Indian Journal of Forensic Medicine and Toxicology
Volume 16 No. 3, July-September 2022
DOI: http://dx.doi.org/xxxxx/ijfmt.xxxx.16322.51

Gender Differences in Pain Intensity and Functional Performance among Older Adults with Knee Pain living in Suburban of Bangkok, Thailand

Pattaraporn Piwong[1], Tiwaporn Junkhaw[2], Ratana Somrongthong[3]

[1]Ph.D student, College of Public Health Sciences, Chulalongkorn University,Bangkok,Thailand, [2]Lecturer, Phetchabun Provincial Public Health Office, Thailand, [3]Associate Professor of Public health,College of Public Health Sciences, Chulalongkorn University, Bangkok ,Thailand.

How to cite this article: Pattaraporn Piwong, Tiwaporn Junkhaw, Ratana Somrongthong. Gender Differences in Pain Intensity and Functional Performance among Older Adults with Knee Pain living in Suburban of Bangkok, Thailand. Indian Journal of Forensic Medicine and Toxicology 2022;16(3):287-291.

Abstract

Purpose of study: To investigate gender-related differences in pain intensity functional performance among older adults with knee pain who live in the suburban area of Bangkok, Thailand.

Method: This cross-sectional study recruited 220 older adults who suffering from knee pain, aged between 50-65 years(male=79, female =141). A convenience sampling method was used to select the participants in this study, each participant underwent an actual functional performance test such as TUG, 30CST, and completed self-report questionnaires consist of demographic characteristics, NPRS, and KOSADLS. An independent samples t-test was used as appropriate to determine gender differences.

Results: Males and females had a difference in two aspects, females have significantly more pain intensity(NPRS scores of female:4.88 ±1.20; male: 3.99 ±1.27, $p < 0.001$), and poorer functional performance also more impairment on a specific functional task such as KOSADLS scores (female:71.74 ±7.49; male:74.67 ±5.01,$p< 0.01$), TUG scores(female:11.66 ±1.11; male:10.81 ±1.06, $p< 0.001$) and 30CST scores (females:11.23 ±1.40; male:12.50 ±1.44, $p < 0.001$).

Conclusion: The differences between genders regarding pain intensity and functional performance which are assessed by self-report measure and actual functional performance test, these two methods provide valuable information. The difference evaluation and preventive health care strategies based on gender differences would be considered in Thai older adults with knee pain to improve their knee function and reduce the pain.

Keywords: Gender; Older adults; Knee pain; Functional performance.

Introduction

Knee pain is a major public health issue causing disability in older adults worldwide[1], with individuals often report difficulty walking or climbing stairs. One of the known influencing factors of knee pain is female gender which is more affected and leading to a higher prevalence of knee pain.[2] Complaints of knee joint pain are common in female older adults.[3] Nearly 50% of older adults aged 50 years and over report knee pain during one year period and of these approximately half of them (50%)

Corresponding Author: Ratana Somrongthong, Associate Professor, College of Public Health Sciences, Chulalongkorn University, Thailand. Institute Building 2-3, SoiChulalongkorn 62, Phyathai Rd., Pathumwan, Bangkok 10330, Thailand.

Email: Ratana3@chula.co.th

had some restrictions of their activities of daily living and reduction in quality of life.[4]

Gender difference in the demographic characteristics of older adults with knee pain is probable affect their health-seeking behavior, access to health care for their musculoskeletal problem.[5] Previous studies have reported that gender differences play a vital role in the level of knee pain and knee functional performance.[6] Although females have a higher prevalence of knee pain[7], gender-related differences among older adults with knee pain have not been adequately studied also received scant attention. Consequently, there were a few studies related to gender differences in pain intensity levels among knee pain older.[8,9] To date, no study has examined gender-related differences regarding pain intensity levels and functional performance in these older adults group, especially in a suburban area of Bangkok, Thailand. Consequently, it is essential to explore gender-related differences among Thai older adults who had knee pain. Although the assessment of functional performance in knee pain older adults is often based on self-reported measures rather than actual functional performance measures.[10] On the other hand, an inclusive assessment of the functional performance of older adults with knee pain should apply not only self-report measures but also, actual functional performance measures. Therefore, the purpose of this study was to assess gender differences in pain intensity and functional performance among older adults with knee pain who live in suburban areas of Bangkok, Thailand which assess by both self-reported measurement and actual functional performance tests.

