



Health Problems, Pain Severity, and Neck Disability for The Patients with Herniated Cervical Disc

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Abstract

Background: Cervical disc herniation is one of the most common spinal disorders in the world. Patients with cervical disc herniation (CDH) often experience a complex interaction between physical and psychological health issues that contribute to increased pain intensity and functional disability.

The study aimed to evaluate health issues, pain intensity, and neck disability regarding patients with herniated cervical disc.

Research design: A descriptive research design was utilized.

Setting: The study was conducted in neurosurgery department at Accidental Hospital and neurosurgery out patient clinic at Zagazig University Hospitals.

Study Subjects : A purposive sample of hundred adult patients with herniated cervical disc were selected from the mentioned setting.

Tools of data collection: Four tools were utilized for data collection, pertinent as follow: Patients' Assessment Questionnaire, Health Issues Assessment Questionnaire, Numerical Rating pain scale (NRPS), Neck Disability Index (NDI).

Results : Revealed that, Majority (86.0%) of the studied patients had unsatisfactory total level of knowledge regarding cervical disc herniation. More than half (55.0%) of studied patients had chronic neck pain and severe pain in neck, shoulder and chronic headache. More than half (52.0%) of studied patients had tingling or numbness in upper body. More than half (51.0 %) of studied patients had moderate pain intensity. There was a highly statistically significant relation between patients' body mass index and total disability index. **Conclusion:** More than two-thirds of the studied patients experienced total health issues regarding cervical disc herniation. Less than half of the studied patients had moderate disability level. There was a highly statistically significant negative correlation between total patients' knowledge, Pain intensity, and patients' disability index. There was a statistically significant positive correlation between patients' health issues, Pain intensity, and neck disability index.

Recommendations: Patients must be educated about the importance of following instructions given by their caregivers to improve their knowledge and health related outcomes.

Key words: Health Issues, Pain intensity, Neck Disability, and Cervical Disc Herniation.



Introduction

Cervical Disc Herniation (CDH) is a common spinal condition affecting the neck (cervical spine) that occurs when one of the intervertebral discs is damaged, resulting in the displacement of its inner material. The CDH is most often the result of age-related wear and tear (disc degeneration), as discs lose water and flexibility over time. However, it can also be triggered by acute trauma, repetitive neck movements, or poor posture **** (Wu et al., 2022). **** Spine injuries may cause tiny tears or cracks in the outer layer (annulus or capsule) of the disc. The jelly-like material (nucleus) inside the disc may be forced out through the tears or cracks in the capsule. This causes the disc to bulge, break open (rupture), or break into fragments **(Choi et al., 2021)**.

The prevalence of CDH increases with age for both men and women and is most common in people in their third to fifth decades of life. This condition occurs more frequently in women, accounting for more than 60% of cases. The most commonly diagnosed patients, regardless of sex, are between the ages of 51 and 60. The most common location for a herniated cervical disc is between the 6th and 7th cervical vertebrae. The second most common location is between the 5th and 6th or between the 4th and 5th cervical vertebrae **(Capin et al., 2022)**.

Herniated discs in the neck (cervical spine) can cause pain, numbness, or weakness in the neck, shoulders, chest, arms, and hands. In some cases a very large herniated disc in the neck may cause weakness or unusual tingling affecting other parts of the body, including the legs. The compression of the nerve roots or spinal cord can lead to a range of symptoms, including neck pain (often worsened by movement) radiating pain, numbness, or tingling that travels down the shoulder and into the arm and hand, weakness, difficulty walking, or problems with coordination and balance **** (Banios et al., 2022). **** A doctor usually can diagnose a CDH from history of symptoms and a physical exam. The doctor will ask about pain and numbness that might be caused by irritation of one or more of the nerves in the cervical spine. If symptoms suggest a cervical herniated disc, rest and rehabilitation often are recommended before further testing is done. If other conditions are suspected, or if there is no improvement in symptoms after a period of rest and rehabilitation, imaging tests such as X-ray, magnetic resonance imaging (MRI), or computerized tomography (CT scan) may be done **** (Abdel -Aziz et al., 2024) ****.

In most cases, CDH are first treated with non-surgical treatment, including rest or modified activities, medicines to relieve pain and inflammation, and exercises, as recommended by the doctor. The doctor may recommend with a physiotherapist to learn how to do exercises and protect neck, and perhaps for other treatment such as traction. Traction is gentle, steady pulling on the head to stretch the neck and allow the small joints between the neck bones to spread a little **** (Awad & Ali, 2023) ****. If symptoms continue, doctor may try stronger medicine such as corticosteroids. Symptoms usually improve over time. But if the herniated disc is squeezing spinal cord or nerves and associated with weakness, constant pain, or decreased control of bladder or bowels, surgery will be considered. In rare cases, an artificial disc may be used to replace the disc that is removed **(Monk et al., 2023)**.

