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Health Care to people with disability: the formation of teams and geographical distribution of the rehabilitation specialized component

Atenção à pessoa com deficiência: composição das equipes e distribuição geográfica do componente especializado em reabilitação

Keywords

Unified Health Service
Disabled People
Health Personnel
Access Equity
Health Services

ABSTRACT

Purpose: to analyze the composition of teams and the geographical distribution of the services and professionals of the Health Care Network for People with Disabilities (RCPD, initials in Portuguese). **Methods:** cross-sectional observational study developed from secondary data on the specialized component in rehabilitation, with a sample of 3,271 professionals. **Results:** half of the services was observed in three broad regions; there is a greater representation of Specialized Services in Intellectual Disability Rehabilitation (SERDI, initials in Portuguese), private services and physiotherapists. We observed that most services had full teams; however, most of them do not comply with the minimum workload established by national policy. The Enlarged Health Regions of Jequitinhonha, Norte and the Centros Especializados em Reabilitação (CER, initials in Portuguese) modality presented the highest averages in terms of professionals and workload. Our results show a significant statistical association between full teams and private services. **Conclusion:** these results have the potential to contribute to the development of strategies to minimize the disparities found in the geographical distribution, in rehabilitation modalities, and public service investments.

Descritores

Sistema Único de Saúde
Pessoas com Deficiência
Pessoal de Saúde
Equidade no Acesso
Serviços de Saúde

RESUMO

Objetivo: analisar a composição das equipes e a distribuição geográfica dos serviços e profissionais da Rede de Cuidados à Pessoa com Deficiência (RCPD). **Método:** estudo observacional-analítico-transversal, desenvolvido por meio de dados secundários do componente especializado em reabilitação, com amostra de 3.271 profissionais. **Resultados:** a metade dos serviços está em três regiões ampliadas; há maior representação de Serviços Especializados em Reabilitação da Deficiência Intelectual (SERDI), serviços privados e fisioterapeutas; observou-se que a maioria dos serviços possui equipes completas e que a maior parte não cumpre carga horária mínima estabelecida pela política nacional; as regiões ampliadas Jequitinhonha, Norte e a modalidade Centros Especializados em Reabilitação (CER) apresentaram maiores médias de profissionais e carga horária; houve associação estatisticamente significante entre equipe completa e serviços privados. **Conclusão:** os resultados podem contribuir no desenvolvimento de estratégias que minimizem as disparidades encontradas na distribuição geográfica, nas modalidades de reabilitação e nos investimentos para rede pública.

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INTRODUCTION

The poor geographical distribution of professionals is a major challenge faced by health systems to ensure comprehensive care. This problem causes inequality in care and, consequently, aggravates health conditions, compromising the principles of SUS (Unified Health System, initials in Portuguese)[1-3]. Concomitantly, the changes in the epidemiological profile, the increasing prevalence of chronic conditions, and the aging of the Brazilian population, increase the demand of public policies that develop actions during the population different life cycles. They also demand, through a comprehensive and effective health system, an adequate number of care centers of different modalities and professionals who act in an articulated way, aiming at longitudinal care[4,5].

Extended health care requires a multidimensional view of the patients´ needs and must be developed through multidisciplinary and interdisciplinary work, producing more effective actions in health services, generating an exchange of experiences, and new knowledge. Thus, the care model and the settings of services in the network significantly affect the resolution, efficiency, and comprehensive care. In this scenario, the professional assumes the role of interlocutor between patients and the different human and technological mechanisms that can contribute to meeting the sanitary and epidemiological demands, and the process of rehabilitation of the population[3,6,7].

The development of disabilities or loss of functionality is one of the consequences of chronic diseases and aging. In 2010, the registered number of people with disabilities was approximately 24% of the population in Brazil[8]. In 2013, 6.2% of the population was identified with some type of disability: hearing, physical, visual, or intellectual[9]. The different numbers found for the prevalence of disabilities are due to different assessment methodologies, significant information for public health management. Thus, services and professionals are important in an adequate number, aiming at health promotion, disease prevention, treatment, and rehabilitation, as well as equal access to people with different types of disabilities to services composed of multidisciplinary teams and interdisciplinary assistance[8,9].

Therefore, the Care Network for People with Disabilities (RCPD, initials in Portuguese) of SUS represents a major advance in the implementation of an integrative public policy, organized around different care centers, to expand access to services, and should offer multi-professional care in an interdisciplinary, regionalized logic and regulated according to the Regionalization Master Plan (PDR, initials in Portuguese) Also, it is a practical inclusion proposal since the care for people with disabilities in SUS is no longer the responsibility of specialized rehabilitation services only[10,11].

Thus, the RCPD-MG (initials in Portuguese) under the bias of geographic organization, the performance of professional categories, types of services, and their respective administrative spheres is substantial to guide the planning of assistance guidelines based on regional needs, collaborating for a network with more access and perspective comprehensive care.

Thus, this study aimed to analyze the distribution of services and professionals and to present the composition of the teams to discuss the geographic access of RCPD (initials in Portuguese).

METHODS

This study is part of the Project called "Care Network for People with Disabilities in Minas Gerais: population profile, access and structure evaluation", funded by FAPEMIG, linked to UFMG, in partnership with the State Health Secretariat (SES-MG (initials in Portuguese)), approved by Opinion 913,612 of UFMG.

This is an observational-analytical-cross-sectional study, developed using secondary data from the institutional database of SES-MG (initials in Portuguese), plus information from the National Register of Health Facilities (CNES/DATASUS (initials in Portuguese), referring to the component specialized in the rehabilitation of RCPD-MG (initials in Portuguese). Hospitals and polyclinics, and non-exclusive services of RCPD (initials in Portuguese) had their data collected in full in the SES-MG (initials in Portuguese) database, while outpatient services had their data collected in CNES/DATASUS (initials in Portuguese) to avoid duplication of information. Data collection was carried out from November 2015 to January 2016. This article reports the first part of the project developed with secondary data used at this time, which is why the Informed Consent Term was waived (ICF).

