

# ASSESSMENT OF PAIN PERCEPTION DEPENDING ON PERSONALITY TYPE AMONG PATIENTS WITH DIAGNOSED DISCOPATHY

## OCENA PERCEPCJI BÓLU W ZALEŻNOŚCI OD TYPU OSOBOWOŚCI W GRUPIE PACJENTÓW Z ROZPOZNANĄ DYSKOPATIĄ

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**A** – przygotowanie projektu badania | study design, **B** – zbieranie danych | data collection, **C** – analiza statystyczna | statistical analysis, **D** – interpretacja danych | interpretation of data, **E** – przygotowanie maszynopisu | manuscript preparation, **F** – opracowanie piśmiennictwa | literature review, **G** – pozyskanie funduszy | sourcing of funding

### SUMMARY

**Background:** The most common symptom among people suffering from spinal degeneration is pain. The character of the pain is usually intermittent – periods of increased pain are interchangeable with periods of remission. The perception of pain can be affected by various physical (obesity, lack of activity, non-observance of ergonomics at work), as well as psychological factors – emotional, cognitive and personality. In treatment of pain, rehabilitation (kinesiotherapy and physiotherapy) is of paramount importance. During periods of severe pain, rehabilitation should be complemented with pharmacological treatment. Furthermore, during those periods some patients are qualified for neurosurgical operations. Doctors from different specialties (orthopaedists, neurologists, doctors of rehabilitation medicine), to whom patients suffering from discopathy are referred, often do not notice the need to suggest, apart from the abovementioned treatments, psychological consultation.

**Aim of the study:** The aim of this study was to assess the relationship between pain perception and the personality type in a group of patients with diagnosed discopathy.

**Material and methods:** The study population comprised of 101 patients (68 women and 33 men) who were hospitalised in Jasinski Provincial Rehabilitation Hospital in Zakopane (Wojewódzki Szpital Rehabilitacyjny), between January and March 2012.

**Results:** Significant difference in pain perception was found between groups of extroverts and introverts. No significant difference was found between groups of neurotics and the emotionally stable.

**Conclusions:** Results of the conducted study show that introverts described pain as stronger than extroverts. Therefore, it is worth to consider adding psychological support, appropriate to a patient's personality type, to comprehensive therapy for diagnosed discopathy, which already includes an individualised physiotherapy program and drug regimen.

**KEYWORDS:** pain, discopathy, personality

### STRESZCZENIE

**Wstęp:** U osób z rozpoznanymi zmianami dyskopatycznymi kręgosłupa najczęstszym objawem procesu chorobowego jest ból, który na ogół ma charakter przerywany – etapy nasilenia dolegliwości są przeplatane okresami

remisji. Na odczuwane przez pacjentów dolegliwości bólowe wpływają różnorodne czynniki zarówno fizyczne (otyłość, brak aktywności ruchowej, nieprzestrzeganie zasad ergonomii pracy), jak i psychologiczne, czyli poznawcze, emocjonalne oraz osobowościowe. W leczeniu bólu podstawowe znaczenie ma rehabilitacja (kinezy- oraz fizyko-terapia), która jest uzupełniana w okresach zaostrzeń leczeniem farmakologicznym. Niektórzy pacjenci, w przypadkach nasilonego bólu, zostają zakwalifikowani do przeprowadzenia operacji neurochirurgicznej. Lekarze różnorodnych specjalności (ortopedzi, neurologi, specjaliści rehabilitacji medycznej), do których zostają skierowani przez lekarza rodzinnego chorzy z zespołem bólowym kręgosłupa w przebiegu dyskopatii, często nie dostrzegają potrzeby zaproponowania pacjentowi, oprócz wyżej wymienionego leczenia, konsultacji psychologicznej.

**Cel pracy:** Zbadanie zależności pomiędzy percepcją bólu a typem osobowości w grupie pacjentów z rozpoznaną dyskopatią.

