



RESEARCH REPORT

Musculoskeletal pain among postmenopausal women in Nigeria: Association with overall and central obesity



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KEYWORDS

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Abstract *Background:* Menopausal women experience musculoskeletal changes such as muscle atrophy, muscle weakness and osteoporosis—symptoms associated with advancing age coupled with depletion of the female sex hormone, estrogen. Estrogen is important in the maintenance of the integrity of the musculoskeletal system and its reduction in the circulation due to menopausal transition results in reduced resting metabolic rate, lowered energy expenditure, increase in fat mass, and central adipose tissue accumulation.

Objective: This study investigated the prevalence of musculoskeletal pain (MSP) in postmenopausal women (PMW) in Nigeria. We examined the association of overall and central obesity with complaints of MSP and the screening potential of obesity measures for risk of musculoskeletal problems among PMW in Nigeria.

Methods: This was a cross-sectional survey of MSP in 310 PMW in Ibadan, Nigeria. MSP was assessed using the Standardized Nordic Musculoskeletal Questionnaire, and overall and central obesity were assessed using body mass index (BMI), waist/height ratio (WHtR), waist circumference, and waist/hip ratio. Data were analysed using descriptive statistics, chi-square test, and logistic regression models with the probability level at $p = 0.05$.

Results: Participants were of the modal age group (51–60 years). The highest prevalence rates of MSP were in the lower extremity (189; 61.0%) and the back (164; 52.9%). A direct association was observed between the categories of BMI and lower extremity symptoms ($p < 0.05$), and the categories of WHtR and waist circumference were associated with back and lower extremity symptoms ($p < 0.05$). Postmenopausal women had greater odds of reporting MSP across various classes of BMI. WHtR revealed the greatest odds for back (odds ratio = 1.70, 95% confidence interval 1.07–2.75) and lower extremity symptoms (odds ratio = 2.33, 95% confidence interval 1.44–3.78).

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Conclusion: Lower extremity and back pain symptoms were the most prevalent. For overall and central obesity directly associated with MSP, WHtR seemed the best obesity screening tool for MSP in postmenopausal women.

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Introduction

Musculoskeletal pain results from musculoskeletal disorders (MSDs)—a general term for several types of disorders affecting various body parts such as the neck, back, upper limbs, or lower limbs. These disorders affect tissues such as tendons, muscles, ligaments, nerves, and other supporting joint structures [1], and they produce symptoms of pain, ache, or discomfort in the affected body part. These symptoms of pain or discomfort may be acute or chronic, focal or diffuse. Several previous studies have attributed musculoskeletal pain from MSDs as being work related [1,2]. It is also well known that musculoskeletal pain can be multifactorial in origin [3]. Indeed, a very pertinent cause is that associated with ageing, and Felson [4] had opined that MSDs are likely to become more prevalent as the population ages throughout the world.

At menopause, women are known to experience a number of physiological and psychological changes [5]. These include musculoskeletal changes such as osteoporosis, muscle atrophy, and muscle weakness [6]—symptoms that are more or less associated with advancing age [7]. Oestrogen, the female sex hormone, plays a prominent role in maintaining the integrity of the musculoskeletal system; hence, a decrease in this hormone as associated with the menopause transition may lead to impaired muscle function [8], particularly in the postmenopausal years. There are also body composition changes at menopause; some studies suggested increases in body mass index (BMI) or total fat mass with menopause [7,9]. Loss of ovarian function induces a reduction in resting metabolic rate, physical energy expenditure, and an increase in fat mass and abdominal adipose tissue accumulation [7] oftentimes resulting in overweight or obesity. However, to the best of our knowledge, studies that directly investigated the association of overall and central obesity with musculoskeletal pain in postmenopausal women are scarce.

The objectives of this study were to investigate the prevalence of musculoskeletal pain in a population of postmenopausal women; examine if overall obesity (BMI) and central obesity [waist/height ratio (WHtR)], waist circumference (WC), and waist/hip ratio (WHpR) are associated with complaints of musculoskeletal pain in postmenopausal women in Nigeria; and possibly determine which of the obesity measures has the best screening potential for musculoskeletal symptoms in these women.

Methods

Participants and setting

This is a cross-sectional survey of urban postmenopausal women in Ibadan North local government area of Oyo State in

Nigeria. Ethical approval was obtained from the research ethics committee of University of Ibadan and University College Hospital, Ibadan, Nigeria. Informed consent was obtained from all participants, and all procedures were conducted in accordance with the Declaration of Helsinki. Postmenopausal women who participated in this study were workers in government secretariats, schools, and hospitals in Ibadan North local government area of Oyo State, Nigeria. A nonprobability sampling technique was used in this study such that women who appeared to be in the menopausal age category were approached in these venues, and the purpose of the study was explained to them. Self-administered questionnaires were distributed by hand to volunteers. Their menstrual cycle status was ascertained through a question in the questionnaire that asked participants to indicate if their menstrual bleeding was regular, irregular, or was no longer present. Women who reported no menses at least in the past 12 months previous to the study and had no surgical menopause were identified as postmenopausal women and recruited into the study.

Assessment of musculoskeletal symptoms

Assessment of musculoskeletal symptoms was done with the aid of the Standardized Nordic Musculoskeletal Questionnaire by Kuorinka et al [10]. The Standardized Nordic Musculoskeletal Questionnaire assesses 7-day and 12-month prevalence and patterns of MSDs such as pain, discomfort, and numbness in nine areas of the body including the neck, shoulders elbows, wrists, upper back, lower back, hips/thighs/buttocks, knees, and ankles/feet [10]. For the purpose of this study, symptoms were categorised into four major body areas—neck/shoulder, upper extremity, the back, and lower extremity [11]—and a 12-month prevalence of musculoskeletal symptoms in the postmenopausal women was considered.

Assessment of obesity

Assessment of obesity was done by rating the BMI as an index of overall obesity, whereas WHtR, WC, and WHpR were used to rate central obesity. BMI was defined as the ratio of weight in kilograms and square of height in metres (kg/m^2). Weight and height were measured using standardised means. WC was taken as the largest circumference around the abdomen about the level of the umbilicus [12], whereas WHtR is WC divided by height in centimetres. BMI was categorised as underweight ($<18.5 \text{ kg}/\text{m}^2$), normal weight ($18.5\text{--}24.99 \text{ kg}/\text{m}^2$), overweight ($25.0\text{--}29.99 \text{ kg}/\text{m}^2$), and obese ($\geq 30.0 \text{ kg}/\text{m}^2$) [12]. WC was categorised as normal ($<88 \text{ cm}$) and obese ($>88 \text{ cm}$), whereas WHtR is classified as normal (<0.5) and obese

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