Without intervention, CDH causing compression of neural structures, can cause irreversible neurological impairment. Health issues from steroid injections are typically mild and occur in 3% to 35% of cases. Other, more serious health issues can include nerve injury, infection, epidural hematoma, epidural abscess, spinal cord infarction, recurrent laryngeal, superior laryngeal, and hypoglossal nerve injuries, esophageal injury, vertebral and carotid injuries, dysphagia, pseudoarthrosis, and adjacent segment degeneration **** (Abd Allah et al., 2021). ****

Patients with herniated cervical disc often experience a complex interaction between physical and psychological health issues that contribute to increased pain intensity and functional disability, as indicated by higher Neck Disability Index (NDI) scores. Recent research shows that in cervical



radiculopathy, which is frequently caused by disc herniation, more severe pain intensity is strongly associated with greater functional disability and reduced quality of life, demonstrating a direct relationship between pain severity and neck disability (**Ferat & Apaydin, 2025**).

Nurses play a vital role in improving quality of care of patients with herniated cervical disc through effective education. Traditionally, patient education has focused on providing information and technical skills, however, there is a move towards self-management through directed education that facilitates patients taking an active role in identifying their problems and provides techniques and skills to help them make decisions and take appropriate actions as they encounter changes in their disease or circumstance (**Weheida et al., 2022**).

Significance of the study:

Herniated cervical disc is a major cause of neck pain, cervical radiculopathy, and functional limitation worldwide, contributing substantially to disability and reduced quality of life. The Global Burden of Disease Study reported that neck pain affected more than 200 million people globally in 2020 and ranks among the leading causes of years lived with disability, with a rising burden attributed to aging populations and occupational risk factors (**GBD 2021 Neck Pain Collaborators, 2024**). In Egypt, although comprehensive national data are limited, regional and hospital-based studies report a notable prevalence of cervical radiculopathy and neck pain, emphasizing the local importance of addressing this condition (**Khedr et al., 2018; Aly et al., 2024**).

Understanding the relationships between health issues, pain intensity, and neck disability in patients with herniated cervical disc is crucial for improving patient outcomes. Physical and psychological health problems can intensify pain perception, in line with the Gate Control Theory of Pain, while higher pain intensity is strongly associated with increased neck disability and functional limitation. Consequently, examining the interrelationships between health issues, pain intensity, and neck disability is essential to inform comprehensive nursing assessment and multidisciplinary interventions aimed at reducing pain and preventing long-term disability (**Abd Elraof et al., 2023**).

Operational Definition

Health Issues:

Refer to the specific physical, psychological, and social, sleep quality and exercise practicing related issues experienced by patients diagnosed with CDH. In this study, health issues was operationally measured using Health Issues Assessment Questionnaire (HIAQ).

Pain Intensity:

Refers to the subjective level of neck pain or radiating arm pain reported by patients diagnosed with CDH. In this study, pain intensity was operationally measured using the Numeric Pain Rating Scale (NPRS).

Neck Disability:

Refers to the degree of functional limitation and impact on daily activities reported by patients diagnosed with CDH. In this study, neck disability was operationally measured using the Neck Disability Index (NDI).

Aim of the study:

The aim of this study was to evaluate health issues, pain intensity, and neck disability regarding patients with herniated cervical disc.

This aim was achieved through the following objectives:

- Assess Patients' knowledge regarding herniated cervical disc
- Determine health issues regarding patients with herniated cervical disc.
- measure Patients' pain intensity level regarding patients with herniated cervical disc.
- Identify Patients' neck disability level regarding patients with herniated cervical disc.

**Research Questions:**

- what is the level of patients' knowledge regarding herniated cervical disc?
- What are the health issues regarding patients with herniated cervical disc?
- What is the level of pain intensity in patients with herniated cervical disc?
- What is the level of neck disability in patients with herniated cervical disc?

Subjects and Methods:**Research design:**

This study used a descriptive design to accomplish the aim of this study and to answer the research questions

Setting:

The study was conducted at neurosurgery department in accidental hospital and neurosurgery outpatient clinic at Zagazig university hospitals, Sharqia governorate, Egypt. Neurosurgery department is located on the fourth floor of accidental hospital. This department contains a men's and a women's ward, both of which include about 30 beds for patients. In which comprehensive care was provided to the patient as well as, delivers continuous post-operative monitoring and multidisciplinary consultations. The neurosurgery outpatient clinic is located on the fourth floor of outpatient clinics at Zagazig University hospitals. The clinic works two days per week for following up after discharge. The neurosurgery outpatient clinic provides comprehensive follow up services for patients after CDH surgery to ensure safe recovery and optimal functional outcomes.

Subjects:

A purposive sample of 100 adult patients with HCD who fulfilling the inclusion criteria.

Tools of data collection:

Four tools were being constructed to achieve the aim of the study as following:

Tool I: Patients' Assessment Questionnaire (Appendix I):- was designed by the researcher based on reviewing of recent literature, it was translated into Arabic, validity and reliability was tested. It included three parts as following:

Part 1 Characteristics of Patients; This part was composed of 12 closed-ended questions that covered personal data related to patients included(age, sex, marital status, level of education, residence, occupation, current work situation, nature of work, work change, weight ,height, and BMI).