**Materiał i metody:** Badaniem objęto 101 pacjentów (68 kobiet i 33 mężczyzn) hospitalizowanych pomiędzy styczniem a marcem 2012 roku w Wojewódzkim Szpitalu Rehabilitacyjnym im. S. Jasińskiego w Zakopanem, u których dyskopia została potwierdzona badaniami obrazowymi.

**Wyniki:** W badanej grupie pacjentów stwierdzono różnice w deklarowanym odczuwaniu bólu u osób ekstra- i introwertywnych. Poziom doświadczanego bólu nie różnił się w grupie osób neurotycznych i zrównoważonych emocjonalnie.

**Wnioski:** W przeprowadzonym badaniu introwertycy opisywali odczuwany ból jako silniejszy niż ekstrawertycy, dlatego w kompleksowej terapii osób z rozpoznaną dyskopatią, oprócz zastosowania zindywidualizowanego programu fizjoterapii oraz leczenia farmakologicznego, należy rozważyć celowość wsparcia psychologicznego dostosowanego do określonego typu osobowości pacjenta.

**SŁOWA KLUCZOWE:** ból, dyskopia, osobowość

## BACKGROUND

Discopathy constitutes a frequent cause of spinal pain. The perception of pain is affected by different factors, such as: cognitive assessment, and emotional and personality factors.

Approximately 70–80% of population from developed countries suffer from spinal pain at some point in their lives, and a little less than half of the people with diagnosed discopathy will spend over 6 months on medical leave [1].

The human spine is comprised of 24 vertebrae and two conjoined bones (sacral and coccygeal). An intervertebral disc (intervertebral fibrocartilage, disc), consisting of elastic outer fibrous rings surrounding a gel-like centre, the nucleus pulposus, lies between adjacent vertebrae [2]. The intervertebral discs facilitate the mobility of the spine and act as amortisation.

The term “discopathy” covers all conditions of the intervertebral discs. A degeneration of the fibrous ring of the intervertebral disc causes it to become weaker and later damaged, with the nucleus pulposus seeping out. The nucleus puts pressure on and irritates vertebral nerves, causing pain. The degeneration of the intervertebral discs is usually gradual and is connected with an individual’s lifestyle (predispositions include obesity, sedentary lifestyle, physical labour – especially lifting heavy objects and previous back injuries), but also degenerative changes characteristic for the process of ageing [3].

Discopathy can occur in any section of the spine, however the most frequent cases are connected with the lumbar section. The main symptom of discopathy is pain located in a particular section of the spine, ra-

diating along the nerves and changing intensity, depending on the position of the body. The pain is usually accompanied by disruptions in exteroceptive sensation, described as tingling, numbness or burning [4]. Symptoms of discopathy become more pronounced with time. The pain is usually intermittent – periods of increased pain are interchangeable with periods of remission [5].

For a doctor, pain – as experienced subjectively by the patient – is difficult to assess. Researchers have introduced different scales for assessing pain, inter alia verbal (VRS – Verbal Rating Scale), numerical (NRS – Numerical Rating Scale) and visual-analogue (VAS – Visual Analogue Scale) [6].

Individually adjusted physical therapy programme (e.g. kinesiotherapy, classic massage, electric currents, thermotherapy) is crucial in the treatment of pain. In periods of more acute pain physical therapy is augmented with symptom-based pharmacotherapy [7]. In some cases of severe pain, patients require neurosurgical intervention.

According to Eysenck, personality is a “more or less stable and enduring organisation of a person’s character, temperament, intellect and physique, which determine [the] unique adjustment to the environment” [8].

Eysenck, based on own studies, determined that the structure of personality is divided into three independent dimensions. The traits are formed hierarchically and contain primary factors which stem from groups of correlated habits and behaviours [9]. The main dimensions, referred to as super traits in this theory, are: psychoticism (P), extraversion (E) and neuroticism (N), which are polar.

In psychoticism one end of the spectrum contains such traits as altruism, empathy and socialisation, while the second contains pathologies – criminality, psychopathy, schizophrenia. Extroversion contains sociability, activity, assertiveness, seeking new experiences, while introversion contains balance, gentleness, passiveness and control. Neuroticism (also emotionality) is comprised of such traits as: fear, depression, guilt, low self-esteem. The second pole to neuroticism is emotional stability [9].

