Predictors of Musculoskeletal Disorders and Falls Among Aged Retirees of Ife-Central Local Government Area, Osun State, Nigeria

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ABSTRACT

Musculoskeletal disorders (MSDs) and falls are major public health concerns among older adults, contributing to reduced quality of life, increased healthcare costs, and higher morbidity. This study investigated key predictors of MSDs and falls among retirees aged 65 years and above in Ife-Central Local Government Area of Osun State, Nigeria. A cross-sectional descriptive survey design was employed, with ethical clearance obtained from the Health Research Ethics Committee (HREC) of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife (protocol number HREC/2024/06/22). A purposive sample of 300 retirees participated, and data were collected using the modified Nordic Musculoskeletal and Postural Instability Questionnaire (NMPIQ) and the adapted Fall Efficacy and Gait Assessment Scale (FEGAS). Demographic variables such as age, gender, body mass index (BMI), physical activity, chronic disease history, medication use, and environmental factors were examined. Descriptive statistics, chi-square tests, and logistic regression analyses were conducted to identify associations and predictors. Findings revealed moderate gait impairment (36.3%) and mild postural instability (0.73±0.70 on the PIGD scale). A high prevalence of MSDs was observed, with 86.3% reporting MSDs in the past 12 months and 80.7% in the past 7 days. Low back pain was the most common MSD, affecting 62.0% in the past year and 57.7% in the past week. Additionally, 60% of participants expressed moderate to high concern about falling. Living alone (χ^2=22.29, $p<0.05$) and hypertension (χ^2=15.97, $p<0.05$) were significantly associated with heightened fear of falling. FGA and PIGD emerged as the strongest modifiable correlates of fear of falling, with a strong negative correlation between FGA and FES ($r = -0.52$, $p<0.05$) and a positive correlation between PIGD and FES ($r = 0.39$, $p<0.05$). Multiple MSDs were also strongly associated with fear of falling (χ^2=49.23, $p<0.05$ within 12 months; χ^2=47.92, $p<0.05$ within 7 days), making them the strongest predictors of high fall concern. Overall, postural instability and gait abnormalities were identified as strong predictors of MSDs, while advancing age, fear of falling, and MSDs were the strongest predictors of actual falls among aged retirees.

Keywords: Musculoskeletal disorders, falls, aged retirees, predictors, physical activity, environmental hazards

INTRODUCTION

Musculoskeletal disorders (MSDs) and falls are among the most pressing health challenges affecting the ageing population. Both conditions significantly reduce quality of life and independence in older adults (WHO, 2021). According to the Centers for Disease Control (CDC, 2020), MSDs, including osteoarthritis, osteoporosis, and chronic back pain are leading causes of disability, while falls remain a major source of injury-related morbidity and mortality. The interaction between these conditions is particularly concerning: MSDs impair mobility and balance, increasing fall risk, while falls often worsen existing musculoskeletal problems (Tinetti et al., 2018).

Psychological factors further complicate this relationship. Bittencourt et al. (2022), in their review of the Fear Avoidance Model, observed that individuals who are highly distressed by pain often develop kinesiophobia (fear of movement). This avoidance behavior restricts activity, leading to physical deconditioning, muscle weakness, and impaired balance, ultimately heightening fall risk.

The prevalence of MSDs and falls is shaped by biological, behavioral, and environmental factors. Advanced age, sedentary lifestyles, obesity, and chronic diseases such as diabetes and cardiovascular conditions are major risk factors (CDC, 2020; Vos et al., 2020; Carpenter, 2021; Freeman et al., 2023). The International Diabetes

Federation (IDF) has estimated that cardiometabolic syndrome affects a large proportion of the global ageing population (Alberti et al., 2009). Falls are also linked to poor balance, medication use, and environmental hazards such as uneven flooring and inadequate lighting (Ambrose et al., 2013).

Retirees represent a particularly vulnerable group. The transition out of the workforce is a critical life stage that, if poorly managed, may trigger declines in physical and mental health. Research highlights retirees' high burden of chronic disease, risks of social isolation (Eguchi, 2021; Kim & Lee, 2021; Shaw et al., 2022), and cycles of cognitive and functional decline (Xavier et al., 2023; Carpenter, 2021). Despite extensive evidence on general risk factors, little research has examined the unique predictors of MSDs and falls among retirees in specific cultural and socioeconomic contexts.

