

# Knowledge on Osteoporosis among Nurses

Chan-Ho Park<sup>1</sup>, Young-Kyun Lee<sup>2</sup>, Kyung-Hoi Koo<sup>2</sup>

<sup>1</sup>Department of Orthopedic Surgery, Yeungnam University Medical Center, Daegu;

<sup>2</sup>Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Seongnam, Korea

## Corresponding author

Young-Kyun Lee

Department of Orthopedic Surgery, Seoul

National University Bundang Hospital,

82 Gumi-ro 173-beon-gil, Bundang-gu,

Seongnam 13620, Korea

Tel: +82-31-787-7204

Fax: +82-31-787-4056

E-mail: ykleemd@gmail.com

Received: April 17, 2017

Revised: May 1, 2017

Accepted: May 8, 2017

No potential conflict of interest relevant to this article was reported.

Copyright © 2017 The Korean Society for Bone and Mineral Research

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Background:** It is crystal clear how important healthcare providers are well-aware of reasonable knowledge on osteoporosis, because they are at the forefront of such management. However, no study has been yet assessed in the knowledge on osteoporosis among healthcare providers particularly in nurse. Therefore, we evaluated the knowledge on osteoporosis of nurses. **Methods:** In April 2017, 67 nurses were evaluated using a modified Facts on Osteoporosis Quiz (FOOQ). **Results:** Although nurses grasped some points of osteoporosis, their knowledge was insufficient concerning effects of weight, physical exercise and calcium intake during adolescence. **Conclusions:** The level of knowledge on osteoporosis was evaluated in nurses, and the effect of weight, physical exercise, and calcium intake during adolescence should be focused in an educational program on osteoporosis for nurses.

**Key Words:** Knowledge, Nurses, Osteoporosis

## INTRODUCTION

Osteoporosis is well-known as a common illness and easily found in elderly population,[1] and osteoporotic fractures are tagged with decreased activity, reduced quality of life and excess mortality.[2-4] Osteoporosis could be treated by several interventions, and osteoporotic fractures could be prevented with osteoporosis treatment.[5-7] Several international guidelines have recommended osteoporosis treatment for elderly patients.[8-10] However, the gaps between the treatment guideline and real treatment situation need to be considered, and low compliance is additionally problematic especially in asymptomatic, chronic conditions like osteoporosis.[11-14]

Among the several factors, well-knowingly associated with low compliance, lack of awareness on osteoporosis has been issued to overcome the gap between guideline and real practice.[13-15] Knowledge and awareness of the health care provider could improve the level of awareness in patients with osteoporosis.[15]

Nurses can be considered as forefront healthcare providers who have widely open chances to communicate with osteoporotic patients. Nurses have a pivotal role to initiate as well as impart primary and secondary osteoporosis prevention education to patients and general populations. Thus, educating them with better knowledge as a healthcare provider might be fundamental element. However, little information is available concerning the knowledge of the nursing profession-

als for osteoporosis.

Recently, Facts on Osteoporosis Quiz (FOOQ) questionnaire is presented to assess knowledge of osteoporosis and it has been used in several studies due to its proven validity and reliability.[16-18]

The purpose of this study is to evaluate the nurses' knowledge on osteoporosis using FOOQ questionnaire. Our study will provide an evidence to educate healthcare provider about the knowledge of osteoporosis.

## METHODS

In April 2017, we conducted a descriptive self-reported questionnaire survey of nurses who participated in a musculoskeletal Symposium that was held for nurses at Seongnam in South Korea.

To evaluate the knowledge of osteoporosis, all 165 registrants at the symposium were asked to answer a self-administered questionnaire, modified FOOQ before symposium.

FOOQ was based on the osteoporosis consensus conference of the National Institutes of Health (NIH) in 2000 [19] and consisted of 20 true and false questions. It has been reported to have a satisfactory validity and reliability.[19]

And it has been used to assess knowledge of osteoporosis in previous studies.[16-18] We modified 2 (item 10 and 15) among the 20 items, according to recent epidemiologic studies from Korean and recommendation by Korean Society for Bone and Mineral Research.[1,20] In modified item 10, the residual lifetime risk of osteoporotic fractures was about 60% in Korean women older than 50 years.[1] In modified item 15, the recommendation of daily calcium intake was 1,200 mg/day for the Korean population.[1,21]

They were assured of confidentiality and anonymity. To ensure this, the participants were not asked to provide any identifying information except the type of institution they worked in.

