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The Efficiency of Physical Therapy for Women with Degenerative Diseases of the Cervical and Thoracic Spine Based on the BodyArt Fitness Method

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Abstract

Objectives. This study aimed to scientifically substantiate, develop and evaluate the effectiveness of including the BodyArt fitness method in the rehabilitation plan of female patients with cervicothoracic osteochondrosis in the phase of periodic maintenance rehabilitation.

Materials and Methods. The study involved 57 women who were randomly divided into a control group (CG, n = 27, age 49.3 ± 1.5 years) and a main group (MG, n = 30, age 50.1 ± 1.2 years) using the sealed envelope method. Inclusion criteria comprised females aged 40 to 60 years with a diagnosis of osteochondrosis of the cervicothoracic region (OCT), confirmed by instrumental methods (X-ray, CT or MRI), established at least one year before the onset of the study. Exclusion criteria were: acute pain, severe somatic pathology, fractures or tumors of the vertebrae. All participants provided written informed consent to be involved in the study. The CG underwent standard rehabilitation according to the hospital protocol (training — 30 min, 4-6 sessions; therapeutic gymnastics — 3 times a week for 1 hour; manual therapy — 6-8 sessions). The MG program included the BodyArt fitness method instead of standard exercises. The study spanned two rehabilitation cycles (28 days). To assess the effectiveness of the intervention, clinical and instrumental methods and scales were used (McGill Pain Questionnaire, MMT of the back and shoulder girdle muscles, cervical and thoracic spine mobility, Index of disability due to neck pain (Neck Disability Index, NDI)), as well as statistical methods.

Results. In patients of the main group, after using BodyArt fitness, there was a significant decrease in pain intensity according to the results of the McGill Pain Questionnaire (MPQ) ($p < 0.01$), an improvement in muscle strength ($p < 0.05$), and an increase in the range of motion in the cervical and thoracic spine (p5). In particular, the NDI disability index decreased by 34.7% ($p < 0.01$).

Conclusions. The findings revealed that incorporating BodyArt fitness into the physical therapy program is an effective means of rehabilitation for patients with cervicothoracic osteochondrosis, helping to reduce pain, improve spinal mobility and restore functional activity.

Keywords: cervicothoracic osteochondrosis, BodyArt fitness, physical therapy, manual muscle testing and goniometry, Neck Disability Index, McGill Pain Questionnaire.

Introduction

Degenerative diseases of the spine, in particular osteochondrosis of the cervicothoracic region (OCR), occupy a leading place among diseases of the musculoskeletal system in the adult population. Their frequency increases with age, but modern data indicate that the initial signs of degenerative changes in the intervertebral discs can appear already in adolescence, and by the age of 50 these changes are recorded in almost 10% of people, and by the age of 70 - already in half of the population (Fakhoury & Dowling, 2023).

Neck pain is not only one of the most common symptoms of OCT, but also a serious public health problem. It is known that neck pain is often accompanied by a decrease in quality of life, impaired performance, and sometimes neurological complications. In a meta-analysis by Fejer et al., it was found that the annual prevalence of neck pain is 7.6%, while the lifetime prevalence reaches 48.5%, with women suffering more often than men (Fejer et al., 2006).

The anatomical and functional features of the cervical spine, in particular its high mobility, complex structure and participation in many movements of the head and neck, determine its vulnerability to overloads and injuries. Chronic static loads, work in uncomfortable positions, decreased physical activity and excessive use of mobile devices - this significantly increases the risk of developing degenerative changes. Significant pressure on the intervertebral discs even with a slight tilt of the head, for example, when using a smartphone, can reach 27 kg, which contributes to premature aging of the spinal structures (Frost et al., 2019).

Research shows that the development of OCT is based on gradual degradation of the intervertebral disc – from loss of moisture and elasticity to the appearance of cracks in the fibrous ring and sequestration. Most often, the pathological process is localized at the levels of C5-C6 and C6-C7, where pronounced osteophytes, a decrease in disc height and sclerosis of the end plates are detected (Kong et al., 2017).

There is a clear age dependence of degenerative changes, but other factors - genetic predisposition, smoking, obesity, past injuries, long-term psycho-emotional stress – also influence the development of the disease (Seok & Kim, 2020; Kalmykova, 2023). In this context, it is important to pay attention to psychosocial aspects: low social support, lack of autonomy in decision-making, as well as job dissatisfaction are associated with an increased risk of developing neck pain (Ariëns et al., 2001).

