Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2023 Jul 20; 11(B):671-677.
https://doi.org/10.3889/oamjms.2023.11630
eISSN: 1857-9655
Category: *B - Clinical Sciences*
Section: *Geriatrics*

Validity and Reliability of Dementia Knowledge Assessment Scale and Dementia Attitude Scale in the Indonesian Language among Nursing Students

Sri Mulyani[1], Azam David Saifullah[1]*, Kadek Dewi Cahyani[2], Anastasia Suci Sukmawati[3], Salsabilla Rohadatul Aisy Sunaryo[2]

[1]Department of Mental Health and Community Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia; [2]School of Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia; 3School of Nursing, Faculty of Health Science, Universitas Jenderal Achmad Yani Yogyakarta, Yogyakarta, Indonesia

Edited by: Mirko Spiroski
Citation: Mulyani S, Saifullah AD, Cahyani KD, Sukmawati AS, Aisy Sunaryo SR. Validity and Reliability of Dementia Knowledge Assessment Scale and Dementia Attitude Scale in the Indonesian Language among Nursing Students. Open Access Maced J Med Sci. 2023 Jul 20; 11(B):671-677. https://doi.org/10.3889/oamjms.2023.11630
Keywords: Attitude; Dementia; Knowledge; Reliability; Translation; Validity
***Correspondence:** Azam David Saifullah, Lecturer, Department of Mental Health and Community Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia. E-mail: azam.david.s@ugm.ac.id
Received: 31-Mar-2023
Revised: 26-Apr-2023
Accepted: 10-Jul-2023

Funding: This study was supported through a research grant scheme in 2018 from the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada
Competing Interests: The authors have declared that no competing interests exist

Abstract

BACKGROUND: The population of persons with dementia (PwD) in Indonesia is increasing. As future nurses, it is important to evaluate the knowledge and attitudes of nursing students because they can affect the quality of health services for PwD. However, no instrument is available in the Indonesian language through a good, valid, and reliable translation process.

AIM: The aim is to report the translational process and determine the validity and reliability of the Indonesian dementia knowledge assessment scale (DKAS) and dementia attitude scale (DAS) questionnaires in nursing students.

METHODS: A quantitative cross-sectional study was conducted involving 486 nursing students from two universities in Yogyakarta, Indonesia. The Brislin method was used to translate DKAS and DAS, then continued with content (involved four experts using items-content validity index [I-CVI]), face, and construct validity tests, as well as reliability tests using Cronbach's alpha.

RESULTS: The I-CVI results were 1.00 for DKAS and 0.98 for DAS, demonstrating a good construct validity index. In addition, the reliability testing had good results, whereas Cronbach's alpha of the DKAS was 0.713, while DAS was 0.779.

CONCLUSION: DKAS and DAS in the Indonesian language are considered valid and reliable to measure nursing student's knowledge and attitudes toward PwD.

Introduction

Following the trend of the increasing aging population in the world, the number of people with dementia is continually increasing every year. Based on data from the Word Health Organization [1], the increase in cases reached more than 50 million people, and it is estimated that this number will continue to increase by more than 9 million cases every year. Most persons with dementia (PwD) are in low- and middle-income countries [2]. As one of the developing country, the number of PwD in Indonesia has reached more than 1 million persons in 2015 [3]. This is in line with a recent report [1] indicating that most PwD live in low- and middle-income countries, where these cases are predicted to increase in the future.

Yogyakarta is a province with the highest proportion of elderly population in Indonesia [4]. Furthermore, based on survey research, almost 2 out of 10 people aged over 65 years in Yogyakarta have dementia [5]. Although this is in line with global trends, PwD can become increasingly vulnerable, not only because of having dementia but also because of the stigma toward PwD and their caregivers.

