

Validity and Reliability of Mini OAKHQoL Questionnaire in Knee Osteoarthritis: A Methodological Study

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Submitted: 13 December 2024 | Accepted: 27 December 2024 | Published: 15 January 2025

DOI: <https://doi.org/10.24843/mifi.2025.v13.i01.p06>

Abstract

Introduction: Osteoarthritis (OA) is a common degenerative disease, particularly among women, which can lead to disability and a decreased quality of life. The decline in quality of life among OA patients can be measured using the Mini OAKHQoL-Ina (Osteoarthritis Knee and Hip Quality of Life Indonesia); however, its validity and reliability have not been tested in Indonesia to date. This study aims to evaluate the reliability of the Mini OAKHQoL-Ina questionnaire in Indonesian OA patients.

Methods: This study employed an observational design with a methodological research approach. A total of 65 subjects were selected through purposive sampling. Validity was assessed using Pearson's Product-Moment correlation, while reliability was evaluated using Cronbach's Alpha to determine the instrument's internal consistency.

Results: The analysis revealed that the Mini OAKHQoL-Ina demonstrated good validity across 16 questionnaire items. Internal consistency testing indicated high reliability, with a Cronbach's Alpha score of 0.828 and an Intraclass Correlation Coefficient (ICC) above 0.9 (excellent) for test-retest reliability.

Conclusion: The Mini OAKHQoL-Ina has been proven to possess good validity across 16 items and high reliability in measuring the quality of life of knee osteoarthritis patients. Therefore, this questionnaire can be applied to assess the quality of life of osteoarthritis patients in Indonesia and serve as a basis for designing more effective interventions.

Keywords: Quality of Life, Mini OAKHQoL, Reliability, Validity

Introduction

Osteoarthritis (OA) is one of the most common musculoskeletal disorders in today's society and a leading cause of disability worldwide. A study by Hunter in 2020 reported that OA affects 500 million people globally, with women being more frequently affected.^{1,2} Osteoarthritis is a chronic degenerative disease that affects the cartilage in joints. It damages the articular cartilage layer and impacts all surrounding joint tissues, including the meniscus, synovial membrane, infrapatellar fat pad, and subchondral bone.³

Osteoarthritis (OA) is the most common joint disorder in Indonesia, with a prevalence of 8.1% in the total population. The prevalence of OA reaches 45.5% in individuals aged 55–64 years, 51.9% in those aged 65–74 years, and 54.8% in those aged 75 years and older.⁴ According to a report by the Ministry of Health of the Republic of Indonesia, approximately 55 million people, or 24.7% of the total population, suffer from joint diseases. Based on data from the 2018 Basic Health Research (Riskesdas), the prevalence of OA in Indonesia has continued to rise. In Central Java, the prevalence of OA was recorded at 6.78%, with 5.69% in men and 7.83% in women diagnosed with OA by doctors.⁵

OA typically occurs in weight-bearing joints, such as the hips, knees, hands, feet, and spine.^{6,7} Among the various types of OA, knee osteoarthritis is the most common. Knee OA occurs due to the abrasion of knee joint cartilage and the formation of osteophytes on the joint surfaces. This condition can manifest symptoms such as muscle and tendon weakness around the knee joint, reduced range of motion (ROM), stiffness, and swelling in the knee area.^{8,9}

Pain is one of the most common primary complaints experienced by individuals with osteoarthritis (OA).^{10,11} Pain in OA is a type of nociceptive pain caused by tissue damage or inflammation.^{12,13} This nociceptive pain is associated with conditions such as synovitis, bone marrow lesions, changes in subchondral bone leading to osteophyte formation, disturbances in the infrapatellar fat pad, and lesions in ligaments, which are tissues with widespread sensory nerve endings.¹ Pain in OA involves a complex mechanism of peripheral and central nerves, originating from the synovium, subchondral bone, and periosteum, innervated by small-diameter nociceptive neurons.¹⁴

The pain caused by osteoarthritis (OA) significantly impacts the quality of life of those affected. Difficulties in daily activities, such as changing positions, climbing stairs, or standing for long periods, reduce patient mobility.¹⁵ The sensation of pain and muscle weakness in the lower limbs can alter gait and balance, reducing physical activity. This, in turn, increases the risk of other health problems such as obesity, cardiovascular disorders, and diabetes. Additionally, physical limitations also affect psychological aspects, with an increased risk of depression and anxiety, as well as decreased social interactions. Overall, OA can significantly reduce the quality of life of individuals both physically and emotionally.¹⁶

Quality of life is an essential indicator in the planning and evaluation of the effectiveness of an intervention program.^{17,18} Measuring the quality of life in individuals with osteoarthritis, both in the short and long term, is crucial for assessing the impact of interventions applied. Moreover, such measurements provide a deeper understanding of how osteoarthritis affects various life dimensions of patients. These impacts include physical, emotional, and social aspects, all of which can be influenced by the disease. One of the instruments used to measure quality of life in osteoarthritis patients is the Mini OAKHQoL (Osteoarthritis Knee and Hip Quality of Life).

