

# Physical capacity, quality of life and body composition of postmenopausal osteoporotic women

**Novo, André<sup>1,3,4</sup>; Mendes, Eugénia<sup>1,4</sup>; Preto, Leonel<sup>1,3</sup>; Azevedo, Ana<sup>1</sup>; Vaz, Josiana<sup>1,5</sup>; Correia, João<sup>1</sup>**

1 – School of Health, Polytechnic Institute of Bragança (Portugal); 2 – Research Center in Sports, Health Sciences and Human Development;  
3 – Center for Aging Research and Intervention; 4 – Institute of Health Sciences – Catholic University of Portugal;  
5 – Institute of Molecular Pathology and Immunology of the University of Porto

Keywords: OPAQ, IPAQ, functional capacity, body composition, muscular strenght || andre@ipb.pt

## Objective

Osteoporosis is a systemic skeletal disease that has great influence on functional independence and quality of life, leading to reduced bone mass, microarchitectural deterioration, increased bone fragility, bone fractures with minimal trauma, decreased bone mineral density and decreased bone quality. This quality is defined by the bone health and is closely related to physical activity, body composition, genetic, hormonal factors and nutrition. Under normal conditions, bone mineral density evolves, increasing up to the 27 years, leveling up to the 40 years. Then, begins to decrease producing a sharp decline in the menopausal stage and after keeps a sharp downward trend. We aim to evaluate the physical condition of postmenopausal osteoporotic women, assessing their functional status, different manifestations of strength and body composition.

## Material/Methods

After approval by the Ethics Committee of the North Health Region, we identified women diagnosed with osteoporosis by dual-energy bone densitometry (DEXA), which fulfilled inclusion criteria and wanted to participate in the study of their own free will. After assessment of blood pressure and heart rate the following data were collected:

- Demographic variables
- Quality of life evaluated with the Osteoporosis Assessment questionnaire (OPAQ) – numeric scale from 1 to 5, in which 1 represents better quality of life and 5 represents poor quality of life
- Tinetti Falls Efficacy Scale (Melo, 2011)
- Physical activity: short version of IPAQ (International Physical Activity Questionnaire).
- Functional capacity: timed up and go test (Fig. 1); 30 sec sit to stand (Fig. 2); unipodal balance eyes shut (Fig. 3);
- Height: stadiometer Seca®;
- Handgrip strength of both hands: Jamar® hand dynamometer (Fig. 4)
- Key pinch strength of both hands with digital dynamometer Baseline® (Fig. 5)
- Body composition: bioelectric impedance on Tanita Ironman Body Composition Monitor® (Fig. 6).

## Results

The 18 women studied have an average age of  $66,8 \pm 6,4$  years,  $148,2 \pm 5,3$  cm of height and  $57,4 \pm 6,2$  Kg of weight which represents a BMI of  $26,2 \pm 3,3$ .

They achieved in the OPAQ,  $3,1 \pm 0,7$  points and in the FES  $79,3 \pm 21,1$  points. In the IPAQ classification 14 women were in low level of physical activity and 4 in moderated physical activity.

The average result of the timed up and go test was  $9,4 \pm 2,7$  seconds, in the 30 sec sit to stand was  $10,1 \pm 2,9$  repetitions and in the unipodal balance test was  $4,1 \pm 6,9$  seconds.

When evaluating strength, we found  $16,8 \pm 6,4$  Kg/f for right handgrip strength and  $16,2 \pm 5,8$  Kg/f for left handgrip strength. When evaluating key pinch strength we found  $6,6 \pm 5,0$  Kg/f and  $6,3 \pm 5,2$  Kg/f for the right and left hand, respectively

Analyzing the body composition average values, we found  $33,6 \pm 6,0\%$  for total body fat,  $47,5 \pm 4,3\%$  for body water,  $2,0 \pm 0,2$  Kg for bone mass and  $36,2 \pm 3,2$  Kg for muscular mass.

Once established correlations between different variables, we can highlight some of the most important:

- Weight correlates with total body fat ( $0,561^*$ ) and with body water ( $-0,470^*$ );
- BMI correlates with average OPAQ ( $0,529^*$ ), total body fat ( $0,732^{**}$ ) and body water ( $-0,709^{**}$ );
- Timed up and go test correlates with age ( $0,633^{**}$ ), sit to stand ( $-0,583^*$ ), handgrip right and left ( $-0,581^*$ ;  $-0,504^*$ )

## Conclusion

The participants in this study show similar values when compared with the population with similar characteristics.

The BMI value means that the participants are averagely overweight.

Most of the women of the study have reduced physical activity levels and none of them have high physical activity levels.

We also can conclude that weight as an important role on body composition and the timed up and go test is an easy and cheap test that gives us much information about the physical functioning of these osteoporotic postmenopausal women.