The study scenario is the RCPD-MG (initials in Portuguese) following the Regionalization Master Plan (PDR-MG, initials in Portuguese), which currently has 77 health regions and 13 enlarged health regions. The state of Minas Gerais has 853 municipalities, in which 147 of them have some specialized care center in the rehabilitation of RCPD (initials in Portuguese)[11].

The primary care components of RCPD (initials in Portuguese) are specialized centers (rehabilitation and dentistry) and hospital. Specialized rehabilitation services are classified as single mode, assisting only one type of disability or Specialized Rehabilitation Center (CER, initials in Portuguese), that addresses two, three, or four types of disabilities. These services are responsible for multi-professional evaluations, diagnostics, assistive technology concessions (according to the modality), habilitation, and rehabilitation[10].

The study population consisted of 3,570 professionals who work in the services of the specialized component in rehabilitation. We included the professionals in the teams of the RCPD (initials in Portuguese) rehabilitation services. Thus, we analyzed information from 3,271 professionals from the minimum teams of 209 specialized rehabilitation services.

Data collection started from the moment when SES-MG (initials in Portuguese) made the RCPD-MG (initials in Portuguese) institutional database containing technical and administrative information available. Based on this information, we created a database using Microsoft Excel© 2010, where CNES/DATASUS (initials in Portuguese) information was inserted.

The care centers analyzed were: Hearing Health Care Services (SASA, initials in Portuguese) Visual Rehabilitation Services (SRV, initials in Portuguese), Physical Rehabilitation Services (SRF, initials in Portuguese), Health Care Services for Ostomy Patients (SASPO, initials in Portuguese), Specialized

Services in Rehabilitation of Intellectual Disability (SERDI, initials in Portuguese), and Specialized Rehabilitation Centers (CER, initials in Portuguese).

We adopted the following variable responses: the distribution of professionals by care centers and the composition of the minimum health teams. As explanatory variables we used: the number of professionals, their respective categories, care centers, service modalities, health region, expanded health region, administrative sphere, minimum health team with required professionals, and minimum health team with full load weekly hourly required. The variable of minimum health team complete with workload was analyzed only in SRV (initials in Portuguese), SERDI (initials in Portuguese), and CER (initials in Portuguese), services with weekly workloads predetermined by Ordinance GM/MS 793 of 04/24/2012[10].

To analyze the association between the distribution of professionals and the expanded health regions, we divided the state into two parts, both with their geographical references North and South. The first considered the coverage of care and the respective flows of services. Thus, in the North, the enlarged health regions were considered Northeast, East, Jequitinhonha, North, Northwest, North Triangle, and South Triangle. In the South, the expanded health regions were considered Center, Center-South, South East, Southeast, South, and West. The second division of the state in the North and South considered the similarity of the Municipal Human Development Indexes (MHDI)[12]. Thus, in the analysis, the expanded regions of the North Triangle and the South Triangle were considered units of the South region.

For the continuous variables, we performed descriptive analyses of each one by numerical synthesis, and categorical variables had analyses of the distribution of absolute and relative frequency. The Chi-Square test evaluated the association between categorical variables. We used the Mann Whitney test to evaluate the association between quantitative variables. We adopted significance level of 5% and confidence interval of 95%. The analyses were performed using the STATA software version 12.0.

RESULTS

In 2015, RCPD-MG (initials in Portuguese) had a total of 209 specialized rehabilitation services, distributed in 147 municipalities, organized in 59 health regions and 13 enlarged health regions.

The results of the descriptive analyses of the RCPD-MG (initials in Portuguese) reveal an expressive concentration of services in the expanded South, Center, and Southeast regions, with 29.7%, 10.5%, and 10.5%, respectively. The North Triangle region stands out with 10%; West with 8.6%; Center-South with 5.3%; East with 4.8%; Southeast with 4.8%; Southern Triangle with 4.8%; Northwest with 4.3%; Northeast with 3.3%; North with 2.4%; and Jequitinhonha with only 1% of the services. As for the types of rehabilitation services, the largest representation was the SERDI (initials in Portuguese) with 63.6%; followed by SASPO (initials in Portuguese) with 13.9%; SRF (initials in Portuguese) with 8.6%; SASA (initials in Portuguese) with 6.2%; CER (initials in Portuguese) with 6.2%; and SRV (initials in Portuguese) with 1.4%. Regarding the composition of the minimum teams, we observed that 82.3% of the services comply with the legislation. However, in the services that require the professionals' pre-established weekly workload, 77.2% do not comply with it. Regarding the administrative sphere, the predominance was 78.4% of private services.

Analyses of the distribution of professionals, and their respective weekly workloads among the expanded health regions, showed that the physiotherapist is the most present professional and with the highest average workload per care center, followed by the speech-language therapist. The expanded health regions Jequitinhonha, North and do South Triangle stood out with higher averages of minimum staff and workloads (Tables 1 and 2). In this study, we chose not to include in Table 1 the results of the categories physiatrist, general practitioner, gastroenterologist, urologist, proctologist, a pediatrician, and general surgeon because they presented means lower than 1 in the expanded health regions and, in Table 2, the categories ophthalmologist, physiatrist, gastroenterologist, urologist, proctologist and general surgeon for presenting means lower than 1 in the total result of the expanded health regions.

When analyzing the care centers based on the composition of the specific minimum teams and their respective workloads required by rehabilitation modality, we observed that the CER (initials in Portuguese) has the highest average, while the SASPO (initials in Portuguese) has the lowest one (Table 3). No pedagogue was observed in the SRV (initials in Portuguese).

