Functional limitations and the use of rehabilitation therapies among brazilian adults with chronic diseases

Limitações funcionais e o uso de terapias de reabilitação entre adultos brasileiros com doenças crônicas

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ABSTRACT

Objective: We aim to analyze the functional limitations and the use of rehabilitation therapies among brazilian adults with chronic diseases. **Methods:** This is a population-based survey with data from the 2013 National Health Survey. There was selected a subsample of the adult population who reported chronic diseases (stroke, arthritis, work-related musculoskeletal disorder, chronic obstructive pulmonary disease, or reported back pain), and that also reported moderate to very intense limitations of their activities. The outcome was the use of rehabilitation therapies. A logistic regression model was estimated, with a 95% confidence interval, adjusted for sociodemographic variables. **Results:** Among brazilian adults, 24.8% were diagnosed with a stroke, arthritis, work-related musculoskeletal disorder, chronic obstructive pulmonary disease, or reported back pain. Among these, 34.6% reported having moderate, intense, or very intense limitations in their daily activities due to illnesses, and, among this population, 26.3% performed some rehabilitation therapy related to their conditions. The use of rehabilitation therapies was more frequent among the female population, with higher education, higher socioeconomic status, older, and living in the southern macro-region of Brazil. **Conclusions:** Among brazilians with functional limitations due to chronic diseases, the low frequency of rehabilitation therapies utilization may be associated with barriers to access health services.

Keywords: Rehabilitation, Chronic Diseases, Health Services, Health Services for Persons with Disabilities, Health Surveys

RESUMO

Objetivo: Analisar as limitações funcionais e o uso de terapias de reabilitação entre adultos brasileiros com doenças crônicas. **Métodos:** Este é um estudo de base populacional com dados da Pesquisa Nacional de Saúde de 2013. Foi selecionada uma subamostra da população adulta que relatou doenças crônicas (acidente vascular cerebral, artrite, distúrbio musculoesquelético relacionado ao trabalho, doença pulmonar obstrutiva crônica ou dor nas costas) e que também relatou limitações moderadas a muito intensas em suas atividades. O desfecho foi o uso de terapias de reabilitação. Um modelo de regressão logística foi estimado, com intervalo de confiança de 95%, ajustado para variáveis sociodemográficas. **Resultados:** Entre os adultos brasileiros, 24,8% foram diagnosticados com acidente vascular cerebral, artrite, distúrbio musculoesquelético relacionado ao trabalho, doença pulmonar obstrutiva crônica ou relataram dor nas costas. Entre estes, 34,6% relataram ter limitações moderadas, intensas ou muito intensas em suas atividades diárias devido a doenças e, entre essa população, 26,3% realizaram alguma terapia de reabilitação relacionada às suas condições. O uso de terapias de reabilitação foi mais frequente entre a população feminina, com maior nível de escolaridade, maior status socioeconômico, mais velha e residente na macrorregião sul do Brasil. **Conclusões:** Entre os brasileiros com limitações funcionais devido a doenças crônicas, a baixa frequência de utilização de terapias de reabilitação pode estar associada a barreiras de acesso aos serviços de saúde.

Palavras-chaves: Reabilitação, Doenças Crônicas, Serviços de Saúde, Serviços de Saúde para Pessoas com Deficiência, Inquéritos Epidemiológicos

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INTRODUCTION

Recent decades have witnessed an epidemiological and demographic transition characterized by an increased prevalence of non-communicable chronic diseases, such as cardiovascular diseases, cancer, diabetes, and respiratory diseases.[1,2] This transition is accompanied by a rise in functional limitations among individuals, particularly the elderly population.[1,2] According to the World Health Organization (WHO), 10% of the population in developed countries and 15% in developing countries experience some form of functional limitation.[3]

The WHO conceptualizes rehabilitation as measures that help people with disabilities, or some transient or permanent functional limitation, to have better functionality in their interaction with their environment.[4] In this sense, rehabilitation can present two aspects: actions focusing on the individual, as indicated by the WHO, and equipment that can help in the rehabilitation process.[5]

Rehabilitation services are a fundamental component in the health care for people with chronic diseases and functional limitations, providing to this population therapies to recovery, support for social inclusion, and improvement in the quality of life.[6]

In Brazil, there is a health care network for people with chronic diseases, funded by the Unified Health System (SUS), that should guarantee rehabilitation services to all users with chronic diseases to meet their needs.[6]

Understanding the patterns of rehabilitation therapies among individuals who potentially need them in Brazil can help identify the most vulnerable populations and guide public health policies.