Dementia is a syndrome characterized by decreased memory and cognitive function. This cognitive disorder results in disturbances in the patient's quality of life, such as obstacles in daily activities, work, and social interactions. Limitations in carrying out daily activities result in patients requiring assistance from caregivers. This poses a challenge to caregivers and families of PwD so sufficient knowledge and attitudes are needed in providing care to these patients.

Increased knowledge and positive attitudes concerning PwD will improve their quality of life and patient comfort. Several studies have reported that

many factors and community characteristics influence knowledge and attitudes toward patients with dementia. Although these factors are not entirely clear, they are generally influenced by cultural uniqueness. However, a person may not have sufficient knowledge and a good attitude to properly treat patients with dementia.

Nurses are the health care professional who has a significant role in caring for PwD. Nurses spent more time with PwD than any other health-care provider. Thus, it is very important for nurses to be knowledgeable about dementia because the information is very effective in improving nursing care and interventions. Knowledge and attitudes towards PwD are interesting aspects to research, especially in order to develop programs to increase knowledge and attitudes for nursing students. Nursing students are the future nurse in communities and hospitals.

Research on health science students' knowledge and attitudes toward PwD has been conducted in various countries, namely the United Kingdom [6], the United States [7], and India [8]. To measure attitudes, a validated measuring scale is needed. As far as the research literature is concerned, Indonesian researchers do not yet have a validated questionnaire for use in measuring the knowledge and attitudes in caring for PwD. The dementia knowledge assessment scale (DKAS) [9] and the Dementia Attitudes Scale (DAS) [10] are instruments that can be used to measure knowledge and attitudes in caring for patients with dementia. They are widely used, relatively valid, and reliable and can measure knowledge and attitudes toward dementia in general. In addition to DKAS, there are other questionnaires, such as the Alzheimer's disease knowledge scale (ADKS) [11], Dementia Knowledge-20 (DK-20) [12], The UJA Alzheimer's Care Scale [13], Dementia Assessment Knowledge Tool Version One (DKAT1) [14], Dementia Assessment Knowledge Tool Version Two (DKAT2) [14], but DKAS has a Cronbach's Alpha which is higher than the others. In addition, the DKAS questionnaire is also suitable for measuring medical and health science students' knowledge of dementia in general. The research team has obtained permission to use the DKAS questionnaire from the developers of the instrument.

Similarly, the DAS is comparable with questionnaires to measure attitudes toward dementia such as The approaches to dementia questionnaire (ADQ) [15], The General Practitioner Attitudes and Confidence Scale for Dementia (GPACS-D) [16], and Adolescent Attitudes toward Dementia Scale (A-ADS) [17]. Research on the validity of DKAS and DAS instruments has been done in several countries, such as China, Japan, Spain, Croatia, and Greece. In these various studies, DKAS and DAS remained valid and reliable, with Cronbach's Alpha for the DKAS in the range of 0.7–0.9; whereas Cronbach's alpha for DAS in the range 0.7–0.8 [18], [19].

Measurements of knowledge and attitudes of nursing students towards PwD are needed to determine how the knowledge and attitude scores of nursing students towards PwD. Accordingly, the availability of a valid and reliable questionnaire to measure both is important. Based on the summary above, the DKAS and DAS questionnaires have good potential to be processed for translation and tested for validity and reliability in the Indonesian version. Moreover, there is no valid and reliable questionnaire on knowledge and attitudes toward dementia in Indonesia, which is the main reason for this research. This study aimed to translate and identify the validity and reliability of the Indonesian DKAS and DAS questionnaires in the Indonesian nursing student population.

Methods

This study used a cross-sectional design to examine the validity and reliability of the Indonesian version of DKAS and DAS instruments. This research started with the process of translating the questionnaire using the Brislin method [20]. The forward translation processes were done by two different sworn translators (T1 and T2) who worked independently. After that, three members of the research team have a meeting to reach a consensus and get 1 version of the translated Indonesian version (T1,2). The back translation process was conducted similarly to the first translation. Two independent translators translate back the instrument from Indonesian to English (T1,2 to BT1, BT2). The process of reaching a consensus was done by three members of the research team after backward translation to compare the results of back translation with the original instrument. This was conducted to make sure that the translated Indonesian version has the equivalent content with the original English version.

