

SCIENTIFIC EVIDENCE ON DISK HERNIA IN ELDERLY PERSON

Evidências científicas sobre hérnia de disco na pessoa idosa

Evidencia científica sobre el disco hernia en persona mayor

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ABSTRACT

Objective: to identify scientific productions about herniated discs in the elderly. **Method:** scoping review protocol according to the Joanna Briggs Institute method with articles from the CINAHL, Scopus, Cochrane, Web of Science, MEDLINE and ScienceDirect databases. Were analyzed 10 articles whose inclusion criteria were primary and / or secondary, qualitative and quantitative investigations written in English, Portuguese and Spanish, forming 3 thematic categories. The study was delimited based on the observation in the professional practice of researchers about the increase in cases of elderly people with herniated discs. **Results:** surgery is a constant medical indication for the treatment of herniated discs. **Conclusion:** low back pain due to herniated discs is a frequent cause of disability in adults and the elderly with constant surgical protocols, especially when there is neural compression. However, studies show the possibility of regression when patients are submitted to conservative treatments.

DESCRIPTORS: Intervertebral disc displacement; Aged; Aged, 80 and over; Posture; Physical therapy modalities.

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RESUMO

Objetivo: identificar as produções científicas sobre hérnia de disco na pessoa idosa. **Método:** protocolo de *scoping review* segundo o método do *Joanna Briggs Institute* com artigos das bases de dados CINAHL, Scopus, Cochrane, Web of Science, MEDLINE e ScienceDirect. Analisaram-se 10 artigos cujos critérios de inclusão foram investigações primárias e/ou secundárias, qualitativas e quantitativas escritos em inglês, português e espanhol, formando 3 categorias temáticas. O recorte do estudo foi delimitado a partir da observação na prática profissional dos pesquisadores sobre o aumento de casos de idosos com hérnia de disco. **Resultados:** a cirurgia representa constante indicação médica para o tratamento da hérnia de disco. **Conclusão:** a lombalgia decorrente da hérnia de disco é uma frequente causa de incapacidade nos adultos e idosos com protocolos cirúrgicos constantes, principalmente quando há compressão neural. No entanto, estudos mostram a possibilidade de regressão quando os pacientes são submetidos aos tratamentos conservadores. **DESCRIPTORIOS:** Deslocamento do disco intervertebral; Idoso; Idoso de 80 anos ou mais; Postura; Modalidades de fisioterapia.

RESUMEN

Objetivo: identificar producciones científicas sobre hernias discales en ancianos. **Método:** protocolo de revisión del alcance según el método del Instituto Joanna Briggs con artículos de las bases de datos CINAHL, Scopus, Cochrane, Web of Science, MEDLINE y ScienceDirect. Se analizaron 10 artículos cuyos criterios de inclusión fueron investigaciones primarias y / o secundarias, cualitativas y cuantitativas escritas en inglés, portugués y español, formando 3 categorías temáticas. El estudio se delimitó en función de la observación en la práctica profesional de los investigadores sobre el aumento de casos de personas mayores con discos herniados. **Resultados:** la cirugía representa una indicación médica constante para el tratamiento de discos herniados. **Conclusión:** el dolor lumbar debido a discos herniados es una causa frecuente de discapacidad en adultos y ancianos con protocolos quirúrgicos constantes, especialmente cuando hay compresión neural. Sin embargo, los estudios muestran la posibilidad de regresión cuando los pacientes son sometidos a tratamientos conservadores. **DESCRIPTORIOS:** Desplazamiento del disco intervertebral; Anciano; Anciano de 80 o más años; Postura; Modalidades de fisioterapia.

INTRODUCTION

The aging of the population nowadays presents global amplitude and repercussion. International organizations predict that people over 60 years and older elderly (over 80 years) will constitute an age group of significant numerical importance.¹

In this context, chronic degenerative diseases and their complications become predominant, leading to functional limitation or disability and interfering with the quality of life of the adult and elderly population.²

Chronic non-communicable diseases (CNCDs) and degenerative diseases of the spine result from the aging process and wear of the bones and soft tissues, where postural inadequacy contributes to an increase in degeneration and muscle tension, which can lead to pain in the course of its evolution.³ In the psychosocial context, spinal injuries can

lead to decreased participation in social activities, family stress, financial losses, irritability, anxiety, and depression.^{4,5}

