Influence of rehabilitation on mental state in patients with lumbar intervertebral disc damage

Desislava Bakova (1), Anna Mihaylova (2), Antoniya Yaneva (3), Nonka Mateva (3)

(1) Department of Health Care Management, Faculty of Public Health, Medical University of Plovdiv, Bulgaria; (2) Medical College, Medical University of Plovdiv, Bulgaria; (3) Department of Medical Informatics, Biostatistics and e-Learning, Faculty of Public Health,Medical University of Plovdiv, Bulgaria.

Abstract

The present study aims to investigate the mental state changes in patients with lumbar intervertebral disc damage after rehabilitation program using a self-administered questionnaire IRES-3. The study was conducted in the Specialized Hospitals for Rehabilitation – National Complex EAD, branches Hissar and Banite, Bulgaria. It included 124 patients – 34 men and 90 women, aged from 35 to 85 years. The questionnaire IRES-3, validated by the authors for the Bulgarian population, was used for measurement of the subjective evaluation of the rehabilitation effect. Measurements were performed at the beginning, end and three months after rehabilitation (RH). The subjective evaluation of the patients' mental state included the following scales: depression, fear, exhaustion of vitality, self-confidence and symptom: cognitive functioning. We found a statistically significant improvement of the scores three months after rehabilitation compared to the beginning of rehabilitation for all scales. The only exceptions are the scales exhaustion of vitality and symptom: cognitive functioning. We found a statistically significant improvement of the self-rated mental state after performed rehabilitation in patients with chronic diseases.

Key Words: Rehabilitation; mental health; psychological disorder; chronic diseases.

Eur J Transl Myol 32 (4): 10666, 2022 doi: 10.4081/ejtm.2022.10666

The interaction of long-term physical conditions and long-term mental health conditions poses particular challenges for the health care systems because they are related to the functional decline, decreased quality of life and a higher level of mortality. Prevalence rates of common mental disorders such as depression are higher in people suffering physical ill health.[1] Deterioration of health status due to chronic diseases and the associated decrease in functional ability increases the individual's dependency to other.[2] Patients with a chronic somatic disorder have approximately one and a half to two times higher risk of developing a concomitant psychiatric disorder than healthy people. After the diagnosis as well as in the course of treatment, many patients with chronic physical diseases are diagnosed with a psychological disorder.[3] Psychological comorbidity often goes unrecognised and untreated or it is considered an unavoidable consequence of their condition and not managed appropriately.[4] The severity of the disease increases the risk for a psychological disorder. Patients with chronic physical diseases and psychological disorders are "double burdened" because both the physical and psychological symptoms are manifested.[3] A higher morbidity and mortality, lower quality of life and higher treatment costs have been identified.[5] The psychosocial loads of chronic diseases can cause different reactions in the affected by the type and degree of disability, intensity, duration, preconceptions about the disease, life threat and control of the disease. Some of them have protracted distress and may develop psychiatric disorders, most commonly depression or anxiety.[6] Rehabilitation is an essential component of care for people with chronic disease, supported by strong scientific evidence. Different possibilities from the methods of physical and rehabilitation medicine, whose application is based on *"the principles of evidence based medicine* ..." are searched for improvement of patients mental and physical health.[7] The study of Härter et al. (2004)[8] showed a need for improved diagnostics of mental disorders in medical rehabilitation. This is important because patients should receive individualized psychology or psychotherapy treatment during rehabilitation, in addition to standardized group therapy,

if the effectiveness of the rehabilitation outcome is at risk because of comorbid mental disorder.[8] The psychological assessment in rehabilitation uses the usual clinical and psychological assessment methods – interview, observation, questionnaires and research procedures. Some of the most commonly used tools, specific for rehabilitation are IRES, SF-36, F-sozU, HADS, etc.[9-12] These instruments assist in the inclusion of the patients perspective in the areas of rehabilitation research, diagnostics and therapy. Personal perceptions of overall health status, as well as the feeling of well-being in physical, mental and social domains, are substantial factors in coping and health-related behavior. Therefore, patient-reported outcomes are a matter of particular interest. According to the ICF model, the definition of rehabilitation measures should be at the physical, mental and social level. The psychological or psychosocial rehabilitation is an integral part of any comprehensive rehabilitation and can be understood as an overall task which can contribute to the work of all professional groups. Due to an increase in chronic diseases with mental disorders, empirical evidence should be generated on effectiveness and efficiency of rehabilitative interventions. The study of literature found no published data for Bulgaria for the self-assessed effect of rehabilitation on the mental health of patients with chronic diseases.

