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Validation of the Indonesian version of Western Ontario and McMaster Universities osteoarthritis index in pre-elderly and elderly with osteoarthritis

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ABSTRACT

Background: This study aimed to examine the psychometric performance of the Western Ontario and McMaster Universities osteoarthritis index (WOMAC) version Indonesia used in pre-elderly and older adults in Indonesia with knee osteoarthritis and hip osteoarthritis.

Methods: This study obtained samples from 124 pre-elderly and elderly individuals affected by knee and hip osteoarthritis in the Denpasar, Badung, and Gianyar areas to check the reliability and validity of the Indonesia WOMAC from Karsten et al. (2019). Knee and hip osteoarthritis were examined using the American College of Rheumatology (ACR) clinical criteria.

Results: The Indonesian WOMAC was valid with a score of (0.809-0.964) for knee osteoarthritis, (0.870-0.982) for hip osteoarthritis, and (0.744-0.944) for knee osteoarthritis and hip osteoarthritis. It is reliable with Cronbach's alpha score of ($\alpha = 0.992$) for knee osteoarthritis, ($\alpha = 0.996$) for hip osteoarthritis, and ($\alpha = 0.980$) for knee osteoarthritis and hip osteoarthritis in pre-elderly and elderly patients.

Conclusion: Based on the research results, the Indonesian WOMAC was valid and reliable for knee and hip osteoarthritis and is used in pre-elderly and elderly patients.

Keywords: elderly, hip osteoarthritis, Indonesian WOMAC, knee osteoarthritis, pre-elderly, reliability, validity.
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INTRODUCTION

A person's age will continue to increase as time passes, and nothing can be done to prevent this.[1] Indonesia is one of the countries with an old-structure population because the percentage of the elderly population reaches more than 7% of the total population of Indonesia. Even though many ways have been done to prevent a person's aging, the human body's systems will still weaken or experience a decline in function as a person ages, so a person's age can be a factor in increasing the risk of developing certain diseases.[2] Diseases closely related to a person's age are diseases related to human movement systems such as bones and muscles. One of these diseases can be osteoarthritis.[3]

Osteoarthritis is a chronic degenerative disease that affects the joints from dynamic pathology with multifactorial etiology.[4] Osteoarthritis causes loss of articular cartilage, subchondral sclerosis, cyst formation, and formation of osteophytes.[5,6] Cartilage tissue on articular joints will rub against each other when someone has osteoarthritis. It will cause pain, loss of functional movement, and decreased quality of life.[7] The higher the intensity of the pain, the lower the physical functional abilities of the pre-elderly and older people will automatically require the help of other people in daily life.[8] Vice versa, if someone who is pre-elderly or elderly feels a lower intensity of pain, the higher their physical functional ability, and the less likely they are to ask for help to carry out daily activities.[9] Prevalence of osteoarthritis in Asia is estimated to increase from 2008, starting from 6.8% to 16.2% in 2040. Data contained in the Indonesian Ministry of Health show the number of osteoarthritis sufferers in Indonesia reaches more than 11.5% of all people in Indonesia. This means that there are 1 to 10 Indonesians who suffer from osteoarthritis.[10] The most common measuring tool used to carry out functional assessments in individuals with knee and hip osteoarthritis in various countries is WOMAC.[11]

WOMAC is a questionnaire for evaluating the condition of knee and hip osteoarthritis patients, especially in pre-elderly and elderly individuals, by assessing pain, stiffness, and physical function of the knee and hip joints.[12] The validity and reliability of the questionnaire may vary when used in countries with language differences, which can affect its validity and reliability when used. The WOMAC, previously translated into Indonesian, has been tested with samples of knee osteoarthritis patients in both knees and declared valid and reliable. However, the samples did not include patients with hip

OA or knee and hip OA, so its validity and reliability are limited. This study is done with the hopes that the Indonesian version of WOMAC can be used in clinical applications and make it easier for patients to understand each question from WOMAC, especially in Indonesia.

METHODS

This quantitative descriptive research used a cross-sectional study to determine the validity and reliability of the Indonesian WOMAC questionnaire from Karsten et al. (2019). The target population in this study was pre-elderly and elderly with knee and hip osteoarthritis. The reachable population in this study was pre-elderly and elderly who experience knee and hip osteoarthritis diagnosed using clinical criteria of the American college of rheumatology (ACR) carried out by a physiotherapist assigned to the research at a location agreed upon by the sample population group around the Denpasar, Badung, and Gianyar areas. Sampling was carried out from October 2023 to March 2024.