According to Eysenck, the listed traits are universal, i.e. are not rooted in any culture. Eysenck sought the basis of the super traits in physiology. Thus, two theories exist for extroversion: recall and activation.

This thesis was replaced by the arousal-activation theory of extroversion, according to which the placement of an individual on the extroversion-introversion scale is determined by individual differences in the activation level of the ARAS-cortex loop, which determines the level of activation. “The level of arousal in introverts is higher than the level of arousal in extroverts, therefore introverts, in comparison with extroverts, have chronically higher levels of cortical arousal” [9].

Individual differences connected with neuroticism can be found in different levels of reactivity of the sympathetic system. These levels are higher in neurotics, in comparison with the emotionally stable. Eysenck placed the biological base of neuroticism in the limbic system. Based on this assumption, the individual differences in the levels of neuroticism stem from differences of such elements of the central nervous system like: hippocampus, amygdala, cingulum, septum pellucidum and hypothalamus [9].

Eysenck introduced the mechanism of recall into his theory. Recall is characterised by decreased reaction, or lower level of execution. Eysenck determined that in introverts recall occurs even with stimuli to which extroverts react properly. In other words, stimuli with identical intensity cause different reactions and behaviour in introverts and extroverts [9].

Multiple studies showed the connections between personality traits and pain severity [10–11]. Especially traits such as neuroticism and extroversion are closely connected with pain assessment. Highly neurotic patients reported more severe pain than those with lower levels of neuroticism. In accordance with Eysenck’s theory, extroverts should handle pain better, but they also complain more and have a tendency to exaggerate what they are experiencing [10].

### AIM OF THE STUDY

The aim of this paper was to determine whether there is a connection between personality type (ac-

ording to Eysenck’s classification) and the subjective assessment of pain in patients with spine discopathy, who were referred to physical therapy in hospital conditions.

### MATERIAL AND METHODS

The study was conducted between January and March 2012 on a population of patients from Jasinski Provincial Rehabilitation Hospital in Zakopane, who gave their written informed consent for participation. The study was approved by the hospital’s Ethics Committee.

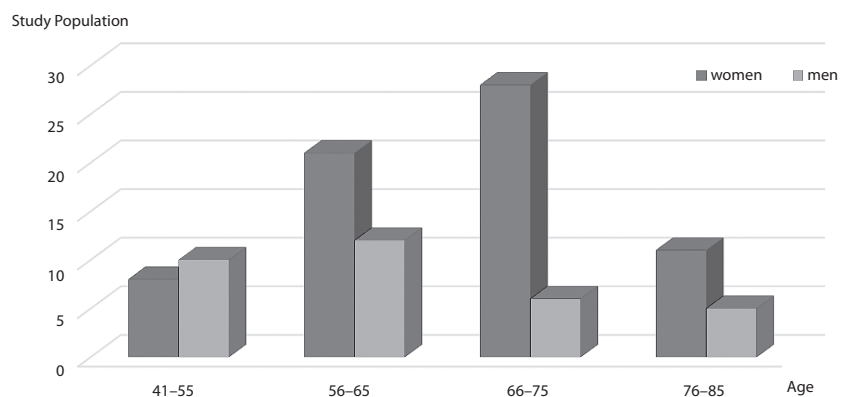
Patients with discopathy diagnosed via imaging examinations were included in the study. The exclusion criteria consisted of a lack of recent imaging examinations of the spine, inflammation of the musculoskeletal system (rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis) and systemic connective tissue diseases (collagenosis).

First, the subjects filled out a questionnaire, which gathered data on age, sex and education, and also assessed the pain severity on the NRS scale (0 to 10, with 0 corresponding to no pain and 10 to the worst pain possible) and asked for words best describing the experienced pain. Moreover, the questionnaire asked about the used pain medication and the frequency in which they are ingested.

In the second part of the study, the subjects filled out the EPQ-R personality questionnaire, in which they answered “yes” or “no” to 100 questions. The answers were rated according to the key on a scale of 0-1. IBM SPSS Statistics 2.0 was used for statistical analysis.