OBJECTIVE

Therefore, we aimed to analyze the factors associated with rehabilitation therapies among Brazilian adults with chronic diseases and limitations in their daily activities.

METHODS

This study had a cross-sectional design with data from the National Health Survey (PNS), an epidemiological survey with a household basis and national representation, conducted in 2013 by the Oswaldo Cruz Foundation and the Ministry of Health in partnership with the Brazilian Institute of Geography and Statistics (IBGE). The micro data is publicly available at the IBGE website (https://www.ibge.gov.br/).

The sampling framework of the PNS-2013 master sample was organized into three distinct stages: the selection of Primary Analysis Units (UPAs), followed by the random selection of households within these UPAs (with a predetermined number per UPA), and the final stage involving the random selection of an adult resident aged 18 years or older within each chosen household. The survey ultimately encompassed 81,254 households, of which 69,994 were occupied. The data collection resulted in 64,348 household interviews and 60,202 interviews with the selected residents.[7,8]

Outcome and associated variables

The subsample analyzed in this study encompassed Brazilian adults who met two specific criteria: (1) self-reported a diagnosis of one or more of the following chronic conditions: ischemic stroke or stroke; arthritis or rheumatism; chronic spinal issues such as back pain, neck pain, low back pain, sciatica, vertebral or disc problems; Work-related Musculoskeletal Disorder (WMSD); and Chronic Obstructive Pulmonary Disease (COPD); and (2) self-reported moderate to severe limitations in daily activities due to these conditions. The self-reported limitations in daily activities were assessed by respondents answering the question: "In general, to what extent does [name of the disease or condition] limit your usual activities?" Respondents could choose from the following options: "not limit," "a little," "moderately," "intensely," and "severely."

The outcome was the use of rehabilitation therapies among the subsampled population (Brazilian adults with chronic diseases that limit their daily activities). The PNS-2013 survey tailored its questions about rehabilitation to respondents who reported specific diseases. Respondents were questioned about their engagement with various rehabilitation modalities for each type of chronic conditions examined in this study. For stroke victims, the survey inquired explicitly about the utilization of physiotherapy or other rehabilitative therapies. In cases of arthritis, respondents were asked whether they engaged in physical activities or exercise in addition to physiotherapy and acupuncture. For those suffering from back pain and WMSD, the questionnaire addressed acupuncture, exercise, or physiotherapy. Notably, the use of medications was not categorized as a form of rehabilitation therapy in the survey, and no distinctions were made between physical activities that were guided or monitored by health professionals and those that were self-initiated or recreational.

Notably, Work-related Musculoskeletal Disorders (WMSDs) comprise various disorders often linked to occupational activities, impacting different body parts, including the spine. Consequently, the PNS questionnaire distinctly addresses WMSD and spinal issues, the latter relating to "chronic spine pain or disorders, such as chronic back or neck pain, low back pain, sciatica, vertebrae or disc diseases." Specifically, for WMSD, the questionnaire inquired if the respondent had been diagnosed by a physician, asking, "Has a doctor already given you the diagnosis of WMSD?"[9]

The sociodemographic characteristics associated with the outcome: Brazilian region of residence (Southeast, South, Midwest, Northeast, North); sex (male; female); age group (18-39; 40-59; and 60 years and over); level of education (incomplete elementary school; complete high school and more); skin color/race (white; non-white); and socioeconomic level,[10] divided into classes A+B, C, D+E.[10]

In all statistical analyses, we incorporated the complex sample design. Initially, with a 95% confidence interval, we described the prevalence of chronic diseases and conditions, limitations of moderate, intense, and very intense activities, and the use of rehabilitation therapies according to disease or chronic condition. Next, we analyzed the prevalence, with a 95% confidence interval, of moderate, intense, and very intense limitations, according to disease or chronic condition and sociodemographic characteristics, and among these, the proportion of those who used rehabilitation therapies.

Finally, we estimated the chance of using rehabilitation therapies, according to disease or chronic condition and sociodemographic variables, by calculating the unadjusted odds ratio (OR) and adjusted odds ratio (AOR), obtained by the logistic regression model.

