Assessment of Depression Among Elderly Patients with Knee and Hip Osteoarthritis in a Tertiary Hospital in the Philippines: A Cross-Sectional Study

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Background: Osteoarthritis (OA) is a leading cause of pain and disability among older adults, often accompanied by mental health issues like depression. Understanding the impact of clinico-sociodemographic factors on OA and depression is essential for improving patient outcomes.

Objective: This study aimed to examine the association between osteoarthritis, clinico-sociodemographic factors and depression among elderly patients in a tertiary hospital setting.

Methods: A cross-sectional study was conducted on elderly patients with osteoarthritis to explore the correlation between clinico-sociodemographic factors and the severity of depression. Data were collected and analyzed using Microsoft Excel 2018, with descriptive and inferential statistics, including Chi-square tests and correlation analyses (Spearman's Rank for WOMAC scores and Geriatric Depression Scale, Pearson's for socio-demographic factors and comorbidities).

Results: Despite most participants (48.15%) having normal depression scores, a significant number (37.04%) had mild depression and 14.81% had moderate depression. Knee pain was the most common affected area (56.79%), and 62.96% had one comorbidity. Albeit having no statistically significant correlations, positive weak relationships were identified between socio-demographic factors, clinical status and depression.

Conclusion: This study identified weak associations between osteoarthritis-related pain and depression, especially among individuals with comorbidities and higher pain levels. While socio-demographic factors may influence the severity of both osteoarthritis and depression, further research is necessary to explore these relationships more thoroughly and to consider additional contributing factors. These findings underscore the importance of integrated care approaches that address both the physical and mental health needs of elderly patients with osteoarthritis.

Key words: Osteoarthritis, depression, elderly patients

Introduction

Osteoarthritis is a chronic degenerative joint disease prevalent in the aging population and may present in one or several joints, with its prevalence increasing with age. Other risk factors include obesity, joint damage, physiological anomalies and physical stress. This condition leads to substantial morbidity from pain, fatigue, sleep disturbance and disability, all of which contribute to the risk of developing mental health issues, particularly depression in the elderly. Globally, the population is aging, with the elderly currently comprising 10% of the global population in 2022, as reported by the World Health Organization[1]. In the Philippines, an estimated 6.5 million people are 65 years and older[2]. It is projected that by 2030, one out of six people will be 60 years old and above worldwide, and by 2050, the elderly population is expected to triple[1]. This increase in global lifespan has, in turn, increased the prevalence of chronic diseases, most notably osteoarthritis, the most common type of arthritis worldwide[3].

Current research has demonstrated a positive impact of osteoarthritis on the development of depression in various age groups, with pain serving as a direct stressor to this mental health problem.

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Studies have found a positive correlation between pain severity in osteoarthritis and depression severity in patients with osteoarthritis[4]. Elderly individuals with osteoarthritis and untreated depression are more likely to require higher doses of pain-relieving medications, have fewer social interactions, poorer quality of life and tend to have increased body mass[5]. Recent studies highlight that higher BMI, greater scores on the Western Ontario and McMaster Universities OA Index (WOMAC), having more than one comorbidity, low education level and having two or more painful sites are associated with a higher presence of depression[6,7]. Despite these findings, there is little effort exerted in clinical practice to assess and address the risk of developing mental health issues, particularly depression, in patients with chronic diseases like osteoarthritis.

Although current research has established a link between osteoarthritis and depression, issues remain unaddressed, particularly in the context of clinical practice and primary care settings. The Philippines continues to face challenges in addressing mental health issues due to underinvestment, a lack of mental health professionals, and underdeveloped mental health services in the community[8]. This study is aimed to determine clinico-sociodemographic predictors for the development of depression in elderly individuals with osteoarthritis. By identifying these predictors, healthcare workers in primary care settings can better identify elderly individuals with osteoarthritis who are at risk for developing depressive symptoms, thereby enabling early detection and prevention and ultimately improving the quality of life for older adults.

This study aimed to determine clinico-socio-demographic predictors in the development of depression in elderly individuals diagnosed with osteoarthritis in the outpatient setting.

