

Profile of victims and treatment of injuries by external causes according to attendance by the Municipal Rehabilitation Center of Uberlândia, MG – External causes and physiotherapy

Perfil de vítimas e tratamento de lesões por causas externas segundo atendimento pelo Centro de Reabilitação Municipal de Uberlândia, MG – Causas externas e fisioterapia

Abstract

In Brazil, external causes are responsible for many disabilities. Most research has emphasized the mortality and the demand for hospital treatment, and little is known about the evolution of non-fatal injuries. The objective of this study was to identify the profile of victims and the characteristics of injuries from external causes, physical therapy and functional evolution of patients treated in a public rehabilitation center. Data were prospectively collected by interviews with patients who entered the Municipal Rehabilitation Center (CEREM) of Uberlândia, from January to July 2005. Most patients were male and predominated those from 20 to 59 years old, with low income and education. The main causes of injury were falls and traffic accidents, almost half of the events occurred on public roads, and fractures were common, especially in upper limbs. The resources most frequently used were physiotherapeutic kinesiotherapy, electrotherapy and thermotherapy by addition, and most treatments started was completed. The profile of patients that seeking CEREM due to injuries from external causes may reflect, above all, that people who suffer such injuries. Simple physiotherapy resources showed to be enough for a good outcome.

Keywords: Epidemiology. External causes. Morbidity. Injuries. Rehabilitation. Physiotherapy.

Carla Andréa Gondim Lemos

Miguel Tanús Jorge

Lindioneza Adriano Ribeiro

Postgraduate Program in Health Sciences, Medical School of Uberlândia, Federal University of Uberlândia (UFU). Uberlândia, MG, Brazil.

Corresponding author: Carla Andréa Gondim Lemos. Av. Raulino Cotta Pacheco, 845, 38400-372 Uberlândia, MG, BRAZIL. E-mail: carlandreagl@yahoo.com.br

Resumo

No Brasil, as causas externas são responsáveis por grande número de incapacidades. A maioria das pesquisas tem dado ênfase à mortalidade e à demanda de atendimentos hospitalares, pouco se sabendo sobre a evolução das vítimas não fatais. O objetivo do presente estudo foi conhecer o perfil das vítimas e as características das lesões por causas externas, o tratamento fisioterapêutico e a evolução funcional de pacientes atendidos em um centro público de reabilitação. Os dados foram colhidos, prospectivamente, por entrevistas com os pacientes que ingressaram no Centro de Reabilitação Municipal (CEREM) de Uberlândia, de janeiro a julho de 2005. A maioria dos pacientes era do sexo masculino e predominaram aqueles de 20 a 59 anos, com baixas renda e escolaridade; as principais causas das lesões foram as quedas e os acidentes de trânsito; quase a metade dos eventos ocorreram em vias públicas e as fraturas foram comuns, principalmente em membros superiores. Os recursos fisioterapêuticos mais utilizados foram a cinesioterapia, a eletroterapia e a termoterapia por adição, e a maioria dos tratamentos iniciados foi concluída. O perfil dos pacientes que procuram o CEREM devido a lesões por causas externas parece refletir, sobretudo, aquele das pessoas que sofrem tais lesões. Recursos fisioterapêuticos relativamente simples mostraram-se suficientes para uma boa evolução dos pacientes.

Palavras-chave: Epidemiologia. Causas externas. Morbidade. Reabilitação. Lesões. Fisioterapia.

Introduction

In recent decades, developments in the area of health have had a positive impact on the increase in life expectancy of the Brazilian population¹. In truth, this is a worldwide phenomenon, resulting from advances in medicine, vaccinations, drugs manufactured by the pharmaceutical industry and improvement in the quality of life. In contrast, especially since 1980, external causes have become a serious public health problem^{2,3}.

According to the World Health Organization (WHO)⁴, external causes are categorized as follows: accidental (falls; poisoning; drowning; transport and work accidents; others) and intentional (assault; self-inflicted injuries; homicides; suicides). Male adolescents are predominantly affected by external causes^{5,6}, having a negative effect on the quality of life of victims and their family members. High direct and indirect costs result in a negative impact on society⁷.

Falls^{2,6} and transport accidents^{8,9} are the external causes with the highest incidence. In Brazil, data from the DENATRAN's statistical yearbook¹⁰ reveal significant numbers of victims and injuries that lead to high morbidity¹¹.