Part 2: Patients' health history; used to assess patients' health history, Covered past health history, present medical and surgical history, family history, and medications used. It consisted of 18 closed and opened end such as If patient previously experienced any problems with the spine or neck? , Have patient been exposed to any injuries to the spine or neck? , Does patient have any medical history? , If patient undergone any previous surgical operations on the spine or neck? , If patient have any chronic diseases? , What symptoms are patient currently experiencing? , Since when did these symptoms begin? , If patient noticed any change in movement or sensation in the limbs? What is the cause of patient's CDH? , Which of the cervical vertebrae are affected? , What are the characteristics of the pain that patient are experiencing? , What makes the pain worse? , What relieves the pain? , If patient currently taking any medications for this condition? , Does patient use any assistive devices, such as a neck collar? If patient undergone any physical therapy or rehabilitation sessions? , What type of treatment is being used for patients' condition? , and Does patient smoke? **It was adapted from (Childress& Becker, 2016 and Yousif et al., 2025).**

Part 3: Patients' Knowledge Assessment Questionnaire; used to assess patients' knowledge regarding the disease included: (definition, causes, signs and symptoms, treatment, health issues, proper positions, etc).The questionnaire consisted of two main sections as following:

Section 1: Assessment of Patients' Knowledge regarding anatomy and Physiology of vertebral



column: included totally eight questions, in the form of Multiple-choice questions (MCQs), such as number of vertebrae of vertebral column, number of cervical vertebrae, what is the main function of the vertebral column? , What is the most important functions of the intervertebral disc? , and etc....**It was adapted from (Smeltzer et al., 2018, Ashinsky et al., 2021).**

Section 2: Assessment of Patients' Knowledge regarding CDH: included 21 MCQ covered key aspects of the disease, such as, definition, causes of CDH, factors that increase the risk of CDH, Which cervical vertebrae are most commonly affected by cervical disc herniation? , symptoms and signs of CDH, required medical investigations to diagnose CDH, treatment methods of CDH, stages of management, home remedies, recommended sleeping position for a patient with cervical disc, latest treatment modalities for treating cervical disc, best therapeutic exercise for treating CDH, most common health issues associated with CDH, most common health issues associated with cervical disc herniation surgery, and most effective method for preventing CDH. **It was adapted from (Fehlings et al., 2017, Tracy & Bartleson, 2021, and Zedan et al., 2021).**

Scoring system for Patients' Knowledge Assessment Questionnaire:

Each question in both sections was scored as one for a correct answer and zero for an incorrect or "don't know" answer. The total knowledge score was obtained by summing the scores of all questions, with a possible total score ranging from zero to 29 , classified as the following: satisfactory knowledge if the score is $\geq 70\%$ from the maximum score, unsatisfactory knowledge if it is $<70\%$. Higher scores indicate better knowledge regarding vertebral column anatomy, physiology, and CDH disease. As well as, for data analysis, mean knowledge scores and standard deviations was calculated to determine the overall level of patients' knowledge.

Tool II: Numerical Rating Pain Scale (NRS) :(Appendix II)

Used to assess the level of pain intensity in patients with HCD. The NRS is a widely used, validated tool that measures pain on a scale from zero to 10, where zero represents no pain, five indicates moderate pain, and 10 corresponds to the worst possible pain .This scale allows patients to self-report their pain intensity, providing a simple and reliable method for evaluating pain severity and monitoring changes over time during clinical assessment or treatment interventions. ****It was adopted from (Shafshak & Elnemr, 2021).****

Scoring System: Numerical Rating Pain Scale (NRS)

The NRS is a reliable self-reported measure in which patients rate their pain on a scale from zero to 10. The scoring categories are defined as follows: 0 = no pain, 1–3 = mild pain, 4–6 = moderate pain, 7–9 = severe pain, and 10 = worst possible pain. This categorization allows researcher to quantify pain severity and monitor changes over time. For statistical analysis, the mean pain score was calculated to represent the average pain intensity in the study population, while the standard deviation (SD) indicated variability or dispersion of individual pain scores around the mean

Tool III: Neck Disability Index (NDI): (Appendix III): used to assess limitations of the cervical spine function during everyday activities. The NDI is comprised of 10 sections regarding: pain intensity, personal care, lifting, sleeping, driving, recreation, headache, concentration, reading and work, each item is expressed by 6 different assertions scored from 0-5, with 0 indicating no disability, 1 indicating mild disability, 2 indicating moderate disability, 3 indicating fairly severe disability, 4 indicating very disability and 5 indicating highest disability. **It was adopted from (Abd El-Hay et al., 2019 and Andrade et al., 2020).**

Scoring system of neck disability index

Total scoring; ranged between 0-50. The following guide used for interpretation of patients score: 0-4= no disability, 5-14=mild disability, 15-24= moderate disability, 25-34= severe disability and 35 or over= complete disability.