### RESULTS

The study population comprised of 101 patients with diagnosed discopathy (33 men and 68 women), aged between 41 and 85 years old (Figure 1).

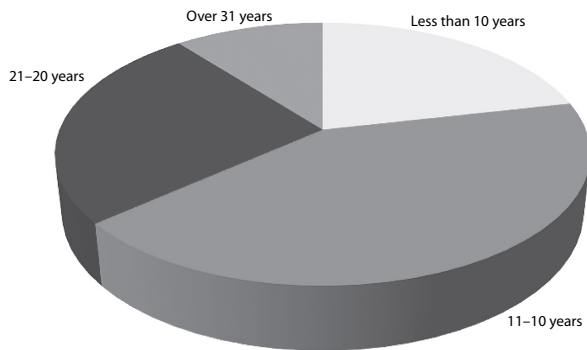


Source: Own study.

**Figure 1.** Number of men and women participating in the study in particular age groups

The majority of the study population (53.4%) had secondary education, 25.7% higher, 13.8% vocational, and the remaining 6.9% primary.

21.7% of the study population have been experiencing spine pain for less than 10 years. 42.5% have been suffering from pain between 11 and 20 years, and 24.7% between 21 and 30 years. 10.8% of the study population have been suffering from spine pain for over 31 years (Figure 2). No significant difference between the reported pain severity was documented based on the period of experiencing pain.



Source: Own study.

**Figure 2.** The period of suffering from pain in the study population

Table 1 contains detailed data on the character of the pain experienced by study subjects. The most frequently, the pain located in the spine radiated towards extremities and became more severe when the position of the body changed, and was accompanied by numbness or tingling.

**Table 1.** Descriptions used by the study population to describe experienced pain

Description of Pain	Percentage of the Study Population
Radiating towards upper or lower extremities	80.19
Accompanied by numbness/tingling	72.27
Stronger when changing position	56.43
Oppressive	45.54
Limiting mobility	44.55
Paroxysmal	32.67
Acute	27.72
Shooting	27.72
Piercing	25.74
Burning	25.74
Stabbing	21.78
Constant	20.79
Appearing when the affected area is palpated	8.91
Difficult to precisely place	4.95

Source: Own study.

The mean pain severity on the NRS scale among the study population was 6.99, with 7.16 for women and 6.81 for men. In 68.31% of the study population pain caused trouble falling asleep or woke the subjects.

The patients were divided into groups based on their EPQ-R results, into extroverts and introverts, and neurotics and emotionally stable, and subjects scoring high on psychoticism and the opposite pole, i.e. normal. The subjects were classified into a given group based on their score in a given dimension (expressed in stens). A score between 1 and 4 indicated low intensity of a given trait, 5–6 average intensity and 7–10 high intensity. Average scores were considered not significant and were not analysed.

### Extroverts and introverts

49 subjects (48.51%) from the study group were extroverts, 14 (13.86%) were introverts. Introverts classified their pain between 5 and 9, with mean 7.67 (SD 1.23,  $p = 0.05$ ). Extroverts classified experienced pain between 1 and 10, with mean 6.75 (SD 2.13,  $p = 0.05$ ). The severity of pain differed between the groups. Introverts reported more severe pain than extroverts (table 2).

**Table 2.** Comparison of introverts' and extroverts' assessment of pain severity on NRS scale

Group	N	Mean	Standard Deviation	Two-tailed Significance
Extraversion	49	6.75	2.13	0.047
Introversion	14	7.67	1.23	

For  $p = 0.05$ .

Source: Own study.

In the case of both groups we did not document significant discrepancies in using pain medication. In both groups most subjects ingested them on an ad hoc basis – in case of severe pain, however they also stated that after medication pain is less severe but does not disappear.