Lianza points out that, according to WHO estimates¹², 10% of the population of any country in peace have several levels of disability. Thus, for these individuals to recover their role in their family and society, adequate therapeutic interventions must be performed in due course¹¹.

In Brazil, studies and research projects on external causes emphasize mortality^{2,5,10} and/or hospital care services^{7,8}. According to certain studies, physiotherapy services are mainly sought by patients with back problems and external cause victims^{13,14}.

The present study aimed to understand the profile of victims and characteristics of external cause injuries, the physiotherapeutic treatment and the functional evolution of patients cared for in the *Centro de Reabilitação Municipal de Uberlândia*

(CEREM – City of Uberlândia Rehabilitation Center), a public rehabilitation center that provides care on a regional level.

Methods

The city of Uberlândia is situated in the *Triângulo Mineiro* and *Alto Paranaíba* region, in the state of Minas Gerais, Southeastern Brazil. It has more than 600,000 inhabitants and holds a privileged position in terms of economy and geographical location, including referral health services for several neighboring cities.

The CEREM is a medium-complexity regional referral center for the 59 cities registered with the Inter-City Agreement Program (a device for planning, programming and regulating the SUS – Unified Health System, aimed at enabling population access to all health care levels), caring for patients who have suffered different types of injuries, with sequelae that raise the need for rehabilitation. During the study period, this center had a team comprised of one orthopedist, 17 physiotherapists, one social worker and one psychologist, among other professionals. It was structured in accordance with Decree 818/GM from June 5th 2001, which provides for mechanisms to organize and implement State Networks of Care for the Physically Disabled¹⁵.

Appointments are usually set up by telephone through the Appointment Booking Center of the City of Uberlândia Department of Health. According to the CEREM norms, patients initially undergo multi-professional triage, where they are referred to different types of health care services and where possible inadequate referrals are evaluated as well.

The following individuals were included in the present study: patients who sought the CEREM between January and July 2005 to begin treatment for an external cause injury, regardless of its being recent or not and having occurred in the city of Uberlândia or some other location. Even patients who had previously attempted injury rehabilitation in other places were included in this study.

In contrast, patients who did not undergo the CEREM's multi-professional triage were excluded.

A semi-structured questionnaire designed by the authors themselves was used as the guidelines for questions. Data were collected prospectively and those provided by patients were personally obtained by the physiotherapist/professor and two physiotherapy students in their third year. Interviews with patients were conducted during the multi-professional triage, where information about the victims and characteristics of injuries and causing event was obtained. As patients were discharged from physiotherapy, they were contacted again to provide information about their clinical evolution. When two consecutive sessions were missed, resulting in disconnection from the CEREM's treatment program, the physiotherapist/researcher would call the patient in this case within one week and obtain information about their evolution from them. Data on the treatment performed, in their turn, were obtained from medical records and interviews conducted by the physiotherapists who provided the services.

External causes were categorized as work accidents, transport accidents, assault, falls, domestic accidents and others, according to this sequence and only one time. Thus, if a certain external cause was categorized as a fall, for example, this fall could not have resulted from a work accident, transport accident or assault, otherwise it would have been categorized as such; likewise, it would not be subsequently categorized as a domestic accident, even if it had occurred at home.

A pilot test was performed with 50 patients who had been cared for prior to the study period. It aimed to enable physiotherapy students to collect data from patients, and to test the questionnaire applicability and form of application. This resulted in certain changes in the questions for higher data reliability.

A database was constructed in the ACCESS 2000 software, where data were processed and information was obtained for

the present study. Data were explored with descriptive statistical techniques (trend measures and proportions) and the chi-square test was exclusively used to show differences in sex and age group.

The present research project was approved by the Federal University of Uberlândia Research Ethics Committee (Official Opinion 252/04) and performed in accordance with the regulatory norms of Resolution 196/96. This project was used as the Master's thesis of the author and funding was not required. Authors declared there were no conflicts of interest.

Results

In the CEREM, during the period studied, 345 patients began treatment of injuries from external causes; 285 (82.6%) were contacted and, as none refused to respond to the questionnaire, all were interviewed and included in the present study. The remaining 60 patients (17.4%) were excluded because they did not undergo triage, in accordance with the institution's usual process.

