Khatu Pranam – Yoga Exercise Sequence Effective in Prevention of Back Pain in Nurses

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Our hypothesis suggests that in the majority of nurses the back pain subsides and the functional status of the spine improves after completing a three-dimensional program

Graph 1

In the FNsP Hospital in Banská Bystrica suffer 63,33 % of nurses from average back pain, an average intensity of pain in nurses is 3,24 , SD ±1,6772 and 19,32% use analgesics (Graph 1).

Characteristics of Group of Patients and Methodology

Clinical research objectifies the effectiveness of compensatory exercises and the back school with principles of proper handling the less mobile patients with nurses working at seventeen inpatient wards. 60 female nurses were included in the clinical study. Their mean age in the **control group** (n=30) was **46 years** (min. 28 years, max. 57 years) and in the **exercise group** (n=30) was **45 years** (min. 23 years, max. 59 years).

In our prospective study we have chosen the three-dimensional intervention

1. **Back school**
2. **Handling less mobile patients**
3. **Compensatory exercise program**

The exercise group was instructed into the back school, the principles of proper handling the less mobile patients and compensatory training exercises which they practiced for three months. The recommended frequency of workout was 3 times per week including once per week 30 minutes under the guidance of a physiotherapist and twice per week at home individually. The entire home workout program took 20 minutes.

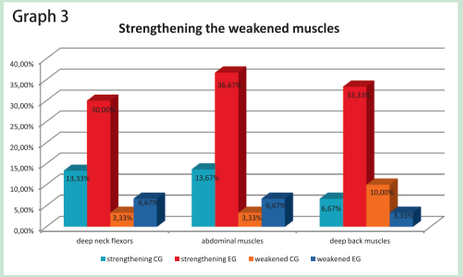
The control group was instructed into the back school and the principles of proper handling the less mobile patients.

Transfer of the patient from a lying position to a sitting position

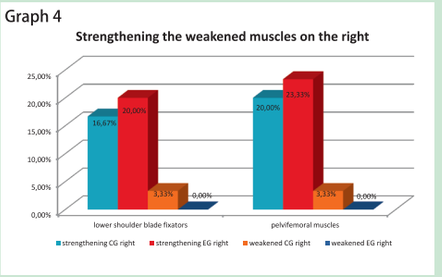
Load lifting

In typically **weakened muscles** the deep neck flexors, lower shoulder blade fixators, deep back muscles and pelvifemoral muscles were statistically significantly strengthened; abdominal muscles were not strengthened (Graphs 3, 4, 5).

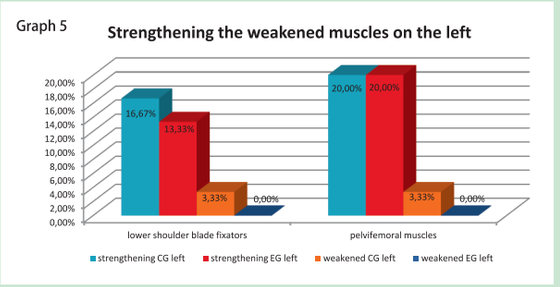
Graph 3



Graph 4



Graph 5



Recommendations for Practice

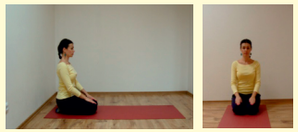
1. Our proposed three-dimensional compensatory program for nurses working at the patient´s bedside comprises of the back school, training of handling the less mobile patients and compensatory exercises. The workout program consists of relaxation, practicing proper breathing and the sequence of exercises Khatu Pranam from the System Yoga in Daily Life®. This compensatory program has proven to be effective, but it should be complemented by yoga exercises improving lateroflexion, shortened muscles m. levator scapulae, m. scalenus, m. quadratus lumborum and weakened abdominal muscles.
2. A 20-minute program with a frequency of practicing 3 times a week seems to be sufficient to actively prevent back pain in nurses.
3. Using the back school and the principles of proper handling the less mobile patients should become a daily routine of each nurse.
4. An isolated training of manual handling of patients is not a sufficient prevention of back pain in nurses.