The Mini OAKHQoL is a simplified version of the OAKHQoL questionnaire, designed to measure the quality of life of knee OA patients using a multidimensional approach. This questionnaire consists of 20 items, divided into five domains: physical activity (7 items), mental health (3 items), pain (3 items), social support (2 items), and three items related to professional life, sexual activity, and anxiety about dependence. Each item is scored from 0 to 10, with 0 indicating the worst condition and 10 indicating the best condition.^{19,20}

Studies on the Mini OAKHQoL questionnaire adaptation have been conducted in various countries, including Turkey, Arab countries, and Spain. The results of these studies have shown that the questionnaire has adequate validity and reliability in measuring the quality of life of patients with osteoarthritis, particularly in the hip and knee joints. These cross-cultural adaptations have successfully demonstrated the consistency and relevance of the instrument across different cultural contexts, allowing it to be used to assess the impact of osteoarthritis on patients' quality of life.

However, most of these studies are still limited to specific cultural contexts, and further efforts are needed to verify whether this questionnaire remains practical and relevant when applied to populations with different cultural backgrounds, including countries with unique social and cultural contexts such as Indonesia.

However, no studies have adapted the Mini OAKHQoL questionnaire in the Indonesian cultural context, particularly for patients with knee osteoarthritis. This indicates a gap in instruments capable of accurately measuring the quality of life of osteoarthritis patients in alignment with the cultural and social context in Indonesia. Given the significant differences in language, social values, and public perceptions of health, it is essential to adapt this questionnaire better to meet the needs and realities of patients in Indonesia.

Therefore, this study aims to conduct a cross-cultural adaptation of the Mini OAKHQoL questionnaire into the Indonesian language and test the adapted instrument's validity and reliability. The evidence generated from this study will demonstrate that the instrument can be widely used in Indonesia, providing a better understanding of the impact of osteoarthritis on patients' quality of life and serving as a foundation for developing more effective and evidence-based interventions for managing osteoarthritis in Indonesia.

Methods

This study uses an observational design with a methodological approach to evaluate the content validity and internal consistency reliability of the Mini OAKHQoL-Ina questionnaire. The research was conducted at RSUD Pandanarang, Boyolali, from August to October 2024. The study population consisted of all knee osteoarthritis (OA) patients at RSUD Pandanarang Boyolali, totaling 97 individuals. The sample consisted of 65 individuals selected using purposive sampling, with samples chosen based on predefined inclusion and exclusion criteria.

Inclusion criteria included unilateral knee OA patients aged ≥ 46 years who can walk without assistive devices. In contrast, exclusion criteria included using steroid medications, a history of lower extremity surgeries (including arthroplasty and fractures), and medical conditions that impaired effective communication.

Purposive sampling was employed to select knee OA patients who would be assessed using the Mini OAKHQoL-Ina questionnaire. This approach allowed researchers to choose respondents with direct experience of knee OA, ensuring that the data obtained was more relevant and in-depth. The appropriate sample selection ensured that the study accurately reflected the validity and reliability of the questionnaire in the context under study. The sample size was determined based on the Slovin formula with a 95% confidence level and a 5% margin of error, resulting in a representative sample that aligns with the characteristics of the population under study. This approach guarantees high validity and strong relevance of the findings to the intended population. However, the results from purposive sampling more precisely represent the selected group or phenomenon, so generalization to a broader population may be limited.

The questionnaire was administered twice with a three-day interval. The three-day interval was chosen to test the validity and reliability of the Mini OAKHQoL-Ina questionnaire. This interval was selected to ensure measurement consistency while minimizing significant changes in the respondents' physical condition or perceptions. A three-day duration was considered sufficient to maintain the stability of the measured variables and reduce recall bias so that the results of the first measurement and retest could accurately reflect the reliability and validity of the questionnaire.

The questionnaire was translated into three stages: forward translation, backward translation, and synthesis of the translation results. In the first stage, forward translation, the questionnaire was translated from the source language into Indonesian by a translator proficient in English. In the next stage, backward translation, another translator retranslated the translated version into the original language to check for meaning alignment. In the final stage, synthesis, three experts with a deep understanding of both languages and knowledge of knee osteoarthritis evaluated and refined the translation. This process aimed to ensure that the translation of the questionnaire remained accurate and relevant to the cultural and medical context. Thus, the translation process was intended to produce a valid instrument applicable to the study.

Data analysis in this study was conducted using SPSS software to minimize potential errors during data processing. A descriptive analysis approach was employed to describe the demographic and clinical characteristics of the study subjects, including age, gender, occupation, duration of osteoarthritis, body mass index (BMI), the affected side of the joint, and the level of quality of life.

