

# The Effect of Rebuilding Osteo Neatly Exercise Program on Quantitative Ultrasound Parameters and Walking Function for Elderly People Requiring Nursing Care

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## 1. Purpose of this study

This study investigated the effects of a specifically designed exercise program, the “Rebuilding Osteo Neatly Exercise (BONE) program,” which focused on strengthening bone strength and improving walking function on quantitative ultrasound (QUS) parameters, plantar pressure distribution, and walking speed.

## 2. Methodology

- 1) Participants: 27 elderly people requiring nursing care were divided randomly into experimental and control groups.
- 2) BONE program: This program comprised 12 steps, each performed for 30s four times for each foot.
- 3) Measurements: QUS parameters, plantar pressure distribution, and walking speed. Plantar pressure was measured at the medial forefoot (MF), the lateral forefoot (LF), and the rear foot (RF).
- 4) Statistical analysis: All measurements were statically analyzed by a paired two-way factorial analysis of variance using IBM SPSS 25. The significance level was defined as 5%.

## 3. Results and Discussion

### 1) QUS parameters (SOS and BAR)

While QUS parameters were significantly increased in the experimental group ( $p < .001$ ) after the program. Furthermore, QUS parameters in the experimental group were significantly higher than in the control group ( $p < .05$ ).

### 2) Plantar pressure distribution

Only the area deviation on the RF in the experimental group was significantly lower than in the control group after 4 months ( $p < .05$ ).

### 3) Walking speed

It was significantly improved in the experimental group ( $p < .001$ ) after the program. Furthermore, walking speed in the experimental was significantly faster than that in the control group after 4 months ( $p < .05$ ).

It is likely that the improvements of both QUS parameters and plantar pressure distribution resulted from the improvement of bone strength and the foot function. This suggested that the BONE program was able to improve the locomotive organs. Furthermore, this improvement led to improving walking speed which is the locomotive function. This suggested that the BONE program was helpful to fundamentally improve locomotive syndrome.

## 4. Conclusion

The BONE program improved in all points. These results clearly showed that the BONE program was useful to improve both locomotive organ and locomotive function for elderly people requiring nursing care.

## 5. Main References

- 1) Shirou Kondo. (1995) Japanese feet getting weak. Soushisha Ltd.
- 2) Tatsuo Suda. (2016) Bone Biology 2<sup>nd</sup>. ISHIYAKU PUBLISHERS INC.