## References

- Andreoli A, Bazzocchi A, Celi M, Lauro D, Sorge R, Tarantino U, et al. Relationship between body composition, body mass index and bone mineral density in a large population of normal, osteopenic and osteoporotic women. *Radiol Med.* 2011.
- Kärkkäinen M, Rikkinen T, Kröger H, Sirola J, Tuppurainen M, Salovaara K, et al. Association between functional capacity tests and fractures: an eight-year prospective population-based cohort study. *Osteoporos Int.* 2008;19(8):1203-10.
- Lips P, van Schoor NM. Quality of life in patients with osteoporosis. *Osteoporos Int.* 2005;16(5):447-55.
- Melo CA. Adaptação cultural e validação da escala "Falls Efficacy Scale" de Tinetti. *Ifisionline.* 2011;1.
- Sinaki M, Pfeifer M, Preisinger E, Itoi E, Rizzoli R, Boonen S, et al. The role of exercise in the treatment of osteoporosis. *Curr Osteoporos Rep.* 2010;8(3):138-44.



Fig. 1



Fig. 2

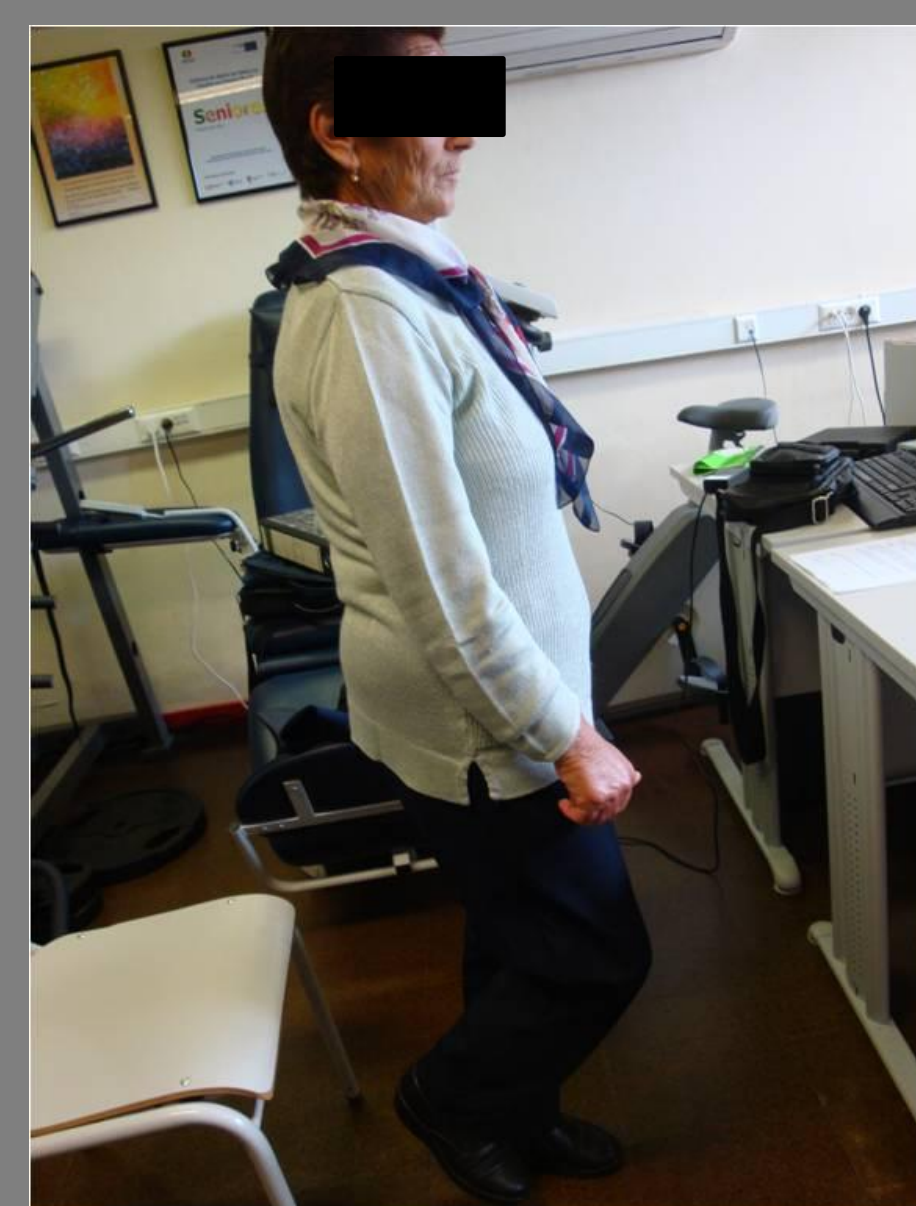


Fig. 3



Fig. 4



Fig. 5



Fig. 6