The content validity of the Mini OAKHQoL questionnaire was tested using Pearson's Product Moment correlation, aimed at analyzing the relationship between each item of the questionnaire and the scores given by the

respondents. To assess the instrument's internal consistency, Cronbach's Alpha was used, with a value greater than 0.70 indicating good reliability.²¹ In this study, intra-rater reliability was measured using the Intraclass Correlation Coefficient (ICC), with an ICC value greater than 0.75 indicating high reliability.²² This study was conducted after obtaining ethical approval from the Health Research Ethics Committee of RSUD Dr. Moewardi, with registration number 1.136/V/HREC/2024.

Results

The target population in this study consisted of 97 knee OA patients. However, due to certain limitations, the accessible population was reduced to 77 individuals. After applying the inclusion and exclusion criteria, the number of subjects eligible for this study was 65. A more detailed process of determining the number of research subjects is presented in Figure 1.

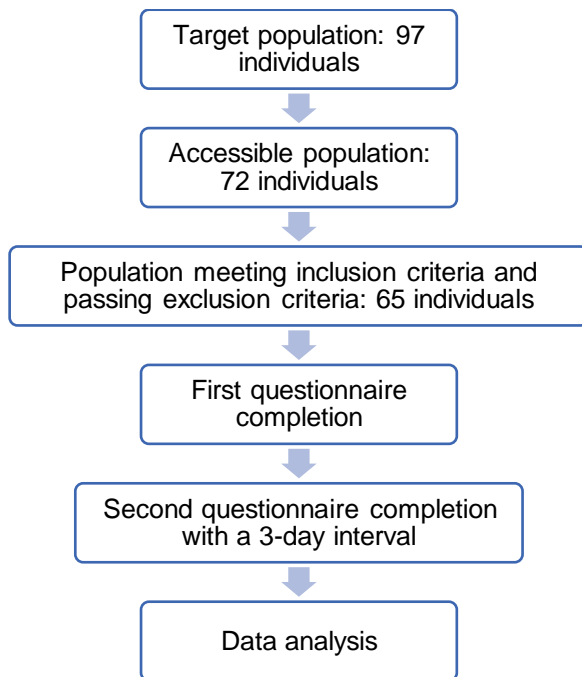


Figure 1. Sampling Process of the Study

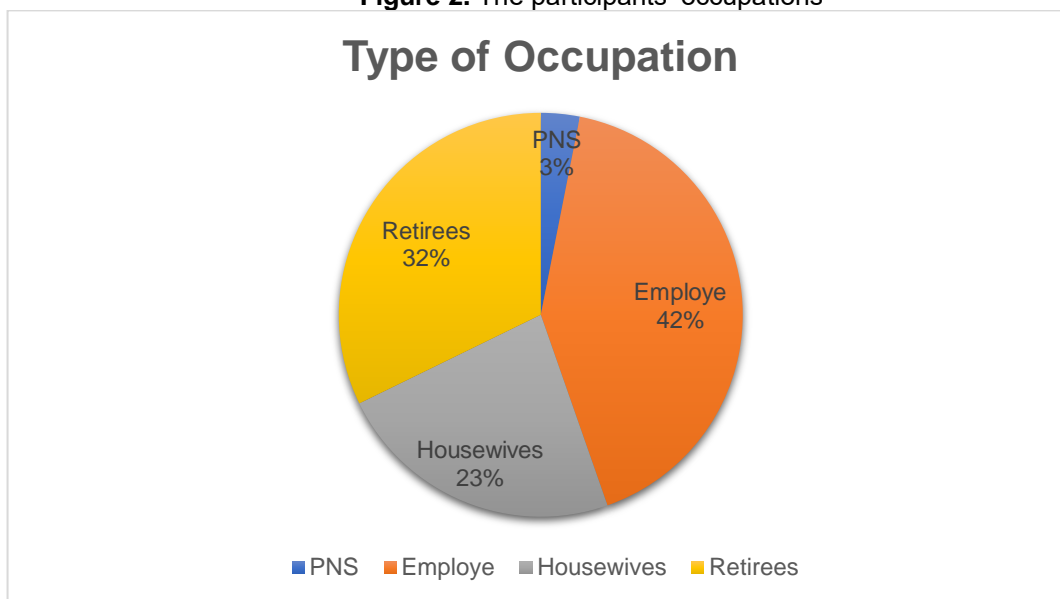
Based on Figure 1, it can be seen that the sample size for the study was 65 individuals aged ≥ 46 years. The characteristics of the research subjects are presented in Table 1.