Special attention is paid to the gender factor. Female gender remains one of the most frequently mentioned risk factors, although research results vary. Some scientific papers indicate a higher incidence and a greater number of years lived with disability due to neck pain among women (Safiri et al., 2017). According to the Global Burden of Disease, 166 million women suffered from neck pain in 2017, compared to 122 million men, highlighting the need for a gender-specific approach to treatment. (Cieza et al., 2020).

Given the complexity of the pathogenesis of cervical-thoracic spine degeneration, which includes both morphological changes and psychosocial factors, it is important to introduce modern non-drug approaches aimed at reducing pain, improving mobility, correcting posture and improving the overall functional state. One of the promising areas of rehabilitation is the use of the Body Art fitness method – a functional area of physical therapy that combines breathing, stabilization and neuromuscular exercises that take into account the individual characteristics of the female body in the context of degenerative diseases of the cervical-thoracic spine. That is, this type of fitness is justified for inclusion in the periodic supporting rehabilitation of the OCT for most effects. Physical therapy of the OCT is an important component of therapy, and new technologies open the way to the development of more effective methods, which determined the relevance of the study.

Purpose: To evaluate the impact of physical therapy in women with degenerative diseases of the cervical-thoracic spine based on the body art fitness method.

Materials and Methods

Participants

The study involved 57 women with a clinically and instrumentally confirmed diagnosis of OCT. The diagnosis was verified using radiography, computed tomography (CT) or magnetic resonance imaging (MRI) within one or two years before the start of the study.

All participants provided written informed consent to participate in the study in accordance with the principles of the Declaration of Helsinki.

Inclusion criteria were: females aged 40 to 60 years with a diagnosis of osteochondrosis of the cervicothoracic region (OCT), confirmed by instrumental methods (X-ray, CT or MRI), established at least one year before the start of the study. Age from 40 to 60 years, the presence of a diagnosis of OCT in remission, the ability to move independently and participate in physical exercise. Exclusion criteria were acute pain syndrome, severe somatic pathology, verified compression fractures of the vertebrae, spinal neoplasm, neurological deficit or systemic diseases of the musculoskeletal system. Evaluators were blinded.

The participants were randomly divided into two groups – control group (CG, n = 27, age 49.3 ± 1.5 years) and main group (MG, n = 30, age 50.1 ± 1.2 years). Randomization was carried out using closed opaque envelopes: pre-prepared envelopes marked "Control" or "Study" were mixed by an independent assistant and given to the participants in the order of their inclusion in the study.

In the control group (CG, n = 27), traditional therapeutic interventions were used: therapeutic gymnastics (3 times/week for 60 min.), manual therapy (6–8 procedures), and an educational component.

In the main group (MG, n=30), standard exercises were replaced by BodyArt training with the same frequency and duration (Table 1).

Table 1. Baseline characteristics of the study participants

Characteristic	CG, X ± m (n = 27)	MG, X ± m (n = 30)	p
Age, years	49.3 ± 1.5	50.1 ± 1.2	>0.05
Diagnosis confirmation method, %	15 (55.6%)	16 (53.3%)	>0.05
Radiography	6 (22.2%)	8 (26.7%)	>0.05
CT	6 (22.2%)	6 (20.0%)	>0.05
MRI	1.6 ± 0.4	1.7 ± 0.3	>0.05
Time since diagnosis	27 (100%)	30 (100%)	-
Ability to move independently, %	27 (100%)	30 (100%)	-

Procedure

The rehabilitation intervention in the study involved the development and implementation of an individualized outpatient physical therapy program for women with cervicothoracic osteochondrosis that included BodyArt training as the primary form of general therapeutic exercise

(ICF code 96129-00 – "therapeutic exercises for the whole body"). The BodyArt program is a holistic system of physical activity based on a combination of elements of yoga, Pilates, functional training, tai chi techniques and breathing practices. Its author, Swiss physiotherapist Robert Steinbacher, developed a concept integrating the philosophy of Yin-Yang and models of energy cycles through five phases: earth, wood, fire, metal and water, each of which is represented by appropriate types of exercises, moving from a warm-up to peak loads and ending with relaxation.