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For each sociodemographic variable, the ORs using the following response categories as a reference for comparison: male gender, non-white race/skin color, incomplete primary education, age between 18 and 39 years, and the Northeast region of the country. Values equivalent to one were considered non-significant, with a 95% confidence interval.

RESULTS

Table 1 shows the prevalence of self-reported medical diagnosis of chronic diseases and the consequent limitations of moderate, intense, and very intense daily activities. Back pain and arthritis are the most prevalent diseases, and stroke and lung disease were the least prevalent. Regarding the limitation of daily activities, stroke and arthritis were the diseases that more frequently limited daily activities in a moderate, intense, and very intense way. About 25% of subjects reported a diagnosis of one or more of the study diseases. Among them, the prevalence of moderate, intense, and very intense limitation of daily activities was about one-third.

Table 1. Prevalence of chronic diseases and limitation of daily activities among the Brazilian adult population (PNS, Brazil, 2013)

Chronic disease or condition[1]	Prevalence[2] (%)	CI 95%	Limitation of daily activities[3]	
			Prevalence (%)	CI 95%
CVA[4]	1.5	(1.4-1.7)	38.6	(34.7-42.6)
Arthritis[5]	6.4	(6.1-6.8)	34.9	(32.4-37.5)
Back Pain[6]	18.5	(17.8-19.1)	34.7	(33.2-36.3)
WMSD[7]	2.4	(2.2-2.7)	30.3	(26.7-34.1)
COPD[8]	1.8	(1.6-2.0)	24.0	(20.7-27.6)
One or more conditions[9]	24.8	(24.1-25.5)	34.6	(33.3-35.9)
Total	**100.0**			

Chronic disease or condition[1]: Self-reported medical diagnosis of disease or condition; Prevalence[2]: taking into account the complex design of the sample. 95%CI: 95% confidence interval taking into account the complex design of the sample; Limitation of their daily activities[3] such as: working, studying, and doing housework (report of moderate, intense, or very intense limitations of chronic diseases); Cerebrovascular accident (CVA), ischemic stroke or stroke[4]; Arthritis or rheumatism[5]; Back Pain: Chronic back problem such as chronic back or neck pain, low back pain, sciatica, vertebrae or disc problems[6]; WMSD: work-related musculoskeletal disorder[7]; COPD: Chronic Obstructive Pulmonary Disease;[8] One or more conditions: report of one or more chronic diseases or conditions[9]

Table 2 illustrates the prevalence of individuals who reported using one or more rehabilitation therapies due to the selected chronic diseases and reported limitations in their daily activities. Individuals who reported having arthritis and WMSD were those who most used rehabilitation therapies.

Exercise or some physical activity was the most used therapy among individuals who reported having arthritis, and exercise, physical therapy, or both were the most used among those who reported having WMSD. Among the individuals who reported having COPD and limited their usual activities, they were the ones who least used rehabilitation therapies.

Table 3 presents the sociodemographic characteristics of individuals with a chronic disease and reported moderate, intense, and very intense limitations in their daily activities. Chronic diseases were more frequent among women than men, non-white race, incomplete elementary education, Social Score C, between 40 and 59 years old, and the Southeast region. Stroke was more prevalent among men than women. COPD was more frequent among individuals who reported white than non-white race.

Stroke, arthritis, and COPD were more prevalent among older than younger individuals, whereas WMSD and back pain was more prevalent among individuals between 40 and 59 years.

Table 2. Prevalence of the use of therapies for chronic diseases among adults with moderate, intense, or very intense limitations of daily activities (PNS, Brazil, 2013)

Therapies	Prevalence[1] (%)	CI 95%[2]
CVA		
Physiotherapy	29.2	(25.2-33.5)
Other Rehabilitation Therapies	13.4	(9.0-19.5)
Reported the use of rehabilitation therapies due to CVA	30.2	(26.1-34.5)
Arthritis		
Exercise or some physical activity	23.6	(20.3-27.3)
Physiotherapy	22.0	(19.0-25.3)
Acupuncture	4.3	(3.2-5.6)
Reported the use of rehabilitation therapies due to arthritis	36.5	(32.8-40.3)
Back pain		
Exercise or physiotherapy	19.2	(17.3-21.2)
Acupuncture	3.0	(2.3-3.8)
Reported the use of rehabilitation therapies due for back pain	20.0	(18.0-22.0)
WMSD		
Exercise or physiotherapy	32.7	(28.3-37.5)
Acupuncture	3.3	(2.0-5.4)
Reported the use of rehabilitation therapies due to WMSD	34.0	(29.3-39.0)
COPD		
Respiratory fisioterapy	10.0	(8.6-11.6)
Reported the use of rehabilitation therapies due to any of the selected chronic diseases (total)	26.3	(24.4-28.2)