Table 1. Characteristics of Research Subjects

Variable	N (%)	Min	Max	Mean \pm SD
Age (years)	-	48	95	63.3 \pm 8.9
Gender				
Male	16 (24.6%)	-	-	-
Female	49 (75.4%)	-	-	-
OA Duration (years)	-	1	5	2.68 \pm 1.3
BMI Category				
Underweight	3 (4.6%)	-	-	-
Normal	51 (78.5%)	-	-	-
Overweight	8 (12.3%)	-	-	-
Obesity Class 1	3 (4.6%)	-	-	-
OA Side				
Right	34 (52.3%)	-	-	-
Left	31 (47.7%)	-	-	-
Occupation				
Housewife	15 (23.1%)	-	-	-
Retired	21 (32.2%)	-	-	-
Private Sector	27 (41.5%)	-	-	-
Civil Servant (PNS)	2 (3.1%)	-	-	-
QoL Level				
Very Poor	5 (7.7%)	-	-	-
Poor	35 (53.8%)	-	-	-
Fair	24 (36.9%)	-	-	-
Good	1 (1.5%)	-	-	-

Table 1 shows that the majority of participants in this study were female (75.4%), with ages ranging from 48 to 95 years. Most subjects were employed in the private sector, accounting for 27 individuals (41.5%), while only two individuals (3.1%) were used as civil servants (PNS). Regarding Body Mass Index (BMI), most subjects were classified as having a normal BMI, totaling 51 individuals (78.5%). Additionally, osteoarthritis (OA) complaints were more frequently observed in the right knee, with 34 individuals (52.3%) affected. The description of the participants' occupations in this study can be seen in Figure 2.

Figure 2. The participants' occupations



Based on Figure 2, most respondents were employed in the private sector, comprising 27 individuals (41.5%). Next, 21 individuals (32.2%) were retirees, 15 individuals (23.1%) were housewives, and the smallest group consisted of civil servants (PNS), totaling two individuals (3.1%). The results of the validity test for the Mini OAKHQoL-Ina can be seen in Table 2.

Table 2. Results of the Validity Test for Mini OAKHQoL-Ina

Question	r-table	r-result
1. Saya kesulitan berjalan (I have difficulty walking)	0.240	0.809
2. Saya kesulitan membungkuk atau berdiri (I have difficulty bending or standing)	0.240	0.664
3. Saya kesulitan naik tangga (I have difficulty climbing stairs)	0.240	0.659
4. Saya kesulitan dalam mengenakan pakaian (kaus kaki, sepatu, celana ketat) (I have difficulty putting on clothes (socks, shoes, tight pants))	0.240	0.732
5. Saya kesulitan untuk masuk atau keluar mobil (I have difficulty getting in or out of a car)	0.240	0.425
6. Saya kesulitan dalam menjalankan tugas saya di tempat kerja (I have difficulty carrying out my duties at work)	0.240	0.845
7. Saya membutuhkan waktu lebih lama untuk melakukan sesuatu (I take longer to do something)	0.240	0.804
8. Saya merasa tidak bahagia karena rasa sakit (I feel unhappy because of pain)	0.240	0.195
9. Saya khawatir karena tergantung dengan orang lain (I worry because I depend on others)	0.240	0.221
10. Saya terbatas dalam aktivitas seks. Tidak ada aktivitas seks dalam 4 minggu terakhir (I am limited in sexual activity. No sexual activity in the last 4 weeks)	0.240	0.519
11. Saya kesulitan untuk tetap pada posisi yang sama dalam waktu yang lama (duduk, berdiri, diam) (I have difficulty staying in the same position for a long time (sitting, standing, still))	0.240	0.621
12. Saya merasakan nyeri (seberapa sering?) (I experience pain (how often?))	0.240	0.702
13. Saya merasakan nyeri (intensitas?) (I experience pain (intensity?))	0.240	0.561
14. Saya mampu merencanakan proyek (pekerjaan) jangka panjang (I am able to plan long-term projects (work))	0.240	0.282
15. Saya keluar rumah sebanyak yang saya mau (I go out as much as I want)	0.240	0.067
16. Saya terbangun karena rasa nyeri (I wake up because of pain)	0.240	0.217
17. Saya penasaran dengan keadaan saya di masa depan (I am curious about my future condition)	0.240	0.449
18. Saya menjadi mudah tersinggung dan pemarah (I become easily irritated and angry)	0.240	0.255
19. Saya merasa orang lain memahami kesulitan yang saya alami terkait dengan sakit sendi saya (I feel others understand the difficulties I experience related to my joint pain)	0.240	0.623
20. Saya merasa didukung dengan orang-orang dekat saya (pasangan, keluarga) (I feel supported by those close to me (partner, family))	0.240	0.253

In Table 2, the table value (r-table) set for the sample size of 65 individuals is 0.240. The validity test results for the Mini OAKHQoL-Ina questionnaire indicate that four items are invalid. The reliability test results for each item of the Mini OAKHQoL-Ina can be seen in Table 3.