This study addresses that gap by investigating predictors of musculoskeletal disorders and falls among aged retirees in Ife-Central Local Government Area, Osun State, Nigeria. Identifying local risk factors will inform targeted interventions to reduce the burden of these conditions and promote healthy ageing. Understanding the cultural and environmental context is also essential for designing effective, relevant strategies to prevent disability and enhance well-being in older adults.

METHODOLOGY

A cross-sectional descriptive survey design was employed to investigate predictors of musculoskeletal disorders and falls among retirees. The study was conducted in Ife-Central Local Government Area, Ile-Ife, Osun State, Nigeria, which hosts a substantial population of retirees aged 65 years and above, largely due to the presence of Obafemi Awolowo University (OAU) and the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC). The distinctive socioeconomic, cultural, and environmental characteristics of this setting were considered relevant to the prevalence and determinants of musculoskeletal disorders and falls.

The study population comprised retirees aged 65 years and older residing in Ife-Central LGA. Using purposive sampling, 300 retirees were recruited. Eligibility criteria required participants to be at least 65 years of age, retired from formal employment, and willing to provide informed consent. Exclusion criteria included severe cognitive impairment (e.g., advanced dementia or significant memory loss), inability to communicate effectively, and being bedridden or completely immobile. Recruitment was conducted at community centres where retirees convene for monthly meetings.

Three instruments were used for data collection: The modified Nordic Musculoskeletal and Postural Instability Questionnaire (NMPIQ) to assess musculoskeletal disorders and postural instability; The adapted Fall Efficacy and Gait Assessment Scale (FEGAS) to capture fall history and gait characteristics, and A Medical History Questionnaire to document lifestyle factors (physical activity, smoking, alcohol use), chronic disease history, and prescription drug use.

Environmental factors such as home safety, lighting, and flooring were also assessed. Ethical approval was obtained from the Health Research Ethics Committee (HREC) of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife (protocol number HREC/2024/06/22). Written informed consent was secured from all participants, and confidentiality was maintained by assigning code numbers in place of names.

Data analysis was conducted using IBM SPSS Statistics version 25. Descriptive statistics summarized participant characteristics and study variables. Inferential analyses, including chi-square tests and logistic regression, were performed to examine associations and identify predictors. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Demographic Characteristics of the Participants (N=300)

Variable	f (%)	$\bar{X} \pm SD$
Age(years)		71.94±7.32

Sex M		175(58.3)	
F		125(41.7)	
Marital status	Single	6(2.0)	
	Married	218(72.7)	
	Widow	42(14.0)	
	Widower	27(9.0)	
	Divorcee	7(2.3)	
Living Alone	No	97(32.3)	
	Yes	203(67.6)	
Caregiver	No	188(62.7)	
	Yes	112(37.3)	
Education Level		91(30.3)	
Low (Primary and Secondary)		209(69.7)	
High (Vocational & Tertiary)			
Years after retirement			12.34±7.45

Key: M = male, F = female, SD = standard deviation

The participants were older adults (mean age: 71.94 ± 7.32 years) who had been retired for an average of 12 years. Males constituted 58.3% of the sample, while females accounted for 41.7%. Although most participants were married (72.7%), a large proportion (67.6%) reported living alone. Widowhood was relatively common (23%), with women more affected than men. Most participants (62.7%) did not have a caregiver, while 37.3% did. Educational attainment was generally high, with 69.7% having vocational or tertiary education.

Table 2: Physical Characteristics and Health History of the Participants (N=300)

Variable		f (%)	$\bar{X} \pm SD$
Age(years)			71.94±7.32
Sex M		1.75(58.3)	
F		1.25(41.7)	
Height (m)			1.65±0.09
Weight (kg)			67.12±10.42
BMI (kgm^{-2})			24.76±3.70
BMI Category	Normal	174(58.0)	
	Overweight	98(32.7)	
	Obesity	28(9.3)	
Hypertension	No	133(44.3)	
	Yes	167(55.7)	

Diabetes	No	226(75.3)	
	Yes	74(24.7)	
Both Diseases	No	242(80.7)	
	Yes	58(19.3)	

The data revealed a significant burden of cardiovascular and metabolic conditions. Overweight (37.2%) and obesity (9.3%) were prevalent. Hypertension was alarmingly high (55.7%), while diabetes affected 24.7% of participants. Nearly one in five had comorbid hypertension and diabetes, consistent with CDC (2022) reports.