In the analyses considering the division of the state into North and South, with the criterion defined by the assistance flows, the North region has 64 care centers, in which 8 were CER (initials in Portuguese), while the South region has 145, with a total of 5 CER (initials in Portuguese). When using the MHDI similarity criterion, the North region has 33 points of attention, 6 of which are CERs (initials in Portuguese). The South region has 176 care centers with a total of 7 CERs (initials in Portuguese). The North region has the only CER (initials in Portuguese) IV of RCPD (initials in Portuguese), a service that has the largest number of professionals.

We found that when using the criterion of assistance flows to analyze the distribution of professionals, the North region has a higher average of professionals than the South region. The number of orthopedists showed a statistically significant association in the health regions, with a higher incidence average of these professionals in the North region. In the analysis of the workloads of the minimum teams, the North region maintains a higher average workload than the South region. The workloads of orthopedists, speech-language therapists, and the total of the minimum team have a statistically significant association in the health regions. The analysis considering the similarity criterion of IDHM also shows the North region with a higher average of professionals than the South region. Also, the average number of orthopedists and speech-language therapists has a statistically significant association in the health regions, being higher in the North region. When analyzing the workload of the minimum teams, the North region maintains a higher average workload than the South region. Speech-language therapists, orthopedists, and nurses presented higher workloads in the North, with a statistically significant association (Table 4).

Table 1. Distribution of professionals by expanded health region - Mean (minimum-maximum)

Professionals	Expanded Health Region													
	Center	South Center	Jequitinhonha	East	Southeast	Northeast	Northwest	North	West	Southeast	South	Northern Triangle	Southern Triangle	Total
Physiotherapist	4.0 (0-20)	3 (0-12)	7.5 (1-14)	2.2 (0-5)	2.2 (0-6)	1.4 (0-4)	2.6 (1-5)	4.2 (0-8)	2.7 (0-14)	2.1 (0-6)	2.4 (0-17)	3.1 (0-17)	4.4 (0-15)	2.8 (0-20)
Speech Language Therapist	3.5 (0-11)	2.0 (0-6)	5.0 (1-9)	3.6 (0-14)	2.1 (0-4)	2.1 (1-6)	2.8 (1-8)	4.6 (1-9)	1.7 (0-5)	2.5 (0-14)	1.7 (0-9)	2.0 (0-10)	2.7 (1-7)	2.4 (0-14)
Occupational Therapist	2.7 (0-12)	1.9 (0-8)	4.5 (2-7)	1.1 (0-2)	1.4 (0-5)	0.7 (0-1)	1.4 (0-3)	2.2 (0-4)	1.1 (0-4)	1.0 (0-3)	1.3 (0-5)	1.3 (0-9)	2.1 (0-5)	1.5 (0-12)
Psychologist	2.4 (0-6)	2.8 (0-6)	4.0 (2-6)	1.6 (0-3)	2.0 (0-5)	1.4 (1-4)	3.0 (1-6)	2.4 (1-5)	1.7 (0-6)	2.3 (1-5)	1.7 (0-7)	2.2 (0-6)	2.8 (1-7)	2.1 (0-7)
Social Worker	1.5 (0-5)	1.3 (0-3)	2.0 (1-3)	1.3 (0-3)	2.3 (0-5)	1.1 (0-3)	1.6 (1-3)	2.0 (1-4)	1.2 (0-5)	1.5 (1-3)	1.3 (0-3)	1.4 (0-4)	1.4 (0-4)	1.4 (0-5)
Nutritionist	0.3 (0-2)	0.5 (0-5)	1.0 (0-2)	0.2 (0-1)	0.2 (0-2)	0.3 (0-1)	0.2 (0-1)	0.6 (0-1)	0.5 (0-1)	0.3 (0-2)	0.3 (0-2)	0.3 (0-1)	0.6 (0-2)	0.3 (0-5)
ORL	0.5 (0-3)	-	1.5 (0-3)	0.5 (0-4)	0.2 (0-2)	0.7 (0-5)	0.1 (0-1)	1.0 (0-5)	0.1 (0-2)	0.4 (0-7)	0.1 (0-2)	0.1 (0-1)	0.2 (0-2)	0.2 (0-7)
Orthopedist	0.2 (0-1)	0.2 (0-1)	2.0 (0-4)	0.3 (0-1)	0.1 (0-1)	0.3 (0-1)	0.2 (0-1)	0.8 (0-2)	0.1 (0-2)	0.3 (0-3)	0.1 (0-1)	0.2 (0-2)	0.6 (0-4)	0.2 (0-4)
Ophthalmologist	0.2 (0-3)	0.1 (0-1)	1.0 (0-2)	0.1 (0-1)	-	-	-	0.2 (0-1)	-	0.0 (0-1)	0.0 (0-1)	0.0 (0-1)	0.3 (0-3)	0.1 (0-3)
Neurologist	0.5 (0-2)	0.5 (0-2)	1.0 (1-1)	0.7 (0-2)	0.7 (0-1)	0.7 (0-1)	0.8 (0-1)	1.0 (0-2)	0.6 (0-1)	0.9 (0-4)	0.7 (0-3)	0.8 (0-3)	0.9 (0-1)	0.7 (0-4)
Psychiatrist	0.4 (0-1)	0.5 (0-2)	1.0 (0-2)	0.5 (0-2)	0.4 (0-1)	0.3 (0-1)	0.3 (0-1)	0.2 (0-1)	0.2 (0-1)	0.6 (0-2)	0.4 (0-2)	0.3 (0-2)	0.2 (0-1)	0.4 (0-2)
Nurse	0.6 (0-3)	0.7 (0-1)	1.0 (0-2)	0.8 (0-4)	0.6 (0-2)	0.3 (0-1)	0.6 (0-2)	1.4 (0-2)	0.7 (0-2)	0.7 (0-2)	0.5 (0-2)	0.6 (0-3)	0.9 (0-3)	0.6 (0-4)
Minimum staff	17.5 (5-45)	14.7 (2-26)	33 (9-57)	13.7 (1-25)	13.2 (1-28)	10.1 (6-19)	14.6 (7-27)	21.8 (15-32)	11.3 (1-31)	14.0 (4-30)	11.8 (1-30)	13.8 (1-47)	17.9 (10-32)	13.9 (1-57)