Table 3. Reliability of Each Item in the Mini OAKHQoL-Ina

Question	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Saya kesulitan berjalan (I have difficulty walking)	0.770	0.802
2. Saya kesulitan membungkuk atau berdiri (I have difficulty bending or standing)	0.602	0.810
3. Saya kesulitan naik tangga (I have difficulty climbing stairs)	0.603	0.812
4. Saya kesulitan dalam mengenakan pakaian (kaus kaki, sepatu, celana ketat) (I have difficulty putting on clothes (socks, shoes, tight pants))	0.683	0.807
5. Saya kesulitan untuk masuk atau keluar mobil (I have difficulty getting in or out of a car)	0.339	0.823
6. Saya kesulitan dalam menjalankan tugas saya di tempat kerja (I have difficulty carrying out my duties at work)	0.815	0.801
7. Saya membutuhkan waktu lebih lama untuk melakukan sesuatu (I take longer to do something)	0.768	0.804
8. Saya merasa tidak bahagia karena rasa sakit (I feel unhappy because of pain)	0.066	0.841
9. Saya khawatir karena tergantung dengan orang lain (I worry because I depend on others)	0.101	0.837
10. Saya terbatas dalam aktivitas seks. Tidak ada aktivitas seks dalam 4 minggu terakhir (I am limited in sexual activity. No sexual activity in the last 4 weeks)	0.417	0.820
11. Saya kesulitan untuk tetap pada posisi yang sama dalam waktu yang lama (duduk, berdiri, diam) (I have difficulty staying in the same position for a long time (sitting, standing, still))	0.545	0.812
12. Saya merasakan nyeri (seberapa sering?) (I experience pain (how often?))	0.646	0.808
13. Saya merasakan nyeri (intensitas?) (I experience pain (intensity?))	0.501	0.817
14. Saya mampu merencanakan proyek (pekerjaan) jangka panjang (I am able to plan long-term projects (work))	0.199	0.829
15. Saya keluar rumah sebanyak yang saya mau (I go out as much as I want)	0.018	0.837
16. Saya terbangun karena rasa nyeri (I wake up because of pain)	0.095	0.838
17. Saya penasaran dengan keadaan saya di masa depan (I am curious about my future condition)	0.353	0.823
18. Saya menjadi mudah tersinggung dan pemarah (I become easily irritated and angry)	0.153	0.832
19. Saya merasa orang lain memahami kesulitan yang saya alami terkait dengan sakit sendi saya (I feel others understand the difficulties I experience related to my joint pain)	0.548	0.812
20. Saya merasa didukung dengan orang-orang dekat saya (pasangan, keluarga) (I feel supported by those close to me (partner, family))	0.178	0.829

Table 3 shows that all items in the Mini-OAKHQoL questionnaire have high reliability, with Cronbach's Alpha if Item Deleted value for all items exceeding 0.8. The results of the reliability test for the Mini-OAKHQoL can be seen in Table 4.

Table 4. Reliability Test Results for the Mini-OAKHQoL

Variable	Cronbach's Alpha	Information
Reliabilitas Mini OAKHQoL-Ina	0.828	Baik (Good)
ICC (Intra-Class Correlation)	0.995	Sangat baik (Excellent)

Table 4 shows that the Mini OAKHQoL-Ina questionnaire is reliable, with Cronbach's Alpha value of 0.828. The test-retest analysis yielded an ICC of 0.995 ($p < 0.001$; 95% CI: 0.992-0.997), indicating excellent consistency.

Discussion

The Mini-OAKHQoL is a measurement tool that assesses the effects of osteoarthritis on the knee and hip, as well as the impact of its treatment on the quality of life of the patients.²⁰ This measurement tool is crucial because osteoarthritis can exacerbate the condition of patients, especially those who also suffer from comorbidities, which often add to their health challenges. Additionally, in the International Classification of Functioning, Disability, and Health (ICF), osteoarthritis encompasses various dimensions, such as emotional function, sleep, pain, sexual activity, work, social life, recreation, family, and physical activity limitations. The Mini-OAKHQoL stands out because it includes various ICF categories and considers the specific conditions of knee and hip osteoarthritis patients.²³

Health-related quality of life has been proven to accurately reflect patients' experiences with a specific disease. This concept encompasses an individual's response to the condition's physical, mental, social, and daily life effects. Therefore, assessing the conceptual relevance and psychometric properties across different cultures or countries is

increasingly important.²⁴ To date, no studies have addressed the validity and reliability of the Mini OAKHQoL in its Indonesian version, making this the first study to validate the Mini OAKHQoL questionnaire in Bahasa, Indonesia.

The validity and reliability testing after cross-cultural adaptation is crucial to ensure that the questionnaire's content aligns with the socio-cultural values in Indonesia, including language, without altering the original meaning of the questionnaire. In this study, we conducted validity and reliability tests on the Mini-OAKHQoL-Ina questionnaire. The construct validity test of the Mini-OAKHQoL-Ina questionnaire using the Pearson Product Moment method was based on the *r*-table value corresponding to the sample size used in the study. A total of 65 respondents were involved in this study, and therefore, the *r*-table value used was 0.240 with a significance level of 0.05 for a two-tailed test.