Prevalence: taking into account the complex design of the sample[1]; 95%CI: 95% confidence interval taking into account the complex design of the sample[2]

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Table 3. Prevalence of moderate, intense or very intense limitations in daily activities among subjects with chronic diseases, by sociodemographic characteristics (PNS, Brazil, 2013)

Variables	CVA % (CI 95%)	Arthritis % (CI 95%)	Back pain % (CI 95%)	WMSD % (CI 95%)	COPD % (CI 95%)	Total[1] % (CI 95%)
Sex						
Men	54.6 (47.1-61.9)	24.5 (21.4-27.9)	37.6 (35.5-39.9)	25.1 (20.3-30.6)	44.8 (41.3-48.4)	37.4 (35.4-39.5)
Women	45.4 (38.1-52.9)	75.5 (72.1-78.6)	62.4 (60.1-64.5)	74.9 (69.4-79.7)	55.2 (51.6-58.7)	62.6 (60.5-64.6)
Race[2]						
White	47.3 (42.7-52.0)	50.7 (47.0-54.5)	47.8 (45.5-50.1)	47.2 (41.5-52.8)	54.1 (45.8-62.3)	47.8 (45.7-49.9)
Non-white	52.7 (48.0-57.3)	49.3 (45.5-53.0)	52.2 (49.9-54.5)	52.8 (47.2-58.8)	45.9 (37.7-54.2)	52.2 (50.1-54.3)
Education[3]						
Elementary incomplete	61.3 (56.9-65.5)	61.4 (57.7-65.0)	63.2 (60.8-65.6)	46.3 (41.1-51.5)	56.1 (49.8-62.2)	60.7 (58.5-62.8)
High School	29.3 (22.5-37.1)	28.2 (24.8-31.8)	27.1 (24.8-29.5)	43.4 (38.2-48.6)	30.5 (25.3-36.2)	28.9 (26.9-31.1)
Higher education	9.5 (5.4-16.2)	10.4 (7.7-13.9)	9.7 (8.1-11.4)	10.4 (8.0-13.2)	13.4 (10.6-16.8)	10.4 (8.9-12.0)
Social Score[4]						
A+B	15.8 (11.8-20.9)	19.7 (16.3-23.6)	22.1 (19.9-24.6)	33.7 (29.4-38.3)	33.5 (27.5-40.1)	22.9 (20.9-25.0)
C	45.3 (41.2-49.4)	48.0 (44.2-51.8)	41.8 (39.3-44.4)	50.1 (45.0-55.2)	35.4 (29.7-41.5)	42.9 (40.7-45.1)
D+E	38.9 (34.0-44.0)	32.3 (29.8-34.9)	36.1 (33.9-38.3)	16.2 (12.6-20.6)	31.1 (28.1-34.3)	34.2 (32.4-36.1)
Age group						
18 to 39 years old	2.0 (1.1-3.5)	6.1 (4.9-7.6)	18.3 (16.6-20.0)	26.5 (21.7-31.9)	18.5 (13.7-24.6)	17.2 (15.7-18.9)
40 to 59 years old	33.5 (29.5-37.7)	45.1 (41.2-49.0)	50.1 (47.8-52.4)	62.9 (57.3-68.1)	30.5 (23.7-38.3)	47.8 (45.7-50.0)
60 years old or more	64.5 (59.6-69.2)	48.8 (44.9-52.7)	31.6 (29.4-33.9)	10.7 (8.4-13.5)	51.0 (43.0-58.9)	35.0 (32.9-37.1)
Region of residence						
Southeast	42.7 (39.8-45.7)	37.1 (34.8-39.6)	36.6 (34.9-38.2)	45.3 (42.5-48.1)	48.4 (45.8-51.1)	38.9 (37.3-40.6)
South	14.0 (12.2-16.0)	18.3 (16.8-20.0)	19.8 (18.5-21.1)	24.9 (22.2-27.7)	28.7 (26.3-31.3)	18.8 (17.7-20.1)
Midwest	5.8 (5.0-6.7)	7.8 (6.8-8.8)	7.6 (7.0-8.4)	9.1 (7.3-11.3)	7.0 (6.2-7.8)	7.7 (7.1-8.3)
Northeast	29.8 (27.7-32.0)	30.9 (29.0-32.9)	30.3 (28.8-31.9)	18.4 (16.8-20.1)	11.8 (10.9-12.9)	29.0 (27.6-30.4)
North	7.7 (7.0-8.5)	5.9 (5.4-6.4)	5.7 (5.2-6.3)	2.3 (2.1-2.6)	4.0 (3.6-4.4)	5.6 (5.2-6.1)

