

Physiotherapeutic performance and quality of life of patients with spinal cord injury: an integrative review

Atuação fisioterapêutica e qualidade de vida de pacientes com Traumatismo Raquimedular: uma revisão integrativa

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ABSTRACT | INTRODUCTION: Spinal cord trauma (MRT) is altered by a spinal cord injury, which generates changes in motor and sensory functions. In view of these changes that are compromised as the health conditions of patients, physical therapy acts in the rehabilitation of these patients. **OBJECTIVE:** To review the scientific literature and analyze physical activity in the quality of life of patients affected by SCI. **METHODS:** This is an integrative literature review with the search for articles in the databases: Scientific Electronic Library Online (SciELO), Virtual Health Library (VHL), Latin American and Caribbean Literature (LILACS) and PubMed, with the use of the crossing of three descriptors in English and Portuguese indexed respectively in Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS). Studies published from January 2015 to May 2020 were included. **RESULTS:** The search resulted in 8 qualified articles to compose the scope of this review. It was found that physiotherapy works with several approaches, such as aerobic exercises, use of virtual reality (VR), electrostimulation, among others. The conducts found in beneficial studies beneficial in the quality of life of individuals affected by TRM. **CONCLUSIONS:** It was found that several physiotherapeutic approaches can contribute to a better quality of life for patients with SCI, with specialized professional monitoring being extremely important for the physical and psychological well-being of these patients.

KEYWORDS: Physical Therapy Specialty. Quality of life. Spinal Cord Injuries.

RESUMO | INTRODUÇÃO: O traumatismo Raquimedular (TRM) é caracterizado por uma lesão na medula espinal, que gera alterações nas funções motoras e sensitivas. Diante destas alterações que comprometem as condições de saúde dos indivíduos acometidos, a fisioterapia atua na reabilitação desses pacientes. **OBJETIVO:** Revisar a literatura científica e analisar a atuação fisioterapêutica e a qualidade de vida dos pacientes acometidos por TRM. **MÉTODOS:** Trata-se de uma revisão integrativa da literatura com a busca de artigos nas bases de dados: *Scientific Electronic Library Online* (SciELO), Biblioteca Virtual em Saúde (BVS), Literatura Latino-americana e do Caribe (LILACS) e PubMed, com a utilização do cruzamento de três descritores em inglês e português indexados respectivamente no *Medical Subject Headings* (MeSH) e Descritores em Ciências da Saúde (DeCS). Foram inclusos estudos publicados no período de janeiro de 2015 a maio de 2020. **RESULTADOS:** A Busca resultou em 8 artigos elegíveis para compor o escopo desta revisão. Verificou-se que a fisioterapia atua com diversas abordagens, tais como exercícios aeróbicos, uso da realidade virtual, eletroestimulação entre outros. As condutas encontradas nos estudos apresentaram efeitos benéficos que repercutem na qualidade de vida de indivíduos acometidos por TRM. **CONCLUSÕES:** Foi verificado que diversas abordagens fisioterapêuticas podem contribuir para a melhor qualidade de vida dos pacientes com TRM, sendo de suma importância o acompanhamento profissional especializado para o bem-estar físico e psicológico desses pacientes.

PALAVRAS-CHAVE: Fisioterapia. Qualidade de vida. Traumatismos da Medula Espinal.

Introduction

Spinal trauma (TRM) is characterized by an injury that occurs in the spinal cord, which generates changes in motor and sensory functions, compromising the sympathetic and parasympathetic nervous system¹. Spinal cord injury (SCI) is classified as partial or total, with temporary or permanent deficits, where the severity of the pathology is related to the level and location of the injury².

Worldwide, it is estimated that the incidence of MRT is between 2.23 and 7.55 cases per 10,000 inhabitants. In Brazil, the estimated incidence is 130 thousand, with automobile accidents as the main cause of SCI, in addition to falls and injuries by firearms. The most affected individuals are males, with an average age of 33 years, where such data are associated with factors such as disrespect for traffic laws and urban violence¹.

Individuals with TRM have spasticity, sensory changes, loss of muscle strength and balance, among other problems, where the level of SCI and its location establishes the degree of involvement and extent of the lesion, which can cause various disorders such as functional decline, which negatively in performing Daily Living Activities (ADLs), and consequently in their Quality of Life (QOL)³.

According to the World Health Organization (WHO), QoL refers to everything from mental, physical and psychological health, to the entire social and cultural context in which that individual lives and is exposed. Therefore, the changes caused by the TRM, generate, in affected patients, functional dependence and depressive conditions that directly influence QOL⁴.