Captions: ORL= otolaryngologist

Table 2. Distribution of professionals with weekly hours required per expanded health region - Mean (minimum-maximum)

Professionals	Expanded Health Region													
	Center	South Center	Jequitinhonha	East	Southeast	Northeast	Northwest	North	West	Southeast	South	Northern Triangle	Southern Triangle	Total
Physiotherapist	96 (0-520)	68 (0-280)	230 (20-440)	49 (0-120)	45 (0-110)	32 (0-84)	76 (28-140)	134 (0-290)	61 (0-280)	50 (0-180)	56 (0-510)	86 (0-440)	118 (0-450)	69 (0-520)
Speech Language Therapist	92 (0-364)	42 (0-134)	150 (20-280)	78 (0-270)	47 (0-160)	48 (8-176)	77 (20-185)	118 (40-208)	39 (0-150)	62 (0-438)	42 (0-320)	63 (0-360)	69 (20-180)	59 (0-438)
Occupational Therapist	63 (0-280)	36 (0-110)	88 (36-140)	24 (0-60)	25 (0-64)	16 (0-30)	42 (0-100)	74 (0-110)	24 (0-100)	24 (0-90)	27 (0-120)	36 (0-239)	55 (0-145)	35 (0-280)
Psychologist	62 (0-184)	63 (0-160)	115 (40-190)	33 (0-60)	51 (0-200)	43 (20-124)	99 (20-226)	64 (12-130)	36 (0-166)	54 (20-120)	40 (0-170)	56 (0-212)	67 (25-144)	52 (0-226)
Social Worker	35 (0-90)	32 (0-80)	60 (20-100)	29 (0-60)	50 (0-110)	30 (0-80)	45 (1-90)	58 (12-120)	28 (0-100)	33 (6-60)	27 (0-80)	37 (0-125)	31 (0-68)	33 (0-125)
Nutritionist	8 (0-50)	9 (0-84)	25 (0-50)	4 (0-20)	4 (0-44)	8 (0-40)	3 (0-20)	16 (0-30)	9 (0-40)	8 (0-50)	6 (0-40)	4 (0-30)	19 (0-45)	8 (0-84)
Pedagogue	21 (0-160)	103 (0-496)	20 (0-40)	10 (0-40)	55 (0-180)	23 (0-100)	42 (0-184)	20 (0-50)	28 (0-160)	21 (0-128)	42 (0-485)	102 (0-1356)	125 (0-840)	47 (0-1356)
Otolaryngologist	7 (0-104)	0 (0-0)	20 (0-40)	7 (0-55)	5 (0-45)	8 (0-59)	1 (0-8)	14 (0-68)	2 (0-40)	10 (0-214)	2 (0-56)	2 (0-40)	7 (0-70)	4 (0-214)
Orthopedist	3 (0-20)	1 (0-8)	20 (0-40)	4 (0-20)	0 (0-2)	3 (0-20)	1 (0-6)	12 (0-20)	1 (0-24)	5 (0-72)	1 (0-30)	3 (0-50)	2 (0-20)	3 (0-72)
Neurologist	7 (0-40)	5 (0-24)	6 (2-10)	6 (0-20)	4 (0-20)	5 (0-10)	4 (0-12)	9 (0-20)	6 (0-20)	11 (0-92)	5 (0-20)	8 (0-48)	7 (0-20)	6 (0-92)
Psychiatrist	3 (0-20)	3 (0-20)	5 (0-10)	5 (0-30)	3 (0-20)	3 (0-10)	1 (0-8)	2 (0-8)	2 (0-20)	5 (0-20)	3 (0-27)	1 (0-8)	1 (0-4)	3 (0-30)
General practitioner	1 (0-12)	6 (0-30)	0 (0-0)	4 (0-20)	9 (0-40)	1 (0-5)	5 (0-20)	10 (0-20)	2 (0-40)	4 (0-20)	4 (0-44)	6 (0-25)	1 (0-4)	4 (0-44)
Pediatrician	3 (0-20)	4 (0-20)	3 (0-6)	1 (0-2)	2 (0-20)	9 (0-40)	1 (0-6)	2 (0-8)	3 (0-20)	7 (0-80)	4 (0-20)	2 (0-10)	5 (0-40)	4 (0-80)
Nurse	16 (0-64)	16 (0-30)	40 (0-80)	23 (0-100)	14 (0-40)	9 .0 (0-40)	16 (0-44)	52 (0-80)	18 (0-60)	24 (0-88)	13 (0-80)	14 (0-90)	28 (0-80)	18 (0-100)
Minimum staff	421 (64-1090)	395 (60-1095)	812 (144-1480)	277 (30-510)	313 (15-784)	237 (120-507)	414 (228-675)	588 (308-942)	260 (30-1018)	324 (109-812)	272 (20-1051)	422 (21-2322)	537 (193-1554)	346 (15-2322)