Of the 65 participants in this study, all met the inclusion and exclusion criteria set by the researchers, with ages ranging from 48 to 95 years. Of the total, 16 were men, and 49 were women. These findings indicate that the prevalence of osteoarthritis (OA) is higher in women than men, which is consistent with the findings of Segal (2024), who also observed a similar trend. One of the commonly cited explanations for this phenomenon is the decline in estrogen levels in women after menopause, which plays a role in increasing the risk of developing OA.²⁵

Based on Table 2, the statistical analysis results conducted to test the validity of the total score of the Mini OAKHQoL-Ina questionnaire in the first and second test phases show a value of 0.991. According to the analysis, the Mini OAKHQoL questionnaire can be considered a valid tool for OA patients because the calculated *r*-value is greater than the *r*-table value set. However, the validity test on each item of the Mini OAKHQoL-Ina questionnaire revealed that some items were invalid. Specifically, items 8, 9, 15, and 16 showed low validity. Item number 8 had an *r* value of 0.195, item number 9 had an *r* value of 0.221, item 15 had the lowest *r* value of 0.67, and item 16 had an *r* value of 0.217.

Item number 8, which reads, "I feel unhappy because of the pain," contains a subjective meaning that depends on each individual's perception. This statement aligns with the concept proposed by Seligman (1998), as cited in Aprilianti (2020), which states that happiness is subjective and that each individual has a different benchmark. Additionally, various factors influencing an individual's life can contribute to their perception of happiness.²⁶ This finding is consistent with the results of Adnani (2022), which indicated that individuals with osteoarthritis tend to experience anxiety, decreased self-confidence, and independence. These factors contribute to the invalidity of item number 9, which reads, "I am worried because I depend on others." This item does not fully capture the complex nature of how dependence may affect a person's perception, as it may vary depending on individual experiences and the extent of their condition.²⁷ This is because, based on interviews, most respondents felt embarrassed when relying on others. The emotional response of shame or discomfort in needing assistance may differ from person to person, making the item less valid in capturing the true essence of their experience.

In item 15, "I go out as much as I want," most respondents found this question irrelevant for osteoarthritis (OA) patients due to mobility limitations caused by pain and joint stiffness. OA patients typically require more careful planning of activities and assistance to leave the house, making this question not reflective of their daily activity limitations. Additionally, question 16, "I wake up because of pain," was less applicable to knee OA patients, as pain is often felt during movement or activity rather than sleep. While morning stiffness may occur, pain that wakes patients up is rare, and factors such as sleeping position also influence pain perception. These findings align with research by Nikmah (2022), which shows that the pain and stiffness experienced by OA patients often limit their ability to perform daily activities.²⁸

The invalidity of four items in the Mini OAKHQoL-Ina questionnaire—items 8, 9, 15, and 16—could impact the accuracy of measuring the quality of life of osteoarthritis (OA) patients and reduce the validity of the study's results. Subjective questions, such as those related to happiness and anxiety caused by dependency, may lead to varying interpretations among respondents. Additionally, irrelevant items, such as those concerning the ability to go outside and pain that wakes the patient, do not reflect the physical condition of OA patients, who typically experience limitations due to pain and joint stiffness. The invalidity of these items could reduce the reliability of the questionnaire and affect its ability to accurately capture the impact of osteoarthritis on patients' quality of life.

To enhance validity, it is essential to adjust the items in the questionnaire to align with the cultural context and daily experiences of patients in Indonesia. Such adjustments should involve using more straightforward, more easily understandable language and considering relevant cultural values. Furthermore, technical or abstract terms should be replaced with expressions that are clearer and easier for patients to comprehend. These modifications aim to make the questionnaire more understandable for respondents, thus leading to more accurate data in assessing the quality of life of OA patients in Indonesia.

Item 8 could be revised to "Pain makes me feel unwell or uncomfortable" to avoid confusion and ensure the question is easier to understand. Item 9 can be changed to "I feel worried because I have to ask others for help" to reflect the anxiety patients experience more clearly. Item 15 should be revised to "I can go outside whenever I want," which is simpler and more appropriate for elderly patients' understanding. Lastly, item 16 could be adjusted to "I wake up because of the pain I feel" to reflect the patient's experience without causing confusing interpretations.

Referring to Table 3, the reliability test results for the Mini OAKHQoL-Ina questionnaire show a value of 0.828, indicating that the questionnaire is reliable. If an item was deleted, the Cronbach's Alpha value for the Mini OAKHQoL-Ina remains high, more significant than 0.8 for each item. The test-retest reliability results in Table 4 indicate an ICC value of 0.995, demonstrating excellent reliability (ICC 0.995, $p < 0.001$, 95% CI: 0.992-0.997). Therefore, it can be concluded that all twenty items in the Mini OAKHQoL-Ina questionnaire exhibit internal consistency and good reliability. The reliability of a questionnaire is related to how consistently, accurately, and timely the measurement is achieved. The higher the reliability value, the more consistent, relevant, and aligned the research results with the study's goals.