Table 3: Gait and Postural Characteristics of the Participants (N=300)

Variable	f (%)	$\bar{X} \pm SD$
FGA		20.01±5.82
FGA Category Poor gait Good gait	191(63.7) 109(36.3)	
PIGD		0.73±0.70
PIGD Category Normal posture Abnormal posture	122(40.7) 178(59.3)	

Key: FGA functional gait assessment, PIGD postural instability gait difficulty, SD standard deviation.

The mean Functional Gait Assessment (FGA) score was 20.01 ± 5.82, below the ideal threshold of ≥30, indicating moderate gait impairment. Scores ≤22/30 are associated with high fall risk (Montero-Odasso et al., 2023), placing the cohort in the "at-risk" category. While 63.7% demonstrated good gait, 36.3% exhibited poor gait function. The Postural Instability and Gait Disorder (PIGD) scale averaged 0.73 ± 0.70, suggesting mild postural instability, though nearly 60% showed abnormal posture. Impaired balance, as measured by PIGD, is a strong independent risk factor for falls (Wei et al., 2023).

Table 4: Musculoskeletal Disorders and Fall Characteristics of the Participants (N=300)

Variable	Response	f (%)
MSD (12-Month)	Yes	259(86.3)
	No	41(13.7)
MSD (7-Day)	Yes	242(80.7)
	No	58(19.3)
Multiple MSD (12-Month)	Yes	133(44.3)
	No	167(55.7)
Multiple MSD (7-Day)	Yes	100(33.3)
	No	200(66.7)

Upper body MSD (12-Month)	Yes	51(17.0)
	No	249(83.0)
Upper body MSD (7-Day)	Yes	28(9.3)
	No	272(90.7)
Upper Extremity MSD (12-Month)	Yes	25(8.3)
	No	275(91.7)
Upper Extremity MSD (7-Day)	Yes	14(4.7)
	No	286(95.3)

Key: FES = fall efficacy scale, BMI = Body Mass Index, M = male, F = female * Significant Association at p<0.05.

MSDs were highly prevalent, with 86.3% reporting conditions in the past year and 80.7% in the past week.

Low back pain was the most common, affecting 62.0% in the past year and 57.7% in the past week. Overall, 60% expressed moderate to high concern about falling, underscoring the impact of MSDs on mobility and fall risk.

Table 5: Associations of Falls and Socio-demographics of the Participants

Variable		FES Low concern	FES Moderate concern	FES High concern	χ_2	P-value
Sex	M	65	57	53	0.012	0.994
	F	47	40	38		
Marital status	Single	4	2	0	16.518	*0.036**
	Married	92	68	58		
	Widow	9	14	19		
	Widower	5	10	12		
	Divorcee	2	3	2		
Living Alone	No	21	32	44	22.29	*0.000**
	Yes	91	64	47		
Caregiver	No	40	34	38	1.103	0.576
	Yes	72	63	53		
BMI Category	Normal	60	52	62	5.991	0.200
	Overweight	42	34	22		
	Obese	10	11	7		
Years after Retirement	0-5	32	19	12	24.618	*0.002**
	6-10	37	31	21		
	11-15	14	22	15		
	16-20	20	14	19		
	21-40					

		9	11	24		
Education level						
Low education		26	27	38	8.593	*0.014**
High education		86	70	53		
Hypertension	No	63	28	42	15.970	*0.000**
	Yes	49	69	49		
Diabetes	No	93	63	70	9.329	*0.009**
	Yes	19	34	21		
Both Diseases	No	98	66	78	14.754	*0.001**
	Yes	14	31	13		

Living alone ($\chi^2 = 22.29$, $p < 0.05$) and marital status ($\chi^2 = 16.52$, $p < 0.05$) were strongly associated with fear of falling, implicating social isolation as a risk factor. Hypertension ($\chi^2 = 15.97$, $p < 0.05$), diabetes, and longer retirement duration (>20 years) were also significantly associated with higher concern. Lower educational attainment correlated with greater fear of falling. No significant associations were found with sex, caregiver presence, or BMI.