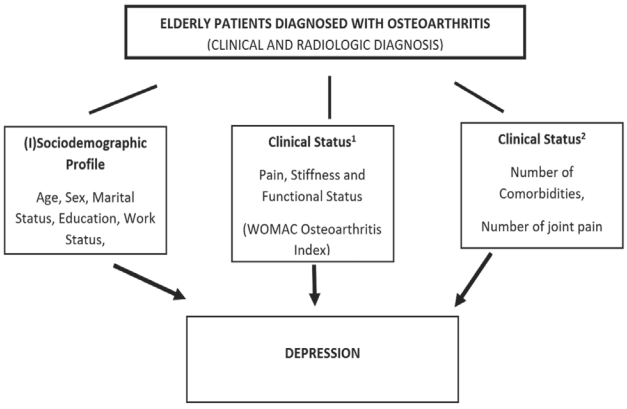

Figure 1. Conceptual framework of the study.

Methods

Study Design and Setting

This study utilized a cross-sectional study design to determine clinico-sociodemographic predictors in the development of depression among elderly individuals with osteoarthritis in the Family Medicine Clinic at Region 1 Medical Center, Dagupan City, Philippines. The patients were recruited through purposive total population sampling, including all geriatric patients who met the inclusion criteria. Data were collected using a questionnaire that assessed sociodemographic factors, clinical status, and the presence and severity of depression. The primary analysis involved the use of correlation coefficients to examine relationships between the variables. The study was conducted in the Family Medicine Clinic at Region 1 Medical Center, located in Dagupan City, Philippines, a tertiary government hospital. Recruitment began on August 15, 2023, to July 13, 2024.

Subjects

Inclusion criteria for the study were elderly patients aged 60 and above who were registered for consultation under the Family Medicine Clinic and diagnosed with osteoarthritis. Exclusion criteria included patients not registered for consultation under the Family Medicine Clinic, those with preexisting mental disorders, terminal diseases (such as end-stage heart failure, end-stage renal disease, neoplasms, and cerebrovascular disease), and those who refused to participate. All participants provided informed consent before participating in the study, ensuring they understood the voluntary nature of their involvement and the confidentiality of their data. For those unable to provide consent on their own, guardians or representatives were allowed to assist in the consent process.

Variables and Data Collection and Follow-up

The risk factors examined included sociodemographic characteristics (age, sex, marital status, education, employment status) and clinical status (pain, stiffness, functional status according to the WOMAC Osteoarthritis Index, number of comorbidities, and number of painful joint sites). The outcome measured was the severity of depression, assessed using the Geriatric Depression Scale (GDS). Data were collected using a structured questionnaire with 46 items divided into three parts: sociodemographic data, clinical status and assessment of depression. The questionnaire was pilot tested to ensure clarity and reliability. Since the study utilized a cross-sectional design, there were no follow-up procedures involved. The outcome, depression severity, was measured at a single point in time using the Geriatric Depression Scale (GDS).

Statistical Analysis

The statistical hypothesis aimed to identify significant correlations between clinico-socio-demographic factors and the incidence and severity of depression. Sample size computation was based on the total population of eligible elderly patients within the study period. Data management was conducted using Microsoft Excel 2018. Descriptive statistics were used to summarize baseline characteristics, while inferential statistics, including Chi-square tests and correlation coefficients (Spearman's Rank for WOMAC and GDS, Pearson for GDS to sociodemographic factors, and number of comorbidities and joint sites), were used to explore relationships between variables. Efforts were made to minimize bias through careful design and implementation of the study.

Ethical Considerations

The study adhered to strict ethical standards to ensure the protection and rights of all participants. Informed consent was obtained from each participant, and for those unable to provide consent independently, guardians or representatives were involved. The informed consent document outlined the study's purpose, procedures, potential risks and benefits, emphasizing the voluntary nature of participation and the right to withdraw at any time without consequence. Participant confidentiality was maintained by anonymizing data and securely storing it. The study protocol was reviewed and approved by the Institutional Review Board (IRB) of Region 1 Medical Center, ensuring compliance with ethical guidelines and regulatory requirements.