The good validity of the 16 items in the Mini OAKHQoL-Ina ensures that each question accurately measures aspects relevant to the quality of life of osteoarthritis (OA) patients, such as physical ability, pain level, and emotional and social impacts experienced in daily life. These aspects are crucial because they influence patients' physical,

psychological, and social well-being. On the other hand, the high reliability of the Mini OAKHQoL-Ina guarantees that the results are consistent, so the data collected can be trusted and used to support clinical decision-making. With precise data on the impact of OA on patients' quality of life, healthcare providers can make more accurate decisions about treatment planning, including selecting pain management or treatments that suit the patient's needs.

Furthermore, this questionnaire also enables monitoring changes in patients' quality of life over time. By tracking changes in quality of life scores, healthcare providers can assess the effectiveness of the treatment provided and adjust care based on the patient's evolving condition. Therefore, the Mini OAKHQoL-Ina not only functions as a measurement tool but also serves as an essential guide in planning care that better meets individual needs, which can ultimately enhance the overall quality of life for OA patients. Thus, this questionnaire plays a significant role in supporting clinical decision-making based on existing evidence and focusing on improving patient care outcomes.

This study has limitations, such as the small sample size, with only 65 selected respondents based on predefined inclusion and exclusion criteria. Although this sample size is sufficient for fundamental statistical analysis, increasing the sample size would strengthen statistical power and improve the ability to generalize the results to a broader population. This study was conducted only on knee osteoarthritis patients at RSUD Pandan Arang Boyolali, so the results may not fully generalize to populations with different characteristics, such as patients with hip osteoarthritis or younger age groups. Therefore, future studies involving a more heterogeneous sample are expected to provide a more comprehensive understanding of the accuracy and applicability of the Mini OAKHQoL-Ina questionnaire in various contexts.

Additionally, this study has limitations related to selection bias due to the non-random selection of samples, which is limited to knee osteoarthritis patients at RSUD Pandan Arang Boyolali. This could affect the representativeness of the findings for the wider population. Non-random sample selection and restriction to one geographic location may reduce the study's external validity, as the condition of osteoarthritis patients in other regions or demographic groups may differ. The focus of the study on knee osteoarthritis also limits the ability to generalize findings to patients with other types of osteoarthritis or different age groups. To improve external validity and broaden the findings' applicability, future research should involve a larger, more diverse sample and include various types of osteoarthritis and a broader geographic scope.

Conclusion

The Mini OAKHQoL-Ina questionnaire has undergone a cultural adaptation process that aligns with established standards and has been adjusted to the Indonesian cultural context. Based on the study's results, the questionnaire demonstrates good validity for 16 items, although four items did not meet the validity criteria. The reliability test shows high results, with intra-rater testing indicating excellent reliability. Therefore, it can be concluded that the Mini OAKHQoL-Ina is valid for 16 items and reliable for measuring the quality of life of knee osteoarthritis patients at RSUD Pandan Arang Boyolali.

The findings of this study are expected to serve as a valuable reference for healthcare providers in assessing the quality of life of knee OA patients. Applying this questionnaire in clinical practice and knee OA intervention programs can better understand the patient's condition, helping to design more precise treatments and improving the patient's quality of life. Further research with a more extensive and diverse sample is necessary to strengthen the external validity of this questionnaire.

References

1. Yao Q, Wu X, Tao C, Gong W, Chen M, Qu M, et al. Osteoarthritis: pathogenic signaling pathways and therapeutic targets. *Signal Transduct Target Ther.* 2023;8(1):56.
2. Hunter DJ, March L, Chew M. Osteoarthritis in 2020 and beyond: a Lancet Commission. *The Lancet.* 2020;396(10264):1711–2.
3. Yu H, Huang T, Lu WW, Tong L, Chen D. Osteoarthritis pain. *Int J Mol Sci.* 2022;23(9):4642.
4. Maharani SY, Sidarta N. Hubungan Antara Osteoarthritis Genu Dan Fleksibilitas Pada Lansia. *Jurnal Penelitian dan Karya Ilmiah Lembaga Penelitian Universitas Trisakti.* 2023;345–56.
5. Warsono W, Fahmi FY, Rahma AK. Pengalaman Keluarga Dalam Merawat Penderita Osteoarthritis. *Jurnal Surya Muda.* 2023;5(1):1–16.
6. Hawker GA. Osteoarthritis is a serious disease. *Clin Exp Rheumatol.* 2019;37(Suppl 120):3–6.
7. Kloppenburg M, Berenbaum F. Osteoarthritis year in review 2019: epidemiology and therapy. *Osteoarthritis Cartilage.* 2020;28(3):242–8.
8. Shimizu H, Shimoura K, Iijima H, Suzuki Y, Aoyama T. Functional manifestations of early knee osteoarthritis: a systematic review and meta-analysis. *Clin Rheumatol.* 2022;41(9):2625–34.
9. Sun X, Zhen X, Hu X, Li Y, Gu S, Gu Y, et al. Osteoarthritis in the middle-aged and elderly in China: prevalence and influencing factors. *Int J Environ Res Public Health.* 2019;16(23):4701.
10. Wojcieszek A, Kurowska A, Majda A, Liszka H, Gądek A. The impact of chronic pain, stiffness and difficulties in performing daily activities on the quality of life of older patients with knee osteoarthritis. *Int J Environ Res Public Health.* 2022;19(24):16815.
11. Dashtyan M, Tavafian SS, Karimzadeh K, Yazdanpanah P. Knee osteoarthritis pain management in post menopause women. *International Journal of Musculoskeletal Pain Prevention.* 2022;7(1):649–57.
12. Bacon K, LaValley MP, Jafarzadeh SR, Felson D. Does cartilage loss cause pain in osteoarthritis and if so, how much? *Ann Rheum Dis.* 2020;79(8):1105–10.
13. O'Neill TW, Felson DT. Mechanisms of osteoarthritis (OA) pain. *Curr Osteoporos Rep.* 2018;16:611–6.