The sample size in this study was determined based on the ratio of subjects to items in the questionnaire, with a ratio of 5:1.[14] Indonesian WOMAC has 24 items, so the sample required for this research was 120 people. This research used purposive sampling with previously established inclusion and exclusion criteria. The inclusion criteria in this study included that the subject was pre-elderly (45-59 years), elderly (60-69 years), or high-risk elderly (70 years and over or 60 years with health problems), the subject was diagnosed with knee or hip osteoarthritis (OA) based on ACR criteria, and willing to fill out informed consent. Meanwhile, the exclusion criteria in this study included subjects with a history of total knee replacement (TKR) or total knee arthroplasty (TKA), total hip replacement (THR) or total hip arthroplasty (THA), as well as subjects with a history of injury or surgery of the knee and the hip during the last 2 weeks known through interviews.

Data analysis was carried out statistically using software in the form of microsoft excel and SPSS 25 to test the data obtained, including univariate analysis to determine demographic data or characteristics of participants in the study such as age, gender, body mass index (BMI), knee osteoarthritis or hip osteoarthritis and the affected side, followed by Construct Validity analysis using Pearson Product Moment, and Reliability analysis using Cronbach's alpha. Cronbach's alpha coefficients of 0.7 or higher were deemed acceptable.[15]

RESULTS

Based on Table 1, there were 124 subjects, consisting of 45 males and 79 females. More than half the subjects were elderly or over 60 (71%). Most subjects were from Gianyar (n=55) and Denpasar (n=49). The rest were from Badung (n=20). A total of 58 subjects were weighing around 50-60 kg. Most subjects' height was 156-169 cm (n=86). The BMI was measured using the height and weight of the subjects. The result showed most subjects had normal BMIs (n=84). A total of 56 subjects had knee OA, 15 had hip OA, and 53 had knee and hip OA.

This is shown in Table 2, the data from the validity test results of the Indonesian WOMAC questionnaire on the knee OA sample. As many as 56 samples obtained a two-way significance value ($p < 0.001$) in each of all questionnaire question items against the total value of each question. The count value was more significant than the total value of each question. The total score on each of these questions and the calculated r-value is greater than the r-table value, so it can be said that the question is correlated significantly to the total score with the smallest (0.809) and largest (0.964) values that exceed the value (0.428) for knee OA sufferers.

In Table 3, which is the data from the validity test results of the Indonesian WOMAC questionnaire on samples who have hip osteoarthritis, as many as 15 samples obtained two-way significance values significance value ($p< 0.001$) in each of all questionnaire question items to the total value of each question and the

Table 1. Frequency distribution of pre-elderly and elderly characteristics

Variable	n	(%)
Age, years		
50-59 (pre elderly)	36	29
Over 60 (elderly)	88	71
Sex		
Male	45	36.3
Female	79	63.7
Domicile		
Denpasar	49	39.5
Badung	20	16.1
Gianyar	55	44.4
Weight, kg		
27-49	35	28.2
50-60	58	46.8
61-80	31	25
Height, cm		
136-154	27	21.8
156-169	86	69.4
170-180	11	8.9
BMI, kg/m^2		
Underweight	22	17.7
Normal	84	67.7
Overweight	15	12.1
Obesitas	3	2.4
Osteoarthritis type		
Knee	56	45.2
Hip	15	22.1
Knee and hip	53	42.7

%, percentage; n, frequency; kg; kilograms, cm; centimeters, m; meters, BMI; body mass index

Table 2. Indonesian WOMAC validity testing on knee OA, hip OA, and knee and hip OA