Demographic characteristics and scores on the FOOQ were summarized using descriptive summary measures. The design and protocol of this study were waived by the Institutional Review Board.

## RESULTS

A total 67 of the 165 nurses completed the questionnaires (Table 1). A response rate was 40.6%.

Among 67, 88.6% was worked in the tertiary referral hos-

**Table 1.** Proportions (%) of correct responses to the modified the facts on osteoporosis quiz

Questions	Correct answer	N (%) (n=67)
1. Physical activity increases the risk of osteoporosis.	False	58 (86.6)
2. High-impact exercise improves bone health.	True	54 (80.6)
3. Most people gain bone mass after 30 years of ago.	False	59 (88.1)
4. Lower weight women have osteoporosis more than heavy women.	True	32 (47.8)
5. Alcoholism is not linked to the occurrence of osteoporosis.	False	62 (92.5)
6. The most important time to build bone strength is between 9 and 17 years of age.	True	62 (92.5)
7. Normally, bone loss speeds up after menopause.	True	65 (97.0)
8. High caffeine combined with low calcium intake increases the risk of osteoporosis.	True	65 (97.0)
9. There are many ways to prevent osteoporosis.	True	63 (94.0)
10. 60% of women older than 50 years will have a fracture due to osteoporosis in their lifetime.	True	52 (77.6)
11. There are treatments for osteoporosis after it develops.	True	51 (76.1)
12. A lifetime of low intake of calcium and vitamin D does not increase the risk of osteoporosis.	False	67 (100.0)
13. Smoking does not increase the risk of osteoporosis.	False	63 (94.0)
14. Walking has a great effect on bone health.	False	1 (1.5)
15. After menopause, women need about 1,200 mg of calcium daily.	True	41 (61.2)
16. Osteoporosis affects men and women.	True	67 (100.0)
17. Early menopause is not a risk factor for osteoporosis.	False	59 (88.1)
18. Replacing hormones after menopause cannot slow down bone loss.	False	43 (64.2)
19. Children 9 to 17 years of age get enough calcium from one glass of milk each day to prevent osteoporosis.	False	22 (32.8)
20. Family history of osteoporosis is not a risk factor for osteoporosis.	False	49 (73.1)
Mean total score (mean ± standard deviation)		12.7 ± 1.7

pital. The mean age of respondents was 33.0 years (range, 24–58).

The majority of participants knew that there are many ways to prevent osteoporosis, osteoporosis affects both men and women, low intake of calcium and vitamin D increase the risk of osteoporosis, and high caffeine combined with low calcium intake increases the risk of osteoporosis. Ninety-seven percent of respondents were aware that bone loss speeds up after menopause and 94.0% knew that smoking increases the risk of osteoporosis.

The true statement that “lower weight women have osteoporosis more than heavy women” (item 4) was correctly identified by just 32 (47.8%) respondent.

The false statement that “walking has a great impact on bone health” (item 14) was correctly identified by only one (1.5%) respondent, with 95.5% (n=64) incorrectly identifying the statement as true. However, 80.6% (n=54) of participants knew that “high impact (weight training) exercise improves bone health” (item 2).

The false statement that “children 9 to 17 years of age get enough calcium from one glass of milk each day to prevent osteoporosis” (item 19) was correctly identified by just 22 (32.8%) respondent.

No respondent scored 100% on the quiz. The scores ranged from 8 to 16 out of a total score of 20. The mean score was  $12.7 \pm 1.7$ , as shown in Table 1.