Total[1]: individuals with at least one of the selected diseases and limitations due to one of these diseases. Race: obtained by self-classification according to the IBGE categories; later categorized as white and non-white (black, brown, yellow, or indigenous)[2]; Education: categorized into incomplete elementary school (no education or incomplete elementary school), high school (complete high school and incomplete college) and higher education (complete college or more)[3]; Social score: classification proposed by the Brazilian Association of Population Studies (http://www.abep.org/criterio-brasil), where the population is divided into five categories, ranging from A (richest) to E (poorest)[4]

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In Table 4, the prevalence of use of rehabilitation therapies was higher among the richest, among women, those who reported white race, higher education or more, aged between 40 and 59 years, and living in the South Region. For COPD, the prevalence of rehabilitation therapies was higher among men, non-whites, with higher education or more, higher social score, and living in the North and Midwest regions. Regarding WMSD, the prevalence of use of rehabilitation therapy was higher among individuals, non-white races, and residents of the Northeast region.

Table 4. Prevalence of rehabilitation therapies among adult population with chronic diseases who reported moderate, intense, or very intense limitations in daily activities by sociodemographic characteristics (PNS, Brazil, 2013)

Variables	CVA Therapy+[2] % (CI 95%)	Arthritis Therapy+ % (CI 95%)	Back pain Therapy+ % (CI 95%)	WMSD Therapy+ % (IC 95%)	COPD Therapy+ % (IC 95%)	Total[1] Therapy+ % (IC 95%)
Sex						
Men	27,6	30,5	16.5	31.5	11.2	21.3
	(17.6-4.5)	(23.6-38.3)	(13.8-19.6)	(23.1-41.3)	(9.7-12.8)	(18.4-24.6)
Women	33.3	38.4	22.1	34.8	9.0	29.2
	(25.6-41.9)	(34.0-43.0)	(19.5-24.8)	(29.1-41.1)	(6.7-12.0)	(26.8-31.8)
Race						
White	40.5	36.2	23.2	29.8	9.3	29.3
	(33.3-48.2)	(30.9-41.8)	(20.1-26.6)	(23.6-36.9)	(7.1-12.2)	(26.4-32.5)
Non-White	20.9	36.8	17.0	37.7	10.8	23.5
	(17.3-25.0)	(31.6-42.2)	(14.6-19.7)	(30.0-46.1)	(8.7-13.3)	(21.1-26.0)
Education						
Elementary incomplete	25.1	36.3	16.9	32.4	9.8	22.7
	(21.4-29.2)	(32.0-40.8)	(14.5-19.6)	(27.4-37.7)	(7.9-12.1)	(20.4-25.2)
High School	34.5	34.6	22.1	33.6	9.9	29.1
	(18.6-54.9)	(28.1-41.8)	(18.6-25.9)	(24.2-44.5)	(6.9-14.0)	(25.6-32.9)
Higher education	49.5	42.5	33.9	43.1	11.1	39.1
	(25.2-74.0)	(28.7-57.6)	(27.0-41.6)	(31.3-55.6)	(7.1-17.0)	(32.8-45.7)
Social Score						
A+B	40.6	42.6	30.4	35.0	13.1	34.5
	(25.7-57.5)	(33.2-52.6)	(25.5-35.8)	(24.4-47.3)	(9.9-17.2)	(30.2-39.0)
C	28.4	38.6	20.4	34.8	6.4	28.0
	(21.1-37.0)	(33.3-44.1)	(17.2-23.9)	(29.0-41.1)	(4.1-9.8)	(24.9-31.3)
D+E	28.0	29.6	13.1	29.6	10.7	18.6
	(22.9-33.7)	(24.3-35.5)	(10.8-15.8)	(21.2-39.6)	(9.5-12.1)	(16.1-21.4)
Age group						
18 to 39 years old	19.9	27.9	16.2	19.3	4.9	17.7
	(7.7-42.6)	(20.3-37.0)	(12.7-20.5)	(12.5-28.6)	(3.3-7.4)	(14.5-21.5)
40 to 59 years old	23.5	40.5	21.1	41.4	13.8	28.8
	(17.5-30.7)	(34.9-46.3)	(18.2-24.3)	(34.5-48.6)	(10.3-18.1)	(26.0-31.9)
60 years old or more	34.0	33.8	20.3	26.9	9.6	26.9
	(28.4-40.0)	(28.8-39.3)	(17.2-23.7)	(17.1-39.7)	(7.2-12.7)	(23.7-30.5)
Region of residence						
Southeast	31.7	36.4	20.7	34.3	10.6	26.5
	(24.3-40.1)	(29.3-44.2)	(17.2-24.7)	(26.5-43.0)	(8.1-13.8)	(23.1-30.1)
South	41.8	43.3	26.9	31.4	7.8	32.1
	(31.1-53.4)	(35.6-51.3)	(21.7-32.8)	(22.7-41.6)	(6.4-9.4)	(27.6-37.0)
Midwest	33.4	28.6	24.7	34.0	16.0	28.6
	(23.6-44.9)	(21.9-36.4)	(20.3-29.8)	(21.8-48.8)	(14.4-17.8)	(24.6-33.1)
Northeast	21.1	35.5	14.1	38.5	4.2	22.1
	(16.4-26.6)	(29.6-41.7)	(11.7-16.9)	(31.5-46.0)	(3.9-4.5)	(19.6-25.0)
North	33.7	31.1	15.9	20.0	24.6	23.3
	(27.8-40.0)	(23.3-40.0)	(11.7-21.1)	(11.5-32.4)	(17.7-33.2)	(19.3-27.9)