The present study aims to investigate the mental state changes in patients with lumbar intervertebral disc damage after rehabilitation program using the self-administered questionnaire IRES-3.

Materials and Methods

Study Design

A prospective questionnaire study among hospitalized patients with chronic disease was conducted for a period of 6 months. The included patients were those with a chronic disease (lumbar intervertebral disc damage with radiculopathy - ICD 10: Code M 51.1), who partook in the rehabilitation program during the period of investigation. The excluded patients were those could not complete the IRES-3 questionnaire due to a cognitive disorder, psychiatric diagnosis or history of psychiatric treatment or language or literacy problems. All patients underwent a ten-day physical rehabilitation program consisting of stabilization exercise training (physical exercises), physiotherapy and balneotherapy (thermo- and hydrotherapy). All participants signed an informed consent form.

The IRES-3 questionnaire, validated for the Bulgarian population, was used for measurement of the subjective evaluation of the rehabilitation effect.[13] Measurements were performed at the admission (t0) of 152 patients, discharge (t1) 138 (90.8 %) and three months after hospitalization (t2) in 124 patients (81.6 %) (pre-post design with one follow-up measurement). Participants were approached three times to fill out a paper-and-pencil IRES-3 questionnaire. Along with the first IRES 3.1 questionnaire (beginning of rehabilitation), participants received an information letter in which the aims of the study were explained and confidentiality was assured. At the end of rehabilitation, the participants filled out an IRES 3.2 questionnaire. Additionally, a postage-paid, addressed envelope was provided for the return of the completed third IRES 3.3 questionnaire to the research team three months later, followed up with a phone call to invite them to participate. The patient questionnaire Indicators of Rehabilitation Status (IRES) is one of the most frequently used questionnaires in measurement of subjective health conditions in medical rehabilitation in Germany. The IRES questionnaire was reported by Gerdes & Jäckel (1992).[9] The new third version IRES-3, was developed according to a theoretical model of rehabilitation based on the International Classification of Functioning, Disability and Health (ICF). Besides the physical condition of patients associated with their chronic complaints, the IRES-3 questionnaire includes various psychical, social, occupational and functional aspects of their health. This instrument is widely applicable for the evaluation of the effect of rehabilitation in different psychosomatic, cardiac, orthopedic, oncologic, neurologic, gastroenterological and other medical conditions.[12] The IRES-3 questionnaire consists of eight dimensions, with a varying number of items.[14] A 5-point Likert scale (0-regularly, 1-often, 2-sometimes, 3-rarely,4- never) is used. The IRES-3 is available in three different versions. The baseline version includes 144 items and assesses additional information about treatment strategy, normal daily activities and vocational life. The end of treatment version comprises 75 items, the follow-up version 123 items.

The collected patient`s data for this research were fully anonymized. Data were analyzed using descriptive statistics, Friedman's test, Wilcoxon's signed ranks test, $\chi 2$ -test and paired samples t-test with SPSS v.19.0 statistical software. The results are presented as mean and standard error of mean (mean±SEM). In all analyses, p-values less than 0.05 were considered significant.

Results

124 (81.6%) of the patients completed all stages of the survey, 34 men (27.42 %) and 90 women (72.58%), aged from 35 to 85 years (mean age 57.98 ± 0.87 years).

The dimension Mental state includes self-assessment of depression, fears, exhaustion of vitality, self-confidence, and symptom: cognitive functioning. Table 1 presents the distribution of responses for all scales at the beginning of rehabilitation.