Among the main chronic-degenerative diseases of the spine that affect adults and the elderly is the herniated disc, originating from the process of protrusion of the intervertebral disc by rupture of its fibers, putting pressure on the nerve roots in the spinal canal and resulting in inflammation and pain, such as cervicalgia, dorsalgia, and/or low back pain, whose symptoms depend on the location, size, type, and degree of radicular involvement.⁶

Epidemiological data on herniated discs in Brazil are still scarce. Among the chronic spinal problems, conditions in the lumbar segment are the most frequent and characterized in the National Health Survey as the second most reported NCD (18.5%) by the population. It is known that one in every five Brazilian adults presents musculoskeletal conditions and that there is a direct relationship with age, favoring functional incapacity for basic and instrumental activities of daily living, justifying the high rate in the elderly population.⁷

As evidenced, 35.8% of the elderly have musculoskeletal conditions and the southern region leads the highest prevalence, followed by the northeastern region. It is noteworthy that Brazil lacks consistent epidemiological data on chronic musculoskeletal conditions with national representation.⁷

As studies advance in the area of rehabilitation, new therapeutic resources and educational methods appear to be used as a tool to prevent injuries. In addition, treatments for postural inadequacy have been included in the conservative therapy of conventional physiotherapy in order to reduce the pain symptoms and functional limitation of the spine in adults and the elderly with disc herniation.⁸

The impacts of herniated discs in the elderly in Brazil and worldwide are a relevant topic to study, considering the direct impact on the biopsychosocial conditions of individuals, modifying the socio-affective and family relationships and the quality of life of the affected elderly.

In this sense, this article aims to: Identify the scientific evidence on disc herniation in the elderly.

METHOD

Scoping review is a method that incorporates different study designs, as well as summarizes practical information, programs, and policies, providing guidance on research prioritization. This scoping review will follow the methodological recommendations of the Joanna Briggs Institute Reviewer's Manual.^{9,10}

The research was conducted by searching scientific articles in the CINAHL, Scopus, Cochrane, Web of Science, MEDLINE/PubMed, and ScienceDirect databases published between 2011 and 2020, using the index descriptors "intervertebral disc displacement" AND aged AND aged, 80 and over AND posture AND "physical therapy modalities" using the Boolean operator "and" and the PCC strategy

(population-concept-context) referring to the elderly population, the concept of non-surgical treatments applied to the context of intervertebral disc herniation. We opted for the allfields strategy in the databases to broaden the search. The study scope was delimited based on the observation in the researchers' professional practice of the increase in the number of cases of elderly individuals with herniated discs.

The search strategy was adjusted according to the specificities of each database, as shown in Chart 1.¹¹

Table 1 - Search Strategy, 2020.

#1 "Herniated intervertebral disc"
#2 Aged
#3 Aged, 80 and over
#4 Posture
#5 "Physical Therapy Modalities"
#6 "Herniated disc"
#7 "Intervertebral disc displacement"
#8 (#1 AND #2 AND #4 AND #5) OR
#9 (#6 AND #2 AND #4 AND #5) OR
#10 (#7 AND #2 AND #3 AND #4 AND #5)

Source: own elaboration.

Data analysis was descriptive with an instrument developed by the research team based on the Scoping review model and the theoretical and methodological framework used for the synthesis of evidence was the Categorical Thematic Content Analysis advocated by Lawrence Bardin¹² following the following steps: Step I - Choice of the Unit of Context: Articles; Stage II - Choice of the Unit of Registration: Theme; Stage III - Categorical Process: 3 empirical categories emerged. They are: 1- functional limitations of elderly people with disc herniation; 2- autonomy and quality of life of the elderly person and; 3- main therapeutic modalities in the care of patients with disc herniation.

The purpose of a scoping review in data synthesis is to aggregate the results and present an overview rather than a meta-synthesis. Thus, the data extracted from the included documents will be presented in a flowchart and summary table according to the purpose of the review to explain the results and summary of the analysis.