The training was adapted to the needs of patients with degenerative changes in the spine and included:

- exercises for postural control and stabilization,
- isometric activation of the muscles of the deep stabilization complex,
- controlled mobilization of the cervicothoracic segment of the spine,
- breathing practices and elements of conscious movement (mindfulness).

Additionally, the program for both groups included educational sessions (ICF code 96076-00) on ergonomics, back pain prevention, and healthy lifestyle (4–6 sessions of 30 minutes).

The rehabilitation intervention lasted 28 days (two cycles of 14 days, a total of at least 26–28 sessions), and was performed on an outpatient basis under the supervision of physical therapy specialists.

Instruments

To assess the effectiveness of the intervention, clinical and instrumental methods and scales were used (McGill pain questionnaire, MMT of the back and shoulder girdle muscles, mobility of the cervical and thoracic spine, Index of disability due to neck pain (Neck Disability Index, NDI)), statistical methods.

The McGill Pain Questionnaire (MPQ) is a tool for the qualitative and quantitative assessment of a patient's pain experience. It consists of 78 descriptors (words of description) grouped into 22 categories reflecting different aspects of pain: sensory, affective and evaluative components. The patient selects the words that most accurately describe his sensations, which allows the clinician to obtain a detailed description of the pain and its impact on the patient's condition (Katz & Melzack, 2022).

Measurement of the range of motion to assess the mobility of the cervical and thoracic spine was performed using a universal plastic goniometer, aligning it with anatomical landmarks in accordance with the neutral zero position method (0–180°). All measurements were performed by the same researcher at the same time of day. To increase reliability, each measurement was performed three times, after which the average value was calculated.

The MMT of the trunk and upper limb muscles was assessed using a 6-point scale. The patient's position for testing the trunk muscles is lying on his back or stomach, with stabilization of the body part within which this muscle is located. To assess the performance of the movement, the amplitude of movement and the activity that the patient must reveal are examined. Without the patient's cooperation, the study will not give the required result. Resistance should be applied in accordance with the age, gender and general condition of the patient. The study assessed the extensor muscles of the spine, the stabilizing muscles of the scapula and the muscles of the upper limbs (Brown et al., 2013).

Neck Disability Index (NDI), also known as the Neck Pain Disability Index, is a 10-question questionnaire that assesses the impact of neck pain on daily activities, including aspects such as work, sleep, rest, personal hygiene, lifting, reading, driving, headache, concentration, and pain intensity (Shkolina et al., 2021). Each question is rated on a scale of 0 to 5, with 0 representing no pain or limitation and 5 representing the most severe pain and limitation. This questionnaire can be a useful tool for assessing the degree of disability in patients with neck pain and can help in planning appropriate treatment.

Statistical Analysis

The following methods of mathematical statistics were used: descriptive statistics and nonparametric tests. Descriptive data are presented as mean (standard error), median (range) or count (percentage) in accordance with the requirements of the study. Nonparametric statistics were used to test differences between groups over time as a result of a small number of observations. Nonparametric tests for comparing mean values for 2 groups in independent populations were introduced – the Krustal-Wallis test, and in related populations – the Friedman test. McNemara's exact test was used to compare relative values. The null hypothesis was taken into account during testing – the statement that there is no difference between the groups, that is, the probability (p) that the groups have the same results.

The value $p > 0.05$ meant that the probability of the null hypothesis was greater than 5%, i.e. there was no difference between the populations; $p<0.05$ the probability of the null hypothesis was less than 5%, i.e. there was a difference with a probability of 95%; $p<0.01$ the probability of the null hypothesis was less than 1%, i.e. there was a difference with a probability of 99%. Statistical analysis was performed using Excel and the statistical computer program SPSS, version 16.0 (Landou & Everitt, 2003).

Results

At the beginning of the study, all women were examined by a multidisciplinary team – a physician of physical and rehabilitation medicine (PRM), a physical therapist (PT), an occupational therapist (OT), and a psychologist. An individual rehabilitation plan was developed for each of the women depending on the existing difficulties in functioning, activity, and participation. The average age in the CG was 49.3 ± 1.5 years, in the MG – 50.1 ± 1.2 years ($p > 0.05$). Between-group differences in age and duration of the disease at the beginning of the intervention were not statistically significant ($p > 0.05$), statistical analysis did not reveal reliable differences between the groups in other indicators ($p > 0.05$), which also indicates the homogeneity of the comparison groups.