Depression

A large part of patients with chronic diseases suffer from depression due to the changes and limitations caused by chronic disease. At the end of rehabilitation and three months after, the percentage of responses for "…*you cannot decide anything*" increased for rarely (36.29%) and decreased for sometimes – 25.81% ($\chi 2 = 52.94$, df =

Table 1. *Distribution of responses at the beginning of rehabilitation (n=124).*

Scale	Item	regularly	often	sometimes	rarely	never
		%	%	%	%	%
Depression	**How often have you had the feeling that…**					
	- you cannot decide anything?	3.22	20.97	32.26	26.61	16.93
	- nothing makes you happy?	4.03	19.35	38.71	26.61	11.29
	- nothing happens as you would like?	7.25	28.22	32.26	25.81	6.45
	- you have no incentive for anything?	7.26	20.16	26.61	29.03	8.87
Fear	**How often have you had the feeling that you have no incentive for anything?**					
	I was tense inside I felt nervous.	7.25	28.22	37.90	17.74	8.87
	I had the feeling that it was difficult for me to calm down.	3.22	23.39	33.87	23.39	16.13
	I felt tireless, I had to be constantly on the move.	6.45	14.52	19.35	33.06	26.61
	I had butterflies in my stomach.	2.42	13.71	27.42	29.84	26.61
Exhaustion of vitality	**How often did you feel…**					
	-utterly exhausted?	3.22	20.97	32.26	25.81	17.74
	-worsening of mood as compared to previously?	4.03	19.35	38.71	26.61	11.29
	-anxiety and fatigue?	7.26	28.22	32.26	25.81	6.45
	-as a “gradually depleting battery?”	7.26	20.16	26.61	29.03	8.87
Self-confidence	**How do you evaluate yourself?**					
	I did not accomplish some tasks, but I could do many things better.	1.61	10.48	35.48	42.74	9.68
	I wanted to have more faith in myself.	19.35	33.06	25.81	17.74	6.45
	I found that I easily let others influence me.	4.84	7.26	27.42	31.45	29.03
Symptom: cognitive functioning	I forget the names of familiar people.	2.42	7.26	25.00	37.10	26.61
	I cannot concentrate well.	0	4.84	26.61	41.13	27.42
	I sometimes forget what I must do.	0.81	7.26	29.03	41.93	20.97
	I have the feeling that I have difficulties perceiving complex situations.	1.61	4.03	29.84	37.90	26.61
	I cannot remember things very well.	3.22	4.84	26.61	40.32	25.00

6, p = 0.0001). Three-point-two percent responded with regularly during the three stages of measurement. The patients who never experienced depressive states were 14.52% at the end, and 15.32% three months after rehabilitation.

At the end of rehabilitation, 38.71% reported with rarely and 12.10% responded with often in regards to “... *nothing makes you happy*”. These values were maintained three months after rehabilitation. A slight increase at the end of rehabilitation without statistical significance was reported in patients who responded never (14.52%), which was maintained after three months ($\chi2 = 2.50$, df = 6, p = 0.86). At the beginning of rehabilitation, 8.87% of patients responded with often for “*…nothing makes you happy*”. This value was maintained at the end and three months after rehabilitation. In connection with the realization of planned targets, the values did not change significantly at the end and three months after rehabilitation ($\chi2 = 5.58$, df = 6, p = 0.47). During the rehabilitation, we found a significant improvement which was maintained three months after rehabilitation (Wilcoxon Signed Ranks Test = 2.507, p = 0.012). We did not obtained statistical significance between the end and three months after rehabilitation (Wilcoxon Signed Ranks Test = 0.434, p = 0.664).

Fears

At the end of rehabilitation, we recorded a significant decrease in those who were often tense and nervous (18.55%) ($\chi2 = 13.83$, df = 8, p = 0.05) in connection with unpleasant feelings of fear. Less and less patients felt internal tension –30.64%. Three months after rehabilitation, we recorded a reduction in the end of rehabilitation measures relative to patient internal stress (Table 2). The distribution of responses for all other aspects at the three measurement points was similar. For patients who felt stressed regularly and those who answered with never, we did not find a significant change in the three measurement points.