Table 6: Correlates of Fear of Falling among Aged Retirees

Variable	FES	FGA	PIGD	Age	Height	Weight	BMI
FES	1	-0.52*	0.39*	0.41*	-0.22*	-0.32*	-0.18*
FGA		1	-0.49*	-0.31*	0.12*	0.07	-0.001
PIGD			1	0.49*	-0.11	-0.18*	-0.10
Age				1	0.01	-0.23*	-0.25*
Height					1	0.40*	-0.29*
Weight						1	0.75*
BMI							1

Key: FES fall efficacy scale, FGA functional gait assessment, PIGD postural instability gait difficulty, BMI body mass index *Sig = p<0.05

Functional mobility was the strongest modifiable correlate of fear of falling. FGA negatively correlated with FES (r = -0.52, p < 0.05), while PIGD positively correlated (r = 0.39, p < 0.05). Age correlated positively with FES (r = 0.41, p < 0.05) and negatively with FGA (r = -0.31, p < 0.05), but positively with PIGD (r = 0.49, p < 0.05). Anthropometric measures also showed significant correlations: height (r = 0.22), weight (r = -0.32), and BMI (r = -0.18).

Table 7: Association between Fall and Presence of Musculoskeletal Disorders (MSD).

Variable		FES Low concern	FES Moderate concern	FES High concern	χ^2	P
MSD in 12 past months	No	31	8	2	31.196	*0.000**
	Yes	81	9	89		

MSD in past 7 Days	No	39	13	6	28.866	*0.000**
	Yes	73	84	85		
Multiple MSD in past 12 months	No	89	50	28	49.226	*0.000**
	Yes	23	47	63		
Multiple MSD in past 7 Day	No	100	60	40	47.917	*0.000**
	Yes	12	37	51		
Upper body MSD in 12 months	No	103	83	63	19.059	*0.000**
	Yes	9	14	28		
Upper body MSD in past 7 Days	No	112	89	71	28.858	*0.000**
	Yes	0	8	20		
Upper extremity MSD in 12 months	No	108	89	78	7.546	*0.023**
	Yes	4	8	13		
Upper extremity MSD in 7 Days	No	112	93	81	13.723	*0.001**
	Yes	0	4	10		
Lower extremity MSD in 12 months	No	101	80	62	16.059	*0.000**
	Yes	11	17	29		
Lower extremity MSD in 7 Days	No	107	86	69	17.862	*0.000**
	Yes	11	11	29		
Low back MSD in 12 months	No	58	29	27	14.418	*0.001**
	Yes	54	68	64		
Low back MSD in past 7 Days	No	64	33	30	16.078	*0.000**
	Yes	48	64	61		

*Significant association at p< 0.05

MSDs, particularly recent, multi-site, or lower-body conditions, were strongly associated with fear of falling.

Multiple MSDs were the strongest predictor (χ^2 = 49.23, p < 0.05 for 12-month; χ^2 = 47.92, p < 0.05 for 7-day). Associations were stronger for recent MSDs, highlighting the impact of acute pain flares as immediate threats that reinforce fear and activity avoidance (Bittencourt et al., 2022).

Table 8: Associations among Fall and Gait, and Postural Characteristics of the Participants

Variable	FES Low concern	FES Moderate concern	FES High concern	χ^2	P
PIGD Category					
Normal	80	22	20	70.102	*0.000**
Abnormal	32	75	71		
FGA Category					

Poor	50	66	75	32.156	*0.000**
Good	62	31	16		

Key: FES fall efficacy scale, PIGD postural instability-gait difficulty, FGA functional gait assessment, *Significant association at p<0.005.

Balance and gait deficits were fundamentally linked to fear of falling. Strong associations were observed between PIGD and FES (χ^2 = 70.102, p < 0.05) and between FGA and FES (χ^2 = 32.156, p < 0.05). Individuals with abnormal balance or poor gait were far more likely to report moderate to high concern about falling.

DISCUSSION

The World Health Organization (WHO, 2021) reported exponential increases in global obesity rates, with older adults particularly vulnerable due to age-related metabolic and hormonal changes. The high prevalence of obesity and overweight observed in this study is consistent with global trends, often described as sarcopenic obesity (Koliaki et al., 2018). This condition, characterized by increased fat mass and reduced muscle mass, is a significant contributor to metabolic dysfunction. A considerable proportion of retirees in the sample presented with hypertension, aligning with data from the American Heart Association (AHA, 2018), which estimated a prevalence of 70% among adults aged 65 years and older. Paneni et al. (2017) identified arterial stiffness, resulting from vascular aging and loss of elasticity, as the most common form of hypertension in this population.