## DISCUSSION

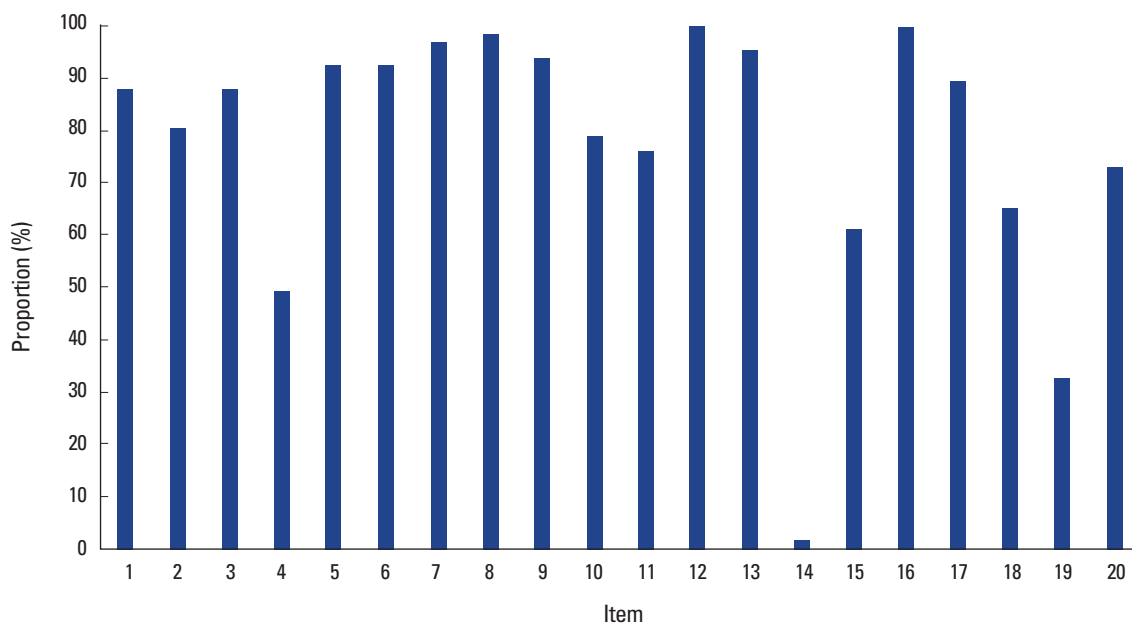
Our result presented the level of knowledge on osteoporosis in nurses.

Although many participants answered correctly in question about the osteoporosis, the most responders did not correctly answer in the three items as previously specified (items 4, 14 and 19), which were statements about the effect of weight, physical exercise, and calcium intake during adolescence on osteoporosis (Fig. 1).

Original FOOQ including 25 items was developed to evaluate the knowledge of osteoporosis in patients or general population. On the other hand, the modified FOOQ consisted of 20 true and false questions, based on the 2000 NIH osteoporosis consensus conference.[19]

Previous studies using FOOQ reported that most physicians, another healthcare provider rather than nurses, did not answer correctly in item 14 (“walking has a great impact on bone health”).[20]

By the 2000 NIH osteoporosis consensus conference, among exercise, only resistance and high-impact activities have been indicated to contribute to establishment of high peak bone mass.[19] Just walking is not enough to improve a bone health, and it was revealed to be promoted at an educational program for healthcare provider. Healthcare provider might pretend to underestimate the efficacy of exer-



**Fig. 1.** The proportion of correct answer in each item among nurses.

cise for osteoporosis in their practice, and try to administer just medication.

The exercise field for osteoporosis was revealed to be promoted at an educational program for healthcare provider.[18]

In terms of weight effect on osteoporosis, the study conducted in Singapore presented that 46.4% of Singapore nurses answered correctly in item 4. Although we cannot directly compare the mean score, because of different survey protocol and participants, their mean score ( $14.6 \pm 2.6$ ) was higher than that ( $12.7 \pm 1.7$ ) of our respondents.[16]

Our study has some limitations. First, we applied FOOQ for the general population to nurses. However, there was no validated questionnaire for clinicians, and modified FOOQ seems to be sufficient because we could find items with inadequate understanding by nurses. Second, there might be selection bias of participants, because almost worded in tertiary referral hospital. It may fail to represent all nurses at each level of medical institution.