Table 2 presents the results of the assessment of the dimension fear at the three measurement points. Between the beginning and end of rehabilitation, the difference is

Table 2. *Mean scores of mental state scales at the beginning, end and three months after rehabilitation.*

Measurement / Scales	Beginning of RH mean±SE	End of RH mean±SE	3months after RH mean±SE	Friedman test	P
Depression	2.58±0.07	2.69±0.08	2.72±0.08	9.420	0.009
Fears	2.29±0.07	2.54±0.09	2.45±0.08	7.469	0.024
Exhaustion of vitality	2.14±0.08	2.31±0.08	2.33±0.08	4.160	0.125
Self-confidence	2.25±0.07	2.45±0.08	2.35±0.07	10.554	0.005
Symptom: cognitive functioning	2.78±0.07	2.86±0.07	2.84±0.07	3.590	0.166

statistically significant (Wilcoxon Signed Ranks Test = 3.509, p = 0.0001); end of rehabilitation and after three months (Wilcoxon Signed Ranks Test = 0.597, p = 0.0001).

Exhaustion of vitality

This scale measures states, which lead to an exhaustion of vital forces (Table 1). At the end of rehabilitation and three months after, we recorded a significant difference in the results between the beginning and end of rehabilitation (Wilcoxon Signed Ranks Test = 2.168, p = 0.03) to the states, which lead to an exhaustion of vital forces. Regarding the slight increase between the end of rehabilitation and three months after, we did not find statistical significance (Wilcoxon Signed Ranks Test = 0.313, p = 0.754) (Table 2).

Self-confidence

Chronic diseases and their effects can affect the patients' self-confidence. At the end of rehabilitation, the distribution was regularly for 1.61% of patients rarely 42.7%, 9.68% often and 29.03% sometimes did not accomplish some tasks. Although small, the percentage of participants who responded with never increased marginally to 19.35% ($\chi2 = 5.91$, df = 6, p = 0.43). Three months after rehabilitation, we recorded a slight decrease without statistical significance (p > 0.05).

In regards to "*I wanted to have more faith in myself,*" at the end of rehabilitation, there was a decrease in the percentage of participants who responded with regularly and often, and an increase in those who responded sometimes (27.42%) and never (12.90%). Three months after rehabilitation, we again found a slight decrease without statistical significance ($\chi2 = 3.54$, df = 8, p = 0.89).

At the end of rehabilitation, in connection to "I *found that I easily let others influence me*", a similar distribution of responses was received, with a slight increase in the percentage of patients who answered with never – 34.68% ($\chi2 = 2.90$, df = 6, p = 0.82). We found a statistically significant improvement at the end of rehabilitation (Wilcoxon Signed Ranks Test = 3.463, p = 0.001). Self-confidence scores again deteriorated with statistical significance three months after rehabilitation (Wilcoxon Signed Ranks Test = 2.220, p = 0.026).

Symptom: cognitive functioning

The following aspects are included in relation to cognitive functioning: "*I forget the names of familiar people; I cannot concentrate well; I sometimes forget what I must do; I have the feeling that I have difficulties perceiving complex situations; I cannot remember things very well.*"

The distribution of answers regarding "*I forget the names of familiar people*" was maintained at the end and three months after rehabilitation ($\chi2 = 2.05$, df = 6, P = 0.91).

At the end of rehabilitation and after three months, the distribution of responses regarding concentration did not change ($\chi2 = 0.76$, df = 6, p = 0.99).

"*I sometimes forget what I must do*" applied sometimes for 30.64%, rarely for 40.32% and never for 20.16% of participants, again having a similar distribution of answers at the end and three months after rehabilitation ($\chi2 = 2.49$, df = 6, P = 0.87).