Therefore, for these patients to have a better QOL after the affection of this pathology, a rehabilitation program with a multidisciplinary approach is needed⁵. Included in this program, physiotherapy is of paramount importance in the functional rehabilitation of these individuals, being able to assist them both in the immediate and late stages, in order to regain functionality and independence, as several approaches are used according to the patient's clinical condition⁶.

However, in most cases of MRT, the rehabilitation process takes a long time, where removal from work activities and treatment expenses involves sociodemographic issues and constitutes a public health problem, due to the prevalence of the disease occurring in economically active individuals. Therefore, rehabilitation after the lesion is affected can directly interfere with QOL.

Furthermore, as physical therapy is part of the rehabilitation process of the TRM, this research aimed to review the scientific literature and analyze the physical therapy performance and quality of life of patients affected by TRM.

Methodology

An integrative literature review was carried out. The search took place in the period from March to May 2020, in the electronic portals / databases Virtual Health Library (VHL), Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS) and PubMed, with a survey and critical analysis of the literature on the physical therapy performance in the quality of life of patients with SCI.

The crossing of three descriptors indexed respectively in Portuguese in the Health Sciences Descriptors (DeCS) and in English in the Medical Subject Headings (MeSH), associated with the Boolean logical operator AND, forming the following groups of words: Spinal cord injuries AND Quality of life AND Physiotherapy and Spinal cord injuries AND Quality of life AND Physical therapy.

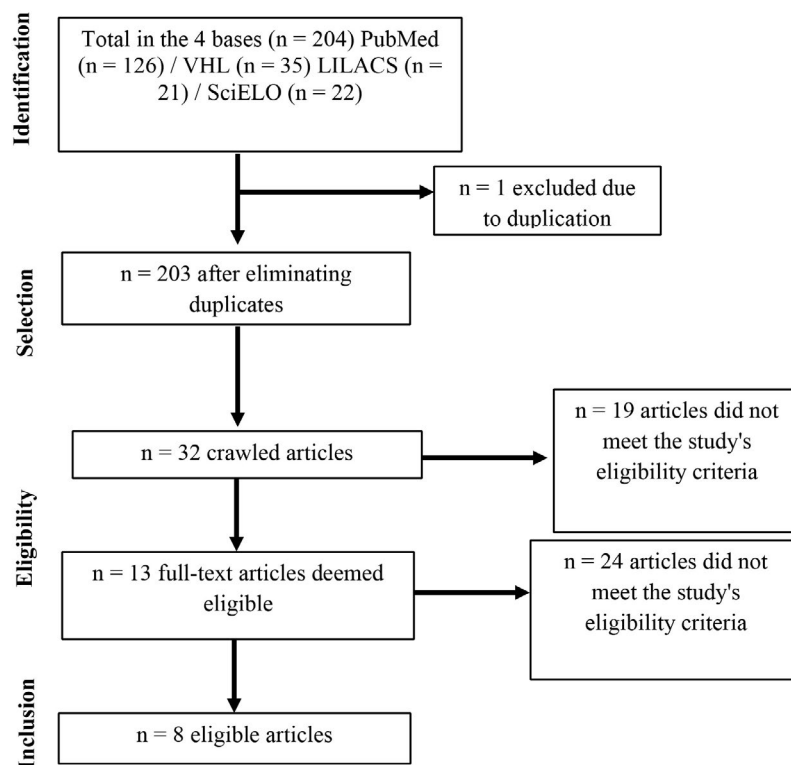
Observational and / or intervention articles were included that addressed the physical therapist performance and QOL in TRM, available in full text in English, Portuguese and Spanish, published between January 2015 and May 2020. As exclusion criteria adopted up, anal-type productions, technical, editorial documents, reviews, comments, reflection articles, theses, dissertations and those not corresponding to the study question, as well as duplication of articles.

After crossing the descriptors, the search resulted in 204. In view of this first sample selection, the titles and abstracts of the articles selected by two independent researchers were carefully read. Soon after the selection of publications by this filtering, they continued to be examined by the two researchers and in the face of any disagreement between them, the same was resolved by a third party. After this analysis of the titles and abstracts, 8 articles were selected to be read in full. To assess the methodological quality of Randomized Clinical Trials (RCTs), the Physiotherapy Evidence Database (PEDro) scale was used, being applied to the studies found and scored independently by the referred researchers, in the case of disagreements, these were resolved by a third investigator.

Results

204 articles were found in the databases. Of this total, after using the inclusion and exclusion criteria, 33 articles were selected, distributed in the databases: PubMed (8), SciELO (9), LILACS (8) and VHL (8), with duplicates not being considered (n = 1), of the 33 articles after reading the titles and abstracts, 21 were excluded for not responding to the objective of this research. Thus, 8 articles were selected for full reading, which are included in this review as shown in Figure 1.