No	Question	r value	r table	*p*-Value	Conclusion
1	seberapa nyeri yang anda rasakan saat berjalan di tempat yang rata	0.905	0.428	0.000	Valid
2	seberapa nyeri yang anda rasakan saat Naik atau turun tangga	0.917	0.428	0.000	Valid
3	seberapa nyeri yang anda rasakan saat Tidur dimalam hari	0.898	0.428	0.000	Valid
4	seberapa nyeri yang anda rasakan saat Duduk atau berbaring	0.914	0.428	0.000	Valid
5	seberapa nyeri yang anda rasakan saat Berdiri tegak	0.908	0.428	0.000	Valid
6	Seberapa berat kaku yang anda rasakan saat Awal bangun tidur di pagi hari	0.817	0.428	0.000	Valid
7	Seberapa berat kaku yang anda rasakan saat Setelah duduk atau berisirahat	0.809	0.428	0.000	Valid
8	Seberapa parah kesulitan yang anda alami saat Turun tangga	0.943	0.428	0.000	Valid
9	Seberapa parah kesulitan yang anda alami saat Naik tangga	0.912	0.428	0.000	Valid
10	Seberapa parah kesulitan yang anda alami saat Bangun dari duduk	0.935	0.428	0.000	Valid
11	Seberapa parah kesulitan yang anda alami saat Berdiri	0.924	0.428	0.000	Valid
12	Seberapa parah kesulitan yang anda alami saat Membungkuk menyentuh lantai	0.951	0.428	0.000	Valid
13	Seberapa parah kesulitan yang anda alami saat Berjalan dipermukaan yang rata	0.946	0.428	0.000	Valid
14	Seberapa parah kesulitan yang anda alami saat Keluar/masuk mobil	0.950	0.428	0.000	Valid
15	Seberapa parah kesulitan yang anda alami saat Pergi berbelanja	0.956	0.428	0.000	Valid
16	Seberapa parah kesulitan yang anda alami saat Memakai kaus kaki/stocking	0.962	0.428	0.000	Valid
17	Seberapa parah kesulitan yang anda alami saat Bangun dari tempat tidur	0.949	0.428	0.000	Valid
18	Seberapa parah kesulitan yang anda alami saat Melepas kaus kaki/stocking	0.962	0.428	0.000	Valid
19	Seberapa parah kesulitan yang anda alami saat Berbaring di tempat tidur	0.964	0.428	0.000	Valid
20	Seberapa parah kesulitan yang anda alami saat Keluar/masuk bak mandi (melangkah setinggi±50cm)	0.922	0.428	0.000	Valid
21	Seberapa parah kesulitan yang anda alami saat Duduk	0.954	0.428	0.000	Valid
22	Seberapa parah kesulitan yang anda alami saat Duduk atau bangun dari toilet duduk	0.904	0.428	0.000	Valid
23	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang berat	0.821	0.428	0.000	Valid
24	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang ringan	0.962	0.428	0.000	Valid

OA, osteoarthritis; WOMAC, western ontario and mcMaster universities osteoarthritis index

calculated r-value is greater than the value of r table. Therefore, the questions on the questionnaire are significantly correlated to the total score, with the smallest (0.870) and largest (0.982) values exceeding the value (0.760) for hip OA.

Table 4 shows the data from the validity test results of the Indonesia WOMAC in knee and hip OA samples in as many as 53 samples. Samples obtained a two-way significance value ($p < 0.001$) in each questionnaire question item to the total value of each question and the value of the r. The calculated r value is greater than the r table value. Therefore, the questions on the questionnaire are significantly correlated with the total value of the question. Questionnaires are significantly correlated to the total score with the smallest (0.744) and largest (0.944), which exceeds the value (0.439) for knee and hip OA.

Table 5 shows scale reliability measured using Cronbach's alpha. For the knee OA variable, Cronbach's alpha was 0.992 with 24 items. For the hip OA variable, Cronbach's alpha was 0.996 with 24 items. For the knee and hip OA variables, Cronbach's alpha was 0.980 with 24 items.

DISCUSSION

Participants were dominated by older adults, which aligns with research by Putra et al. in 2019, which stated that osteoarthritis, especially in the knees, was dominated by seniors with an average age of 59 years and over.[16] It is also said that the older the person's age, the higher the risk of developing osteoarthritis, following the results of another research by Sacitharan in 2019, which shows that older people dominate the number of participants.[7] Similarly, previous research by Karsten et al. in 2019 found the number of participants was dominated by women, which is in line with the gender of the participants collected in this research. It is known that women experience osteoarthritis more often than men, and the risk increases with age and body mass.[13]

In previous research by Shannen Karsten et al. In 2019, participants in the study weighed 38-98 kg with an average body weight of 64.38 kg. Although body weight is one of the risks of developing osteoarthritis in the hips and knees, what increases the risk is a person's body mass or BMI.[17] Participants' height and weight will be used to measure BMI based on research by Karsten et al. in 2019.[13] The average height of participants was slightly different compared to this study, which was 154.63 cm.[10] According to the Indonesian ministry of health, the categories of BMI are underweight (<18.5), average (18.5-25.0), overweight (>25.0-27.0), and