The International Classification of Functioning (ICF) was used to assess the functional state of patients with osteochondrosis of the cervicothoracic spine. The definition of profiles was based on the results of muscle strength and spinal mobility.

Table 2. Dynamics of the McGill Pain Questionnaire (MPQ) scores in patients of the main (MG) and control (CG) groups with cervicothoracic osteochondrosis (conventional units)

Type of pain	Group	At the beginning	After 4 weeks	Wilcoxon test (dynamics within a group t, p)	Mann–Whitney test (between groups, U, p)
		X ± m	X ± m		
Pain intensity, conventional units	Control	3.8 ± 0.8	1.8 ± 0.5*&	3.45; 0.001	225.0; 0.004
	Main	3.9 ± 0.7	0.9 ± 0.3*&	4.12; 0.002	
Overall pain assessment, conventional units	Control	2.8 ± 0.4	1.3 ± 0.4*&	4.53; 0.002	210.0; 0.002
	Main	2.7 ± 0.5	0.5 ± 0.1*&	3.42; 0.001	

Note: * - significant difference in dynamics within a group (Wilcoxon test); p between groups - Mann-Whitney test; & - significant difference in dynamics groups (Mann-Whitney test)

Table 3. Dynamics of mobility indicators of the cervical-thoracic spine (key movements) (degrees)

Mobility indicators	Group	At the beginning	After 4 weeks	Wilcoxon test (dynamics within a group t, p)	Mann–Whitney test (between groups, U, p)
		X ± m	X ± m		
Neck extension, degrees	Control	17.0 ± 2.2	32.0 ± 2.5*	3.25; 0.005	190.0; 0.001
	Main	16.0 ± 3.3	20.0 ± 3.2&	>0.05	
Thoracic extension, degrees	Control	14.0 ± 3.7	18.0 ± 3.2	>0.05	215.0; 0.004
	Main	15.0 ± 2.9	25.0 ± 2.5*&	3.40; 0.001	
Thoracic rotation, degrees	Control	21.0 ± 3.7	28.0 ± 2.1	>0.05	205.0; 0.003
	Main	24.0 ± 3.1	36.0 ± 3.8*&	3.42; 0.001	
Thoracic lateroflexion, degrees	Control	18.0 ± 1.6	21.0 ± 2.3	>0.05	198.0; 0.002
	Main	18.0 ± 2.0	28.0 ± 2.2*&	3.42; 0.001	

Note: * - significant difference in dynamics within a group (Wilcoxon test); p between groups - Mann-Whitney test; & - significant difference in dynamics groups (Mann-Whitney test)

Table 4. Dynamics of strength indicators of the cervical-thoracic spine (basic movements) (points)

Strength indicators	Group	At the beginning	After 4 weeks	Wilcoxon test (dynamics within a group t, p)	Mann–Whitney test (between groups, U, p)
		X ± m	X ± m		
Spinal extensors, points	Control	4.2 ± 0.2	4.1 ± 0.1	>0.05	208.0; 0.002
	Main	4.1 ± 0.1	4.9 ± 0.2*&	3.40; 0.001	
Rhomboids, points	Control	3.8 ± 0.2	3.9 ± 0.1	>0.05	190.0; 0.001
	Main	3.9 ± 0.1	4.9 ± 0.1*&	3.40; 0.001	
Right supraspinatus, points	Control	3.9 ± 0.1	4.0 ± 0.1	>0.05	200.0; 0.001
	Main	4.0 ± 0.1	4.6 ± 0.1*&	3.39; 0.001	
Left supraspinatus, points	Control	4.0 ± 0.1	4.0 ± 0.2	>0.05	212.0; 0.003
	Main	4.0 ± 0.2	4.5 ± 0.2*&	3.41; 0.001	
Left wrist extensors, points	Control	4.1 ± 0.1	4.1 ± 0.1	>0.05	195.0; 0.001
	Main	4.1 ± 0.1	4.8 ± 0.1*&	3.41; 0.001	

Note: * - significant difference in dynamics within a group (Wilcoxon test); p between groups - Mann-Whitney test; & - significant difference in dynamics groups (Mann-Whitney test)

The key difficulties were the ICF components "Structure and Function" (b280 Pain Perception, b134 Sleep Functions, b710 Joint Mobility Functions), but many queries also related to the component "Activities and Participation". The domains d850 Work Relationships, d920 Leisure and Rest, d166 Reading, d475 Management caused varying degrees of difficulty for all study participants.