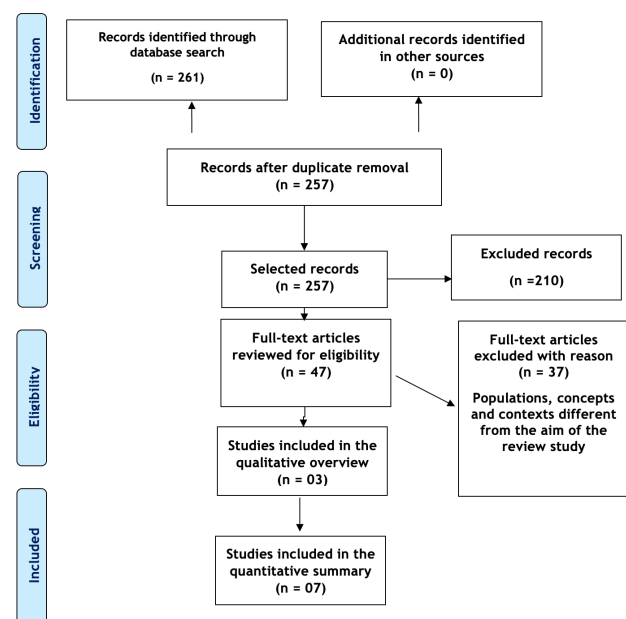
We analyzed 10 articles whose exclusion criteria were articles with populations, concepts, and contexts different

from the objective of the review study, i.e., that did not answer the guiding question and did not describe the method clearly, as well as articles with only the abstract available online, duplicates, and from conference proceedings.

The inclusion criteria were primary and/or secondary investigations available in full online in the selected databases, quantitative, qualitative research articles written in English, Portuguese, and Spanish, forming 3 thematic categories and keeping adequacy to the guiding question: **What is the scientific evidence on disc herniation in the elderly?**

The Preferred Reporting Items for systematic reviews and meta-analyses (PRISMA) was used to illustrate the sample selection of articles.¹³

Figure 1 - Prism Flow Diagram of the sample selection of articles, 2020.



Source: Adapted from Prisma.¹³

RESULTS

A summary table was prepared that included the following assertions: title, journal, year of publication, origin, author, country, type of research, objective, and results, as shown below in Chart 2.

Table 2 - Characterization of sample articles, João Pessoa, PB, 2011-2020. (N=10)

Title/ Periodical/ Year Procedence	Author/ Country	Research Type	Goal	Results
Three dimensional analysis of spino-pelvic alignment in individuals with acutely herniated lumbar intervertebral disc - Journal of Back and Musculoskeletal Rehabilitation, 2017 - CINAHL	KHALLAF, M.E. Egito	quantity	To measure the spinopelvic alignment and its relationship to functional limitations in 16 patients with lumbar disc herniation and 16 matched healthy volunteers.	Postural changes are unrelated to functional disability, highlighting the importance of staying active during the acute stage.
Effects of segmental traction therapy on lumbar disc herniation in patients with acute low back pain measured by magnetic resonance imaging: A single arm clinical trial - Journal of Back and Musculoskeletal Rehabilitation, 2016 -CINAHL	KARIMI, N et al. Azerbaijan	quantity	To identify the effects of therapeutic segmental traction in 15 patients with lumbar disc herniation from the Tusi Memorial Clinic in Baku, Azerbaijan.	Therapeutic segmental traction is beneficial in patients diagnosed with lumbar disc herniation, with a reduction in herniation size, improvement in pain, and improvement in range of motion for lumbar flexion.
Cervical disc herniation: Is the regression flawed by age? A case report - International Journal of Therapy and Rehabilitation, 2013 - CINAHL	DI CIACCIO E, et al. Itália	qualitative	To describe the effectiveness of global postural re-education treatment in herniated cervical disc in an elderly patient.	Global postural re-education has been shown to be a promising conservative treatment in herniated cervical disc in an older patient.
Correlation between intervertebral disc degeneration, paraspinal muscle atrophy, and lumbar facet joints degeneration in patients with lumbar disc herniation - International Journal of Therapy and Rehabilitation, 2013 - CINAHL	SUN D, et al. Japão	quantity	To analyze the lumbar degenerative changes in 120 herniated patients.	Strengthening programs for the lumbar extensor musculature can be effective in preventing muscle muscular atrophy and degeneration of the spine.
Spontaneous Resorption of Lumbar Disc Herniation Is Less Likely When Modic Changes Are Present - SPINE, 2014. - CINAHL	SHAN, Z et al. China	quantity	To investigate the probability of herniated lumbar disc resorption in 85 patients aged 20 to 66 years.	Conservative treatments are less likely to be effective in patients with lumbar disc herniation with Modic's sign.
Factors Affecting Patient Decision-making on Surgery for Lumbar Disc Herniation - SPINE, 2019. - CINAHL	ANDERSEN, S.B et al. Dinamarca	qualitative	To explore from the perspective of 14 patients, what factors influence their decision to undergo surgery for herniated lumbar disc.	Understanding the decision-making factors will help physicians in supporting patients choosing between surgical and non-surgical treatment for lumbar disc herniation.
Ouch! I Think I've Slipped a Disc - Positive Health, 2019. - CINAHL	VELLEMAN, N. UK	qualitative	Identify the main therapeutic modalities in the treatment of herniated discs.	Patients with herniated discs exerting neural compression who have not responded to conservative treatments should undergo surgical procedure.
Surgery for Herniated Lumbar Disk in Individuals 65 Years of Age or Older: A Multicenter Observational Study - JAMA Surgery, 2017. - CINAHL	MADSBU, M.A et al. EUA	quantity	Compare the outcomes reported by 381 patients aged 65 years and older after herniated disc surgery with younger patients.	Although patients aged 65 and older remain in long hospital stays after lumbar disc herniation surgery, age alone does not imply a contraindication, provided the individual is fit for surgery.
Specific treatment of problems of the spine (STOPS): design of a randomised controlled trial comparing specific physiotherapy versus advice for people with subacute low back disorders - BMC Musculoskeletal Disorders 2011. - MEDLINE/PubMed	HAHNE et al. Austrália	quantity	To determine the difference between specific physiotherapy treatment and the counseling recommended in the guidelines for low back pain in 250 participants.	The results of these trials will be of interest in determining which classification and treatment protocols have the greatest potential to benefit people with low back pain.
Low back pain- myths and facts - Journal of Clinical Orthopaedics and Trauma, 2019. - ScienceDirect	HANDA, R. Índia	quantity	To evaluate the effects of low back pain from chronic degenerative diseases of the spine in young and old people.	Low back pain is a frequent cause of disability in young and old adults, and is the occupational injury most commonly associated with economic burden.