Results

The baseline sociodemographic characteristics of the participants revealed significant differences across several variables. The majority of the participants were aged 60-69 years (66.67%), with fewer in the 70-79 years (22.22%) and 80+ years (11.11%) groups. A higher proportion of females (72.84%) participated compared to males (27.16%). Most participants were married (74.07%), followed by widowed (13.58%), single (9.88%), and others (2.47%). A large percentage of participants were unemployed (91.36%), with only 8.64% employed. In terms of education, the majority had completed high school (48.15%), followed by elementary education (33.33%), bachelor's degree or higher (13.58%) and vocational training (4.94%). All sociodemographic factors demonstrated statistically significant associations with the study variables, with p-values consistently less than 0.001.

The WOMAC Osteoarthritis Index Scores among elderly patients in this study revealed varying levels of pain, function and stiffness. The average pain score was 7.47 ± 3.59, with individual scores ranging from a minimum of 1 to a maximum of 17. For the function subscale, the mean score was 22.44 ± 10.03, ranging from 4 to 51. The stiffness subscale had an average score of 2.98 ± 1.37, with scores ranging from a minimum of 0 to a maximum of 7. The total WOMAC score, which combines pain, function and stiffness, had an average of 32.89 ± 13.90, with a range from 10 to 71. The thresholds for severe disability and severe pain were 51 and 15, respectively, and a portion of participants exceeded these thresholds, indicating significant impairment in daily activities and high levels of pain.

Table 1. Baseline sociodemographic of participants.

Characteristics	Frequency (n)	Percentage (%)	p value
Age			
60 69 years	54	66.67	<0.001
70 79 years	18	22.22	
80+ years	9	11.11	
Sex			
Female	59	72.84	<0.001
Male	22	27.16	
Marital Status			
Single	8	9.88	<0.001
Married	60	74.07	
Widowed	11	13.58	
Other	2	2.47	
Employment			
Unemployed	74	91.36	<0.001
Employed	7	8.64	
Education			
Elementary	27	33.33	<0.001
High School	39	48.15	
Bachelor's degree or higher	11	13.58	
Vocational	4	4.94	

Table 2. WOMAC osteoarthritis index scores among elderly patients.

WOMAC Subscale	Mean ± Standard Deviation	Minimum	Maximum
Pain (0-20)	7.47 ± 3.59	1	17
Function (0-68)	22.44 ± 10.03	4	51
Stiffness (0-8)	2.98 ± 1.37	0	7
WOMAC Total	32.89 ± 13.90	10	71

The assessment of depression among elderly patients with osteoarthritis revealed that albeit 48.15% were categorized as normal (0-4) on the Geriatric Depression Scale (GDS), a significant number (37.04%) had mild depression (5-8), and 14.81% had moderate depression (9-11), while no participants had severe depression. In terms of joint pain, majority (56.79%) experienced knee pain, 14.81% had hip pain, and 28.40% reported pain in both the knee and hip. Regarding the number of painful joint sites, 71.60% had pain in one joint, while 28.40% had pain in more than one joint. As for comorbidities 19.75% had no comorbidities, 62.96% had one comorbidity, and 17.28% had more than one comorbidity. Lastly, only 3.70% of the participants required a gait aid, while 96.30% did not.

The correlation analysis between sociodemographic, clinical status and depression (as measured by the Geriatric Depression Scale) revealed that age had a positive correlation of 0.46 ($p = 0.64$), indicating a weak association, though not statistically significant. Gender, marital status, education and employment status all showed weak correlations with depression, with correlation coefficients of -0.12 ($p = 0.93$), 0.26 ($p = 0.79$), 0.03 ($p = 0.97$), and -0.16 ($p = 0.87$), respectively, and none were statistically significant. The number of comorbidities, number of joint pain sites, and the total WOMAC score also showed weak positive correlations of 0.45 ($p = 0.65$), 0.43 ($p = 0.66$), and 0.44 ($p = 0.66$), respectively, with depression, but none reached statistical significance.

Discussion

The results indicate that the majority of participants were in the 60-69 age group and predominantly female. The high marital status among participants indicates potential social support, which can be a protective factor in managing osteoarthritis. Additionally, a notable proportion of participants were unemployed. which could exacerbate feelings of isolation and depression, thus the need for comprehensive support systems[9]. Conversely, active engagement in the workforce may have significant physical and psychological implications, potentially influencing both their overall health and the management of

Table 3. Assessment of depression, site of joint pain, presence of comorbidities, and gait aid among elderly patients with osteoarthritis.