Materials and Method

A descriptive cross-sectional study was used. The older adults both males and females, aged between 50 to 65 years, living in suburban Bangkok also had been diagnosed with knee pain by physicians at the selected health center of Bangkok were eligible for the study. In total, 220 older adults were recruited using the convenience sampling method. Data were collected from August to October 2020. The inclusion criteria were as follows: (1) having knee pain either right, left, or both sides of the knee during movement, knee pain at least on most days in a week or more within the past 12 months. (2) Able to read and understand Thai language. (3) Can perform activities of daily living without assistance. (4) Willingness to participate in the study. Regarding older adults who diagnosed osteoarthritis knee with radiologically confirmed or had previous knee replacement surgery, cognitive impairment, vision, and hearing impairment were excluded from this study.

Measurements

Demographic characteristics data

Demographic characteristics data of each participant were collected by self-reported questionnaires such as gender, age. For height and body weight were obtained without shoes or heavy clothing on a suitable calibrated weighing machine via standard techniques. Body mass index (BMI) was calculated by dividing the weight in kilogram by the square of height in meters(kg/m^2). In this study, BMI was categorized by using BMI categories in Asian populations as the following:underweight (BMI <18.5), normal weight (BMI 18.5-22.9), overweight (BMI 23-24.9), and obese (BMI > 25).[11]

Pain intensity

The numeric pain rating scale (NPRS) is valuable in describing even the most severe levels of knee pain, and the number of levels makes it sensitive to clinically applicable changes in knee pain which is a valid and reliable measurement tool to assess knee pain intensity for older adults in this study.[12] Participants were requested to indicate the knee pain experienced over the past week, The NPRS has a range from 0-10, which is 0 for no pain and 10 for the most severe pain, and cut-off point of NPRS scores ≤ 3 correspond to mild pain, scores 4-6 to moderate pain and scores ≥7 to severe pain.[13]

Functional performance test

1. Knee Outcome Survey Activities of Daily Living Scale (KOS-ADLS)

The KOS-ADLS is a self-reported questionnaire consists of 14 items thatare reliable and valid measurement tool for assessing symptoms of the knee and limitation of the knee joint in older adults with daily activities of life. The first 6 items(subscale "symptoms") to measure symptoms involved pain, stiffness, swelling, instability, weakness, and limping. Then follow by 8 items (as subscale "activities of daily living") to assess participants' functional limitation of the knee through their daily activities for example walking, climbing and descending stairs, standing, squatting, kneeling, and stand from a chair. Each item

was scored on a six-point Likert scale (ranging from 0 to 5 per item), the maximum score is 70 and the total score can be expressed as 0 to 100% (the lower score defined as worse symptoms and more serious about functional disability).[14]

2. Timed up and Go (TUG)

The Timed Up and Go test was selected to evaluate older's function mobility in this study, this test has been suggested as a simple screening tool for the older population. Testing was implemented by researchers following the original protocol.[15] A standard chair with an armrest is used as equipment for the test. The participants were asked to stand up from an armchair, walk 3 meters at their normal pace, turn then walk back again, and sit down on the chair. To completed the test, participants were performed twice consecutively, an average score in seconds as the TUG test score was recorded. A TUG score of participants ≤ 10 seconds refers to good functional performance, a score ≥13.5 seconds indicates a high risk of fall.[15-17]

3. 30-Second Chair Stand (30CST)

The 30-second chairst and test is widely used to measure the strength of lower limbs in older adults, this test is easy to complete and score.[18] To perform the test by researchers asked participants to stand up with arms crossed on the chest from a standard chair (with a 40 centimeters of seat height, without armrests), and then return to sitting down as many times as safely within 30 seconds. The participants suggested to practice 1-2 times before completing the test, if they use their arms to stand, the score is recorded "0". All older adults are instructed to complete the test within 30 seconds by performed many full stands as possible and fully sit between each stand. Researchers count the total number of times as fully stands within 30 seconds and record it. The cut-off point score defines as lower than 12 times meaning that older adults have a low functional performance.[19]

Data collection procedure

The researchers contacted and visited all participants at their houses initially to recruit them into the study. The data collection process was accomplished in 12 weeks at a selected area in Saimai district, suburban of Bangkok. Participants completed a face to face interviews to answered self-reported questionnaires included demographic data, NPRS, KOS-ADLS. Moreover, the actual functional performance tests consist of TUG and 30CST were instructed by researchers under the standard protocol.

Data analysis

All data were analyzed by IBM SPSS version 22 for windows. Descriptive statistics involved frequency, mean and standard deviation (SD) were calculated for all outcomes in this study. A t-test for independent samples was conducted to assess gender differences. Statistical significance was considered at *P*-value less than 0.05.