**Tool IV: Health Issues Assessment Questionnaire (Appendix IV):**

****It was adapted from (Nuij et al .,2019 and Yee et al ., 2020).****Used to assess the presence and severity of health issues in patients with herniated cervical disc, including neck pain, neck disability, numbness, upper limb weakness, burning sensations, and related symptoms. The questionnaire consists of five subdomains:

1. **Physical issues:** 16 items (e.g., chronic neck pain, neck disability, numbness, headache, arm and upper part weakness, and etc.....)
2. **Psychological issues:** five items (e.g., anxiety, depression, stress, etc.....)
3. **Social issues:** two items (e.g., limitations in social activities "isolation", and the ability to visit family and friends.)
4. **Sleep quality:** five items (e.g., difficulty falling asleep, disturbed sleep due to severe neck and lower back pain, uncomfortable sleeping position, and etc...)
5. **Exercise/activity limitations:** four items (e.g., difficulty performing routine exercises or physical activity, etc....).

Scoring System for Health Issues Assessment Questionnaire:

Each item was scored as 1 for “Yes” (indicating presence of the problem) and 0 for “No” (indicating absence of the problem). Scores for each subdomain are summed to provide a subdomain total, and the overall questionnaire score is calculated by summing all subdomain scores. Higher total scores indicate more severe or numerous health issues. For statistical analysis, the mean score and standard deviation (SD) was calculated for each subdomain and for the total score to assess the average burden of health issues and the variability among patients. This allows researchers to quantify the prevalence and severity of health issues.

Tools validity& Reliability:

It was used to modify the tools to determine whether the tools covered the aim or not. It ascertained by five jury of expertise (one professor, four assistant professors in medical surgical nursing) who were reviewed the tools for clarity, relevance, comprehensiveness, applicability, and understanding. According to the expertise's modifications and the results of the pilot study, some modifications were applied in the form of rephrasing or rewording, and sometimes changing of some questions. The final form had been drawn.

The reliability of tools was tested by the internal consistency method. Cronbach's alpha reliability coefficient was found to be 0.762 for patients' knowledge assessment questionnaire and 0.831 respectively for testing numerical rating pain scale (NRS) .Reliability was conducted before data collection began. Cronbach's alpha reliability coefficient was found to be 0.856 for neck disability index (NDI) and .765 for health issues assessment questionnaire.

Field work:

A letter was delivered by the dean of the faculty of nursing to the head of the neurosurgery department, requesting the required agreement to carry out the current study. Once permission to continue the study was obtained, the researcher began data collection. Initially the patients were interviewed by the researcher to initiate a line of communication. Data collection was carried out over a period of six months, from November 2024 to the end of April 2025.

Each patient was interviewed individually during the study period two days (Saturday and Tuesday) per week in two shifts at morning and afternoon shift. The data were collected two days a week (Saturday and Tuesday) in the morning and afternoon shifts. The researcher gave patients her phone numbers and contacted with them through Whats app and other social media to answer any questions, illustrate any misinformation.

Eligible patients who met the inclusion criteria were interviewed individually in a quiet and private area



to ensure comfort and privacy. Data were collected using a structured interview questionnaire that consisted of: demographic characteristics and patients health history, patient's knowledge assessment questionnaire, Numerical Rating Scale (NRS) to assess pain intensity, Neck Disability Index (NDI) to assess the level of neck-related functional disability, and Health Issues Assessment Questionnaire (assessing physical, psychological, social, sleep, and exercise-related problems).

Each interview lasted approximately 20–30 minutes, depending on the patient's condition and response rate. The researcher read and explained the questions when necessary, especially for patients with low literacy levels, and recorded the responses accurately. Data were checked daily for completeness and accuracy to avoid missing or inconsistent information. Field work continued until the required sample size was achieved.

Pilot study:

A pilot study was carried out on ten patients (10%) of the total study sample to test whether the tools are clear, understandable, feasible, applicable, and time consuming. Necessary modifications were made according to the pilot study results. Pilot subjects were later excluded from the main study sample.

Administrative and ethical consideration:

The necessary approvals were obtained from the dean of the Faculty of Nursing and submitted to general director of Zagazig University Hospitals. Then Permission to carry out the study was obtained from the head of mentioned setting after explaining the purpose of the study. At the initial interview, each potential subject was informed about the nature, purpose, benefits of the study, and informed that his/her participation is voluntary. Confidentiality and anonymity of the subjects were also assured through coding of all data. The researcher assured that the data collected, and information will be confidential and would be used only to improve their health and for the purpose of the study and there was no risk for study subject during application of the research. In addition, an informed consent was obtained from each participant prior to inclusion into the study and after a full explanation of its aim and procedures. They were informed about their rights to refuse or withdraw from the study at any time with no reason to be given or consequences. **Ethical code:**

M.D.Zu.Nu.R/250/11/8/2024.

Statistical analysis:

The data obtained tabulated and statistically analyzed using SPSS, version 25.0. Quantitative data were expressed as the mean $\pm$ SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Independent t-test and ANOVA test were also used. Spearman's rank correlation coefficient (r) was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation-value < 0.05 was considered statistically significant (S), and p-value ≥ 0.05 was considered statistically insignificant (NS).