The dynamics of the McGill Pain Questionnaire (MPQ) scores showed a significant decrease in the intensity and overall pain score in both groups after the four-week rehabilitation program ($p<0.05$ according to the Wilcoxon test) (Table 2).

However, in the main group, these changes were statistically more significant compared to the control group ($p<0.05$ according to the Mann-Whitney criterion), which confirms the higher efficiency of the applied method with the inclusion of BodyArt fitness.

After completing two rehabilitation cycles, an improvement in the range of motion in the cervical and thoracic spine was recorded in both groups (Table 3).

The changes were especially pronounced in the thoracic region in patients in the MG (extension, rotation, lateroflexion; $p < 0.05$), while in the CG the most noticeable improvement was in neck extension. Intergroup differences in most thoracic mobility indices were statistically significant ($p < 0.05$), indicating different directions of the interventions.

Manual muscle testing (MMT) indices indicate a significant improvement in the strength of the back muscles (spinal extensors and rhomboid muscles) and individual

Table 5. Dynamics of assessment according to the NDI (Neck Disability Index) scale (conventional units)

Neck Disability subscale	Group	At the beginning	After 4 weeks	Wilcoxon test (dynamics within a group t, p)	Mann–Whitney test (between groups, U, p)
		X ± m	X ± m		
Pain intensity, conventional units	Control	3.1 ± 0.6	1.1 ± 0.2*	3.40; 0.001	>0.05
	Main	3.6 ± 0.5	1.2 ± 0.7*	4.60; 0.003	
Lifting objects, conventional units	Control	1.8 ± 0.6	1.5 ± 0.1	>0.05	190.0; 0.001
	Main	1.5 ± 0.6	0.1 ± 0.1*&	3.39; 0.001	
Work, conventional units	Control	2.3 ± 0.4	2.0 ± 0.1	>0.05	185; 0.001
	Main	1.9 ± 0.3	0.1 ± 0.1*&	3.40; 0.001	
Driving a car, conventional units	Control	1.5 ± 0.3	1.0 ± 0.2	>0.05	200.0; 0.002
	Main	1.4 ± 0.3	0.1 ± 0.1*&	4.51; 0.003	
Sleep, conventional units	Control	2,1 ± 0,3	1.1 ± 0.2	>0.05	185.0; 0.001
	Main	1.8 ± 0.2	0.1 ± 0.1*&	4.01; 0.002	
Rest and leisure, conventional units	Control	2.7 ± 0.3	2.0 ± 0.5	>0.05	210.0; 0.003
	Main	2.3 ± 0.5	0.9 ± 0.4*&	5.40; 0.005	
Total score (NDI), conventional units	Control	19.5 ± 1.5	14.5 ± 1.7	>0.05	205.0; 0.002
	Main	16.4 ± 1.7	9.6 ± 1.7*&	3.41; 0.001	

Note: * - significant difference in dynamics within a group (Wilcoxon test); p between groups - Mann-Whitney test; & - significant difference in dynamics groups (Mann-Whitney test)

muscles of the upper limbs (supraspinatus muscle, left wrist extensors) in the main group (Table 4).

Similar dynamics were not observed in the control group. Statistically significant intergroup differences in these indicators confirm the greater effectiveness of the intervention using BodyArt.

Changes in the level of activity and participation

According to the results of the NDI (Neck Disability Index) questionnaire, the overall assessment of functional limitations significantly decreased in both groups ($p<0.05$), but in patients of the main group the decrease was more pronounced (from 16.4±4.1 to 9.6±1.9 points) (Table 5).

The intergroup difference after the intervention was statistically significant ($p<0.05$). The most significant changes in MG were observed in the categories: lifting objects, performing work duties, driving a car, quality of sleep and leisure.

The obtained results indicate the effectiveness of the developed individualized outpatient rehabilitation program using BodyArt fitness as a means of physical therapy in women with cervicothoracic osteochondrosis.

Discussion

The present study was based on the hypothesis that integrating BodyArt fitness into a structured physical therapy program would yield superior functional and pain-related outcomes in women with cervicothoracic osteochondrosis (OCT) compared to traditional therapeutic modalities. This hypothesis stems from the understanding that chronic neck and upper back pain syndromes are not only biomechanical in nature but also involve disturbances in motor control, postural balance, and neuromuscular coordination.