Table 3. Distribution of professionals and weekly workload by care center

Professionals	Care centers											
	SRV		SERDI		SASA		SRF		SASPO		CER	
	N	WW	N	WW	N	WW	N	WW	N	WW	N	WW
Physiotherapist Mean (Min-Max)	2.3 (2-3)	71.0 (32-120)	2.4 (1-11)	56.0 (10-379)	-	-	8.7 (1-20)	225.0 (20-520)	-	-	7.2 (4-15)	209.0 (90-440)
Speech-Language Therapist Mean (Min-Max)	-	-	2.1 (1-7)	48.0 (7-205)	8.2 (4-14)	231.0 (64-438)	2.0 (0-5)	55.0 (0-152)	-	-	5.2 (3-9)	151.0 (80-320)
Occupational Therapist Mean (Min-Max)	2.0 (1-3)	47.0 (16-85)	1.6 (0-8)	35.0 (0-155)	-	-	3 .0(0-12)	77.0 (0-280)	-	-	2.9 (1-7)	79.0 (30-145)
Psychologist Mean (Min-Max)	2.7 (1-4)	60.0 (16-100)	2.4 (1-7)	57 .0(7-226)	1.5 (0-5)	35.0 (0-200)	1.6 (0-6)	39.0 (0-150)	0.4 (0-1)	11.0 (0-40)	4.2 (1-6)	120.0 (40-190)
Social Worker Mean (Min-Max)	1.7 (0-4)	33.0 (0-68)	1.6 (0-5)	36.0 (0-125)	1.3 (1-3)	26.0 (6-90)	1.1 (0-2)	26.0 (0-60)	0.6 (0-2)	16.0 (0-60)	2.0 (0-4)	58.0 (0-120)
Nutritionist Mean (Min-Max)	-	-	-	-	-	-	0.8 (0-5)	22.0 (0-84)	0.3 (0-1)	7 .0(0-40)	-	-
Pedagogue Mean (Min-Max)	-	-	-	-	0.0 (0-0)	-	-	-	-	-	-	-
Mobility technician Mean (Min-Max)	-	-	-	-	0.0 (0-0)	-	-	-	-	-	-	-
Otorhinolaryngologist Mean (Min-Max)	-	-	-	-	3.0 (1-7)	62.0 (10-214)	-	-	-	-	0.5 (0-3)	23.0 (8-40)
Orthopedist Mean (Min-Max)	-	-	-	-	-	-	1.3 (0-4)	16.0 (0-72)	-	-	1.2 (0-4)	16.0 (0-50)
Ophthalmologist Mean (Min-Max)	2.3 (1-3)	32.0 (7-48)	-	-	-	-	-	-	-	-	0.4 (0-2)	23.0 (2-40)
Physiatrist Mean (Min-Max)	-	-	-	-	-	-	0.2 (0-1)	3.0 (0-20)	-	-	-	-
Neurologist Mean (Min-Max)	-	-	0.9 (0-3)	8.0 (0-40)	0.8 (0-2)	13.0 (2-40)	0.6 (0-4)	11.0 (0-92)	-	-	1.0 (0-2)	12.0 (0-30)
Psychiatrist Mean (Min-Max)	-	-	0.5 (0-2)	7.0 (0-27)	-	-	-	-	-	-	0.7 (0-2)	9.0 (0-30)
General practitioner Mean (Min-Max)	-	-	0.6 (0-3)	4.0 (0-44)	-	-	0.2 (0-1)	7.0 (0-20)	0.2 (0-1)	4.0 (0-40)	-	-
Gastroenterologist Mean (Min-Max)	-	-	-	-	-	-	-	-	0.0 (0-1)	1 .0(0-20)	-	-
Proctologist Mean (Min-Max)	-	-	-	-	-	-	-	-	0.1 (0-1)	3.0 (0-40)	-	-
Urologist Mean (Min-Max)	-	-	-	-	-	-	0.1 (0-1)	-	0.1 (0-2)	40.0 (0-80)	-	-

Caption: N = number of professionals; WW = weekly workload; Min. = minimum; Max. = maximum; SRV = Visual Rehabilitation Service, initials in Portuguese; SERDI = Specialized Service in Intellectual Rehabilitation, initials in Portuguese; SASA = Hearing Health Care Service, initials in Portuguese; SRF = Physical Rehabilitation Service, initials in Portuguese; SASPO = Health Care Service for Ostomy Patients, initials in Portuguese; CER = Specialized Center for Rehabilitation, initials in Portuguese.

Table 3. Continued...

Professionals	Care centers											
	SRV		SERDI		SASA		SRF		SASPO		CER	
	N	WW	N	WW	N	WW	N	WW	N	WW	N	WW
Pediatrician Mean (Min-Max)	-	-	0.5 (0-1)	2.0 (2-2)	0.7 (0-2)	2.0 (1-2)	-	-	-	-	-	-
General surgeon Mean (Min-Max)	-	-	-	-	-	-	-	-	0.3 (0-2)	32.0 (0-80)	-	-
Nurse Mean (Min-Max)	-	-	-	-	-	-	1.2 (0-3)	-	1.1 (0-2)	-	2.1 (0-4)	-
Minimum staff Mean (Min-Max)	12.3 (7-20)	239.0 (64-423)	13.5 (6-32)	335 (47-2322)	16.1 (9-30)	377 (216-812)	20.3 (6-45)	501 (120-1090)	3.7 (1-13)	86 (15-300)	29.9 (23-57)	816.0 (459-1480)

Caption: N = number of professionals; WW = weekly workload; Min. = minimum; Max. = maximum; SRV = Visual Rehabilitation Service, initials in Portuguese; SERDI = Specialized Service in Intellectual Rehabilitation, initials in Portuguese; SASA = Hearing Health Care Service, initials in Portuguese; SRF = Physical Rehabilitation Service, initials in Portuguese; SASPO = Health Care Service for Ostomy Patients, initials in Portuguese; CER = Specialized Center for Rehabilitation, initials in Portuguese.