Of all 285 patients, 238 (83.5%) had not had previous physiotherapeutic treatment and 47 (16.5%) had had at least one type of treatment, due to the injury in question; 198 (69.5%) had completed their treatments and

been personally contacted again; 79 (27.7%) patients did not complete the treatment and the second contact was made by telephone exclusively. Additionally, 8 (2.8%) did not require treatment or reassessment, as they were considered to be functionally normal in the triage.

The majority of patients were males. They had a median age of 36.5 years and were mainly concentrated in the 20-to-29-year age group; female patients had a median age of 49 years and, unlike men, were concentrated in the 60-and-older age group ($p < 0.01$) (Table 1).

Data on place of origin, marital status, employment status, level of education, health insurance, profession/occupation and monthly income of patients are shown in Table 2.

Of all 185 patients who had a formal employment status, 129 (69.7%) had been on a leave of absence for 66 days on average.

The majority of injuries were caused by accidents and fractures predominated (Table 3). The body parts most frequently affected were the upper limbs (Table 4).

Almost half of the events (135; 47.3%) occurred on public roads (especially transport accidents); out of the remaining events, 71 (24.9%) occurred at home, 30 (10.5%) in the workplace, 26 (9.1%) in areas for the practice of sports and track and field, 13

Table 1 – Sex and age of victims of external causes entrants from January to July 2005 in the Municipal Rehabilitation Center of Uberlândia, MG.

Tabela 1 – Sexo e faixa etária dos pacientes vítimas de causas externas ingressantes de janeiro a julho de 2005 no Centro de Reabilitação Municipal de Uberlândia, MG.

Age group (years)	Sex					
	Male		Female		Total	
	N	%	N	%	N	%
0 – 19	7	4.3	10	8.0	17	6.0
20 – 29	48	29.8	9	7.3	57	20.0
30 – 39	30	18.6	17	13.7	47	16.5
40 – 49	31	19.3	29	23.4	60	21.1
50 – 59	27	16.8	26	21.0	53	18.6
60 and older	18	11.1	33	26.5	51	17.9
Total	161	100.0	124	100.0	285	100.0

Table 2 – Origin, marital status, employment status, education, health insurance, profession/ occupation and monthly income of victims of external causes entrants from January to July 2005 in the Municipal Rehabilitation Center of Uberlândia, MG.

Tabela 2 – Procedência, estado civil, situação de emprego, escolaridade, posse de convênio de saúde, profissão/ocupação e renda mensal dos pacientes vítimas de causas externas ingressantes de janeiro a julho de 2005 no Centro de Reabilitação Municipal de Uberlândia, MG.

Characteristics of patients victims of external causes	N	%
Place of origin		
Uberlândia	280	98.2
Other locations ¹	5	1.8
Marital status		
Married/cohabiting	141	49.5
Single	91	31.9
Widowed/separated/divorced	53	18.6
Employment status		
Employed ²	185	65.0
Economically inactive ³ or unemployed ⁴	98	34.3
Ignored	2	0.7
Level of education		
Illiterate	17	5.9
Primary education (completed or not)	154	54.0
Secondary education (completed or not)	83	29.2
Higher education (completed or not)	31	10.9
Health insurance		
No	220	77.2
Yes	65	22.8
Profession/occupation		
Economically inactive	62	21.8
General services	38	13.3
Civil construction workers	31	11.0
Retailer	21	7.4
Driver	19	6.6
Civil servant	18	6.3
Others	96	33.6
Monthly income (in minimum wages)⁵		
0 – 3	133	46.7
3 – 6	103	36.1
6 or more	44	15.4
Ignored	5	1.8
Total	285	100.0

¹Araguari MG, and Campo Alegre Catalão-GO; Martinésia and Cruzeiro dos Peixotos / ¹Araguari-MG; Campo Alegre e Catalão-GO; Martinésia e Cruzeiro dos Peixotos.

²Individuals who had paid work, but who were temporarily inactive; (b) Self-employed professionals or those with their own gains or family earnings who received money; (c) Individuals who had a business but were temporarily inactive; and (d) Unpaid workers (those supporting religious institutions, benefit societies or cooperatives) / ²Aqueles que possuem emprego remunerado, mas que não estão temporariamente trabalhando; (b) trabalham por conta-própria, em proveito próprio ou com ganho familiar, recebendo em dinheiro ou espécie; (c) possuem uma empresa, mas que, temporariamente, não estão trabalhando; e (d) os trabalhadores não remunerados (ajuda a instituições religiosas, beneficentes ou cooperativas).