The validity of the two questionnaires was identified with content validity and face validity. The content validity test was conducted by four experts in gerontic nursing with a minimum qualification of a master's degree using item-content validity index (I-CVI) and scale-content validity index (S-CVI). Moreover, face validity testing was conducted on 10 students at two academic institutions. Meanwhile, the reliability of the questionnaires was identified with Cronbach's Alpha score. In addition, the reliability of DKAS and DAS was measured using Cronbach's Alpha.

This research was conducted on nursing students at two institutions in Yogyakarta, Indonesia. This study involved 486 respondents with the inclusion criteria of students in the academic stage of nursing science studies and willing to become research respondents voluntarily. Meanwhile, the exclusion criteria were students who were unable to attend the data collection process, which was done using the paper and pencil method.

The DKAS instrument was developed by Michael J. Annear, Christine M. Toye, Claire E. Eccleston, Frances J. McInerney, Kate-Ellen J. Elliott, Bruce K. Tranter, Thomas Hartley, and Andrew L. Robinson in 2015 [9]. The DKAS has 25 question items with four sub-scales. The four sub-scales, namely: (1) Causes and Characteristics, (2) Communication and Behavior, (3) Care Considerations, and (4) Risks and Health Promotion. The original DKAS has a Cronbach's Alpha of 0.85, indicating an acceptable internal consistency subscale. In addition, the DKAS is very suitable to be used to measure knowledge about dementia in students [9]. The DAS was used to measure student attitudes toward PwD. The DAS was developed by Melissa L. O'Connor and Susan H. McFadden in 2010 [10]. The DAS was developed by testing caregivers, professionals, and students. The DAS has 20 items using a 5-point Likert scale ranging from "Strongly Agree = 1" to "Strongly Disagree = 5". The DAS instrument has two factors which are labeled with "dementia knowledge" and "social comfort," and can be used to measure dementia attitudes in students. The original DAS has a Cronbach's Alpha range of 0.83–0.85 [10].

Data collection was done by respondents who filled out the informed consent form to indicate their consent to become research respondents. Respondents who were willing to participate in this study were given sufficient time to fill out the questionnaire package. The average time required by respondents to fill out the questionnaires was <30 min. Then, the research team collected the completed questionnaires and re-checked whether all questions were filled out by the respondent. Data analysis was conducted when all data had been collected. In writing the report, the researchers maintained the respondent's confidentiality by not displaying the respondent's real name but using a code or initials.

Data were analyzed using the excel program for I-CVI and S-CVI. SPSS version 26 (IBM Corp., Armonk, NY USA) was also used to analyze Cronbach's Alpha as well as conducting factor analysis. Numerical variable description tables were used with means and standard deviation (SD) for normal data distribution and in the median for abnormal data distribution [21]. The reliability of the questionnaire was indicated by Cronbach's Alpha score.

Results

This study was conducted on 486 nursing students at X and Y Universities in Yogyakarta, Indonesia. Most of the respondents (270 respondents or 55.6%) were aged 20–22 years old. Moreover, 149 (30.7%) respondents were in the 4th year batch. The description of the characteristics of the respondents is shown in Table 1.

Table 1: Characteristics of respondents (n = 486)

Characteristics	Frequency (f)	Percentage	Mean ± SD
Age (years)			19.91 ± 1.526
Gender			
Man	82	16.9	
Woman	404	83.1	
Class (year)			
1	134	27.6	
2	90	18.5	
3	110	22.6	
4	152	31.3	

SD: Standard deviation.