Results:

Table 1: Shows that, more than three -quarters (78.0 %) of studied patients aged ≥ 40 years old with Mean $\pm$ SD 48.75 ± 10.40 , half (50.0 %) of studied patients were males, and the other half (50.0 %) of them were females, nearly less than three quarters (74.0%) of studied patients were educated and lived in rural area, Majority (86.0%) of studied patients were married, less than two thirds (61.0%) were working, nearly more than one third (34.0%) of them had hard work, less than one fifth (18.0%) changed their work related to illness, less than two thirds (62.0%) of the studied patients had insufficient monthly income, more than one third (36.0%) were overweight while, less than one third (32.0%) of the studied patients were obese with Mean $\pm$ SD $= 27.73 \pm 4.29$.

Figure (1) illustrates that, (86.0%) of studied nurses had unsatisfactory knowledge regarding cervical disc herniation , while(14.0%) of them had satisfactory level of knowledge with Mean $\pm$ SD $= 10.24 \pm 4.67$.



Table 2: indicates that, more than half (57.0 %) of patient had previous spine or neck problems, nearly more than half (52.0%) of them hadn't previous history of orthopedic problem. As well as, nearly less than one third (32.0%) of studied patients had rheumatoid arthritis & nearly more than one fifth (22.0%) of them had slipped disc, one fifth (20.0%) of patient had previous spine or neck surgeries, less than half (48.0%) of the subjects had comorbidity (25.0% diabetes & 32.0% hypertension).

Table 3: illustrates that two thirds (65.0%) of the studied patients experienced physical problems. In addition, more than half (58.0%) of them reported sleep quality problems. Conversely, more than half (53.0% and 57.0%) respectively of the patients did not experience psychological problems or difficulties in performing exercises. Furthermore, more than two thirds (68.0%) of the patients did not report social problems. Overall, more than two thirds (67.0%) of the studied patients experienced total health issues following cervical disc herniation, with a total mean $\pm$ SD score of 13.71 ± 6.31

Table 4: clarifies pain intensity regarding patients with cervical disc herniation. Only 2.0% of the studied patients reported no pain, while 11.0% experienced mild pain. More than half (51.0%) of the patients reported moderate pain intensity. Regarding severe pain, nearly more than one third (34.0%) of them experienced severe pain, and one fifth (20.0%) reported the worst possible pain. The mean $\pm$ SD pain intensity score was 5.75 ± 2.01 .

Figure 2: presents total level of neck disability regarding herniated cervical disk as, this table clarifies that, only (2.0%) of studied patients had no disability, while less than one fifth (18.0%) had mild disability level. Whereas, less than half (46.0 %) of studied patients had moderate disability level. In addition, this table showed that less than one third (30.0%) of studied patients had severe disability level. Also, the same table shows that, (4.0%) of studied patients had complete disability.

Table 5: confirms that there was a highly statistically significant relationship was found between total patients' knowledge and monthly income ($p = 0.008$). The results also revealed a highly statistically significant relationship between patients' body mass index and their total knowledge ($p = 0.005$).

Table 6: This table shows that; there was a highly statistically significant negative correlation between total patients' knowledge and their disability index with ($r = -0.357$. at $P = 0.001$). There was a statistically significant negative correlation between patients' pain intensity and total patients' knowledge with ($r = 0.235$. at $P = 0.018$). Also, the same table illustrated that, there was a statistically significant positive correlation between patients' pain intensity and patients' disability index with ($r = 0.227$. at $P = 0.023$) In addition there was a highly statistically significant positive correlation between patients' health issue and their disability index with ($r = 0.596$. at $P = <0.001$). Also, the same table illustrated that, there was a statistically significant positive correlation between patients' health issue and patients' Pain intensity with ($r = 0.415$. at $P = <0.001$).

Discussion:

The present study revealed that, half of the studied patients aged ≥ 40 years old, with mean 48.75 ± 10.40 . This result can be explained by age-related degeneration of the cervical spine, combined with accumulated lifetime stress on the neck, which leads to disc degeneration and annular weakening making discs vulnerable to herniation even with minor stress.

This finding in contrast with **Abbady et al., (2019)**, in the study entitled "Assessment of Daily Living Activities Among Elderly Patient with Low Back Pain at Ministry Health Hospitals" found that, the mean age of the studied patients ranged between 60 and 80 years with mean 64.89 ± 4.64 years.

The present study revealed that, nearly less than three quarters of the studied patients were educated. This study is supported by **Said & Mahmoud, (2021)**, in the study entitled "Effect of Educational Program for Patients Post Herniated Cervical Disk Surgery on Their Knowledge and Daily Living Activities" found that, nearly half of study and control groups can read and write. In contrast with **Abd Elwahhab et al., (2019)****, in the study entitled "Effect of rehabilitative nursing program on functional status among



patients with discectomy" found that, more than one third of studied patients had secondary education. The current study showed that, less than two thirds of patients had work and nearly more than one third of them had hard work. From researcher point of view, this result may be due to higher prices and an increase in the cost of living push the person to work. This finding was inconsistent with **Feninets et al., (2022)**, whose study was about "The Effect of Preoperative Educational Intervention on Anxiety and Pain of Patients Undergoing Spinal Decompression Surgery: A Pilot Randomized Controlled Study" reported that, more than half of studied patients were employees.