Total: individuals with at least one of the selected diseases and limitations due to one of these diseases[1]; Therapy +: prevalence of individuals who reported use of one or more rehabilitation therapies[2]

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In table 5, female individuals with higher education or more, wealthier (A+B classes), between 40 and 59 years old, and residing in the South Region had a significantly higher chance (AOR) of using therapies for rehabilitation when compared with the other categories. Regarding back pain, wealthier women with higher education, belonging to wealthier classes (A+B classes), aged 60 years or more, and residing in the South Region had a higher chance of using rehabilitation therapies. White individuals and those living in the North region, with a self-reported diagnosis of stroke, had a significantly higher chance of using rehabilitation therapies when compared to the reference categories. Except for stroke, the race variable was not statistically significant when compared to its reference category. Regarding COPD, the age group from 40 to 59 years old and those living in the North and Midwest regions had a significantly greater chance of using rehabilitation therapies when compared to the other reference categories.

Table 5. Chance of use of rehabilitation therapies for chronic diseases that caused moderate, intense, or very intense limitations in daily activities among adult population by sociodemographic characteristics (PNS, Brazil, 2013)

Variables	CVA AOR[1]	Arthritis AOR	Back pain AOR	WMSD AOR	COPD AOR	Total[1] AOR
Sex						
Men	1	1	1	1	1	1
Women	1.6	1.4	1.3	1.1	0.7	1.5
	(0.8-3.3)	(1.0-2.1)	(1.0-1.7)*	(0.7-1.9)	(0.4-1.1)	(1.2-1.8)
Race						
Non-white	1	1	1	1	1	1
White	2.1	0.8	1.0	0.7	1.0	1.1
	(1.1-4.1)	(0.6-1.1)	(0.8-1.4)	(0.4-1.2)	(0.5-1.8)	(0.9-1.4)
Education						
Elementary incomplete	1	1	1	1	1	1
High School	1.8	0.8	1.2	1.1	0.8	1.2
	(0.8-4.1)	(0.5-1.1)	(1.0-2.6)*	(0.6-1.9)	(0.4-1.6)	(0.9-1.6)
Higher education	2.7	0.9	2.1	2.4	1.1	1.7
	(0.7-10.4)	(0.4-2.0)	(1.3-3.2)	(1.1-5.1)	(0.5-2.5)	(1.2-2.6)
Social Score						
D+E	1	1	1	1	1	1
A+B	1.0	1.9	1.5	1.3	1.4	1.7
	(0.4-2.9)	(1.1-3.3)	(1.1-2.0)	(0.5-3.2)	(0.8-2.5)	(1.2-2.5)
C	0.5	1.5	1.4	1.4	0.5	1.6
	(0.3-1.1)	(1.1-2.1)	(1.0-2.0)*	(0.7-2.7)	(0.3-0.9)	(1.2-2.0)
Age group						
18 to 39 years old	1	1	1	1	1	1
40 to 59 years old	1.2	1.6	1.4	3.7	4.2	2.1
	(0.3-4.6)	(1.0-2.6)	(1.0-2.0)*	(2.0-7.0)	(2.0-8.8)	(1.6-2.7)
60 years old or more	1.9	1.2	1.5	1.7	2.3	2.0
	(0.5-7.5)	(0.7-2.0)	(1.0-2.1)*	(0.8-3.7)	(1.3-4.3)	(1.5-2.7)
Region of residence						
Northeast	1	1	1	1	1	1
Southeast	1.7	0.9	1.2	0.7	2.7	1.0
	(1.1-2.6)	(0.6-1.4)	(0.9-1.6)	(0.4-1.2)	(1.9-3.9)	(0.7-1.2)
South	2.2	1.3	1.8	0.8	1.8	1.4
	(1.1-4.3)	(0.9-2.1)	(1.3-2.7)	(0.4-1.4)	(1.2-2.7)	(1.0-1.8)*
Midwest	2.1	0.7	1.7	0.8	5.2	1.2
	(0.9-4.6)	(0.4-1.0)	(1.2-2.4)	(0.3-1.9)	(3.9-7.1)	(0.9-1.6)
North	2.4	0.9	1.1	0.3	9.7	1.0
	(1.4-4.1)	(0.5-1.4)	(0.7-1.7)	(0.1-0.5)	(5.6-16.9)	(0.8-1.5)

Statistically significant (p<0.05); AOR[1]: Adjusted odds ratio, obtained by logistic regression model, considering the complex design of the sample; Outcome: report of carrying out one or more rehabilitation therapies