Table 3. Indonesian WOMAC validity testing on hip OA

No	Question	r value	r table	*p*-Value	Conclusion
1	seberapa nyeri yang anda rasakan saat berjalan di tempat yang rata	0.950	0.760	0.000	Valid
2	seberapa nyeri yang anda rasakan saat Naik atau turun tangga	0.950	0.760	0.000	Valid
3	seberapa nyeri yang anda rasakan saat Tidur dimalam hari	0.950	0.760	0.000	Valid
4	seberapa nyeri yang anda rasakan saat Duduk atau berbaring	0.950	0.760	0.000	Valid
5	seberapa nyeri yang anda rasakan saat Berdiri tegak	0.950	0.760	0.000	Valid
6	Seberapa berat kaku yang anda rasakan saat Awal bangun tidur di pagi hari	0.870	0.760	0.000	Valid
7	Seberapa berat kaku yang anda rasakan saat Setelah duduk atau berisirahat	0.870	0.760	0.000	Valid
8	Seberapa parah kesulitan yang anda alami saat Turun tangga	0.963	0.760	0.000	Valid
9	Seberapa parah kesulitan yang anda alami saat Naik tangga	0.963	0.760	0.000	Valid
10	Seberapa parah kesulitan yang anda alami saat Bangun dari duduk	0.965	0.760	0.000	Valid
11	Seberapa parah kesulitan yang anda alami saat Berdiri	0.965	0.760	0.000	Valid
12	Seberapa parah kesulitan yang anda alami saat Membungkuk menyentuh lantai	0.959	0.760	0.000	Valid
13	Seberapa parah kesulitan yang anda alami saat Berjalan dipermukaan yang rata	0.949	0.760	0.000	Valid
14	Seberapa parah kesulitan yang anda alami saat Keluar/masuk mobil	0.981	0.760	0.000	Valid
15	Seberapa parah kesulitan yang anda alami saat Pergi berbelanja	0.981	0.760	0.000	Valid
16	Seberapa parah kesulitan yang anda alami saat Memakai kaus kaki/ stocking	0.976	0.760	0.000	Valid
17	Seberapa parah kesulitan yang anda alami saat Bangun dari tempat tidur	0.966	0.760	0.000	Valid
18	Seberapa parah kesulitan yang anda alami saat Melepas kaus kaki/ stocking	0.982	0.760	0.000	Valid
19	Seberapa parah kesulitan yang anda alami saat Berbaring di tempat tidur	0.982	0.760	0.000	Valid
20	Seberapa parah kesulitan yang anda alami saat Keluar/masuk bak mandi (melangkah setinggi±50cm)	0.976	0.760	0.000	Valid
21	Seberapa parah kesulitan yang anda alami saat Duduk	0.982	0.760	0.000	Valid
22	Seberapa parah kesulitan yang anda alami saat Duduk atau bangun dari toilet duduk	0.982	0.760	0.000	Valid
23	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang berat	0.964	0.760	0.000	Valid
24	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang ringan	0.982	0.760	0.000	Valid

OA, osteoarthritis; WOMAC, Western Ontario and McMaster Universities osteoarthritis index

obesity (>27.0).

There are several statements regarding BMI being one of the risks of knee or hip OA because the higher the BMI, the greater the body mass the hips and knees will support for weight-bearing.[18] Therefore, BMI is one of the risk factors for knee and hip OA. However, in this study, the number of participants with an average BMI was more significant than other BMIs, showing BMI as one of many risk factors for osteoarthritis.[19] Other factors influence why someone with a normal BMI can also get knee and hip OA due to its underlying multifactorial etiology.[20]

The prevalence of knee OA cases is higher compared to hip osteoarthritis. This can be attributed to several factors, such as the biomechanics of the two joints, which tend to be different.[21] The risk of knee OA is higher than hip OA. The hip joint is a ball and socket joint type, while the knee joint is a more complex hinge joint type.[22] This causes disease progression in the knee joint quicker than the hip joint. In line with other statements, there are more individual sufferers with hip and knee OA than OA of the hip alone. It is also close to the number of sufferers of knee OA alone.[21]