The present study revealed that, nearly more than one-third of the studied patients had hard work. This result can be explained by heavy workload and continuous bending and working so workers were more prone to cervical disc herniation. This study is supported by **Shiri et al. (2018)**, reported that, higher prevalence of neck pain and cervical spine disorders among office workers compared to more physically active occupations, in addition **Andersen et al. (2012)**, found that, workers exposed to heavy physical demands and awkward postures had a significantly higher risk of cervical disc disease and radiculopathy.

The current study revealed that, less than one-fifth of studied patients didn't have occupational change. This result was in the same line with **Garczyk, et al., (2013)**, in the study entitled "patient satisfaction with nursing after surgery due to cervical or lumbar discopathy" emphasized that, about one quarter of their patients had changed their quality of work because of pain. On the other hand **Ólafsson, (2018)**, in the study entitled "cost of low back pain: results from a national register study in Sweden" who documented that pain affects work in more than two thirds related to sick leave and early retirement, in addition **Mohamed et al., (2021)**, in the study entitled "Effect of Educational Program for Patients Post Herniated Cervical Disk Surgery on Their Knowledge and Daily Living Activities" stated that, majority of patients didn't change their work.

The current study revealed that, more than one-third of the studied patients were overweight, while less than one third of the studied patients were obese with mean $=27.73 \pm 4.29$. This is related to increased load on the spine that caused by over-weight with weak back muscles that protect the cervical spine increase the risk for disc prolapse. The present finding was in agreement with **Abdelmowla et al., 2023** showed that, less than half of the studied patients in the study and control groups were obese with a body mass index ≥ 30 (42.90%, 45.70% respectively). In contrast with **Ahmed et al., (2023)**, revealed that, less than two-thirds of the patients were overweight.

The present study revealed that, majority of patients had unsatisfactory knowledge regarding cervical disc herniation. While, only less than one fifth of the studied patients had satisfactory total knowledge score with mean 10.24 ± 4.67 . This result was in agreement with **Alshehri et al., (2019)**, whose study was about "Awareness of disc herniation among general population in Aseer province, Saudi Arabia" stated that, the general population in Aseer region recorded very poor awareness regarding disc prolapse, risk factors, treatment, and preventive measures.

The present study revealed that, more than half of studied patients had chronic neck pain, severe pain in neck and shoulder, chronic headache and tingling or numbness in upper body with a mean $\pm$ SD score of 6.31 ± 3.59 . This study was supported by **(Koch et al., 2021)**, stated that, Patients with cervical disc herniation face significant impact as a result of neck and arm pain and disability. Disability leads to worsening of roles in life, loss of productive days at work with poor general health from being more sedentary in their lifestyle.

The current study showed that, there was a highly statistically significant negative correlation between patients' knowledge, pain intensity and their disability index. This study is supported by **(Guo et al., 2019)**, in the study entitled "Rehabilitation nursing for patient rehabilitation after minimally invasive spine surgery", stated that, there was a statistically significant negative correlation between total pain



score and total knowledge score post program implementation. Also, there was statistically significant negative correlation between total pain score and total neck disability index scale pre and post program implementation.

The present study revealed that, there was a highly statistically significant positive correlation between total patients' health issues and their disability index and pain intensity. This result is consistent with** (World Health Organization [WHO], 2011), **indicating that, multiple or chronic health issues are closely associated with increased disability and reduced functional capacity .Also this study is supported by** (Sahebalam et al., 2023),** in the study entitled “The association between disability and physical performance, pain intensity, and pain-related anxiety in patients after lumbar decompression surgery: A cross-sectional study” reported that ,there was a statistically significant positive correlation between total patients' health issues and their disability index and pain intensity. Moreover, pain intensity and disability are closely linked to psychosocial issues, and pain intensity itself has been identified as a significant contributor to disability even after adjustment for demographic variables.

Conclusion

On the light of the present study results, can concluded that, Patients with herniated cervical disc often experience a complex interaction between physical and psychological health issues that contribute to increased pain intensity and functional disability. Majority of the studied patients had unsatisfactory total level of knowledge regarding cervical disc herniation. More than two-thirds of the studied patients experienced total health issues regarding cervical disc herniation. More than half of the studied patients reported moderate pain intensity. Less than half of the studied patients had moderate disability level. There was a highly statistically significant negative correlation between total patients' knowledge, Pain intensity, and disability index .There was a statistically significant positive correlation between patients' pain intensity and patients' disability index. There was a statistically significant positive correlation between patients' health issues, patients' Pain intensity, and neck disability index.