Source: Direct Research, 2020.

The database searches covered a total of 261 publications, and 10 articles were selected about herniated discs and the modalities of treatment for intervention in spinal pain. The target population that participated in the research had ages ranging from 20 to 74 years. In 4 articles the main physiotherapeutic techniques for the treatment of herniated discs were analyzed. As can be seen in Chart 1 above, only 1 article with a sample consisting exclusively of an elderly woman was found as a case study; in the remaining articles, the elderly were part of studies together with young adults.

The results pointed out some instruments adopted in the studies, namely: Oswestry Low Back Pain Disability Index (ODI); Visual Analog Scale (VAS); Imaging examinations such as MRI; as well as, interviews and/or questionnaires.¹⁴

As for the study sites, we identified the following registers: Africa (n=01), Europe (n=04), Asia (n=03), North America (n=01) and Oceania (n=01). Regarding the research design, the predominance of quantitative studies stands out, with data processing based on the software Statistical Package for the Social Sciences SPSS 20.0.

DISCUSSION

The articles analyzed were grouped into three categories by affinity. The first was composed of two articles, the second by only one, and the third by seven articles. Category 1: functional limitations of the elderly with disc herniation; Category 2: autonomy and quality of life of the elderly and Category 3: main therapeutic modalities in the care of patients with disc herniation.

Category I - Functional limitations of adults and elderly with disc herniation

Chronic degenerative diseases of the spine are frequent as age advances, leading to bone changes, structural disorders, and mechanical deviations¹⁵. It is known that the biomechanics of the intervertebral disc decreases with the aging process due to dehydration and increased mechanical stress, thus predisposing to protrusion.¹⁵

Pathologies such as herniated discs occur frequently in the adult and elderly population, and are considered a multifactorial syndrome, impacting the life of the individual, and can keep him/her away from active socio-labor activities, as demonstrated in a study conducted in India.¹⁶

The osteomuscular alterations that most affect the elderly population may be related to the workload accumulated over the years, stress, repetitive movements, and the daily positions adopted, assuming an inadequate posture and favoring pain, especially in the lumbar spine.¹⁷

The functional capacity to perform the activities of daily living has been considered an indicator of health in the elderly population. Articles from Africa and Asia show that the main limitations and functional disabilities that affect elderly people with herniated discs are similar in some continents, but differ from a study conducted in Egypt that shows active individuals

even in acute stages.¹⁷ The ideal is to maintain rest in this phase of the disease.

Studies conducted¹⁸ in Japan have shown that during disc degeneration in response to the inflammatory process, in addition to nerve root compression in the lumbar region, there may be rapid development of atrophy of the multifidus muscles that provide trunk stability and segmental control. Thus, the author emphasizes the importance of a lumbar extension muscle strengthening program, justifying its relevance in preventing muscle atrophy and consequent degeneration of the spine.