The researchers conducted content validity by asking four geriatric experts to review the relevance of the items on the questionnaire. The researchers also asked for input related to technical errors in the preparation of items, word order (grammar), and the presence or absence of bias. Each item of the questionnaire was assessed for relevance on an ordinal scale of 1–4. A scale of 1 means "Irrelevant"; 2 means "Slightly relevant and requires very significant changes"; 3 means "Relevant but requires minor changes or modifications"; and 4 means "Very relevant". Scales 1 and 2 are worth 0 while scales 3 and 4 are worth 1.

I-CVI is obtained by adding up the value of the level of relevance then divided by the number of experts on each item. Meanwhile, the value of the S-CVI is the average value of the I-CVI sum of all questionnaire items. The I-CVI and S-CVI scores of the Indonesian version of the DKAS were 1.00. While the I-CVI value of the DAS was in the range of 0.75–1.00 and the S-CVI of the DAS was 0.9875. The content validity test revealed that Indonesian DKAS and DAS in the Indonesian version is valid.

Face validity testing was conducted on 10 respondents, which aimed to see the readability and appearance of the instrument. The results showed that the respondents stated that they understood the sentences in the instrument. On the instrument display, some respondents suggested improvements to make the instrument easier to understand in its operation. Responding to this input, the researchers conducted a discussion and agreed to make changes to the appearance of the instrument to make it easier for respondents to fill out the questionnaire.

The reliability of the instrument in this study was measured using Cronbach's alpha formula. The DKAS questionnaire has Cronbach's alpha of 0.713 and DAS had 0.779. In addition, each item in the DKAS and DAS questionnaires also has a Cronbach's Alpha in the range of 0.691–0.715 for DKAS and 0.756–0.790 for DAS (Tables 2 and 3).

Discussions

The instruments used in this research are DKAS and DAS. Several methods are used to ensure

Table 2: The results of the validity and reliability testing of items on the Indonesian DKAS instrument (n = 486)