Recommendation

In line with the findings of the study, the following recommendations were derived and suggested:

1. Patients must be educated about the importance of following instructions given by their caregivers to improve their knowledge and health related outcomes.
2. Establishment of health care educational center in the neurosurgery department to educate patients necessary instructions about their conditions using booklets and illustrated pamphlets for each patient especially those who cannot read and write.
3. Implement standardized discharge protocols: Hospitals should adopt standardized discharge protocols for cervical disc hernia. These protocols should include clear and simple instructions for patients regarding pain management, followup appointments, and exercises.
4. Further research is needed to assess health issues ,pain intensity and neck disability for patients with herniated cervical disk.
5. Replication of the study using a larger probability sample for generalization of results.

**Table 1: Frequency and Percentage Distribution of the Studied Patients regarding to their Demographic Characteristics (n=100).**

Demographic Characteristics	Studied Patients	
	No	%
Age (year)		
<40	22	22.0
≥40	78	78.0
Mean± SD	48.75±10.40	
Gender		
Male	50	50.0
Female	50	50.0
Place of residence		
Rural	74	74.0
Urban	26	26.0
Marital status		
Married	86	86.0
Not married	14	14.0
Educational Level		
Educated	74	74.0
Not Educated	26	26.0
Occupation		
Working	61	61.0
Not working	39	39.0
Nature of work n= (61)		
Hard work	34	34.0
Light work	27	27.0
Change work due to illness n= (61)		
Yes	18	18.0
No	43	43.0
Monthly income		
Sufficient	38	38.0
Insufficient	62	62.0
Body mass index		
Underweight	2	2.0
Normal	30	30.0
Overweight	36	36.0
Obese	32	32.0
Mean± SD	27.73±4.29	

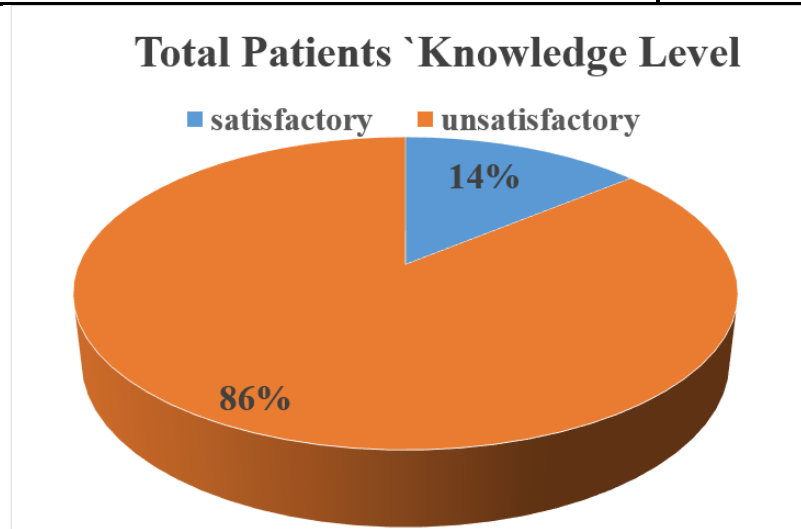
**Figure1:Total Patients ` Knowledge level**



Table 2: Frequency and Percentage Distribution of the Studied Patients regarding to Past Health History (n=100).

Past Health History	No	%
Previous Spine or Neck Problems		
Yes	57	57.0
No	43	43.0
Previous Spinal or Neck Injuries		
Yes	28	28.0
No	72	72.0
Previous History of Orthopedic Problem		
Yes	48	48.0
No	52	52.0
Orthopedic Problems		
Rheumatoid arthritis	32	32.0
Inflammation of the spondyloarthritis	13	13.0
Spinal stenosis	7	7.0
Slipped disc	22	22.0
Congenital deformities of spine	3	3.0
Previous Spine or Neck Surgeries		
Yes	20	20.0
No	80	80.0
Comorbidity		
Yes	52	52.0
No	48	48.0
Chronic Disease		
Diabetes	25	25.0
Hypertension	32	32.0
Cardiovascular diseases	4	4.0
Respiratory disease	2	2.0

Table 3: Frequency and Percentage Distribution of Total Health Issues regarding Patients with Cervical Disc Herniation (n=100).

Health Issues Domain	No	%	Mean± SD
Physical Problems			
Yes	65	65.0	6.31±3.59
No	35	35.0	
Psychological Problems			
Yes	47	47.0	2.49±1.38
No	53	53.0	
Social Problems			
Yes	32	32.0	0.91±.739
No	68	68.0	
Sleep Quality			
Yes	58	58.0	2.39±1.53
No	42	42.0	
Exercise			
Yes	43	43.0	1.61±.91
No	57	57.0	
Total Health Issues			
Yes	67	67.0	13.71±6.31
No	33	33.0	



Table 4: Frequency and Percentage Distribution of Pain Intensity regarding Patients with Cervical Disc Herniation (n=100).