Category 2 - Autonomy and quality of life of the elderly

Among the ten articles selected, only one took into account the autonomy of the patients when they were advised by the team about the need to undergo surgery for the treatment of herniated discs.

The study¹⁹ conducted in Denmark found that the patients' decision process is multifactorial, involving the amount and quality of information received from the health care team compared to their preconceived notions as well as the amount of time to consider their personal choice and experience.

From the understanding of these factors, the interdisciplinary team will be able to support patients about whether to undergo surgical or non-surgical treatment.¹⁹ It is noteworthy that respecting the autonomy of the elderly person contributes to quality of life.

Taking into account that there is a lack of evidence to favor which treatment is ideal, it is important to conduct research involving patients in the decision-making process.

Category III - Main therapeutic modalities in the care of patients with disc herniation

This category includes 06 articles published in Azerbaijan, Italy, Japan, China, UK and Australia that highlighted the main modalities of physiotherapeutic treatment used for pain relief, both cervical and lumbar, resulting from disc herniation, which are: osteopathy, chiropractic, acupuncture, global postural re-education (GPR) and segmental traction associated with stretching.^{20,21}

A research conducted in Italy with a 74-year-old patient diagnosed with cervical disc herniation (CDH), history of persistent algia, and short-term dizziness, identified significant improvement in the resorption of the nucleus pulposus of the intervertebral disc after 2 months of weekly GPR sessions in a physical therapy outpatient clinic.²²

Research shows that lumbosciatalgia caused by herniated discs has good results with conservative treatment depending on the patient's pain tolerance and degree of neurological impairment. If the patient obtains slight but progressive improvement, it is imperative to persist with non-surgical treatment. However, in one of the articles reviewed, little efficacy of conservative treatment was observed in patients

with lumbar disc herniation associated with cartilaginous endplate loss.²³

Some authors cite the administration of steroid injections in order to reduce the inflammatory process, however, there are controversies about its effectiveness since the injections do not treat the causes of the injury.²⁴

Taking into consideration the imaging findings, it is known that when the intervertebral disc is uninjured, the forces are equally distributed. Shock absorption by the intervertebral disc is impaired when the disc is degenerated, dehydrated and with reduced height, often leading to Modic alterations visualized on magnetic resonance imaging. The Modic type I represents the edema type signal change; In Modic II there is liposubstitution pattern and Modic III is related to bone sclerosis.²⁵

In the study conducted in China, 35 of 85 adult and elderly patients had Modic type II and less nucleus pulposus. It was found that conservative treatment reduced the Oswestry Disability Index score in the non-Modic group but reductions in the Modic group were not significant. In summary, it was evidenced that conservative treatments are less effective in patients with lumbar disc herniation with Modic sign on MRI.²³

Among the articles analyzed, there was consensus on surgical treatment if pain in the lumbar region and irradiation to the lower limbs persist despite a period of conservative treatment; however, data on surgical outcomes in elderly patients are still limited, because some surgeons delay performing microdiscectomy considering the sequelae potentiated by aging.²³

In contrast, other neurosurgeons argue that age alone should not be a contraindication to surgery as long as the individual is fit for it.²²

A study published in the US showed that 63 of 381 patients aged 65 years or older and 1658 of 5195 patients under 65 years of age showed improvement in ODI. Data collected through the Norwegian Registry of Spine Surgery (NORspine), showed in the registries that 65% of all patients who underwent lumbar spine surgery, underwent non-emergency single-level lumbar microdiscectomy between 2007 and 2013.²⁶

There were no differences between the age cohorts although patients 65 years and older had complications and longer hospitalizations, they experienced improvements in their conditions after lumbar microdiscectomy similar to patients under 65 years of age. Age alone does not characterize a contraindication to surgery.²⁶

CONCLUSION

Different therapeutic modalities can provide a positive effect in the treatment of herniated discs in the elderly, promoting pain relief, muscle strengthening, and flexibility. However, there is no specific program that defines the ideal rehabilitation for all situations.

Studies show that the union between equivalent techniques (postural re-education, analgesic physiotherapy

techniques in the cervical and lumbar segments of the spine, associated with regular physical exercises) improve the strength of muscle groups that are important for the performance of daily activities in the elderly, with a consequent improvement in quality of life.

This research points to the need for more scientific production that relates intervertebral disc herniation and the elderly, since the studies found in the vast majority associate the elderly with young adults.

Thus, with an adequate and careful sample selection, it will be possible to show ways of preventing chronic pain and treatment, considering the functionality that is sometimes limited by the aging process.

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