Variable	Category	Frequency	Percentage
Depression (GDS)	Normal (0 4)	39	48.15
	Mild (5 8)	30	37.04
	Moderate (9 11)	12	14.81
	Severe (12 15)	0	0
Site Joint Pain	Knee	46	56.79
	Hip	12	14.81
	Both	23	28.40
Number of Joint Pain	One site	58	71.60
	More than one site	23	28.40
Comorbidity	No comorbidity	16	19.75
	1 comorbidity	51	62.96
	More than 1 comorbidity	14	17.28
Gait Aid	Yes	3	3.70
	No	78	96.30

Table 4. Correlation between sociodemographic, clinical status and depression (GDS Score)

Category	Correlation Coefficient (r)	P value
Sociodemographic		
Age	0.46	0.64
Gender	0.12	0.93
Marital Status	0.26	0.79
Education	0.03	0.97
Employment Status	0.16	0.87
Number of Comorbidities	0.45	0.65
Number of Joint Pain Sites	0.43	0.66
WOMAC Total	0.44	0.66

osteoarthritis and depression[10]. The WOMAC scores revealed significant pain and functional limitations, with many participants reaching thresholds for severe disability. Despite the moderate to severe pain, most participants exhibited normal or mild depression, though a notable proportion experienced moderate depressive symptoms, potentially linked to pain and mobility issues. The presence of comorbidities in a large majority of patients (80.03%) complicates the management of osteoarthritis, highlighting the need for integrated care strategies that address both physical and mental health. Healthcare providers should consider these sociodemographic and clinical factors when designing interventions to proactively manage osteoarthritis in the elderly, particularly focusing on pain relief, and functional improvement, ultimately mitigating mental health impacts. For patients, this means the importance of comprehensive care plans that include pain management, physical therapy, and psychological support. The health system should aim to provide holistic care that considers the physical, emotional and social needs of elderly patients with osteoarthritis.

Similar findings have been reported by other studies on the relationship between osteoarthritis and depression in elderly populations. It was found that pain and functional limitations in osteoarthritis were strongly associated with higher levels of depression, which aligns with the current study's findings[11]. They noted that pain management and mobility support were critical in reducing depressive symptoms. Another study supports the finding that osteoarthritis leads to significant depression, but they emphasize that chronic pain's duration and intensity, rather than the number of joints affected, are the primary contributors to depressive symptoms[12]. Additionally, a study found that comorbidities, including hypertension and diabetes, worsened both physical and mental health outcomes in osteoarthritis patients, which was also evident in the current study, where a high prevalence of comorbidities was observed[13]. Thus, while physical health factors such as pain and function are critical, sociodemographic characteristics and comorbidities may also play significant roles in influencing depression, depending on the population studied[12,13].

This study had several limitations that must be considered when interpreting the results. The sample size may be too small to detect significant correlations between sociodemographic and clinical variables and depression, limiting the generalizability of the findings. Additionally, the cross-sectional design of the study means that causal relationships cannot be established, and the data collected at a single point in time may not fully capture the dynamic nature of osteoarthritis and its impact on mental health. The use of self-reported measures, such as the Geriatric Depression Scale (GDS) and WOMAC scores, could introduce response bias, as participants may underreport or overreport symptoms based on personal perceptions or social desirability. Furthermore, the lack of longitudinal data or follow-up may limit understanding of the long-term relationship between osteoarthritis symptoms and depression. Future research with larger, more diverse samples and longitudinal designs is needed to explore these relationships in greater depth. Despite these limitations, the study provides valuable insights into the complex interplay between physical and mental health in elderly individuals with osteoarthritis, and the results should be interpreted cautiously in the context of the broader body of evidence.

Conclusion and Recommendations

This study aimed to explore the relationship between osteoarthritis, depression, and socio-demographic factors among elderly patients. Despite weak correlations, the results showed a positive association between osteoarthritis-related pain and depression, particularly among individuals with comorbidities and those experiencing higher levels of pain and disability. It was also found that socio-demographic factors such as age, gender and marital status may affect the development and severity of both osteoarthritis and depression. This interplay between the study factors emphasizes the need for integrated and comprehensive care approaches in managing osteoarthritis that address both the physical and mental health implications. These approaches may involve multidisciplinary interventions and proactive screening among elderly patients with osteoarthritis.