Figure 1. Description of the selection, evaluation and inclusion of studies that address physiotherapy and the quality of life of patients with SCI. Fortaleza - CE, Brazil, 2020



Source: The authors (2020).

Description of the studies

The organization and tabulation of the data extracted from the 8 articles are described in tables 1 and 2 according to the following characteristics: authors, year of publication, country, study population and design (Table 1) and objectives, assessment instruments and the main findings (Table 2).

According to table 1, regarding the year of publication, there are studies between the years 2016 to 2019. The majority of the studies were developed in Brazil and the others in countries in the European and North American continents. The population with the highest prevalence in the studies are wheelchair users with different age groups. Regarding the design, four studies are intervention and the others are cross-sectional.

Table 1. Characterization of articles that address physiotherapy and the quality of life of patients with SCI. Fortaleza / CE, Brazil, 2020

Author	Year	Parents	Study population (n)	Research Outline
FENIMA N et al. ⁹	2016	Brazil	72 Patients (40 years)	Cross-sectional study
MOTA; RIBEIRO. ¹⁰	2016	Brazil	118 Patients (37.4 years)	Cross-sectional study
RICHARDSON et al. ¹¹	2016	USA	69 Patients (42 years)	Cross-sectional study
AKKURT et al. ¹²	2017	Turkey	40 Patients (15 to 65 years old)	Randomized controlled clinical trial
LEÃO et al. ¹³	2017	Brazil	15 Patients (22 to 50 years old)	Case study
MARESCA et al. ¹⁴	2018	Italy	1 Patient	Case study
SIVARAMAKRISHNAN et al. ¹⁵	2018	Norway	22 Patients (39 years)	Randomized double-blind
CALLIGA et al. ¹⁶	2019	Brazil	38 Patients (18 to 65 years)	Cross-sectional study

Source: Research data (2020).

Table 2. Presentation of articles according to the objectives and main findings in relation to physiotherapy and quality of life of patients with SCI. Fortaleza / CE, Brazil, 2020

Author / Year	Objective of the study	Assessment tools	Main findings
FENIMA N et al., 2016. ⁹	Create and test the psychometric properties of a specific instrument for quantifying QOL in SCI	Quality of life in spinal cord injury 1 (QVLM1).	The QL Assessment Questionnaire for Individuals with SCI was created with an adequate methodology and the assessment of psychometric properties translates into a valid, reliable, consistent and sensitive instrument to changes.
MOTA; RIBEIRO., 2016 ¹⁰	Identify the prevalence of pressure ulcers in patients with SCI and analyze their QOL.	WHOQOL-bref	A high prevalence of pressure ulcers was observed among people with SCI. The assessment of QoL reveals a significant dissatisfaction among the participants, especially regarding the physical aspects.
RICHARDSON et al., 2016 ¹¹	To evaluate the effect of changes in pain on mobility and physical independence and QOL in people with SCI.	Short Form Health - 12	Basal nociceptive pain interference is greater satisfaction with QOL related to life and mental health. Neuropathic pain interference was associated with a change in physical independence.
AKKURT et al., 2017 ¹²	Investigate the effects of aerobic exercise on patients with SCI.	Intervention	Aerobic exercise of the lower limb performed by patients with spinal cord injury improves their aerobic exercise capacities, improving the physical aspects of QOL.
LEÃO et al., 2017 ¹³	To verify the influence of virtual reality (VR) on the trunk balance and QoL of individuals with TRM.	Intervention	The treatment protocol used for the study proved to be effective for balance and QOL, optimizing its functionality and providing a better QOL.
MARESCA et al., 2018 ¹⁴	Assess cognitive and motor outcomes after combined rehabilitation training using a standard cognitive and VR approach.	Intervention	The combined VR of standard cognitive training can be effective in improving motor and cognitive recovery in patients with SCI, in addition to the noticeable reduction in anxiety and depressive symptoms, which improves the emotional aspect and consequently the QOL.
SIVARAMAKRISHNAN et al., 2018 ¹⁵	To compare the effects of transcutaneous electrical nerve stimulation and electrical stimulation function on lower limb spasticity in patients with MRT.	Intervention	Through transcutaneous electrical nerve stimulation (TENS) and functional electrical stimulation (FES), they have the potential to be used as a therapeutic adjuvant to relieve spasticity, thus providing greater functionality gains that increase QOL.
CALLIGA et al., 2019 ¹⁶	Investigate the factors that interfere with return to work in individuals with SCI.	Evaluation of medical records.	Returning to work is shown to be relevant for adults with traumatic paraplegia, as we have a better QOL, greater income and greater purchasing power among the injured people who were working.

Source: Research data (2020).