### Neurotics and emotionally stable

49 subjects (48.51%) from the study group were neurotics, 30 (29.7%) were classified as emotionally stable. Neurotics classified their pain between 5 and 9, with mean 7.15 (SD 1.64,  $p = 0.05$ ). Emotionally stable classified experienced pain between 1 and 10, with mean 6.65 (SD 2.28,  $p = 0.05$ ). The severity of pain did not differ significantly between the groups (table 3).

**Table 3.** Comparison of neurotics' and emotionally stables' assessment of pain severity on NRS scale

Group	N	Mean	Standard Deviation	Two-tailed Significance
Neuroticism	49	7.15	1.64	0.29
Emotionally Stable	30	6.65	2.28	

For  $p = 0.05$ .

Source: Own study.

Similarly as in the case of intro- and extroverts, we did not document significant discrepancies in using pain medication between the groups. In both groups most subjects ingested them on an ad hoc basis, however they also stated that after medication pain does not disappear, only becomes less severe.

### Psychotics and normal

11 subjects (10.89%) were classified as psychotic, 64 (63.36%) were classified on the other end of the spectrum, i.e. as normal. In the case of this group we did not perform comparative analysis due to too high difference in the number of subjects in each group.

## DISCUSSION

Similar studies were conducted, inter alia, by A. Tavallai et al. from Iran. The researchers, based on the MMPI test, documented the highest number of profiles with clear neurotic triad (depression, hysteria, hypochondria), which characterises patients suffering from chronic pain. Furthermore, the correlation between hysteria and hypochondria and age was also clear, in comparison with scales in the test. There is also a significant correlation between the severity of hysteria and sex, which means women scored higher on this scale. Moreover, they did not establish significant differences in the assessment of pain severity between men and women [1].

A corresponding study was conducted in the USA by M. BenDebba et al. They undertook to study the correlations between personality traits, duration and severity of pain in patients with acute and chronic pain. Based on Eysenck's EPI test, they obtained results from subjects suffering from pain on scales: extroversion, neuroticism and lying scale similar to those from general population [10].

Czarnecka and Tylka studied, inter alia, the correlations between personality traits from the Costa and McCrae model, the so-called Great Five, and perception of pain in patients suffering from chronic pain. Their results show that there is a correlation between neuroticism and perception of pain: the higher the level of neuroticism, the higher the reported level of chronic pain [11]. The discussed results are contrary to the conclusions drawn from the present study, where similar correlations were not established. The discrepancy may be caused by the fact that our study population was comprised entirely of subjects suffering exclusively from pain caused by discopathy, while results published by Czarnecka and Tylka were obtained from a study population comprised of patients from a Pain Treatment Clinic, without specifying the type of pain the subjects were suffering from.

Another conclusion by Czarnecka and Tylka was a lack of correlation between extroversion and the severity of experienced pain [11]. Similar results were reported by De Walden-Gałuszko et. al., who did not document a difference in the reported severity of pain between groups of introverts and extroverts [12].

Janowski et al. also did not establish a correlation between the severity of pain and personality traits and psycho-social functioning in subjects suffering from sacrum pains [13].

Taking psychological conditions of how pain is perceived into account in comprehensive therapy may prove beneficial and help provide higher quality care and better adjust the treatment (not only pharmacological, physical therapy, but also psychological) to the individual needs of the patient.

## CONCLUSIONS

In the present study conducted on a population of patients with discopathy, we established differences in how pain is perceived by people with different personality traits – introverts described pain as more severe in comparison with extroverts. However, due to the discussed discrepancies with the results of other studies, further analysis of this phenomenon is required.

Adding psychological support tailored to the needs of a given patient's personality traits can help improve the overall effectiveness of comprehensive treatment of patients with discopathy.

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Word count: 3224

• Tables: 3

• Figures: 2

• References: 13

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**Sources of funding**

The review was funded by the authors.

**Conflicts of interests**

The authors report that there were no conflicts of interest.

**Cite this article as:** Lewandowska A, Adasik A, Noga A. Assessment of pain perception depending on personality type among patients with diagnosed discopathy. PU-HSP 2016; 10, 3: 3–8.

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Received: 15.01.2016

Reviewed: 16.06.2016

Accepted: 18.07.2016