Results

Table 1: Demographic characteristics (mean ± SD) of participants by gender and comparison between genders, n=220

Variables	Male (n= 79)	Female (n= 141)	P value
Age (years)	59.77±2.73	58.47 ±3.31	< 0.01*
Weight (kg)	64.62±4.32	63.64 ±4.52	0.11
Height (cm)	164.29±4.74	163.42 ±4.17	0.15
BMI[t] (kg/m^2)	23.99±1.00	23.86 ±1.14	0.39

* *P*-value < 0.01; [t]Ref WHO,BMI for Asian populations(11)

There were 220 participants (79 male and 141 female) comply with the study's inclusion and exclusion criteria. Demographic characteristics of participants by gender are shown in Table1.

Table 2: Functional performance variables (mean ± SD) of participants by gender and comparison between genders, n= 220

Variables	Male (n=79)	Female (n=141)	P value
NPRS	3.99 ±1.27	4.88 ±1.20	< 0.001**
KOSADLS	74.67 ±5.01	71.74 ±7.49	< 0.01*
TUG (sec)	10.81 ±1.06	11.66 ±1.11	< 0.001**
30CST [t]	12.50 ±1.44	11.23±1.40	< 0.001**

**P*-value < 0.01, ***P*-value <0.001; NPRS: Numeric pain rating scale; KOS-ADLS: Knee Outcome Survey Activities of Daily Living Scale; 30CST: 30-second chair stand test;TUG: Timed up and go test; [t] score are number of chair stand in 30 second

Table 2 shows the function performance results of participants, the statistical analysis revealed significant gender differences for NPRS, KOSADLS, TUG, and 30CST. Furthermore, the female reported greater knee pain levels, lower KOSADLS scores, lower levels of 30CST, and poorer TUG performance when compared to the male.

Discussion

The present study found that female older adults represented more than half of all participants (64.1%), which is consistent with the previous study as the higher prevalence of knee pain among females. [(2)] Furthermore, we found that female participants had a higher knee pain intensity in comparison with male participants, which is showed the same result of Peat et al.,[20] who also demonstrated there was a difference between males and females in an analysis of pain intensity related to gender differences among older adults in the community. A current study related to musculoskeletal pain, in concurrence with the prior literature,revealed clear gender differences in pain intensity with the female having a greater pain intensity and it's linked to hormonal change and psychological factors.[21] The differences in the results of this study might be associated with the differences in older adults' background characteristics such as age.

Among both gender, we also found females had significantly lower functional performance in every aspect (eg. KOSADLS, TUG, and 30CST). These findings are in accordance with most previous studies.[14,22] The results of this study revealed that knee pain had a greater impact on functional performance in females compared to males. This indicates that knee pain had more adversely affect lower limbs function among females. One particular interest, there are conflicting findings from the literature about the reported functional performance test in gender differences of those who had knee pain, while some have found that females tend to have worse functional performance than males even measure by self-report and actual functional performance test[22] same as this study, others have not found the differences between gender.[23] From their conflicting reported might stem from different background characteristics of older participants and/or pain catastrophizing of the study population compared to others. Our findings highlight the importance of using a variety of measurement tools when assessing knee pain among older people.

Conclusion

In comparison with males, females reported greater knee pain intensity, lower functional performance as evaluated by the self-report and actual functional performance test. Accordingly, a disparity of knee pain in Thai older adults between males and females was observed and exits prior to the onset of knee pain in this age group. Our study results contribute to the literature that self-report measures and actual functional performance tests could be used in combination with each other to gain potentially greater benefit to developing an effective health prevention program for the specifics needs among knee pain older adults.

Source of Funding: Supported by the 90th Anniversary of Chulalongkorn University Scholarship under the Ratchadaphisek Somphot fund, research project no. (GCUGR1125621049D)

Conflict of Interest: None

Ethical Clearance: The study was approved by The Research Ethics Review Committee for Research Involving Human Research Participant, Health Science Group, Chulalongkorn University, Bangkok, Thailand (COA No.166/2020).