Item number	Items	λ	Interpretation of validity	Cronbach's alpha	Interpretation of reliability
1	Dementia is a normal part of the aging process. *Demensia adalah hal normal dari proses penuaan.*	0.390	Valid	0.705	Reliable
2	Alzheimer's disease is the most common form of dementia. *Penyakit alzheimer adalah bentuk demensia yang paling umum.*	0.369	Valid	0.710	Reliable
3	People can recover from the most common forms of dementia. *Orang dapat pulih dari bentuk demensia yang paling umum.*	0.381	Valid	0.706	Reliable
4	Dementia is not caused by physical changes in the brain. *Demensia tidak disebabkan oleh perubahan fisik di otak.*	0.564	Valid	0.703	Reliable
5	End-of-life care planning is generally not necessary once dementia is diagnosed. *Perencanaan asuhan untuk akhir kehidupan umumnya tidak diperlukan setelah terdiagnosis demensia.*	0.496	Valid	0.693	Reliable
6	Vascular dementia is the most common form of dementia. *Demensia vaskuler merupakan bentuk demensia yang paling umum.*	0.404	Valid	0.708	Reliable
7	Most forms of dementia generally do not shorten a person's life. *Sebagian besar bentuk demensia umumnya tidak memperpendek usia seseorang.*	0.498	Valid	0.714	Reliable
8	Having high blood pressure increases a person's risk for developing dementia. *Memiliki tekanan darah tinggi meningkatkan risiko seseorang untuk terkena demensia.*	0.353	Valid	0.712	Reliable
9	Maintaining a healthy lifestyle does not reduce the risk of developing the most common form of dementia. *Mempertahankan gaya hidup sehat tidak mengurangi risiko terkena bentuk demensia yang paling umum.*	0.434	Valid	0.698	Reliable
10	Symptoms of depression can be mistaken for symptoms of dementia. *Gejala-gejala depresi dapat disalahartikan sebagai gejala demensia.*	0.511	Valid	0.715	Reliable
11	In general, exercise is beneficial for people with dementia. *Secara umum olahraga bermanfaat bagi orang yang mengalami demensia.*	0.467	Valid	0.698	Reliable
12	Early diagnosis of dementia generally does not improve the quality of life for people with the condition. *Diagnosis dini demensia secara umum tidak meningkatkan kualitas hidup orang yang mengalami kondisi tersebut.*	0.514	Valid	0.692	Reliable
13	The sudden onset of cognitive problems is characteristic of a common form of dementia. *Timbulnya masalah kognitif secara tiba-tiba adalah karakteristik dari bentuk demensia yang umum.*	0.411	Valid	0.717	Reliable
14	Communicating with people who have advanced dementia is impossible. *Berkomunikasi dengan orang yang memiliki demensia tahap lanjut adalah hal yang tidak mungkin.*	0.439	Valid	0.709	Reliable
15	A person who is in advanced stages of dementia generally will not respond to changes in their physical environment. *Seseorang yang berada pada demensia tahap lanjut secara umum tidak akan menanggapi perubahan pada lingkungan fisiknya.*	0.706	Valid	0.717	Reliable
16	It is important to correct people with dementia when they are confused. *Penting untuk mengoreksi orang dengan demensia saat mereka sedang bingung.*	0.581	Valid	0.716	Reliable
17	People with advanced dementia often communicate using body language. *Orang dengan demensia tahap lanjut sering kali berkomunikasi menggunakan bahasa tubuh.*	-0.419	Valid	0.705	Reliable
18	Unnatural behavior in people with dementia is generally a response to unmet needs. *Perilaku yang tidak wajar pada orang yang mengalami demensia umumnya merupakan respon terhadap kebutuhan yang tidak terpenuhi.*	0.402	Valid	0.703	Reliable
19	Medication is the most effective way to treat behavioral symptoms in dementia. *Obat adalah cara yang paling efektif untuk mengobati gejala-gejala perilaku pada demensia.*	0.512	Valid	0.716	Reliable
20	People with dementia generally have no difficulty making decisions. *Orang demensia pada umumnya tidak mengalami kesulitan mengambil keputusan.*	0.518	Valid	0.692	Reliable
21	In advanced stages, dementia generally affects the sufferer's ability to move. *Pada tahap lanjut, demensia umumnya memengaruhi kemampuan gerak penderitanya.*	0.442	Valid	0.700	Reliable
22	People with advanced dementia may have difficulty speaking. *Orang dengan demensia tahap lanjut dapat mengalami kesulitan berbicara.*	0.542	Valid	0.695	Reliable
23	People with dementia often have difficulty learning new skills. *Orang dengan demensia sering mengalami kesulitan mempelajari keterampilan baru.*	0.574	Valid	0.692	Reliable
24	In general, difficulty eating and drinking occurs in people with advanced dementia. *Pada umumnya, kesulitan makan dan minum terjadi pada orang dengan demensia tahap lanjut.*	0.581	Valid	0.691	Reliable
25	Day-to-day care for people with advanced dementia will be effective if focused on providing comfort. *Perawatan sehari-hari bagi orang dengan demensia tahap lanjut akan efektif apabila difokuskan pada upaya memberikan rasa nyaman.*	0.439	Valid	0.701	Reliable

that these two tools are valid and reliable in measuring knowledge and attitudes toward patients with Alzheimer's. These two measurement tools also use the process of translation and adaptation into Indonesian. Several instruments are used to measure knowledge related to dementia, namely Alzheimer's disease knowledge test for health care professionals [22], The ADKS [11], and knowledge in dementia [23].

In addition to knowledge, student attitudes are a measurable variable in this study. There are several instruments used to measure attitudes toward people with dementia, namely the Approach to Alzheimer's disease questionnaire (ADQ) [24], Bryan DAS [22], attitudes to aggression scale [25], approaches to dementia questionnaire, Chinese dementia attitude scale (DAS) [26]. Attitudes toward people with dementia are measured using different instruments, but not all of them are validated.

