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Assessment of the Relationship between Students' Knowledge of Osteoporosis and Profession in View

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Abstract: *Osteoporosis is a skeletal disease that can compromise the bone mineral density, worsen the bone fragility leading to increase in the risk of bone fractures This study sought to assess the level of osteoporosis knowledge among students in medicine and surgery, nursing, nutrition and dietetics, pharmacy and physiotherapy in SouthEast Nigeria. A cross-sectional study design was adopted for the study. The study was carried out in two selected universities in southeast, Nigeria. The two selected universities used for this study from southeast Nigeria universities include; Nnamdi Azikiwe University, Akwa and University of Nigeria, Nsukka. The population of the study was 1682 from the two Universities. The instrument used was a questionnaire titled 'Facts on Osteoporosis Quiz (FOOQ)'. The data were analysed using chi square. From the study it was concluded that Health professional students in Medicine and Surgery, Nursing, Pharmacy, Nutrition and Dietetics and Physiotherapy in both UNN and UNIZIK have poor knowledge of osteoporosis. One of the recommendation made from the study states that there is the need for increase in osteoporosis education in the curriculum for health care academic programs in order to increase osteoporosis knowledge and better prepare graduates.*

Keywords: *Osteoporosis, Knowledge, Medicine and Surgery, Nursing, Nutrition and Dietetics, Pharmacy and Physiotherapy.*

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Introduction

Osteoporosis is a skeletal disease that can compromise the bone mineral density, worsen the bone fragility leading to increase in the risk of bone fractures (Werner, 2005; Khosla, Lufkin, Hodgson, Fitzpatrick and Melton, 1994). It is also defined as a skeletal disease of reduced bone mineral density (BMD) that is diagnosed as 2.5 standard deviations below the adult peak mean that compromises bone strength resulting in an increased risk of bone fracture (Kanis, Melton, Christiansen, Johnston and Khaltaev, 1994). Osteoporosis statistics revealed an estimated 8.9 million fractures each year globally with the silent pattern of this chronic bone disease, that patient

may not experience any pain till the first fracture occur (Lam, 2008).Osteoporosis treatment constitutes a huge burden costing billions of dollars per year on the nation's healthcare system which is expected to continuously and greatly increase in the next couple of decades (Ray, Chan, Thamerand Melton, 1997; Burge, Dawson-Hughes, Solomon, Wong, King andTosteson, 2007). With osteoporosis being a silent disease, plans are to be made for its prevention; some of the plans include primary preventive measures. The Primary preventive measures are early detection of the risk factors, teaching and guiding the people whom at risk, on how to prevent the disease and giving treatment at a proper and suitable time to help reduce mortality and morbidity rate and the cost (Juby and Davis, 2001; Cheung, Tan, Cheung and Kung, 2016).Considering that most of the osteoporosis risk factors are modifiable, more campaigns to increase its awareness and consequences can play a role in its primary prevention initiatives (Chan, Kwong, Zang and Wan, 2007).Therefore, ensuring the appropriate level of knowledge on osteoporosis may play a crucial role in deterring the rate of incidence of the disease later on. Over the years there has been an increase in the amount of research studies investigating osteoporosis knowledge among populations considered to be most at risk but "very little attention has been paid to the knowledge of health care professionals involved in the prevention and treatment of osteoporosis" (Werner, 2005).

Statement of Problem

Assessment of the knowledge of college students, particularly those in healthcare-related fields regarding osteoporosis is substantial as they will play a role in dissemination of osteoporosis-related knowledge as a part of their future health education responsibilities. Osteoporosis knowledge has not been assessed among health professional students in SouthEast Nigeria which constitutes a significant part of the country's workforce of future healthcare practitioners. Therefore, this study intends to investigate osteoporosis knowledge in students who are soon to be Doctors, nurses, pharmacists, physical therapists, and dieticians.

Objective of the Study

Specifically, this study aims to assess the association between level of knowledge of students on Osteoporosis and Profession in View

Research Question

What is the association between level of knowledge of students on Osteoporosis and Profession in View?

Concept of Osteoporosis

Osteoporosis is a chronic, progressive disease of multifactorial causes and is the most common metabolic bone disease in the United States. It has been most often recognized in postmenopausal women, persons with small bone structure, the elderly, and in Caucasians and person of Asians background, although it does occur in both sexes, all races, and all age groups. It is characterized by low bone mass and microarchitectural deterioration of bone tissue, with a resultant increase in bone fragility (Al Saedi, Stupka and Duque, 2020). The disease often does not become clinically apparent until a fracture occurs. Osteoporosis represents an increasingly serious health and economic problem in the United States and around the world (Majumdar et al., 2009). Many individuals, male and female, experience pain, disability, and diminished quality of life as a result of having this condition. Over current decades, osteoporosis has gone from being viewed as an inevitable effect of aging to being recognized as a serious, highly preventable and treatable disease. Regardless of the adverse effects of osteoporosis, it is a condition that is often overlooked and undertreated, in large part because it is so often clinically silent before manifesting in the form of fracture. Fractures in patients with osteoporosis can occur after minimal or no trauma (Cosman et al., 2014). For example, a Gallup survey performed by the National Osteoporosis Foundation revealed that 86% of

