Summary

Title: The influence of selected Schroth therapy exercises on the quality of life and physical fitness of postmenopausal women with osteoporosis.

Introduction: Among the numerous methods of physiotherapy, breathing exercises are one of the basic forms. They are used in people with diseases of internal organs, musculoskeletal system or neurological problems. An example of breathing exercises can be Schroth breathing therapy, which was originally used in patients with scoliosis. The main purpose of its use is to improve respiratory efficiency, which is impaired as a result of the disease. A review of the literature indicates that Schroth respiratory therapy has not been used so far in other diseases, such as osteoporosis. For this reason, an attempt was made to assess the effectiveness of this method among patients with osteoporosis.

Aim: The aim of the study was to assess the impact of elements of Schroth therapy on the quality of life and physical fitness of postmenopausal women with osteoporosis.

Material and methods: The study was an experiment involving 55 postmenopausal women – 40 women covered by the physiotherapy program using Schroth therapy exercises (study group) and 15 women not doing any exercises (control group). Measurements were carried out in both groups twice. The first study in the study group took place before the start of rehabilitation with Schroth therapy and the second time, after the end of the 5-week treatment process. In the comparison group, the measurements were carried out on similar dates. The tests included: assessment of the quality of life using the SF-36 quality of life questionnaire, assessment of physical activity using the International Physical Activity Questionnaire IPAQ, measurement of the range of motion of the spine in three planes of motion, measurement of chest mobility expressed by inspiratory and expiratory peripheral measurements, measurement of spirometric indicators (FVC – forced vital capacity, FEV1 – first second forced expiratory volume, PEF – peak expiratory flow, SpO2 – saturation, heart rate) and assessment of back pain using the VAS scale. Parametric tests (Student's t-test for dependent and independent variables) and one-way analysis of variance with Tukey's post hoc tests were used for data analysis, assuming the significance level $\alpha=0.05$.

Results: The results of the study indicate a significant improvement ($p<0.001$) in the quality of life after using Schroth therapy exercises. The patients from the study group unequivocally stated that after the exercises, their quality of life significantly increased in each of the analyzed domains (physical and mental). No such changes were noted in the

control group. The total sum of IPAQ scores was significantly higher in the study group (1390.33 MET hours/week) than in the comparison group (985.36 MET hours/week) ($p < 0.001$). The range of motion of the spine in the sagittal and frontal planes changed significantly. However, the range of rotation of the spine did not change. The total range of motion of the spine in the sagittal plane also improved, which was also confirmed by the finger-to-floor test. The applied exercises significantly improved ($p<0.001$) also the mobility of the chest measured in three places with maximal inspiration. Maximum exhalation values also increased, but the differences were not statistically significant. As a result of the improvement in the mobility of the chest, the values of spirometric indices also improved significantly. After the therapy performed in the study group, the value of FVC, FEV1, PEF and saturation (SpO2) increased. The heart rate decreased slightly, but the difference was not statistically significant. There were no significant changes in the comparison group. The Schroth therapy performed also contributed to a significant reduction ($p<0.001$) of the patients' pain,. In the control group, the level of pain did not change ($p=0.164$). One-way analysis of variance showed, both before and after therapy, in both groups statistically significant differences ($p<0.001$) between the values of respiratory indices, regardless of the BMI level.

Conclusions: The applied Schroth therapy had a positive impact on the patients' quality of life, improved physical fitness and reduced back pain in postmenopausal women with osteoporosis. The use of Schroth therapy exercises improved the range of motion of the spine in the sagittal and frontal planes and the range of motion of the chest.

Key words: Schroth Therapy, osteoporosis, quality of life, physical activity, spirometry, physiotherapy.