The validity test of the questionnaire was carried out using Pearson Product Moment to assess the validity of the questionnaire in people with knee OA, hip OA, and people with both knee and hip OA. The result of a validity test on participants who experienced knee OA was found that 56 participants experienced knee osteoarthritis, which means that to determine the r table using DF = n-2, then DF = 56-2 produces an r table value of 54 with a two-way significance of 0.001. Namely, the r table is 0.428. The validity value has a two-way significance of 0.000 for each of the questionnaire items for the total value of each question totaling 24 questions, which is lower than the two-way significance in the table (*p*-value= 0.001), so the 24 questions can use r validity. The table has a two-way significance of 0.001, and the validity value obtained for each question is above the r table value. So, it can be said that the 24 questions of the Indonesian WOMAC questionnaire are valid for use in knee OA individuals.

Validity testing on participants who suffer from hip OA also uses the same

Table 4. Indonesian WOMAC validity testing on knee and hip OA

No	Question	r value	r table	P Value	Conclusion
1	seberapa nyeri yang anda rasakan saat berjalan di tempat yang rata	0.776	0.439	0.000	Valid
2	seberapa nyeri yang anda rasakan saat Naik atau turun tangga	0.850	0.439	0.000	Valid
3	seberapa nyeri yang anda rasakan saat Tidur dimalam hari	0.866	0.439	0.000	Valid
4	seberapa nyeri yang anda rasakan saat Duduk atau berbaring	0.714	0.439	0.000	Valid
5	seberapa nyeri yang anda rasakan saat Berdiri tegak	0.792	0.439	0.000	Valid
6	Seberapa berat kaku yang anda rasakan saat Awal bangun tidur di pagi hari	0.723	0.439	0.000	Valid
7	Seberapa berat kaku yang anda rasakan saat Setelah duduk atau berisirahat	0.808	0.439	0.000	Valid
8	Seberapa parah kesulitan yang anda alami saat Turun tangga	0.808	0.439	0.000	Valid
9	Seberapa parah kesulitan yang anda alami saat Naik tangga	0.769	0.439	0.000	Valid
10	Seberapa parah kesulitan yang anda alami saat Bangun dari duduk	0.944	0.439	0.000	Valid
11	Seberapa parah kesulitan yang anda alami saat Berdiri	0.821	0.439	0.000	Valid
12	Seberapa parah kesulitan yang anda alami saat Membungkuk menyentuh lantai	0.880	0.439	0.000	Valid
13	Seberapa parah kesulitan yang anda alami saat Berjalan dipermukaan yang rata	0.859	0.439	0.000	Valid
14	Seberapa parah kesulitan yang anda alami saat Keluar/masuk mobil	0.920	0.439	0.000	Valid
15	Seberapa parah kesulitan yang anda alami saat Pergi berbelanja	0.870	0.439	0.000	Valid
16	Seberapa parah kesulitan yang anda alami saat Memakai kaus kaki/ stocking	0.894	0.439	0.000	Valid
17	Seberapa parah kesulitan yang anda alami saat Bangun dari tempat tidur	0.870	0.439	0.000	Valid
18	Seberapa parah kesulitan yang anda alami saat Melepas kaus kaki/stocking	0.882	0.439	0.000	Valid
19	Seberapa parah kesulitan yang anda alami saat Berbaring di tempat tidur	0.811	0.439	0.000	Valid
20	Seberapa parah kesulitan yang anda alami saat Keluar/masuk bak mandi (melangkah setinggi±50cm)	0.754	0.439	0.000	Valid
21	Seberapa parah kesulitan yang anda alami saat Duduk	0.911	0.439	0.000	Valid
22	Seberapa parah kesulitan yang anda alami saat Duduk atau bangun dari toilet duduk	0.830	0.439	0.000	Valid
23	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang berat	0.801	0.439	0.000	Valid
24	Seberapa parah kesulitan yang anda alami saat Melakukan pekerjaan rumah yang ringan	0.824	0.439	0.000	Valid

OA, osteoarthritis; WOMAC, western ontario and mcMaster universities osteoarthritis index

Table 5. Indonesian WOMAC reliability testing on knee OA, hip OA, and knee and hip OA

Variable	*Cronbach's Alpha*	Total items
Knee OA	0.992	24
Hip OA	0.996	24
Knee and Hip OA	0.980	24