An essential feature of our therapeutic strategy was the use of BodyArt fitness as a central, non-pharmacological modality. This method combines yoga, Pilates, breathing techniques, and stabilization exercises that holistically target balance, flexibility, strength, and proprioception. In contrast to traditional physiotherapeutic programs, BodyArt emphasizes controlled movement and awareness of body position, which is crucial in conditions such as OCT, where postural dysfunction and compensatory movement patterns are common.

Our results confirmed the hypothesis: participants in the experimental group showed significantly greater improvements in pain intensity, spinal mobility (particularly extension and rotation), muscle strength (rhomboids, scapular stabilizers, wrist extensors), and functional activity (NDI subscales) than those in the control group. These findings are in line with prior evidence supporting the efficacy of therapeutic exercise in managing chronic neck pain. In particular, multiple studies have demonstrated the benefits of scapular muscle training (Andersen et al., 2011; Kang et al., 2021), resistance-based strengthening (Ma et al., 2011; Li et al., 2017), and multimodal rehabilitation programs (Ylinen et al., 2004; Borisut et al., 2013) in reducing pain and improving functional status.

A frequency of 3–4 sessions per week is considered optimal for therapeutic benefit in chronic pain management (O'Riordan et al., 2014; Jones et al., 2024). Our program adhered to these recommendations, suggesting that the observed improvements were not only due to the content of the intervention (BodyArt) but also to its appropriate dosage and progression. Furthermore, the emphasis on movement control, breathing, and mental focus may have contributed to pain reduction via central mechanisms such as downregulation of sensitization pathways, which warrants further neurophysiological investigation.

Pain, often underestimated as a clinical marker, plays a central role in limiting physical performance. Our results, showing reduced force production in the rhomboids, supraspinatus, and forearm extensors, support the findings of Ylinen et al. (2004), who emphasized the inhibitory effects of pain on maximal voluntary muscle contraction. The recovery of muscle strength observed in the experimental group may thus reflect not only mechanical adaptation but also normalization of motor output due to decreased nociceptive interference.

Mobility deficits were most prominent in the extension of the cervical (16–17°) and thoracic spine (14–15°), which may result from muscle hypertonicity, imbalance, or degenerative disc changes. These values are comparable with those reported in the literature for similar populations and reinforce the clinical significance of targeted mobility training (Ylinen et al., 2004; Wegner et al., 2010). BodyArt fitness, through its fluid and controlled movement patterns, may improve fascial elasticity and restore segmental motion, contributing to the significant mobility gains observed.

Altered scapular positioning is a hallmark of chronic cervicothoracic dysfunction. Studies by Cagnie et al. (2014) and Wannaprom et al. (2021) highlighted the impact of scapular dyskinesis on cervical spine load and pain perception. Active correction of scapular alignment has been shown to improve clinical outcomes (Lluch et al., 2014; Seok & Kim, 2020), and our findings corroborate these observations. The BodyArt approach, which emphasizes scapular stabilization, offers a practical and effective solution that could be implemented in various rehabilitation settings.

From a practical standpoint, BodyArt fitness requires minimal equipment and can be delivered in group or individual formats, making it a cost-effective option for outpatient or home-based rehabilitation. The inclusion of cognitive and respiratory elements also promotes patient engagement and may support long-term adherence, which is often a limiting factor in rehabilitation success. The structured yet adaptable nature of BodyArt exercises allows therapists to tailor intensity and complexity based on patient condition, ensuring safety and individualization.

Importantly, our findings underscore the need for a paradigm shift from passive to active rehabilitation strategies in patients with degenerative spinal disorders. The improvement observed across multiple outcome domains suggests that BodyArt fitness addresses both the mechanical and neurophysiological components of chronic cervicothoracic pain. This holistic effect is particularly relevant for women in midlife, who often face cumulative biomechanical stressors and hormonal changes that affect connective tissue quality and pain perception.

Nevertheless, certain limitations must be acknowledged. The relatively small sample size and short intervention period restrict the generalizability of our results. The absence of long-term follow-up precludes conclusions regarding the durability of therapeutic effects. Furthermore, the lack of direct neurophysiological assessments (e.g., EMG, pain sensitization indices) limits our ability to explain the observed changes at the mechanistic level. Future studies should incorporate these aspects and include control groups receiving alternative active interventions to better isolate the unique effects of BodyArt fitness.