At the beginning of rehabilitation, 22.58% of the participants sometimes "*...felt that they have difficulties*

Table 3. *General score of the mental state dimension.*

Score / Measurements	mean±SE (n=124)	Comparing periods	t-test	P
Beginning of RH(t_0)	6.02±0.14	t_0 - t_1	1.15	0.252
End of RH (t_1)	6.12±0.13	t_0 – t_2	3.65	0.0001
3 months after RH (t_2)	6.35±0.15	t_1 – t_2	2.77	0.007

perceiving complex situations." They responded rarely and never – 45.97% and 25.81%, respectively. Similar values were recorded at the end and three months after rehabilitation ($\chi 2 = 1.83$, df = 8, p = 0.84).
"*I cannot remember things very well*" has been a problem sometimes for 25.81%, and rarely for 41.13%. Twenty-four-point-two percent never had memory problems. Again, we did not notice a significant change between the three times of measurement ($\chi^2 = 1.25$, df = 6, p = 0.97). When comparing the results for the individual aspects of cognitive functioning, we did not report a significant change at the end of rehabilitation and three months after (Table 1).

General score of Mental state dimension

The general score of the dimension Mental state revealed a statistically significant improvement from the initial state to three months after rehabilitation (Table 3). Total mean scores of the self-rated mental state at the beginning of RH is 6.02±0.14, at the end of RH is 6.12±0.13 and three months after RH is 6.35±0.15.
We do not find a statistically significant difference in the assessment of the results by age and gender.

Discussion

At the end of rehabilitation, we reported positive changes for scales *depression, fear* and *self-confidence* (Table 2). Three months after rehabilitation, we recorded a reduction in the end of rehabilitation measurements. This change we ascribe to the fact that the rehabilitation process improves not only the physical condition, but also greatly reduces the unpleasant feelings associated with fear. Returning patients to their usual lifestyle is likely to "reawaken" these sensations again due to varying causes. Therefore, patients need to be aided with ways to deal with the possible occurrence of unpleasant sensations and conditions in their daily lives. The general score of the dimension *Mental state* revealed a statistically significant improvement from the initial state to three months after rehabilitation (Table 3).
Monitoring the health status of patients has become a major activity in rehabilitation research in recent years. As a result, various self-assessment instruments have been developed, adapted or improved with the aim of measuring patient-reported outcomes and predictors. The many problems that result from somatic diseases often affect to a great extent the mental state and quality of life of the patients with chronic diseases. In recent years, they have been the subject of in-depth studies in the field of psychosocial rehabilitation.[15-19]
The nature of the disease seems to play a major role in psychological distress and disability.[2,20] The frequent association of somatic disorders with mental disorders has been demonstrated in numerous clinical trials. However, until recently there was no data on their type and frequency in rehabilitation. In two consecutive projects, the working group of Härter M, Baumeister H, Bengel J (2007)[3] investigated how often a mental illness is present and to what extent the patient is aware of it.[3,17] The main objective was to improve differentiation in diagnostic evaluation. A total of about 3,000 patients were interviewed. The results showed that nearly 40% of the patients with a somatic disease suffered with a mental disorder, i.e. every fifth patient. Affective disorders, fear and anxiety were at the forefront. In addition, any second mental disorder was undetected by doctors. Only every fourth patient received the appropriate diagnosis for their complaints. Similar results were obtained in similar studies.[18-20] Keck et al. (2006)[18] studied the effect of support measures for the professional integration of 1,000 patients with heart disease in a cardiologic rehabilitation clinic. Their results showed that about 20% of patients had significantly increased anxiety and fear. Nübling R. and collaborators found a significant proportion of patients with phychological problems in about 1,000 patients in the field of orthopedics, cardiology and psychosomatics (orthopedics: 36%, cardiology: 23%, comparison group of psychosomatic medicine: 77%).[19,20]
All studies show a partial presence of high phychological comorbidity in patients with primary somatic diseases. This applies to all important fields of medical rehabilitation, where medical somatic judgment often dominates, i.e. sometimes in the treatment of acute conditions, many of the psychiatric diseases and disorders are not detected (recognised). This shows that the actions in the current practice of healthcare often do not meet the requirements for the implementation of a holistic model in medical rehabilitation. Recommendations have been proposed, both in terms of diagnostics and in education, training and specialization of doctors. Attention is also directed to the integration of psychologists and psychotherapists in rehabilitation clinics and their potential contribution to the improvement of treatment options.
Hohever, several strengths and limitations of our study should be discussed. Knowledge of health outcomes from the patients' point of view is important for the provision of patient-centered health care. The present study has identified the enduring effects of rehabilitation process on mental state by using epidemiologic survey methods and the standardized IRES questionnaire, but this study was limited because it included patients, who didn`t report for the presence of a mental disorder, and this could impact the effectiveness of the rehabilitation outcome. Mental difficulties are often due to non-compliance with recommendations in the course of the treatment and during the conduct of medical treatment. This asks for improved diagnostics of mental disorders in medical rehabilitation. In such cases, in addition to standardized group therapy patients should receive individualized psychological or psychotherapeutic treatment during rehabilitation.
In conclusion, the results of our study show that the typical development of the rehabilitation process in patients with an intervertebral disc disorder. In

