EFFECTIVENESS OF THERAPEUTIC MASSAGE FOR PAIN IN THE CERVICOBRACHIAL REGION, MANIFESTED BY PROFESSIONAL BURNOUT AND STRESS

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ABSTRACT

Neck and shoulder pain is among the most common musculoskeletal complaints and is a significant factor in limiting work and social activity. It has been proven that stress causes somatic manifestations and has a direct impact on emotional state, mood, and cognitive functions. Objective: To investigate the relationship between neck and shoulder pain and occupational stress, as well as to evaluate the effectiveness of therapeutic massage in influencing physical and psycho-emotional symptoms. Materials and methods: The study was conducted from 2024 to 2025 at the Day Care Center for Rehabilitation of Children and Adults with Disabilities in Burgas. Forty-seven working individuals with chronic non-specific neck and shoulder pain were included, divided into an experimental and a control group. The experimental group underwent a course of ten therapeutic massage procedures, while the control group was provided with instructions for stress management through walking, breathing exercises, and meditation. To assess the effect, the Visual Analogue Scale (VAS), the V. Boyko Burnout Questionnaire, and the Perceived Stress Scale (PSS-10) were applied. Results: At the end of the study, a statistically significant reduction in pain symptoms was found in the experimental group compared to the control group, as well as a significant improvement in burnout and stress indicators. Discussion: The observed correlation between stress and burnout reduction and improvement in pain symptoms confirms the effectiveness of therapeutic massage on the physical and psycho-emotional aspects of chronic neck and shoulder pain. Conclusion: Therapeutic massage demonstrates a reliable effect on the reduction of neck and shoulder pain and levels of professional stress, which defines it as an effective method for improving the health status of individuals with chronic symptoms.

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INTRODUCTION

Chronic stress and adverse working conditions are key risk factors for the development of burnout syndrome, accompanied by significant somatic and psychological consequences. Physiological manifestations include hypercholesterolemia, type 2 diabetes mellitus, coronary heart disease, hospitalizations for cardiovascular diseases, musculoskeletal pain, impaired nociceptive mechanisms, chronic fatigue, headache, gastrointestinal and respiratory disorders (Salvagioni et al., 2017).

Psychological consequences include insomnia, depressive symptoms, increased consumption of psychotropic and antidepressant medications, hospitalizations for mental disorders, and objective deterioration of mental health (Salvagioni et al., 2017). Accumulating data show that stress has a direct adverse effect on cognitive functions and memory, causing long-term dysfunctions due to impaired activity of the hippocampus - a key structure responsible for learning and memory (Deekshitulu, 2024). Similar results were reported by Day et al. (2012), who highlighted the link between chronic stress and cognitive deficits, leading to difficult decision-making and increased levels of anxiety and depression.

A study among firefighters demonstrated the mediating role of mental states on musculoskeletal symptoms. It was found that the combination of high occupational stress with posttraumatic stress disorder increased the likelihood of somatic manifestations by 37%, while low levels of stress were associated with a 14% reduction in musculoskeletal symptoms (Khoshakhlagh, 2024). Additionally, Bonato et al. (2017) showed that neck and shoulder pain induced by mental stress was accompanied by a moderate increase in heart rate and m. trapezius activity, measured by surface electromyography.

Chronic psycho-emotional stress leads to persistent secretion of catecholamines and cortisol, which hinder the restorative processes of the musculoskeletal system. The mutual reinforcement of workplace stress and burnout syndrome outlines a pathological cycle, the interruption of which requires a targeted therapeutic approach (Guthier, 2020).

This study aims to establish the correlation between pain symptoms in the cervical and shoulder region and levels of professional burnout in individuals with moderate and high levels of stress, as well as to assess the effectiveness of therapeutic massage in optimizing the physical and psycho-emotional state.

METHODOLOGY

The study was conducted from January 2024 to February 2025 at the Day Care Center for Children and Adults with Disabilities in Burgas. A total of 47 participants with chronic non-specific pain in the cervical and shoulder area and the presence of subjectively perceived professional and life stress were included.

The inclusion criteria are: persons in employment; presence of pain in the cervical and shoulder area without established structural pathology, with a proven myofascial nature; subjective feeling of stress and tension; and providing written informed consent to participate. Exclusion criteria: surgical treatment of disc herniations in the cervical region; clinical data for root compression (paresthesias, muscle weakness, reduced reflexes, sensory disorders); diagnosis of spondyloarthritis; persistent pain of high intensity, refractory to drug treatment; presence of mental disorders.