Perspective and future research

The results obtained indicate that BodyArt fitness is a promising, safe, and effective intervention for the rehabilitation of women with cervicothoracic osteochondrosis. However, future multicenter randomized controlled trials with larger sample sizes, longer follow-up periods, and objective measures of neuromuscular function are needed to confirm and expand these findings. In addition, studies investigating the impact of BodyArt on psychological outcomes, quality of life, and central pain mechanisms would provide a more comprehensive understanding of its therapeutic potential. Expanding the use of BodyArt into clinical guidelines and integrating it into multidisciplinary care pathways for chronic spinal pain may enhance both short-term outcomes and long-term self-management.

Conclusions

Chronic cervicothoracic osteochondrosis in women is accompanied by pain syndrome, muscle weakness and limited mobility of the spine, which negatively affects the quality of life and work capacity. According to the results of the study, the inclusion of BodyArt fitness in the physical therapy program significantly reduced the intensity of pain ($p < 0.01$), increased muscle strength ($p < 0.05$) and improved the mobility of the cervical and thoracic spine ($p < 0.05$). In particular, the NDI disability index decreased by 34.7% compared to the initial level ($p < 0.01$).

Regular performance of BodyArt exercises 3-4 times a week contributed to the normalization of muscle balance, correction of the position of the scapula and an increase in functional activity, which is consistent with modern scientific data.

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Conflicts of Interest

The authors declare no conflict of interest.

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Ефективність фізичної терапії жінок з дегенеративними захворюваннями шийно-грудного відділу хребта на основі методики BodyArt-фітнес

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Реферат. Стаття: 8 с., 5 табл., 25 джерел.

Мета дослідження. Науково обґрунтувати, розробити та оцінити ефективність включення методики BodyArt-фітнесу до реабілітаційного плану пацієнток із шийно-грудним остеохондрозом у фазі періодичної підтримувальної реабілітації.

Матеріал і методи. У дослідженні взяли участь 57 жінок, які були рандомно (метод закритих конвертів) розподілені на контрольну (КГ, n = 27, вік 49,3 ± 1,5 роки) та основну групу (ОГ, n = 30, вік 50,1 ± 1,2 роки). Критерії включення: особи жіночої статі віком від 40 до 60 років із діагнозом остеохондроз шийно-грудного відділу хребта (ОШГВХ), підтверджений інструментальними методами (рентгенографія, КТ або МРТ), який було встановлено не менш ніж за рік до початку дослідження. Критеріями виключення були: гострий біль, тяжка соматична патологія, переломи або пухлини хребців. Усі учасниці надали письмову інформовану згоду на участь у дослідженні. КГ проходила стандартну реабілітацію за лікарняним протоколом (навчання — 30 хв., 4–6 занять; лікувальна гімнастика – 3 рази на тиждень по 1 год.; мануальна терапія — 6–8 сеансів). У програму ОГ замість стандартних вправ була включена методика BodyArt-фітнесу. Тривалість дослідження становила два реабілітаційні цикли (28 днів). Для оцінки ефективності втручання використовувалися клініко-інструментальні методи та шкали (опитувальник болю Мак-Гілла - MPQ (McGill Pain Questionnaire), ММТ м'язів спини та плечового поясу, рухливість шийного та грудного відділів хребта, Індекс обмеження життєдіяльності через біль у шиї (Neck Disability Index, NDI)), статистичні методи.

Результати. У пацієнток основної групи після застосування BodyArt-фітнесу спостерігалося достовірне зниження інтенсивності болю за результатами опитувальника болю Мак-Гілла (MPQ) ($p < 0,01$), покращення м'язової сили ($p < 0,05$) та збільшення амплітуди рухів у шийному та грудному відділах хребта ($p < 0,05$) порівняно з контрольною групою. Зокрема, індекс непрацездатності NDI зменшився на 34,7 % ($p < 0,01$).

Висновки. Включення BodyArt-фітнесу до програми фізичної терапії є ефективним засобом реабілітації пацієнток із шийно-грудним остеохондрозом, сприяючи зменшенню болю, покращенню рухливості хребта та відновленню функціональної активності.

Ключові слова: шийно-грудний остеохондроз, фітнес BodyArt, фізична терапія, мануальне м'язове тестування та гоніометрія, Індекс обмеження життєдіяльності через біль у шиї (Neck Disability Index, NDI)), опитувальник болю Мак-Гілла - MPQ (McGill Pain Questionnaire).

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