comparison to the beginning (t0), the improvement of the mental state recorded at the end of rehabilitation (t1) was maintained three months later (t2). Health care providers in rehabilitation clinics should be encouraged and trained to recognize and treat comorbid psychological problems in patients with chronic diseases.
Therefore, future efforts should enhance inter-professional treatment, including appropriate follow-up rehabilitative activities, taking into account individual needs of patients.

List of acronyms

F-SozU - (Fragebogen zur sozialen Unterstützung), Social Support Questionnaire
HADS - Hospital Anxiety and Depression Scale
ICD 10: Code M51.1 - International Classification of Diseases Code M51.1 · Thoracic, thoracolumbar and lumbosacral intervertebral disc disorders with radiculopathy · Radiculopathy, lumbar region.
ICF - International Classification of Functioning
IRES-3 - Indicators of rehabilitation status, version 3
RH - rehabilitation
SF-36 - Short Form 36

Contributions of Authors

DB, AM, AY, NM were involved in the conception, drafting and critical revision of the manuscript. All authors approved the final edited typescript.

Acknowledgments

We sincerely thank for their gratuitous support in the survey the Specialized Hospitals for Rehabilitation, National Complex EAD, branches of Hissar and Banite, Bulgaria.

Funding None

Conflict of Interest

The authors declare no conflict of interests.

Ethical Publication Statement

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

Corresponding Author

Anna Mihaylova, Medical College, Medical University of Plovdiv, Bulgaria. 120 Br. Bukstone str., 4004 Plovdiv, Bulgaria. Phone +359 888 315382
ORCID ID: 0000-0002-7674-6074
E-mail: anna.mihaylova@mu-plovdiv.bg

E-mails and ORCID iD of co-authors

Desislava Bakova: desislava.bakova@mu-plovdiv.bg
ORCID iD: 0000-0002-6567-8854
Antoniya Yaneva: antoniya.yaneva@mu-plovdiv.bg
ORCID iD: 0000-0002-8778-2660
Nonka Mateva: nonka.mateva@mu-plovdiv.bg
ORCID iD: 0000-0001-9332-6760