women with osteoporosis had never discussed its prevention with their physicians (Maybury, 2002). Failure to recognize vulnerable patients, to educate them, and to put into practice preventive measures may lead to tragic consequences. Medical care includes lifestyle modifications including exercise, smoking cessation, and avoiding excess alcohol intake along with taking calcium, vitamin D, and antiresorptive agents such as bisphosphonates, the selective estrogen receptor modulator (SERM) raloxifene, and denosumab. Anabolic agents, include: teriparatide, abaloparatide, and romosozumab, are available as well (Haas and LeBoff, 2018). Prevention and identification of the secondary causes of osteoporosis are first-line measures to lessen the impact of this condition.

Risk factors

Risk factors for osteoporosis, such as advanced age and reduced bone mineral density (BMD), have been recognized by virtue of their direct and strong relationship to the incidence of fractures; however, many other factors have been considered risk factors based on their relationship to BMD as a surrogate indicator of osteoporosis.

Risk factors for osteoporosis include the following (Lyles, Schenck and Colón-Emeric, 2008; Fink et al., 2008):

1. Advanced age (≥50 years)

2. Female sex

3. White or Asian ethnicity

4. Genetic factors, such as a family history of osteoporosis

5. Thin build or small stature (e.g, bodyweight less than 127 lb [57.6 kg])

6. Amenorrhea

7. Late menarche

8. Early menopause

9. Postmenopausal state

10. Physical inactivity or immobilization (Sinaki, 1989)

11. Use of certain drugs (e.g, anticonvulsants, systemic steroids, thyroid supplements, heparin, chemotherapeutic agents, insulin)

12. Alcohol and tobacco use

13. Androgen or estrogen deficiency

14. Calcium or vitamin D deficiency

15. Dowager hump

Diagnosis

Baseline laboratory studies include the following:

1. Complete blood count: May reveal anemia

2. Serum chemistry levels: Usually normal in persons with primary osteoporosis

3. Liver function tests

4. Thyroid-stimulating hormone level: Thyroid dysfunction has been associated with osteoporosis

5. 25-Hydroxyvitamin D level: Vitamin D insufficiency can predispose to osteoporosis

6. Serum protein electrophoresis: Multiple myeloma may be associated with osteoporosis

7. 24-hour urine calcium/creatinine: Hypercalciuria may be linked with osteoporosis; more investigation with measurement of intact parathyroid hormone and urine pH may be indicated; hypocalciuria may indicate malabsorption, which should be further evaluated with a serum vitamin D measurement and consideration of testing for malabsorption syndromes such as celiac sprue

8. Testosterone (total and/or free) and luteinizing hormone/follicle-stimulating hormone: Male hypogonadism is associated with osteoporosis

Prevention of Osteoporosis

Primary prevention of osteoporosis starts in childhood. Patients require adequate calcium intake, vitamin D intake, and weight-bearing exercise. Beyond this, prevention of osteoporosis has two components: behavior modification and pharmacologic interventions.

The National Osteoporosis Foundation specifies that the following behaviors should be modified to reduce the risk of developing osteoporosis (Cosman et al., 2014):

1. Cigarette smoking

2. Physical inactivity

3. Intake of alcohol, caffeine, sodium, animal protein, and calcium

Patients should be counselled on smoking cessation and moderation of alcohol intake. Regular weight-bearing exercise and back extensor strengthening help delay bone loss. In a study that found osteopenia in over a quarter of men and women in early middle age, there was a negative correlation between exercise and BMD in the men despite relatively high levels of exercise—but the majority of men in the study reported cycling as their preferred exercise, rather than weight-bearing activities such as walking or running (Bass et al., 2019).

Knowledge as a Concept

Knowledge is the awareness, understanding, or familiarity acquired through experience, education, or reasoning. It represents the ability to apply information effectively in decision-making, problem-solving, and innovation (Nonaka and Takeuchi, 1995). Knowledge forms the cornerstone of human development, fostering personal growth and societal advancement. It is not just the accumulation of facts but also the capacity to understand their relationships and contexts

Knowledge is defined as facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject. Knowledge is closely linked to doing and implies know-how and understanding. The knowledge possessed by each individual is a product of his experience, and encompasses the norms by which he evaluates new inputs from his surroundings. It is imperative for healthcare professionals who work with individuals with osteoporosis to be adequately educated to have proficient knowledge of the disease and how to prevent and treat it. Healthcare professionals should receive adequate osteoporosis education in their academic programs in order to give them adequate knowledge of the disease to prepare them for treating osteoporosis population.