Eligible participants were randomly assigned to an experimental group (EG; n = 22; average age 46.19 ± 12.37 years) and a control group (CG; n = 25; average age 42.12 ± 18.32 years). No statistically significant differences were found between the groups in terms of gender, age, pain intensity, and stress level at the beginning of the study. Participants from the EG underwent a course of 10 therapeutic massage procedures (three times a week for 4 weeks; duration 30 minutes), including classical massage techniques (stroking, rubbing, kneading) and pressure techniques on active points in the cervicothoracic region and upper limbs (Fengchi GB20, Fengfu GV16, Dazhui GV14, Jianjing GB21, Jianliao TE14, Feishu BL13, Quchi LI11, Waiguan TE5, Hegu LI4, Houxi SI3).

The CG received written instructions on non-drug stress management strategies, including: diaphragmatic breathing (5–10 minutes daily); moderate-intensity walking (60–70% of maximum heart rate), three times a week for 30–35 minutes; short *mindfulness meditation sessions* (10–15 minutes daily). Participants kept a diary with parameters for date and time, type and duration of activity, heart rate before and after the intervention, as well as subjective assessment of stress and pain.

To assess effectiveness, the following were used:

- Visual Analogue Scale (VAS);
- Burnout Questionnaire (V. Boyko scale);
- Perceived Stress Scale (PSS–10).

Statistical analysis

The descriptive data are presented as Mean ± SD. The inferential analysis was carried out with the help of a *t*-test on the results from the change (Post-Pre), which is equivalent to ANCOVA in this design with two groups, to determine whether the treatment effect differed significantly between groups. All analyses were performed using Microsoft Excel, with a statistical significance level of $p < .01$ a priori.

RESULTS

The analysis of received data, focused on the difference in change (Post-Pre) between groups, confirms that the applied massage therapy (MT) has a substantially and statistically significant bigger impact on all tracked indicators in the Experimental group (EG) compared to the Control group (CG). This finding is statistically significant for all variables ($p < .01$ or $p < .001$). As described in Table 1, in the EG, a statistically significant reduction was found in all indicators related to professional burnout. EG demonstrates improvement in all three phases on the test for burnout – tension, resistance, and exhaustion – which shows an effective impact on both somatic as well as psycho-emotional manifestations. Crucially, statistical comparison of the results from the change between the groups confirmed that this improvement is significantly better in EG for all indicators.

The analysis of the obtained data shows that the applied massage therapy (MT) has a significant impact on the monitored indicators. The therapeutic course resulted in a clear improvement in the condition of participants from the experimental group (EG), with the most significant changes observed in terms of pain symptoms and stress levels. The improvement is clearly expressed and reaches statistical significance ($p < .001$).

At the end of the therapeutic period, a statistically significant reduction was found in all indicators related to professional burnout. Participants in the EG reported improvement in all three phases of the burnout test – tension, resistance, and exhaustion – which indicates an effective impact on both the somatic and psycho-emotional manifestations of the condition.

Table 1. *Comparative analysis of mean scores (Mean±SD) for the Experimental Group (EG) and Control Group (CG) pre- and post-intervention.*

Measure	EG: Pre *Mean ± SD*	EG: Post *Mean ± SD*	*p* (EG Within-Group)	CG: Pre *Mean ± SD*	CG: Post *Mean ± SD*	*p* (CG Within-Group)	*p* (Between-Group Change)
VAS	5.64 ± 3.10	0.55 ± 4.20	$p < .001$	4.33 ± 2.40	4.56 ± 3.60	$p = .650$	$p < .001$
PSS-10	21.80 ± 2.60	11.73 ± 3.70	$p < .001$	20.11 ± 6.40	20.00 ± 5.20	$p = .980$	$p < .001$
Burnout (tension)	39.36 ± 4.30	13.57 ± 5.40	$p < .001$	40.39 ± 3.90	58.83 ± 3.70	$p < .001$	$p < .001$
Burnout (resistance)	55.00 ± 6.70	29.33 ± 3.30	$p < .001$	48.61 ± 7.20	35.67 ± 6.50	$p < .010$	$p < .010$
Burnout (exhaustion)	46.55 ± 2.40	24.77 ± 1.60	$p < .001$	61.50 ± 3.70	43.17 ± 3.90	$p < .010$	$p < .010$

Note: Within-Group p is derived from a Paired Samples t-test (Post vs. Pre). Between-Group Change p is derived from a t-test on change scores (ANCOVA), comparing the magnitude of change (Post – Pre) between the EG and CG.