Table 4. Distribution of professionals and weekly workload by North and South regions - Mean (minimum-maximum)

Professionals	Assistance Flow						Similarity of the Human Development Index					
	North	South	p-value	North	South	p-value	North	South	p-value	North	South	p-value
	N	N		WW	WW		N	N		WW	WW	
Physiotherapist	3.1 (0-17)	2.7 (0-20)	0.889	86.0 (0-450)	62.0 (0-520)	0.310	2.8 (0-14)	2.8 (0-20)	0.588	76.8 (0-440)	67.9 (0-520)	0.231
Speech-Language Therapist	2.8 (0-14)	2.2 (0-14)	0.156	74.0 (0-360)	53.0 (0-438)	**0.017**	3.3 (0-14)	2.2 (0-14)	**0.018**	81.8 (0-280)	54.9 (0-438)	**0.006**
Occupational Therapist	1.5 (0-9)	1.5 (0-12)	0.649	40.0 (0-239)	32.0 (0-280)	0.087	1.5 (0-7)	1.5 (0-12)	0.600	38.6 (0-140)	33.9 (0-280)	0.234
Psychologist	2.3 (0-7)	2.0 (0-7)	0.252	61.0 (0-226)	47.0 (0-200)	0.664	2.2 (0-6)	2.1 (0-7)	0.671	62.8 (0-226)	49.5 (0-212)	0.163
Social Worker	1.5 (0-4)	1.4 (0-5)	0.814	38.0 (0-125)	31.0 (0-110)	0.335	1.5 (0-4)	1.4 (0-5)	0.742	40.0 (0-120)	31.7 (0-125)	0.285
Nutritionist	0.4 (0-2)	0.3 (0-5)	0.604	8.0 (0-50)	7.0 (0-84)	0.525	0.3 (0-2)	0.4 (0-5)	0.995	19.3 (0-50)	18.0 (0-84)	0.715
Pedagogue	2.3 (0-46)	1.5 (0-23)	0.642	65.0 (0-1356)	39.0 (0-496)	0.730	0.9 (0-5)	1.9 (0-46)	0.977	23.8 (0-184)	51.7 (0-1356)	0.797
Mobility technician	0.0 (0-1)	0.0 (0-2)	0.923	0.0 (0-20)	1 .0(0-66)	0.928	0.0 (0-1)	0.0 (0-2)	0.407	0.6 (0-20)	0.5 (0-66)	0.411
Otolaryngologist	0.4 (0-5)	0.2 (0-7)	0.334	5.0 (0-70)	4.0 (0-214)	0.322	0.6 (0-5)	0.2 (0-7)	0.123	7.3 (0-68)	3.8 (0-214)	0.135
Orthopedist	0.4 (0-4)	0.2 (0-3)	**0.012**	4.0 (0-50)	2.0 (0-72)	**0.026**	0.5 (0-4)	0.2 (0-4)	**0.014**	4.9 (0-40)	2.2 (0-72)	**0.009**
Ophthalmologist	0.1 (0-3)	0.1 (0-3)	0.266	2.0 (0-40)	1.0 (0-48)	0.273	0.1 (0-2)	0.1 (0-3)	0.285	1.9 (0-40)	0.9 (0-48)	0.286
Physiatrist	0.0 (0-1)	0.0 (0-1)	0.806	0.0 (0-20)	0.0 (0-20)	0.310	0.0 (0-1)	0.0 (0-1)	0.611	0.6 (0-20)	0.2 (0-20)	0.602
Neurologist	0.8 (0-3)	0.7 (0-4)	0.159	7.0 (0-48)	6.0 (0-92)	0.289	0.8 (0-2)	0.7 (0-4)	0.487	5.8 (0-20)	6.4 (0-92)	0.718
Psychiatrist	0.3 (0-2)	0.4 (0-2)	0.250	2.0 (0-30)	3.0 (0-27)	0.110	0.4 (0-2)	0.4 (0-2)	0.818	2.9 (0-30)	2.8 (0-27)	0.840
General practitioner	0.5 (0-3)	0.4 (0-2)	0.631	4.0 (0-25)	4.0 (0-44)	0.493	0.5 (0-1)	0.5 (0-3)	0.727	4.2 (0-20)	3.8 (0-44)	0.539
Gastroenterologist	0.0 (0-1)	0.0 (0-1)	0.806	0.0 (0-20)	0.0 (0-10)	0.818	0 .0(0-0)	0 .0(0-1)	0.383	0.0 (0-0)	0.2 (0-20)	0.383
Proctologist	0.0 (0-1)	0.0 (0-1)	0.603	0.0 (0-0)	1.0 (0-40)	0.732	0.0 (0-0)	0.0 (0-1)	0.328	0.0 (0-0)	0.5 (0-40)	0.383
Urologist	0.0 (0-1)	0.0 (0-2)	0.303	0.0 (0-20)	0.0 (0-40)	0.156	0.1 (0-1)	0.0 (0-2)	0.237	0.7 (0-20)	0.3 (0-40)	0.137
Pediatrician	0.3 (0-1)	0.5 (0-4)	0.231	3.0 (0-40)	4.0 (0-80)	0.129	0.3 (0-1)	0.4 (0-4)	0.362	2.8 (0-40)	3.8 (0-80)	0.320
General surgeon	0.1 (0-1)	0.1 (0-2)	0.537	1.0 (0-30)	1.0 (0-40)	0.391	0.1 (0-1)	0.1 (0-2)	0.961	0.6 (0-20)	0.8 (0-40)	0.950
Nurse	0.7 (0-4)	0.6 (0-3)	0.702	21.0 (0-100)	16.0 (0-88)	0.459	0.7 (0-4)	0.6 (0-3)	0.829	45.8 (0-100)	31.6 (0-90)	**0.034**
Minimum staff	15.3 (1-57)	13.3 (1-45)	0.254	421 (21-2322)	313 (15-1095)	**0.049**	15.6 (1-57)	13.6 (1-47)	0.352	583.4 (30-1520)	405.5 (15-1554)	0.149