Compensatory exercise program :

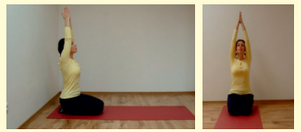
1. **Short relaxation**
2. **Practicing yoga breathing**
3. **Sequence of exercises Khatu Pranam from the System Yoga in Daily Life®**

Sequence of exercises Khatu Pranam

The exercise sequence Khatu Pranam comprises 10 positions that systematically influence the whole spine and through the closed and open kinetic chains they activate muscle interactivity with shoulder and pelvic girdle. The sequence strengthens and stretches typical weakened and shortened muscle groups. The sequence warms-up and mobilizes the movement of spine and joints. Some positions, such as the seventh and tenth, influence the balance ability. The sequence can be practiced dynamically or statically with holding time. We used a dynamic form with precise inhalation and exhalation at specified positions and by repeating several rounds in this way we can have an aerobic training effect.



Basic position



First position

Second position

Third position

Fourth position

Fifth position

Sixth position

Seventh position

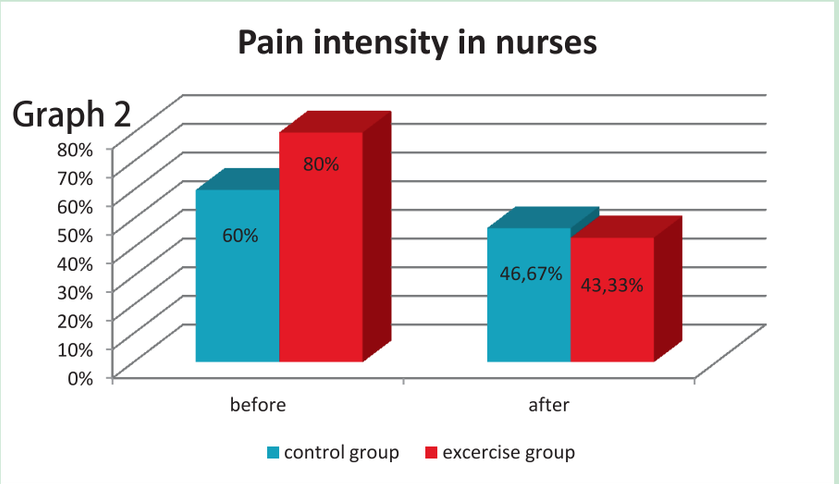
Ninth position

Tenth position

Results

In the exercise group (n=30) **back pain decreased by 36.67 %** with statistical significance of p=0,003. In the control group (n=30) back pain decreased by 13,33 % without significance p=0,301

(Graph 2).



By means of **Sharpened Romberg Test** we evaluated the balance abilities. In the exercise group we observed a prolonged holding time in a tandem position by an average of 21 seconds with the statistical significance p=0,007.

As for assessing the **breathing stereotype**, breathing modified to physiological in ten out of totally 20 participants with statistical significance p=0,009.

In the exercise group the mobility in the **thoracic spine according to Otto´s inclination index** improved by 1,45 cm and **reclination index** by 1,40 cm with statistical significance p<0,05. In the **lumbar spine**, the input and output mean values in both groups ranged within physiological limits, so the variances were insignificant.

Thomayer´s test, however, statistically significantly improved p<0,05 only in the exercise group by 10,4 cm.

As for the **cervical spine**, there was significant improvement of p<0,05 **in all movement directions except for rotation to the right**. The exercise group showed improvement in the cervical spine **anteflexion** by 0,883 cm while the same worsened in the control group. **Retroflexion** in the exercise group improved by 1,05 cm and worsened in the control group. **Inclination** improved in the exercise group by an average of 1,183 on the right and 1,3 on the left, while in the control group inclination worsened on the right and improved on the left by 0,486 cm.

Lumbar spine lateroflexions have not changed significantly bilaterally as a consequence of absence of sideways bending positions in the sequence.

When assessing the effect of the exercise on typically **shortened muscles** there was a statistically significant modification of m. pectoralis minor, m. sternoceidomastoideus, m. trapesius, short head extensors, paravertebral muscles and m. iliopsoas and no change occurred to m. levator scapulae, m. scalenus and m. quadratus lumborum .