Further studies are needed that follow through with longitudinal data to better understand the long-term effects of osteoarthritis on depression and functional capacity, as well as address the limitations of this study. Future research should examine the roles of socio-demographic variables and explore additional factors such as sleep quality, pain management strategies, and healthcare access and utilization, which contribute to the psychological impacts of osteoarthritis.

Conflict of Interest

The primary investigator declared no conflict of interest, and the study was funded solely by the primary investigator, ensuring independence in its conduct and reporting.

References

1. World Health Organization. Ageing and health [Internet] 2022 [cited 2024 Dec 25]. Available from: https://www.who.int/news-room/fact-sheets/detail/ageing-and-health
2. Philippine Statistics Authority. Philippine population surpassed 100 million [Internet] 2022 [cited 2024 Dec 25]. Available from: https://psa.gov.ph/population-and-housing/statistical-tables
3. Arthritis Foundation. Osteoarthritis [Internet] 2022 [cited 2024 Dec 25]. Available from: https://www.arthritis.org/diseases/osteoarthritis
4. Hunter DJ, Schofield D, Callander E. The individual and socioeconomic impact of osteoarthritis. Nat Rev Rheumatol 2014;17(9): 534-41. https://doi.org/10.1038/s41584-021-00642-0
5. Vina E, Hausmann L, Obrosky D, Youk A, Ibrahim S, Weiner D, Gallagher R, Kwoh C. Social and psychological factors associated with oral analgesic use in knee osteoarthritis management.
6. Godziuk K, Hawker GA. Obesity and body mass index: Past and future considerations in osteoarthritis research. Osteoarthritis Cartilage 2024; 32(4): 452–9. https://doi.org/10.1016/j.joca.2024.02.003
7. Murphy L, Schwartz TA, Helmick CG, Renner JB, Tudor G, Koch G, Jordan JM. Lifetime risk of symptomatic knee osteoarthritis. Arthritis Care Res 2008; 72(6): 882-8. https://doi.org/10.1002/acr.24147
8. Martinez B, Bertulfo DJ, Magsambol J. Addressing mental health challenges in the Philippines. J Comm Health 2020; 45(3): 586-92. https://doi.org/10.1007/s10900-020-00791-3

9. Arena AF, Mobbs S, Sanatkar S, Williams D, Collins D, Harris M, Harvey SB, Deady M. Mental health and unemployment: A systematic review and meta-analysis of interventions to improve depression and anxiety outcomes. J Affect Disord 2023; 335: 450–72. https://doi.org/10.1016/j.jad.2023.05.027
10. Mori K, Odagami K, Inagaki M, Moriya K, Fujiwara H, Eguchi H. Work engagement among older workers: a systematic review. J Occup Health 2023; 66(1). https://doi.org/10.1093/joccuh/uiad008
11. Rathbun A, Shardell M, Stuart E, Yau G, Gallo J, Schuler S, Hochberg M. Pain severity as a mediator of the association between depressive symptoms and physical performance in knee osteoarthritis. Osteoarthritis Cartilage 2018; 26(11): 1453–60. https://doi.org/10.1016/j.joca.2018.07.016
12. Carlesso L, Jafarzadeh S, Stokes A, Felson D, Wang N, Frey-Law L, Lewis C, Nevitt M, Neogi T. Depressive symptoms and multi-joint pain partially mediate the relationship between obesity and opioid use in people with knee osteoarthritis. Osteoarthritis Cartilage 2022; 30(9): 1263–9. https://doi.org/10.1016/j.joca.2022.06.002
13. Sharma A, Kudesia P, Shi Q, Gandhi R. Anxiety and depression in patients with osteoarthritis: impact and management challenges. Open Access Rheumatol Res Rev 2016; 8: 103–13. https://doi.org/10.2147/OARRR.S93516
14. Lally J, Tully J, Samaniego R. Mental health services in the Philippines. BJPsych Int 2019; 16(3): 62–4. https://doi.org/10.1192/bji.2018.34
15. Wang ST, Ni GX. Depression in osteoarthritis: Current understanding. Neuropsychiatr Dis Treat 2022; 18: 375–89. https://doi.org/10.2147/NDT.S346183