References

1. Porcheret M, Jordan K, Croft P, Society icwtPCR. Treatment of knee pain in older adults in primary care: development of an evidence-based model of care. Rheumatology. 2006;46(4):638-48.
2. Kim IJ, Kim HA, Seo Y-I, Jung YO, Song YW, Jeong JY, et al. Prevalence of knee pain and its influence on quality of life and physical function in the Korean elderly population: a community based cross-sectional study. J Korean Med Sci. 2011;26(9):1140-6.
3. Thiem U, Lamsfuß R, Günther S, Schumacher J, Bäker C, Endres HG, et al. Prevalence of Self-Reported Pain, Joint Complaints and Knee or Hip Complaints in Adults Aged ≥ 40 Years: A Cross-Sectional Survey in Herne, Germany. PLOS ONE. 2013;8(4):e60753.
4. Porcheret M, Jordan K, Jinks C, Society PCicwtPCR. Primary care treatment of knee pain—a survey in older adults. Rheumatology. 2007;46(11):1694-700.
5. Mann EG, VanDenKerkhof EG, Johnson A, Gilron I. Help-seeking behavior among community-dwelling adults with chronic pain. Canadian Journal of Pain. 2019;3(1):8-19.
6. Peterson LJ, Meng H, Dobbs D, Hyer K. Gender Differences in Mobility Device Use Among U.S. Older Adults. The Journals of Gerontology: Series B. 2016;72(5):827-35.
7. Cheon Y-H, Kim H-O, Suh YS, Kim MG, Yoo W-H, Kim RB, et al. Relationship between decreased lower extremity muscle mass and knee pain severity in both the general population and patients with knee osteoarthritis: Findings from the KNHANES V 1-2. PLOS ONE. 2017;12(3):e0173036.
8. Peterson CK, Humphreys BK, Hodler J, Pfirrmann CWA. Gender differences in pain levels before and after treatment: a prospective outcomes study on 3,900 Swiss patients with musculoskeletal complaints. BMC Musculoskeletal Disorders. 2012;13(1):241.
9. Stubbs D, Krebs E, Bair M, Damush T, Wu J, Sutherland J, et al. Sex Differences in Pain and Pain-Related Disability among Primary Care Patients with Chronic Musculoskeletal Pain. Pain Medicine. 2010;11(2):232-9.
10. Farrokhi S, Chen Y-F, Piva SR, Fitzgerald GK, Jeong J-H, Kwoh CK. The Influence of Knee Pain Location on Symptoms, Functional Status, and Knee-related Quality of Life in Older Adults With Chronic Knee Pain: Data From the Osteoarthritis Initiative. Clin J Pain. 2016;32(6):463-70.
11. Consultation WE. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet (London, England). 2004;363(9403):157-63.
12. Williamson A, Hoggart B. Pain: a review of three commonly used pain rating scales. Journal of clinical nursing. 2005;14(7):798-804.
13. Boonstra AM, Stewart RE, Köke AJ, Oosterwijk RF, Swaan JL, Schreurs KM, et al. Cut-off points for mild, moderate, and severe pain on the numeric rating scale for pain in patients with chronic musculoskeletal pain: variability and influence of sex and catastrophizing. Frontiers in psychology. 2016;7:1466.
14. Irrgang JJ, Snyder-Mackler L, Wainner RS, Fu FH, HARNER CD. Development of a patient-reported measure of function of the knee. JBJS. 1998;80(8):1132-45.
15. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. Journal of the American geriatrics Society. 1991;39(2):142-8.
16. Bischoff HA, Stähelin HB, Monsch AU, Iversen MD, Weyh A, von Dechend M, et al. Identifying a cut-off point for normal mobility: a comparison of the timed 'up and go' test in community-dwelling and institutionalised elderly women. Age Ageing. 2003;32(3):315-20.
17. Lusardi MM, Pellecchia GL, Schulman M. Functional performance in community living older adults. Journal of Geriatric Physical Therapy. 2003;26(3):14.
18. Jones CJ, Rikli RE, Beam WC. A 30-s chair-stand test as a measure of lower body strength in community-residing older adults. Research quarterly for exercise and sport. 1999;70(2):113-9.
19. Knoop J, Ostelo RWJG, van der Esch M, de Zwart A, Bennell KL, van der Leeden M, et al. Construct validity of the OCTOPuS stratification algorithm for allocating patients with knee osteoarthritis into subgroups. BMC Musculoskeletal Disorders. 2021;22(1):633.
20. Peat G, McCarney R, Croft P. Knee pain and osteoarthritis in older adults: a review of community burden and current use of primary health care. Annals of the Rheumatic Diseases. 2001;60(2):91.
21. Gutiérrez Lombana W, Gutiérrez Vidál SE. Pain and gender differences. A clinical approach. Colombian Journal of Anestesiology. 2012;40(3):207-12.
22. Zasadzka E, Borowicz AM, Roszak M, Pawlaczyk M. Assessment of the risk of falling with the use of timed up and go test in the elderly with lower extremity osteoarthritis. Clin Interv Aging. 2015;10:1289-98.
23. Elboim-Gabyzon M, Rozen N, Laufer Y. Gender differences in pain perception and functional ability in subjects with knee osteoarthritis. International Scholarly Research Notices. 2012;2012.