³Economically inactive population: retirees, students, housewives / ³População não economicamente ativa: estudantes, donas de casa, aposentados etc.

⁴Based on the following three criteria, which should occur simultaneously: (a) Individuals without work; (b) Those who were currently available to work; and (c) Those seeking jobs / ⁴Baseado em três critérios que devem ocorrer simultaneamente: (a) estar sem trabalho; (b) encontrar-se correntemente disponível ao trabalho; e (c) estar procurando trabalho.

⁵Cooperative and self-management plans. / ⁵Planos de autogestão e cooperativos.

⁶Average 3.5, median 3.0, standard deviation 2.7 minimum wages in 2005 / ⁶Média 3,5; mediana 3,0; desvio padrão 2,7 salários mínimos de 2005.

Table 3 – Type of injury and clinical diagnosis of patients victims from external causes entrants from January to July 2005 in the Municipal Rehabilitation Center of Uberlândia, MG.

Tabela 3 – Tipo de agravo e diagnóstico clínico dos pacientes vítimas de causas externas ingressantes de janeiro a julho de 2005 no Centro de Reabilitação Municipal de Uberlândia, MG.

Type of health problem	Clinical diagnosis													
	Fracture		Sprain/ Bruise		Joint dislocation		Tendon/ ligament/ meniscus injury		Nerve injury		Others		Total N=285	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Work accidents	13	7.1	1	2.6	-	-	6	17.1	1	8.3	6	60.0	27	9.5
Transport accidents	65	35.5	8	21.1	4	15.5	2	5.7	1	8.3	3	30.0	83	29.1
Assaults	2	1.1	1	2.6	-	-	2	5.7	-	-	-	-	5	1.8
Falls	90	49.2	14	36.8	12	46.1	4	11.4	3	25.0	1	10.0	124	43.5
Domestic accidents	8	4.4	-	-	-	-	4	11.4	3	25.0	-	-	15	5.3
Others	5	2.7	14	36.8	10	38.4	17	48.6	4	33.3	-	-	31	10.9
Total N=304*	183	100.0	38	100.0	26	100.0	35	100.0	12	100.0	10	100.0	285	100.0

* Number of injuries / *Número de lesões.

(4.5%) in service and business areas, and 5 (1.7%) on farms.

Almost all referrals (281; 98.6%) originated from the public network. The period between the request for physiotherapy and the beginning of treatment lasted 48.4 days on average (median of 14 days).

Kinesiotherapy (228; 80%), electrotherapy (211; 74%) and thermotherapy (200; 70.1%) were the most frequent types of therapy, usually combined with each other. The number of sessions varied from 10 to 148 per patient (mean of 17 and median of 20 sessions per patient).

Pain, restriction in movements and dependence on a certain type of assistance were frequent when patients arrived at the service. They progressed well, regardless of having completed the entire treatment proposed (Table 5).

Discussion

It is difficult to know whether certain conditions such as professions and occupations, employment status, length of absence from work, type of service requesting physiotherapy, ownership of health

insurance and time required for patients to receive physiotherapeutic treatment for injuries from external causes are similar to those found in other locations in Brazil, as they have not been assessed by other studies. Additionally, no special reasons were found to believe that patients referred to CEREM in the first semester of the year had significantly different characteristics than those referred to such center in the second semester, although this cannot be entirely disregarded.

The higher frequency of male adolescents, low level of education of patients and high percentage of falls and accidents on public roads, according to data from the present study, appear to simply reflect the most common situations involved in the occurrence of injuries from external causes^{2,5,16-19}. A study conducted in the University of Cuiabá physiotherapy clinic showed similar results²⁰. Unlike the present study, a predominance of single individuals cared for in public emergency services and hospitalized due to external causes has been reported^{2,5,8}. It is probable that the samples assessed in these studies better reflect the profile of victims as a whole, because they

Table 4 – Body segment of the affected victims of external causes entrants from January to July 2005 in the Municipal Rehabilitation Center of Uberlândia, MG.

Tabela 4 – Segmento corporal acometido dos pacientes vítimas de causas externas ingressantes de janeiro a julho de 2005 no Centro de Reabilitação Municipal de Uberlândia, MG.