DISCUSSION

Approximately 25% of Brazil's population was diagnosed with a stroke, arthritis, WMSD, COPD, or reported back pain, and one in three affected by these diseases and conditions had moderate, intense, or very intense limitations in their daily activities.

However, only a quarter of these individuals with moderate to severe limitations engage in rehabilitation therapy, highlighting a gap in the utilization of such services. The scenario of relatively low use of rehabilitation therapies among people with chronic diseases and limited daily activities may indicate challenges in accessing rehabilitation services, including barriers on both the

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demand and the supply for these services.[11,12] Examples of barriers in demand are the high cost of accessing services, including transport costs, waiting time, and lack of awareness of rehabilitation needs. In terms of supply, the absence of an integrated national policy on rehabilitation, inadequate provision of services, insufficient infrastructure, lack of professionals and professionals with little training can be included.[11,12,13]

Although the PNS-2013 does not address the possible barriers to the use of rehabilitation therapies in the population studied, all individuals should be able to access quality rehabilitation services without fear of financial difficulties, according to the WHO. In Brazil, about 72% of the Brazilian population depends exclusively on the Unified Health System (SUS), and, despite social inequalities in access to medical and dental services, they are offered almost universally.[14,15] However, the offer of rehabilitation services through the Unified Health System does not have a consolidated policy, legislation, or even a specific budget,[13] having sparse regulations from different areas of the Ministry of Health, such as Occupational Health, Elderly Health, and Disability, Trauma and Violence Program.[13]

In Brazil, rehabilitation services are offered predominantly in urban areas, concentrated in the most economically developed regions, and with a low assistance coverage, mostly offered in a precarious network with little articulation with an integrative and multidisciplinary proposal.[16,17] The concentration of these services occurs in hospital care at the expense of primary health care, with few reference services and difficulties reported by patients related to distance, cost, transport, and accessibility, in addition to the delay in scheduling these services and the vulnerability of the lower-income population.[17,18,19] These barriers may explain the present study's findings, where we observed higher chances of using rehabilitation therapies among the female population, with higher education, higher socioeconomic status, older, and living in the Southern region of Brazil. In USA, Medicaid expansion was associated with increases in the utilization of inpatient rehabilitation services, particularly among minority subpopulations (Hispanic or Black).[20,21]