Table 3. Methodological quality according to the PEDro scale. Fortaleza / CE, Brazil, 2020

Author / Year	Criteria*											Total Score
	1	2	3	4	5	6	7	8	9	10	11	
AKKURT et al. ¹²	-	1	-	1	-	-	1	-	-	1	1	5
SIVARAMAKRISHNAN et al., 2018. ¹⁵	-	1	-	1	-	-	1	1	-	1	1	6

*Criterion 1, referring to eligibility is not added to the final score. The other criteria are: 2) The subjects were randomly assigned to groups; 3) Blinding distribution; 4) Comparison of the baseline; 5) Blinding of the participants; 6) Blinding of therapists; 7) Blinding of the evaluators; 8) Adequate monitoring; 9) Analysis of intention to treat; 10) Comparisons between groups and 11) Point estimates and variability. Each positive answer is assigned 1 point, with the total ranging from 0 to 10 points.

Source: Research data (2020).

Discussion

The study sought to verify physical therapy performance and QoL of patients with SCI. Being a traumatic pathology in the spinal cord, the TRM makes the individual dependent due to the limitations caused by the injury, such as: sensory and motor changes, sexual dysfunctions, less social interaction, inability to move around and perform work activities and ADL's, thus generating a decrease in quality of life.

Akkurt et al.¹² with the majority of the sample consisting of males, it verified the importance of the practice of physical activity performed by a multiprofessional team, in the prevention of secondary diseases and comorbidities such as cardiovascular diseases, diabetes, hypertension, among others. Results like de Almeida et al.¹⁷ and kawanishi¹⁸, are similar to those by Akkurt et al.¹², verifying that the improvement of physical conditioning through the practice of physical exercises in the environment, for example, can contribute to the reduction of comorbidities, health promotion and quality of life of patients with SCI.

The use of virtual reality presented itself as a promising resource, where significant results were found in the treatment of patients with SCI. Studies such as Leão et al.¹³ and Maresca et al.¹⁴ claim that treatment with VR was beneficial for the gain of motor function, balance, coordination and functional autonomy in young individuals. In addition to these benefits, when MRI was applied to adults, there was a reduction in anxiety and depressive symptoms, improving the QoL of patients with SCI.

VR is a resource that can be used to stimulate movement during interactive games, the technologies present in this resource create artificial sensory information in a virtual environment, simulating the real world, encouraging physical activity and gaining balance Darekar et al.¹⁹. However, the literature presents few results related to VR as a treatment method in patients with SCI, making it difficult to prove and be effective in this method²⁰. Thus, the importance of further research that addresses this issue is emphasized.

In addition to functional limitations, other variables can compromise the physical and mental well-being of individuals affected by TRM, such as difficulty in socializing, sexual inactivity, pressure injury and pain, which can directly affect their QOL. According to Motorcycle; Ribeiro (2016), in a cross-sectional study of 118 patients with a mean age of 34.7 years, a high prevalence of pressure injuries was observed in people with SCI, with the assessment of quality of life being elucidated by significant dissatisfaction regarding physical aspects. Another study with a similar methodological approach, identified pain as a factor that reduces the QOL of the studied patients¹¹.

For pain relief and functional recovery, physiotherapy uses several techniques and resources, including electrotherapy and kinesiotherapy. The use of electrotherapy reduces spasticity and pain have shown a significant improvement in the patient's condition, where social reintegration, reduction of depressive symptoms and return to work that improve QOL are possible^{15,16}.

Physiotherapy in the treatment of SCI patients has been shown to be increasingly important, both in helping to reduce pain and in orienting and preventing or reducing complications before and after injury, using multidisciplinary treatment to improve quality of life, in their rehabilitation and readaptation of the patient to social life²¹.

According to the literature, family support, guidance from a multidisciplinary team and rehabilitation focused on motor skills help to promote physical and mental well-being as well as sexual, social, emotional re-education that generate positive impacts on the quality of life of these patients^{1,22}.

Considering the studies presented, it was found that there were several variables addressed in relation to patients with MRT, with physical therapy of paramount importance for the QOL of these patients. However, some limitations were identified in carrying out this research, such as the types of studies found and their small samples. In view of this, further studies on the topic addressed are suggested.

Conclusion

It was found that several approaches can contribute to a better quality of life for patients with SCI, with specialized professional monitoring being extremely important for the physical and psychological well-being of these patients. However, more research is suggested on the subject studied to offer means of treatments that increase the QoL of patients with SCI.

Author contributions

Silva FVM contributed to the design, structuring, writing of the essay and critical review of the manuscript. Silva ANJ, Castro DMP, Ribeiro RP, Sales TO contributed with articles search, writing and manuscript writing. Nunes PPB contributed to the design, structuring, writing of the essay and critical review of the manuscript.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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