OA, osteoarthritis; WOMAC, western ontario and mcMaster universities osteoarthritis index

method to assess the questionnaire's construct validity for hip OA sufferers. The difference is in the number of participants who suffer from hip OA, which is a smaller number, namely 15 participants, so in determining the r table value using DF = n-2, the result obtained is DF = 15-2, namely 13, and the r table obtained is 0.7604 in two-way significance value 0.001. The Indonesian WOMAC validity test for hip osteoarthritis sufferers shows a two-way significance value of 0.000 for each question against the total value of each question totaling 24 questions, so the two-way significance table r value of 0.001 can be used. The calculated r-value of each question towards the total value of each question in the questionnaire is higher than the r-table value so that all 24 questions are declared valid with a two-way significance value r table of 0.001 for use in hip OA individuals.

The validity test of the Indonesian WOMAC questionnaire on knee and hip OA participants was tested using Pearson product moment to assess the construct OA of the questionnaire. In this validity test, the participants suffered from knee and hip OA, so the number of participants differed from that of the participants in the previous validity test. Fifty-three participants were suffering from knee and hip OA, so in calculating the r table, the value degrees of freedom (DF) = n-2 became DF= 53-2 and produced a value of 51 to determine the r table value, and the two-way significance used was 0.001 so the r-table value obtained at number 51, namely 0.4393. The two-way significance value of 0.001 is used because the validity value obtained a two-way significance value of 0.000 for each question for the total value in each question and is smaller than the two-way significance value of

0.001, so the r table value has a significance of two. Direction 0.001 can be used. The validity value of participants suffering from knee and hip OA in each question for the total value of each is higher than the value in the r table, so each question in the Indonesian WOMAC is declared valid and can be used for sufferers of knee and hip OA.

Reliability testing was carried out using *Cronbach alpha* to test the internal consistency of the Indonesian WOMAC questionnaire for people with knee osteoarthritis, hip osteoarthritis, and people with both knee and hip osteoarthritis. Testing is carried out by filling out a questionnaire only once by the research subject. The result of the reliability test on the Indonesian WOMAC questionnaire for knee OA sufferers in 56 participants, the results of the *Cronbach's alpha* reliability test for the 24 questions were 0.992 and had an α value ≥ 0.9 so it can be said that the internal consistency value of the questionnaire Indonesian WOMAC for knee OA individuals is "excellent" and reliable.

The Indonesian WOMAC reliability test on Hip OA sufferers was also tested using *Cronbach's alpha* reliability test and produced results carried out for the 24 questions with a total of 15 participants showed a value of 0.996, which means the α value ≥ 0.9 so that the internal consistency value of the Indonesian WOMAC questionnaire for hip OA individuals is said to be "excellent" and reliable.

Cronbach's alpha reliability test was used to test the reliability of Indonesian WOMAC in patients with knee and hip OA, and the results the value obtained from the results of the reliability test with 53 participants suffering from knee osteoarthritis and hip osteoarthritis is 0.980, so the value of α ≥ 0.9 which shows that the internal consistency of the Indonesian WOMAC questionnaire for people with both, knee and hip OA "excellent" and reliable.

This study had several limitations. First, the research was conducted only in the Denpasar, Badung, and Gianyar areas, so the results might not be generalizable to the pre-elderly and elderly population with knee and hip osteoarthritis in other regions of Indonesia. Additionally, the use of questionnaires as the sole data collection tool could have caused response bias. The grade of knee and hip OA was limited because the examination used ACR clinical criteria, which cannot identify grades according to the Kellgren Lawrence (KL) classification.

CONCLUSION

Based on the research results, it can be concluded that the Indonesian WOMAC is valid with a score of (0.809-0.964) for knee OA, (0.870-0.982) for hip OA, and (0.744-0.944) for knee and hip OA and reliable with Cronbach's alpha score of (α = 0.992) for knee OA, (α = 0.996) for hip OA, and (α = 0.980) for knee and hip OA use in pre-elderly and elderly patients.

ETHICAL CLEARANCE

This research obtained ethical approval from the Universitas Udayana, Faculty of Medicine, with registration number 2658/UN14.2.2.VII.14/LT/2023. Additionally, informed consent was obtained from the survey participants, allowing for sampling.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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AUTHOR CONTRIBUTIONS

PMYH is responsible for study design, data collection, data processing, and manuscript writing. NLPGKS, AAGESU, and IDGAK oversee data collection and manuscript revisions.

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