14. Berteau JP. Knee pain from osteoarthritis: pathogenesis, risk factors, and recent evidence on physical therapy interventions. *J Clin Med*. 2022;11(12):3252.
15. Koesrul AN, Fau YD, Pradita A, Hargiani FX. Kombinasi Isometric Quadriceps Exercises dan Edukasi Treatment Terhadap Perubahan Nyeri Lutut Pada Penderita Osteoarthritis Genu. *Jurnal Keperawatan Muhammadiyah*. 2023;8(1).
16. Zeng Z peng, Liu Y bin, Fang J, Liu Y, Luo J, Yang M. Effects of Baduanjin exercise for knee osteoarthritis: a systematic review and meta-analysis. *Complement Ther Med*. 2020;48:102279.
17. Alfian R, Susanto Y, Khadzah S. Kualitas hidup pasien hipertensi dengan penyakit penyerta di poli jantung RSUD Ratu Zalecha Martapura. *Jurnal Pharmascience*. 2017;4(2).
18. Yamin M, Salim S, Setiati S, Alwi I, Zulmiyusrini P. Cross-cultural adaptation and validation of the Indonesian version of AQUAREL on patients with permanent pacemaker: a cross-sectional study. *BMC Res Notes*. 2019;12:1–6.
19. Fekete H, Guillemin F, Pallagi E, Fekete R, Lippai Z, Luterán F, et al. Evaluation of osteoarthritis knee and hip quality of life (OAKHQoL): adaptation and validation of the questionnaire in the Hungarian population. *Ther Adv Musculoskelet Dis*. 2020;12:1759720X20959570.
20. Guillemin F, Rat AC, Goetz C, Spitz E, Pouchot J, Coste J. The Mini-OAKHQOL for knee and hip osteoarthritis quality of life was obtained following recent shortening guidelines. *J Clin Epidemiol*. 2016;69:70–8.
21. Al Hayyan AJ, Mei Wulan SM, Masduchi RH, Nugraheni N, Poerwandari D, Melaniani S, et al. Validity and reliability of the loco-check questionnaire after cross-cultural adaptation for Indonesia. *Journal of Orthopaedic Science*. 2023 Jan 1;28(1):267–71.
22. Purnomo D. Uji validitas dan reliabilitas step test sebagai alat ukur keseimbangan pada lansia. *Jurnal Fisioterapi Dan Rehabilitasi*. 2018;2(2):53–70.
23. Duruöz MT, Kasman SA, Gezer HH, Duruöz E. Validity and reliability of the Mini-Osteoarthritis Knee and Hip Quality of Life scale in Turkish population. *Arch Rheumatol*. 2021;37(1):119.
24. Abdul Kadir A, Mohd Arif MF, Ishak A, Hassan II, Mohd Noor N. Adaptation and validation of the malay version of the osteoarthritis knee and hip quality of life questionnaire among knee osteoarthritis patients. *Biomed Res Int*. 2018;2018(1):4329751.
25. Segal NA, Nilges JM, Oo WM. Sex differences in osteoarthritis prevalence, pain perception, physical function and therapeutics. *Osteoarthritis Cartilage*. 2024;32(9):1045–53.
26. Aprilianti AF. Konsep Kebahagiaan Perspektif Psikologi dan Al-Qur'an. *Dar El-Ilmi: Jurnal Studi Keagamaan, Pendidikan Dan Humaniora*. 2020;7(2):82–100.
27. Adnani H, Hikmawati AN, Sihapark S, Suharyanta D, Widiyaningsih D. Factors of independent of activities of daily living among osteoarthritis elderly. *Int J Public Health*. 2022;11(1):1–7.
28. Nikmah BK, Fariz A, Kusuma WT, Sartoyo S. Pengaruh Latihan Isometric Quadriceps Terhadap Penurunan Nyeri Lutut Pada Pasien Osteoarthritis Knee Bilateral Di RS Wawa Husada Kepanjen. *Jurnal Keperawatan Muhammadiyah*. 2023;8(1).



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