Affected body part	N	%
Upper limbs		
Radiocarpal/radioulnar joint	43	14.2
Glenohumeral joint	24	7.9
Hand phalanx bones	27	7.9
Carpal bones	20	6.6
Elbow joint	18	5.9
Radius	18	5.9
Humerus	9	3.0
Subtotal	156	51.4
Lower limbs		
Tibiofemoral joint	40	13.2
Talocrural joint	38	12.6
Tibia	18	6.0
Tarsal bones	17	5.6
Femur	9	3.0
Fibula	8	2.6
Foot phalanx bones	2	0.7
Calcaneus	1	0.3
Subtotal	133	44.0
Head and trunk		
Spine (cervical, thoracic and lumbar)	5	1.9
Scapula	3	1.0
Hips	3	1.0
Cranium	2	0.7
Subtotal	13	4.6
Total*	302	100.0

*Total number of injuries / *Número total de lesões.

evaluate patients upon their arrival at the health services, whereas only a portion of them have specific characteristics and needs and thus seek physiotherapeutic care.

The great number of motorcyclists among victims of transport accidents is probably due to the incidence of this type of accident as well^{5,6,8}.

The high frequency of injuries on public roads and at home may simply reflect where these events resulting from external causes usually occur^{5,21}.

The small percentage of assaults among victims of external causes, which has also been observed in broader studies^{6,7}, could be partly due to the fact that violence and assaults, especially in the domestic context, are not often explicitly revealed to health services^{1,19}.

Upper limbs were predominantly affected, partly due to the fact that they are often involved in external causes in general^{2,11,22}. It has been suggested that this happens as a result of the upper limbs being the most

Table 5 – Functional evolution of patients victims of external causes entrants from January to July 2005, according to adherence to treatment, in the Municipal Rehabilitation Center of Uberlândia, MG.

Tabela 5 – Evolução funcional dos pacientes vítimas de causas externas ingressantes de janeiro a julho de 2005, segundo a adesão ao tratamento, no Centro de Reabilitação Municipal de Uberlândia, MG.

	Functional evolution of patients							
	Patients interviewed (285)*				Completed treatments (198)			
	Upon arrival at the service		In the last assessment		Upon arrival at the service		Upon completion of the treatment	
	N	%	N	%	N	%	N	%
Characterization of pain (NRS)								
Absent	45	15.8	167	58.5	37	18.7	116	58.5
Mild	36	12.6	64	22.5	15	7.5	48	24.2
Moderate	108	38.0	36	12.6	80	40.4	24	12.1
Severe	88	30.8	14	5.0	65	32.8	8	4.0
Unbearable	8	2.8	1	0.3	1	0.5	2	1.0
Not recorded	-	-	3	1.0	-	-	-	-
Total	285	100.0	285	100.0	198	100.0	198	100.0
Amplitude of movement								
Complete	41	14.4	154	54.0	28	14.1	122	61.6
Incomplete	244	85.6	95	33.3	170	85.8	76	38.4
Not recorded	-	-	36	12.6	-	-	-	-
Total	285	100.0	285	100.0	198	100.0	198	100.0
Function								
Fully independent	177	62.1	223	78.2	120	60.6	191	96.4
Requires non-human assistance	85	29.8	19	6.6	61	30.8	4	2.0
Requires human assistance	19	6.6	5	1.7	15	7.6	3	1.5
Fully dependent	4	1.4	1	0.3	2	1.0	-	-
Not recorded	-	-	37	13.0	-	-	-	-
Total	285	100.0	285	100.0	198	100.0	198	100.0

*The eight patients who didn't started treatment were counted here as yet been interviewed.

*Os oito pacientes que não iniciaram o tratamento foram aqui contabilizados já que mesmo assim foram entrevistados.

frequently used body parts in the activities of daily living, in the workplace and in leisure activities, thus being more exposed to injuries²². However, it is also likely that injuries in these body parts lead to more recommendations for rehabilitation than others.

As in the present study, in a municipal health service of the city of Santa Maria, RS, that provides physiotherapy care, the majority of services resulted from fractures²³. This high frequency, although also found in studies with patients cared for in emergency rooms and hospitals^{19,24}, may be partly due to this type of injury resulting in a significant number of rehabilitation services.