Although the clear benefits of rehabilitation therapies in the conditions and chronic diseases studied, this was not often reported by the subjects.[22,23] In the case of post-stroke patients, who had moderate to very severe limitations, less than 1/3 were undergoing any therapy due to stroke, an even lower proportion (slightly more than ¼) when considering all the chronic diseases studied.[24]

Although stroke is less prevalent among the conditions studied, it has the highest percentage of individuals with moderate to very intense impairment. Schmidt et al.[25] noted that the change in the epidemiological profile that has taken place in recent decades in Brazil has highlighted diseases of the circulatory system and, among the most important, stroke, one of the leading causes of hospitalization and mortality. The literature indicates that most post-stroke patients have chronic sequelae that require rehabilitation to restore their functionality in their daily activities.[24,25,26] In this study, the percentage of people who reported medium, intense, or very intense degrees of limitations in activities of daily living was 38%. Considering the disabling potential of stroke, the active monitoring of patients should occur from the onset of the disease, with a rehabilitation program aimed at joint protection, maintenance of the functional state of the locomotor system, and the cardiorespiratory system.[27,28]

In the present study, individuals who reported having WMSD were the ones who most frequently used rehabilitation therapies. WMSDs are damage resulting from overuse imposed on the musculoskeletal system, without adequate time for recovery.[29,30] According to a study developed by the Ministry of Health, WMSD affects 50% to 80% of the economically active population.[29,30,31]

Age, gender, time working in the profession, and education may be factors associated with WMSD, considering economic activity and occupation. One study observed high proportions of symptoms related to WMSD, such as limit or inability to perform tasks, in addition to withdrawal from work activities.[32]

In this study, individuals who reported having COPD, aged between 40 and 59 years, were significantly more likely to use rehabilitation therapies when compared to the other reference categories. COPD is among the leading causes of morbidity and mortality in developing countries.[33] In Brazil, COPD is among the ten leading causes of death.[33] The specialized literature indicates that pulmonary rehabilitation improves exercise capacity, reduces dyspnea, and improves the overall quality of life, and its benefits surpass any other therapy. In addition, pulmonary rehabilitation increases the functional exercise capacity, reduces hospitalizations, and reduces the cost of treatment.[34,35,36]

The study's main limitations are related to the structure of the PNS-2013 questions, which limits the possible answers for the use of rehabilitation therapies to up to three options, at most, for each chronic disease. Another limitation of the questionnaire is related to the option "physical exercise" as rehabilitation therapy, sometimes offering the option "exercise or some physical activity" (in case the respondent has reported a stroke), sometimes offering the option "exercise or physiotherapy," combined, without the possibility of analyzing the two separately or distinguishing whether the practice was prescribed or monitored by a health professional. Another limitation of the study is related to the self-reporting of daily activities by the subjects. This method does not allow for external verification or accurate classification of the provided information.

For the present study, we decided to use any positive response (exercise or exercise and physiotherapy) to characterize the use of rehabilitation therapies, implying putting on the same level the use of physiotherapy, which depends on access to health professionals, and physical activity, which can be guided by a health professional or practiced spontaneously by the respondent. Future studies should separate possible rehabilitation therapies in their analysis.

The authors' option to analyze all chronic diseases and the resulting use or not of rehabilitation therapies together, without discriminating the factors that interfere in using these therapies for each chronic disease listed, can be considered a limitation as a fortress. The potential limitation stems from the fact that each disease has different consequences on the individual's health, with variations in the frequency and intensity of limitations in daily activities caused by morbidities. However, we consider this option an opportunity since rehabilitation therapies are necessary for moderate or severe limitations resulting from morbidities. The use of one or more therapies can be a marker of both access to health services and self-care in the case of physical activity.

We recommend studies to assess individual perceptions of the need for rehabilitation, access to and barriers to health services, factors that improve patient adherence to rehabilitation therapies, and the geographic distribution of these services.

CONCLUSION

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In conclusion, the low usage rates of rehabilitation therapies among Brazilian adults with functional limitations due to chronic diseases is a pressing issue that demands our attention. This situation not only hampers the health and well-being of individuals but also poses a significant societal challenge. It underscores the necessity for the universalization and expansion of the availability of rehabilitation services, particularly among populations that are socially and economically vulnerable and more reliant on the Unified Health System. By implementing a national public policy that ensures and coordinates equitable access to rehabilitation therapies and health promotion measures that enhance adherence to necessary treatments, we cannot only improve individual health outcomes but also contribute to the overall societal well-being in Brazil.

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