Total Pain Intensity	No	%
No pain (0)	2	2.0
Mild pain (1-3)	11	11.0
Moderate pain (4-6)	51	51.0
Sever pain (7-9)	34	34.0
Worst possible pain (10)	2	2.0
Mean± SD	5.75±2.01	

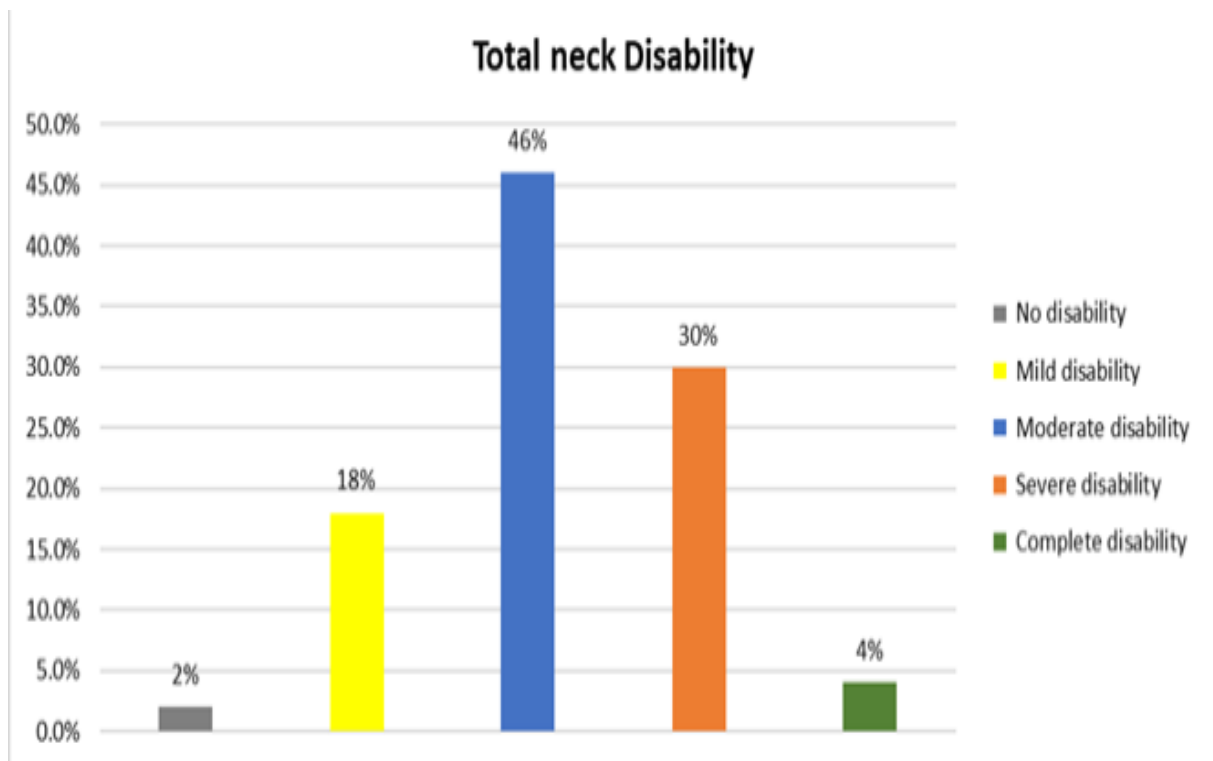


Figure 2: Total Neck Disability Regarding Herniated Cervical Disc.

**Table 5: Relation between Total knowledge and Demographic Characteristic among Studied Patients (n=100)**

Demographic Characteristics	Total patients Knowledge				χ^2	p-value
	Satisfactory		Unsatisfactory			
	No	%	No	%		
Age (year)						
<40	6	6.0			4.410	0.216
≥40	8	8.0				
Gender						
Male	8	8.0	42	42.0	0.332	0.774
Female	6	6.0	44	44.0		
Place of Residence						
Rural	10	10.0	64	64.0	0.056	1.00
Urban	4	4.0	22	22.0		
Marital Status						
Married	12	12.0	74	74.0	0.001	1.00
Not married	2	2.0	12	12.0		
Educational Level						
Educated	12	12.0	62	62.0	1.161	0.346
Not Educated	2	2.0	24	24.0		
Occupation						
Working	12	12.0	49	49.0	4.180	0.073
Not working	2	2.0	37	37.0		
Monthly Income						
Sufficient	10	10.0	28	28.0	7.721	0.008**
Insufficient	4	4.0	58	58.0		
Body Mass Index (BMI)						
Underweight	2	2.0	0	0.0	15.029	0.005**
Normal	6	6.0	24	24.0		
Overweight	4	4.0	32	32.0		
Obese	2	2.0	30	30.0		

Table 6: Correlation matrix between knowledge score, Intensity, Neck Disability and Health Issues (n=100)

		Total Knowledge	Disability Index (DI)	Pain Intensity
Total Knowledge	r			
	p			
Disability Index (DI)	r	-0.357		
	p	<0.001**		
Pain Intensity	r	-0.235	0.227	
	p	0.018*	0.023*	
Health Issues	r	-.098	0.415	0.596
	p	0.331	<0.001**	<0.001**

r: Pearson Correlation coefficient

*: Statistically significant at p <0.05



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