Traumatic injuries affecting the musculoskeletal system usually require care and therapeutic measures in due time, as the lack or inadequacy of treatment can lead to temporary or even permanent functional impairment, being directly reflected in the victim's activities of daily living and in the workplace¹¹. The contributions of physiotherapy to the treatment of injuries from external causes have been discussed in the literature and there have been more opportunities for professionals to work in public and private hospitals, clinics and other health units¹¹.

Physiotherapy services provided in a municipal clinic in the state of Rio Grande

do Sul, Southern Brazil, revealed an average of seven services per patient and, among the physiotherapeutic treatments provided, kinesiotherapy (72.5%), electrotherapy (72%) and massage therapy (72%) were those most frequently used²³. Unlike the present study, there was a significant frequency of massage therapy and lack of references to the use of thermotherapy among the most often used resources. No reasons could be found for this difference, as the types of injuries appear to be the same and thermotherapy, based on its effects and recommendations, is more frequently used in the rehabilitation of musculoskeletal system injuries than massage therapy^{11,25,26}.

It is known that accurate interventions performed in due course are key in the recovery process of patients^{25,26}. Among the advantages of physiotherapy, Lianza¹¹ points out the efficiency in functional rehabilitation and localized treatment with a low incidence of adverse effects. Starkey²⁷ complements this by stating the capacity of this type of treatment to create a favorable environment for injured tissue recovery.

Physiotherapists determine the most adequate resources for the patients' physical and mental conditions^{25,26}. Kinesiotherapy, electrotherapy and thermotherapy are key resources for rehabilitation, especially when injuries result from traumas. Lianza¹¹ emphasizes kinesiotherapy as the most frequently used type of therapy in the field of rehabilitation and it is prescribed for the majority of disabilities. Additionally, Kisner and Colby emphasize the effectiveness of this resource to prevent the development of adherences, contractures and stiffness and its capacity to promote the tissue regeneration process and increase lubrication through the synovial fluid, thus preventing the harmful effects of immobilization²⁸.

Moreover, the literature points out the benefits of electrotherapy for local tissues. In this sense, the promotion of the normalization of local blood flow and production of an anti-irritating effect result in pain suppression, which in its turn facilitates the maintenance of the therapeutic process^{11,29}.

The effects of thermotherapy, such as the gain in amplitude of movement resulting from the increase in soft tissue elasticity and reduction in joint stiffness, in their turn, have been widely observed in practice^{11,25,26}. In this context, the therapeutic ultrasound is a resource frequently used both in the treatment of musculoskeletal system disorders and in the speeding up of tissue repair of muscular injuries³⁰.

The need for a higher or lower number of physiotherapy sessions to be fully recovered depends on the severity and type of injury and response to the treatment²⁶. More serious injuries require a greater number of sessions and, in these cases, full recovery may not be achieved.

Patients who did not complete the treatment also had good recovery, which could suggest that this is a natural evolution, independent from the treatment. However, some of them may have abandoned the treatment precisely due to pain relief and return to their regular activities.

The qualification and practice of physiotherapists are currently aimed at outpatient and hospital care. Studies on physiotherapy, in their turn, tend to value individual therapy and the search for sophisticated methods and techniques³¹. The evolution of patients cared for in rehabilitation services, which could enable comparisons to be made, has not been reported.

Conclusion

The profile of patients seeking rehabilitation due to external causes at the CEREM in the city of Uberlândia seem to reflect, above all, the characteristics of individuals who are usually exposed this type of health problem, which can be observed through the predominance of male adolescents, individuals with a low income and level of education, and victims of falls or transport accidents. In the universe of this study, the great occurrence of fractures, especially in the upper limbs, appears to be associated not only with the high frequency of this type of injury among victims of external causes,

but also with the fact that they raise the need for rehabilitation.

It could be observed that relatively simple resources such as kinesiotherapy, electrotherapy and thermotherapy, frequently used in physiotherapeutic treatment, are sufficient for the good evolution of patients who complete the treatment. Additionally, researchers found that even those who did not complete it usually showed satisfactory progress, which could be due to the natural history of the health problem and to the

treatment, although incomplete.

The data point to a positive view of health service organization with Rehabilitation Centers operating in accordance with the Ministry of Health requirements. Moreover, the construction of a centralized database, which enables information to be obtained from the services offered in similar centers in other Brazilian regions, could provide useful information to health service managers.

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