Mann Whitney test

Caption: bold = values with $p \leq 0.05$; N = number of professionals; WW = weekly workload

Table 5. Analysis of association between the minimum complete team, care centers, and administrative sphere

Variables	Minimum health staff (n = 209)				p-value	Team with full-time categories (n = 149)				p-value
	Yes		No			Yes		No		
	N	%	N	%		N	%	N	%	
Care centers										
SRV	-	-	3	8.1	**< 0.001**	-	-	3	2.6	0.071
SERDI	129	75.0	4	10.8		34	100.0	99	86.1	
SASA	11	6.4	2	5.4		-	-	-	-	
SRF	10	5.8	8	21.6		-	-	-	-	
SASPO	14	8.1	15	40.5		-	-	-	-	
CER	8	4.7	5	13.5		-	-	13	11.3	
Administrative sphere										
Public	19	11.0	26	70.3	**< 0.001**	-	-	2	1.7	0.999
Private	153	89.0	11	29.7		34	100.0	113	98.3	

Chi-Square Test

Caption: bold = values with $p \leq 0.05$; N = number of professionals; SRV = Visual Rehabilitation Service; SERDI = Specialized Service in Intellectual Rehabilitation, initials in Portuguese; SASA = Hearing Health Care Service, initials in Portuguese; SRF = Physical Rehabilitation Service, initials in Portuguese; SASPO = Health Care Service for Ostomy Patients, initials in Portuguese; CER = Specialized Center for Rehabilitation, initials in Portuguese

The analysis of the association between the variable of minimum health teams and care centers revealed that SERDIs (initials in Portuguese) are the services that most have complete teams, while SASPO (initials in Portuguese) represent the care centers with the highest number of incomplete teams. The analysis between the variable of minimum health teams and administrative level showed a statistically significant association, in which the private services were the majority that fulfills the requirement. Regarding the variable of minimum staff required with a full workload, no statistically significant association was observed between care centers and administrative levels (Table 5).

DISCUSSION

An important data evidenced by the analysis is the concentration of more than half of the services in only three (South, Center, and Southeast) of the 13 enlarged health regions, with 10,961,348 inhabitants. The division assists the population numerically; however, it is necessary to consider that almost a third of the services are in the enlarged South region, which has the second-largest population. We also observed that the expanded North region has a population like the Southeast; however, it presents less than 3% of services. Such results lead to questions on access to rehabilitation services, since the network with a shortage of these services in certain regions may have the principle of equity compromised, especially in regions with social vulnerability. This premise is a topic of discussion in several countries that present different configurations of health systems and that face the concentration of health professionals in large cities, resisting the internalization of health care[2,13]. Thus, the management process for implementing a Care Network must be in line with the demographic and epidemiological profile of the population, and not centered only on administrative interests and the installed capacity of service providers[14,15].

In this context, we need to discuss these results since a health care network with difficult access and random distribution of population, and epidemiological indicators require evaluation mechanisms to ensure the quality of the care offered[16]. Also, the irregular distribution of services and intense and continuous care, defined in the medium and long terms, can compromise the patient's motivation to join the rehabilitation service[17].

The types of rehabilitation services also proved to be heterogeneous with SERDI (initials in Portuguese) representing more than half of RCPD-MG (initials in Portuguese). This result may indicate the historical negligence of the Public Power worldwide, assisting people with disabilities, which led to the organization of a privatized policy, reflected in institutionalization practices[18]. In this scenario of omission by the State, civil society took charge of this public; however, this care was instituted by guidelines that did not ensure the principles of equity and universality, carried out by private services, mostly aimed at assisting people with intellectual disabilities. Initially, their financing was provided by social and education assistance[19]. The learning difficulty identified in schools and the high repetition rate of students encouraged the need to approach the health component, which started with a model centered on the physician[19].

When considering the types of disabilities, the different coverage of health procedures is accentuated by the lack of assistance in visual rehabilitation at RCPD-MG (initials in Portuguese), suggesting inequality in the care provided to these people. A study carried out in the United States revealed the disparities in the coverage of health procedures, in which people with hearing impairment had better coverage, while people with visual impairment had the worst coverage. The difficulties faced in geographical, behavioral, and communication barriers are also highlighted[20].

The SUS (initials in Portuguese) institution represented a major milestone in the history of public health and assistance to people with disabilities. However, its implementation faced several problems. In the 1990s, the difficulty in ensuring comprehensive actions through the own network demanded the complementation of assistance by outsourced services. The articulation between public and private services, with the purpose of complementary actions promoted the expansion of the assistance offer but also created complexity in human resources policies and distribution of financial resources among services from different administrative spheres. This

situation can have generated negative or positive impacts in the process of integrating the health system[21,22,23]. Therefore, the predominance of private services in the RCPD (initials in Portuguese) represented by more than two thirds also highlights the difficulty faced by SUS (initials in Portuguese) in ensuring assistance to the population with its services. The private health services of the referred network are contracted by SES-MG (initials in Portuguese) or Municipal Health Secretariats, with assistance coverage agreed in the Bipartite Intergovernmental Commissions, established as RCPD-MG (initials in Portuguese) service providers. Although the contracted services are regulated by SUS (initials in Portuguese), the hiring rules are determined by the services, which can cause difficulties in linking and keeping professionals in the services. Thus, the need for investments that strengthen public services, references to the diversity of health conditions of the population, and the universalization of care provided by multi-professional teams stands out.