In conclusion, our study showed the level of knowledge on osteoporosis in nurses, and that the effect of physical exercise should be focused in an educational program on osteoporosis for healthcare provider.

## REFERENCES

1. Park C, Ha YC, Jang S, et al. The incidence and residual lifetime risk of osteoporosis-related fractures in Korea. *J Bone Miner Metab* 2011;29:744-51.
2. Salaffi F, Cimmino MA, Malavolta N, et al. The burden of prevalent fractures on health-related quality of life in postmenopausal women with osteoporosis: the IMOF study. *J Rheumatol* 2007;34:1551-60.
3. Yoon HK, Park C, Jang S, et al. Incidence and mortality following hip fracture in Korea. *J Korean Med Sci* 2011;26:1087-92.
4. Lee YK, Jang S, Jang S, et al. Mortality after vertebral fracture in Korea: analysis of the National Claim Registry. *Osteoporos Int* 2012;23:1859-65.
5. Cranney A, Wells G, Willan A, et al. Meta-analyses of therapies for postmenopausal osteoporosis. II. Meta-analysis of alendronate for the treatment of postmenopausal women. *Endocr Rev* 2002;23:508-16.
6. Eastell R. Treatment of postmenopausal osteoporosis. *N Engl J Med* 1998;338:736-46.
7. McClung MR. Therapy for fracture prevention. *JAMA* 1999;282:687-9.
8. Watts NB, Bilezikian JP, Camacho PM, et al. American Association of Clinical Endocrinologists Medical Guidelines for Clinical Practice for the diagnosis and treatment of postmenopausal osteoporosis. *Endocr Pract* 2010;16 Suppl 3:1-37.
9. Qaseem A, Snow V, Shekelle P, et al. Pharmacologic treatment of low bone density or osteoporosis to prevent fractures: a clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2008;149:404-15.
10. Dawson-Hughes B. A revised clinician's guide to the prevention and treatment of osteoporosis. *J Clin Endocrinol Metab* 2008;93:2463-5.
11. Seeman E, Compston J, Adachi J, et al. Non-compliance: the Achilles' heel of anti-fracture efficacy. *Osteoporos Int* 2007;18:711-9.
12. Compston JE, Seeman E. Compliance with osteoporosis therapy is the weakest link. *Lancet* 2006;368:973-4.
13. Gong HS, Oh WS, Chung MS, et al. Patients with wrist fractures are less likely to be evaluated and managed for osteoporosis. *J Bone Joint Surg Am* 2009;91:2376-80.
14. Choi HJ, Shin CS, Ha YC, et al. Burden of osteoporosis in adults in Korea: a national health insurance database study. *J Bone Miner Metab* 2012;30:54-8.
15. Kim SR, Ha YC, Park YG, et al. Orthopedic surgeon's awareness can improve osteoporosis treatment following hip fracture: a prospective cohort study. *J Korean Med Sci* 2011;26:1501-7.
16. Zhang RF, Chandran M. Knowledge of osteoporosis and its related risk factors among nursing professionals. *Singapore Med J* 2011;52:158-62.
17. Wilson RK, Tomlinson G, Stas V, et al. Male and non-English-speaking patients with fracture have poorer knowledge of osteoporosis. *J Bone Joint Surg Am* 2011;93:766-74.
18. Baek JH, Lee YK, Hong SW, et al. Knowledge on osteoporosis in guardians of hip fracture patients. *J Bone Miner Metab* 2013;31:481-4.
19. Ailinger RL, Lasus H, Braun MA. Revision of the facts on osteoporosis quiz. *Nurs Res* 2003;52:198-201.
20. Yoon BH, Baek JH, Lee YK, et al. Knowledge on osteoporosis of prescriber according to level of medical institute. *Yonsei Med J* 2014;55:1058-62.
21. Korea Women's Health and Osteoporosis Foundation, Ko-

rean Society of Osteoporosis, Korean Society of Gynecologic Endocrinology. Calcium and vitamin D recommendation. Seoul: Korea Women's Health and Osteoporosis

Foundation, Korean Society of Osteoporosis, Korean Society of Gynecologic Endocrinology; 2010.