Medical Professional Fields

The healthcare system is supported by diverse professional fields, each playing a crucial role in ensuring patient care, recovery, and well-being. Among these are medicine, surgery, nursing, nutrition and dietetics, pharmacy, and physiotherapy. These fields require specialized training and expertise to address different aspects of health care.

1. Medicine and Surgery

Medicine is the foundation of healthcare and involves diagnosing, treating, and preventing diseases. Physicians, also known as doctors, are central to this field, providing primary and specialized care. They work in various specialties, including internal medicine, pediatrics, cardiology, and neurology. Physicians use evidence-based approaches and collaborate with other healthcare professionals to manage patient care effectively (Smith et al., 2020).

Surgery involves the use of operative techniques to treat injuries, diseases, and deformities. Surgeons specialize in areas such as general surgery, orthopedic surgery, neurosurgery, and plastic surgery. This field requires precision, skill, and a thorough understanding of anatomy and physiology. Surgeons often work closely with anesthesiologists, nurses, and other medical staff to ensure successful outcomes (Brown, 2018).

2. Nursing

Nursing is a vital component of healthcare, providing direct patient care and emotional support. Nurses work in various capacities, including general nursing, midwifery, and specialized areas such as critical care and oncology. They play a critical role in monitoring patients, administering medications, and educating families about health management. Advanced practice nurses, such as nurse practitioners, can diagnose and treat patients independently (Johnson and Patel, 2019).

3. Nutrition and Dietetics

Nutrition and dietetics focus on the role of food and nutrition in health and disease prevention. Dietitians and nutritionists work with individuals and communities to promote healthy eating habits and manage conditions such as diabetes, obesity, and heart disease. Clinical dietitians collaborate with healthcare teams in hospitals to create personalized dietary plans for patients (World Health Organization [WHO], 2021).

4. Pharmacy

Pharmacy is the science of preparing and dispensing medications. Pharmacists ensure the safe and effective use of drugs by providing information on proper usage, side effects, and interactions. They collaborate with physicians and other healthcare professionals to optimize treatment regimens. Additionally, pharmacists contribute to pharmaceutical research and the development of new medications (Davis et al., 2022).

5. Physiotherapy

Physiotherapy, also known as physical therapy, helps individuals recover from injuries, surgeries, or chronic conditions by restoring movement and functionality. Physiotherapists design and implement rehabilitation programs tailored to each patient's needs. They address conditions such as musculoskeletal disorders, neurological impairments, and sports injuries. Their work is essential in promoting mobility and enhancing the quality of life (American Physical Therapy Association, 2020).

Methodology

A cross-sectional study design was adopted for the study. The study was carried out in two selected universities in southeast, Nigeria. The two selected universities used for this study from southeast Nigeria universities include; Nnamdi Azikiwe University, Akwa and University of Nigeria, Nsukka. The population of the study was 1682 from the two Universities. The instrument used was a questionnaire titled ‘Facts on Osteoporosis Quiz (FOOQ)’. The data were analysed using chi square.

Result

Research Question

Table 1: The Association between Level of Knowledge of Students on Osteoporosis and Profession in View

Variables	Categories	Level of knowledge f (%)			N	X^2	P
		Poor	Average	Good			
Type of HP	Medicine	416(74.8)	62(11.2)	78(14.0)	556	156.356	<0.0001
	Nursing	230(61.5)	45(12.0)	99(26.5)	374		
	Pharmacy	317(78.5)	36(8.9)	51(12.6)	404		
	PT	20(24.4)	9(11.0)	53(64.6)	82		
	N and D	203(76.3)	22(8.3)	41(15.4)	266		

HP – Health profession, N and D = Nutrition and Dietetics, PT = Physiotherapy

From table 1, this study showed that participants in pharmacy have the highest percentage (78.5%) for poor knowledge of osteoporosis whereas those in physiotherapy have the highest percentage (64.6%) for good knowledge of osteoporosis, consequently there was a significant association between type of health profession and the level of knowledge (p=<0.0001). This is in-line with Wan and Mohammad, (2020).

Conclusion

Health professional students in Medicine and Surgery, Nursing, Pharmacy, Nutrition and Dietetics and Physiotherapy in both UNN and UNIZIK have poor knowledge of osteoporosis. Knowledge of facts on osteoporosis among the students was significantly associated with the health profession of the students. The knowledge of facts on osteoporosis was poor among health professions of students in universities in South East Nigeria and there was significant association in the level of knowledge of osteoporosis among the students from various health professions

Recommendation

From the study, the following recommendations were made.

1. This study recommends the need for increase in osteoporosis education in the curriculum for health care academic programs in order to increase osteoporosis knowledge and better prepare graduates.
2. It also recommends that more studies should be done on this topic, incorporating more universities so that a generalized level of future health care practitioners' osteoporosis knowledge can be determined.

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