Diabetes was also highly prevalent among participants, consistent with the Centers for Disease Control and Prevention (CDC, 2022), which reported that 26.8% of U.S. adults aged 65 years and above live with diabetes. Kalyani et al. (2017) attributed age-related diabetes to increasing insulin resistance, sarcopenic obesity, physical inactivity, and declining pancreatic beta-cell function. Nearly one in five retirees in this study presented with comorbid hypertension and diabetes, a hallmark of cardiometabolic syndrome. This clustering of conditions amplifies the risk of atherosclerotic cardiovascular disease and mortality, as highlighted by Grundy (2012) and the International Diabetes Federation (Alberti et al., 2009).

Functional Gait Assessment (FGA) scores further underscored the burden of mobility impairments. With a mean score of 20.01, participants fell within the "at-risk" category, below the validated cut-off of ≤22/30 for high fall risk (Montero-Odasso et al., 2023). This finding is consistent with Verghese et al. (2021), who reported that age-related declines in muscle strength, proprioception, and vestibular function contribute to gait dysfunction. Similarly, Postural Instability Gait Difficulty (PIGD) scores indicated mild to moderate postural instability, reinforcing evidence that impaired balance is a strong independent predictor of falls (Wei et al., 2023). These results highlight the need for targeted strength and balance training interventions, as meta-analyses have consistently shown structured exercise programs to be effective in fall prevention (Sherrington et al., 2019).

Musculoskeletal disorders (MSDs) were highly prevalent, particularly in the lower extremities and core, which are critical for mobility. Mills et al. (2023) reported that conditions such as knee osteoarthritis, hip pain, and ankle weakness impair gait biomechanics, reducing stride length and walking speed, and increasing instability. Low back pain was also common, consistent with global burden of disease studies identifying it as the leading cause of years lived with disability (Low Back Pain Collaborators, 2023). Sanchez-Romero et al. (2021) emphasized that core instability resulting from low back pain undermines anticipatory postural adjustments, thereby increasing fall-related anxiety. Degenerative changes such as spinal stenosis, facet joint arthritis, and sarcopenia in core stabilizers further exacerbate functional decline (Urits et al., 2021).

Fear of falling emerged as a significant concern among participants, particularly those with chronic pain or who lived alone. Rivasi et al. (2020) noted that fear of falling is highly prevalent in older adults with chronic pain, while Eguchi et al. (2021) reported a 40% higher incidence among older adults living alone compared to those cohabiting. In this study, functional capacity measured by FGA and PIGD was strongly associated with fear of falling, consistent with neurophysiological models described by Smania et al. (2022). Lower FGA scores,

reflecting impaired dynamic balance, directly increased perceived fall risk. Wei et al. (2023) confirmed that FGA is a powerful predictor of fear of falling, as it mirrors real-world walking challenges.

Overall, the associations identified between falls, gait, postural instability, and fear of falling reinforce the clinical relevance of objective measures such as FGA and PIGD. The findings support Horak's (2021) assertion that postural instability, even in static positions, is a profoundly threatening sensation that signals loss of bodily control. These results underscore the importance of comprehensive interventions addressing musculoskeletal health, balance, and functional mobility to reduce fall risk and improve quality of life among older retirees.

CONCLUSION AND IMPLICATIONS

The findings of this study highlight the complex interplay between metabolic disorders, musculoskeletal conditions, gait impairments, and psychosocial factors such as fear of falling among older retirees. The clustering of hypertension, diabetes, and obesity underscores the growing burden of cardiometabolic syndrome in aging populations, while the high prevalence of musculoskeletal disorders and postural instability further compounds functional decline and fall risk. Importantly, the strong associations between objective measures of gait and balance (FGA, PIGD) and subjective fear of falling confirm that perceived instability is grounded in measurable physical deficits.

From a public health perspective, these results emphasize the urgent need for integrated interventions that address both metabolic and functional health. Policies should prioritize routine screening for cardiometabolic risk factors, musculoskeletal disorders, and fall risk in older adults. Clinically, multidisciplinary approaches combining medical management of chronic conditions with structured exercise programmes, particularly those incorporating strength, balance, and functional training are essential to reduce morbidity and enhance quality of life. Community-based initiatives that foster social support, especially for older adults living alone, may also mitigate fear of falling and its associated functional decline.

Overall, the study underscores the importance of proactive, holistic strategies in geriatric care. By addressing the dual burden of chronic disease and functional impairment, health systems can better support aging populations in maintaining independence, mobility, and well-being.

Conflict of Interest

We, the authours hereby declare that we have no conflict of interest whatsoever in the study.

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