References

1. Doherty AM., Gaughran F. The interface of physical and mental health. Soc Psychiatry Psychiatr Epidemiol 2014; 49, 673–682. https://doi.org/10.1007/s00127-014-0847-7
2. Karapolat H. Important Points in Taking Care of Elderly Patients with Chronic Diseases. Turk J Phys Med Rehab 2009; 55: 88-9.
3. Härter M, Baumeister H, Bengel J. Psychische Störungen bei körperlichen Erkrankungen [Mental disorders in physical illnesses]. Springer Medizin; 2007; p.66. German.
4. Pevele R, Carson A, Rodin G. Depression in medical populations. BMJ 2002;325:149
5. Sander et al. BMC Psychiatry 2017; 17:36 DOI 10.1186/s12888-017-1193-6
6. Turner J, Kelly B. Emotional dimensions of chronic disease. West J Med. 2000;172(2):124-128. doi:10.1136/ewjm.172.2.124
7. Oral A, Ilieva E. Physiatric approaches to pain management in osteoarthritis: a review of the evidence of effectiveness. Pain Manag 2011;1:451–71.
8. Härter M, Woll S, Reuter K, Wunsch A, Bengel J. Recognition of psychiatric disorders in musculoskeletal and cardiovascular rehabilitation patients. Arch Phys Med Rehabil. 2004 Jul;85(7):1192-7. doi: 10.1016/j.apmr.2003.08.106.
9. Gerdes N, Jäckel WH. "Indikatoren des Reha-Status (IRES)"--Ein Patientenfragebogen zur Beurteilung von Rehabilitationsbedürftigkeit und -erfolg ["Indicators of Reha-Status (IRES)"-a patient questionnaire for assessing need and success of rehabilitation]. Rehabilitation (Stuttg). 1992 May;31(2):73-9. German.
10. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care. 1992 Jun;30(6):473-83. German.
11. Sommer G, Fydrich T. Entwicklung und Überprüfung eines Fragebogens (F-sozU) [Development and review of a questionnaire (F-sozU)]. Diagnostica 1991;37:160–78. German.
12. Zigmond A, Snaith R. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361–70.
13. Bakova D, Mateva N. Reliability and Cross-cultural Validity of the Bulgarian Version of IRES-3. Folia Med. 2011;53:51–6.
14. Bührlen B, Gerdes N, Jäckel WH. Entwicklung und psychometrische Testung eines Patientenfragebogens für die medizinische Rehabilitation (IRES-3) [Development and psychometric testing of a patient questionnaire for medical rehabilitation (IRES-3)]. Rehabilitation (Stuttg) 2005;44:63–74. doi: 10.1055/s-2004-834687. German.

15. Nübling R, Schmidt J WW. Langfristige Ergebnisse Psychosomatischer Rehabilitation [Long-term outcomes of psychosomatic rehabilitation]. Psychother Psychosom med Psychol. 1999;49:343–53. German.
16. Çağlar N, Walden G, Esenyel M, Esenyel CZ, Tetik S, Emel E. Chronic Musculoskeletal Pain: Pain Related Disability and Psychological Distress. Turkish J Phys Med Rehab 2004;50.
17. Härter M. Ätiologie psychischer Störungen bei chronischen körperlichen Erkrankungen [Etiology of mental disorders in chronic physical illness]. Rehabilitation (Stuttg). 2002 ;357–66. German.
18. Keck ME, Ropohl A, Rufer M, Hemmeter UM, Bondolfi G, Preisig M, Rennhard S, Hatzinger M, Holsboer-Trachsler E, Hättenschwiler J, Seifritz E. Die Behandlung der Angsterkrankungen. Teil 1: Panikstörung, Agoraphobie, generalisierte Angststörung, soziale Phobie, spezifische Phobien [The treatment of anxiety disorders. Part 1: Panic Disorder, Agoraphobia, Generalized Anxiety Disorder, Social Phobia, Specific Phobias]. Swiss Medical Forum 2011; 11:558-566. doi.org/10.5167/uzh-54483. German.
19. Nübling R, Muthny FA, Bengel J, Kriz D, Herwig J, Hafen K. Die Bedeutung von Reha - Motivation und Behandlungserwartung für die Praxis der medizinischen Rehabilitation [The importance of rehabilitation motivation and treatment expectation for the practice of medical rehabilitation]. Rehabilitation motivation and treatment expectations. Book, Publisher: Huber, 2006; 15-23. German.
20. Nübling R, Löschmann C, Steffanowski A, Wittmann WW. Effektivität und Effizienz der stationären Behandlung psychisch Kranker : Vergleich zwischen den Versorgungssektoren Rehabilitation und Akutpsychosomatik [Effectiveness and efficiency of inpatient treatment of the mentally ill: comparison between the rehabilitation and acute psychosomatic care sectors]. Deutsche Rentenversicherung / DRV-Schriften. Publisher: Buschmann-Steinhage, Rolf 2005;(59):472-476. German.

Disclaimer

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

Submission: June 10, 2022
Revision received: June 25, 2022
Accepted for publication: June 25, 2022