The results are consistent with previous studies. For example, in a randomized crossover study conducted by Matzer et al. (2018), 81 healthy adult participants underwent four types of short-term stress reduction interventions: physical activity, physical activity combined with rest, walking and balneotherapy, rest and balneotherapy, and rest alone.

Participants with high levels of stress ($n = 25$) reported reduced fatigue and increased cheerfulness after balneotherapy, while the combination of walking and rest resulted in increased fatigue ($F = 3.20$; $p = .044$). The authors concluded that physical activity and relaxation, as well as rest or balneotherapy, have advantages for short-term stress reduction, both reducing systolic blood pressure and promoting relaxation.

In the control group of the present study, which was only applied a program of breathing exercises, walking, and meditation, no significant changes were found in any of the monitored indicators. This confirms the assumption that the reported positive effects in EG are due precisely to massage therapy, and not to the time spent in usual activities or light physical activity. The present study demonstrates that massage therapy is an effective and scientifically based method for reducing pain, stress levels, and manifestations of professional burnout, especially in individuals with chronic psychophysical tension.

DISCUSSION

The application of ten consecutive massage procedures led to a significant reduction in subjectively reported stress and pain in the cervical and shoulder area. This effect can be explained by the complex impact of massage on neuromuscular relaxation, hormonal regulation, and the activation of endogenous analgesic mechanisms.

Similar observations were reported by Adams et al. (2010), who found out that massage therapy significantly reduced pain and improved emotional well-being, sleep quality, and overall psychophysical well-being. Arsovski (2024) showed that regular therapeutic massage led to lasting relief of pain symptoms, while skipping treatments caused a re-escalation of pain. These data emphasize the importance of consistency and regularity in massage therapy.

The positive effects of massage can be explained by the reduction of muscle spasm and hypertonicity, which leads to reduced compression on nerve endings and blood vessels. Activation of the parasympathetic nervous system leads to a decrease in corticotropin hormone and cortisol, which contributes to the reduction of the physiological stress response and the improvement of the psycho-emotional status (Field et al., 2005).

In the context of occupational burnout, where sympathetic tone dominates, massage provides a physiological and emotional "detachment" from chronic stress. Our results are consistent with data from studies in nurses that show a significant reduction in occupational stress after the implementation of a therapeutic intervention (Nazari, 2015).

Additional research suggests that massage is superior to placebo, relaxation, or no treatment in managing neck and back pain (Miake-Lye, 2019). The positive impact is due to both the physical effect on muscles and fascia, as well as the psycho-emotional component, including an increase in serotonin and dopamine levels, which improves mood and raises the individual's pain threshold.

Physical contact in the therapeutic context activates systems related to trust and social safety (oxytocin), which counteract the emotional isolation and alienation often observed in burnout. The control group, which practiced only walking and breathing exercises, did not demonstrate significant changes, confirming the specific effect of massage therapy.

Mechanical pressure during massage on active points reduces muscle tone, improves local oxygenation, stimulates lymphatic drainage, and reduces inflammation, while walking and meditation have a more moderate effect on the hypothalamic-pituitary axis and cortisol (Anan, 2021; Tunwattanapong, 2016; Machino, 2021). These data indicate that massage is a scientifically based and effective method for managing pain, stress, and professional burnout.

An interesting prospect for future research is the combined intervention, which combines massage, physical activity, and psychological counseling, for optimal management of pain and stress in occupational burnout.

CONCLUSION

The results of the present study demonstrate that pain symptoms in the cervical and shoulder areas, accompanied by professional burnout and increased stress levels, are reduced both quantitatively and statistically significantly after a course of therapeutic massage. The reported correlation between the improvement of pain and stress indicators confirms the objectivity and consistency of the changes that occurred under the influence of the therapy. Despite the significant results achieved, future studies with a larger number of participants are necessary for additional verification and increasing the reliability of the findings.

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