Physiotherapists are the most present in the composition of the minimum teams among the professionals registered with RCPD-MG (initials in Portuguese). Studies carried out in Brazil in rehabilitation services and primary care have also revealed greater representativeness of the physiotherapist in multi-professional teams[17,24]. The speech-language therapist, the second category in the number of professionals in RCPD (initials in Portuguese), may have its expansion in Minas Gerais associated with the conduct of public policies, such as the teams from the Family Health Support Centers (NASF, initials in Portuguese)[25]. Given the various activities performed by these professionals, their absence or insufficiency can subject them to work overload, increasing the waiting time in the health system and generating a shortage of procedures. This situation shows the need to raise awareness among managers and other sectors about the importance of the work of multi-professional teams, providing an expansion of the offer of assistance in actions of promotion, prevention, and rehabilitation[26,27].

Among the diversity of related professional categories, we found an interesting result of the position taken by educators, registered mostly in SERDI (initials in Portuguese), services that have a close relationship with education. The definition of the multidisciplinary team for diagnostic evaluation, especially of intellectual disability, is still a matter of discussion. However, there is a consensus on the need for areas essential to social integration, such as education, health, and social assistance, to develop the necessary support planning, considering the interdependence of individuals, to achieve an interdisciplinary relationship, inducing the exchange of knowledge[19]. In this context, the expanded health care model, with the work of several specialists, promotes care from a multidimensional perspective, collectively building qualified and humanized care[3,6].

The results regarding the number of professionals and their respective workloads in the expanded health regions revealed relevant data, especially when observing the HDI. A study carried out in the oral health area revealed that the lower the HDI of the municipalities and the lower the number of professionals in the services, the greater the number of treatment procedures and extractions, which is in opposition to the health promotion policy and timely, objective interventions common principles of RCPD(initials in Portuguese)[28]. On the other hand, the greater coverage of first consultations is associated with the greater number of professionals, indicating the implementation of public policies that resulted in new hires and, consequently, in the improvement of access by the population. The study of oral health still reveals a tendency contrary to the principle of equity, in which municipalities with a higher HDI had a greater number of services, providing better access to their residents. In a pro-equity trend, this showed that the most socioeconomically vulnerable municipalities had higher proportions of collective procedures[28]. This study corroborates data from the literature that show the concentration of services associated with regions with the highest HDI. In contrast, regions with greater social vulnerability showed positive results in the coverage of professionals, which may be related to the implementation of a new care model[28]. The extended regions Jequitinhonha and North have many municipalities with low HDI; however, they have the highest averages of minimum teams, a relationship that may be associated with the fact that the Jequitinhonha region has a CER (initials in Portuguese) IV and the North region has a CER II (initials in Portuguese) and a CER III (initials in Portuguese), services that had the best results in the composition and workload of the minimum teams.

CER (initials in Portuguese) is a recently established service with a differentiated operating and financing logic, through financial incentive/costing, while single-mode services are still reimbursed upon presentation of production registered with SIA- SUS (initials in Portuguese)[10]. We assume that the form of financing and the induction of public policies can influence health indicators[28].

The constitution and maintenance of multi-professional teams is a challenge imposed on SUS (initials in Portuguese) managers. The literature shows that the hiring of professionals, their adherence, permanence, different definitions of workload between professional categories and their fulfillment may be closely related to the fragility of bonds employment, low remuneration, financial limitations of the municipalities, and regional competition in the search for hiring professionals to meet the needs of the population[13,15,24,27,29]. These problems faced by managers, especially in the public service, may reflect the non-compliance with the hiring of the minimum complete health team and their respective workload, compromising the integrality and quality of care.

This study has limitations because it did not evaluate the impact of the assistance flow and the coverage and efficiency of health transportation in the access of RCPD (initials in Portuguese) patients. The lack of health transportation and the need for large displacements causing costs for the patient stand out as important barriers to health care[30]. Also, this study did not consider the history of the constitution of each type of service in the RCPD (initials in Portuguese), its relationship between employment relationships and compliance with multi-professional teams, which, possibly, would allow the analysis of the predominance of the identified administrative spheres and compliance legislation for the provision of multidimensional care. These are important issues to be discussed in future studies.

The diagnosis of the municipalities conditions to ensure the sustainability and quality of care that must be offered are essential, aiming at comprehensive, equitable, and feasible care[13]. Therefore, it is important to develop studies that analyze the socioeconomic conditions of SUS-MG (initials in Portuguese) regions, generating results that indicate their needs and investment needs in RCPD (initials in Portuguese), considering the demand of the population and their vulnerability.

CONCLUSIONS

The study provided a cross-sectional analysis of the RCPD (initials in Portuguese) of a Brazilian state that is robust in geographic dimensions and diverse in its socioeconomic characteristics. Despite the expressive number of specialized services in rehabilitation, RCPD (initials in Portuguese) shows heterogeneity in geographic access and the distribution of services in different types of rehabilitation in the expanded health regions. Another important data is the composition of the minimum teams, their distribution in the expanded regions, and in the services of different administrative spheres, revealing a relevant advance in the coverage of professionals in regions with greater social vulnerability and the need for financial and technological investments, especially in public services. The lack of assistance or insufficient services in some health modalities and regions reinforces that this network governance must invest in the articulation and integration of the different care centers, favoring the quality and equity in the care of people with disabilities. We expect that the results of this study can guide management discussions and actions, developing strategies that correct the observed disparities.

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Author´s contributions

MFNS participated in the collection, conception, design, analysis, and interpretation of data, writing of the article, and approval of the version to be published. AALF, co-advisor, participated in the conception, design, analysis, and interpretation of data, critical review, and approval of the version to be published. SMAL, advisor, participated in the conception, design, analysis, and interpretation of data, critical review, and approval of the version to be published.