some studies also have called attention to the limited

and inadequate access to depression treatment (Kocsis, 2008; Wang *et al.*, 2003). Almost 80% of patients with depression were not receiving any treatment (Lopes *et al.*, 2016), and 14.1% were receiving only pharmacology therapy (Lopes *et al.*, 2016). As an alternative, these patients tend to use the emergency room excessively (Clarke *et al.*, 2016), according to the present study.

Although there is no specific exam for depression diagnosis, the number of exams performed, and their costs, were relatively high. Most performed exams and procedures were related to confirming and/or excluding comorbidities or differential diagnoses. They reinforce the difficulties faced by physicians in diagnosing and managing depression disorders.

In agreement with expert opinion and data from the database, studies show that patients with depression often assume that they have a medical condition rather than a psychiatric condition and tend to have themselves re-examined repeatedly in internal medicine or emergency rooms (Borwin, 2015). This behavior is associated with a fragmented health system. Professionals are neither well-prepared to detect and diagnose psychological disorders nor forward the patient to proper management, or psychiatrists might implicate the high use of healthcare resources.

Cost-of-illness research has shown that depression is associated with an enormous economic burden. Still, the real impact of this disease on Private Healthcare Insurers is underestimated due to the complexity of measuring the disease´s costs. Besides that, only a low percent of the overall burden of illness was attributable to the direct medical costs of treating depression itself (Razzouk, 2016). An analysis of the depression economic burden in the United States demonstrated that indirect expenses, such as reduced work productivity, accounted for the clear majority (~60%) of the costs (Wang *et al.*, 2003). Although not assessed in the present study, literature and experts state that the highest economic impact of depression relies on indirect costs.

This complex clinical picture of depression associated with an inadequate health private framework negatively impacts disease progression, providing ineffective care assistance and enhancing direct and indirect costs. However, nowadays, depression disorder is not noted as an economic burden from the private healthcare perspective due to the substantial under-recognition of patients and costs. The present database outcomes and expert comments give us real-world clinical practice visibility about these gaps, challenges, and the impact of depression in Brazil. There is an unmet need to manage depression disorders in private settings that should be mitigated to improve health outcomes and lower costs.

Several limitations of this study are noteworthy. First, Orizon's outcomes may represent severe/resistant depressed patients due to the methodology adopted to include patients: hospital admission of depression ICD-10 code (does

not reflect the diagnosis). Still, it is the only possible moment to recognize a patient in the private healthcare system. Costs are not restricted to depressive disease since it is impossible to link all procedures performed with the respective ICD-10 code and dissociate comorbidities. However, it represents the profile of a patient with at least one ICD-10 depression code during the study period. The small sample of expert physicians might not reflect all Brazilian practices; however, the invited specialists were carefully chosen to reflect the most representative practices of depressive disease management in the Brazilian Private Healthcare System. Costs were derived from reimbursement values of private databases, which may underestimate actual costs.

The study described the profile and the healthcare resource use and costs during 4 years of patients that reported depression ICD-10 code in private institutions in Brazil associated with key experts in depression. Considering all these aspects, the burden associated with depressive disorder in the Brazilian Private Healthcare System is difficult to estimate. It requires an integrated healthcare framework and investing in the continuing education of these professionals to provide better assistance and avoid unnecessary costs. Finally, the depressive disorder must be considered an issue of high importance to implement adequate health policies.

Acknowledgment

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Supplementary material

Supplementary Table 1. List of pre-defined drugs considered as exclusion criteria

Agomelatine	Doxepin	Lithium	Reboxetine
Amitriptyline	Duloxetine	Maprotiline	Selegiline
Amoxapine	Escitalopram	Mianserin	Tianeptine
Befloxatane	Phenelzine	Mirtazapine	Tranylcypromine
Bupropion	Fluoxetine	Moclobemide	Trazodone
Citalopram	Fluvoxamine	Nefazodone	Trimipramine
Clomipramine	Imipramine	Nortriptyline	Venlafaxine
Desipramine	Isocarboxazid	Paroxetine	Vilazodone
Desvenlafaxine	Levomilnacipran	Protriptyline	Vortioxetine

Supplementary Table 2. Top 10 exams performed

	Number of exams performed	Ranking
Exams		
Conventional ECG	2,391	1st
Full abdominal US	1,3022	2nd
X-ray	1,182	3rd
Transthoracic Doppler echocardiogram	923	4th
X-ray – Thorax	914	5th
MRI – Cervical or dorsal or lumbar spine	667	6th
MRI – Articular cartilage	646	7th
Ultrasound - Articular cartilage	620	8th
Ultrasound – Surface organs	591	9th
Tomography – Skull	588	10th

Supplementary Table 3. Top 10 groups of exams performed

	Number of exams performed	Ranking
Laboratory	162,952	1st
Imaging exam	22,433	2nd
Specific exams	7,836	3rd
Electrophysiology	5,177	4th
Anatomical Pathology	3,490	5th
Diagnoses	915	6th
Endoscopy	536	7th
Nuclear medicine	356	8th
Colonoscopy	263	9th
Genetic	10	10th