Several aspects of the use of this instrument can be used by students, health workers, and the community. DKAS is a new dementia-related knowledge tool with good validity and reliability and has undergone translation and back-translation processes in previous studies. In addition, this instrument proved to be more sensitive than previous instruments [27].

The DAS contains 20 items on a Likert scale ranging from "strongly agree" to "strongly disagree" [10]. This instrument was used in this study because the content is appropriate and is a standard instrument with good psychometric properties. and go through the structure mapping process.

Table 3: The results of the validity and reliability testing of items on the Indonesian DAS instrument (n = 486)

Item number	Questions items	λ	Interpretation of validity	Cronbach's alpha	Interpretation of reliability
1	Working with people with Alzheimer's disease and other dementias is rewarding. *Bekerja bersama orang dengan penyakit alzheimer dan demensia lainnya memberi kepuasan tersendiri.*	0.307	Valid	0.777	Reliable
2	I fear people with Alzheimer's disease and other dementias. *Saya takut terhadap orang dengan penyakit alzheimer dan demensia lainnya.*	0.442	Valid	0.769	Reliable
3	People with Alzheimer's disease and other dementias can be creative. *Orang dengan penyakit alzheimer dan demensia lainnya bisa menjadi kreatif.*	0.480	Valid	0.768	Reliable
4	I feel confident around people with Alzheimer's disease and other dementias. *Saya merasa percaya diri berada di sekitar orang dengan penyakit alzheimer dan demensia lainnya.*	0.495	Valid	0.765	Reliable
5	I feel comfortable touching people with Alzheimer's disease and other dementias. *Saya merasa nyaman menyentuh orang dengan penyakit alzheimer dan demensia lainnya.*	0.627	Valid	0.758	Reliable
6	I feel uncomfortable around people with Alzheimer's disease and other dementias. *Saya merasa tidak nyaman berada di sekitar orang dengan penyakit alzheimer dan demensia lainnya.*	0.539	Valid	0.763	Reliable
7	Everyone with Alzheimer's disease and other dementias has different needs. *Setiap orang dengan penyakit alzheimer dan demensia lainnya mempunyai kebutuhan yang berbeda.*	0.464	Valid	0.778	Reliable
8	I'm not very familiar with Alzheimer's disease and other dementias. *Saya tidak terlalu mengenal penyakit alzheimer dan demensia lainnya.*	0.522	Valid	0.788	Reliable
9	I would avoid people with Alzheimer's disease and other dementias who are anxious. *Saya akan menghindari orang dengan penyakit alzheimer dan demensia lainnya yang sedang gelisah.*	0.459	Valid	0.769	Reliable
10	People with Alzheimer's disease and other dementias enjoy being close to everything they know. *Orang dengan penyakit alzheimer dan demensia lainnya senang berada dekat dengan segala sesuatu yang dikenalinya.*	0.558	Valid	0.765	Reliable
11	Knowing the history of people with Alzheimer's disease and other dementias is very important. *Mengetahui riwayat orang dengan penyakit alzheimer dan demensia lainnya sangatlah penting.*	0.498	Valid	0.767	Reliable
12	It is possible to enjoy interacting with people with Alzheimer's disease and other dementias. *Adalah hal yang mungkin untuk menikmati interaksi bersama orang dengan penyakit Alzheimer dan demensia lainnya.*	0.643	Valid	0.761	Reliable
13	I feel relaxed around people with Alzheimer's disease and other dementias. *Saya merasa santai berada di sekitar orang dengan penyakit alzheimer dan demensia lainnya.*	0.683	Valid	0.756	Reliable
14	People with Alzheimer's disease and other dementias can enjoy life. *Orang dengan penyakit alzheimer dan demensia lainnya bisa menikmati hidup.*	0.630	Valid	0.761	Reliable
15	People with Alzheimer's disease and other dementias are able to sense when other people are nice to them. *Orang dengan penyakit alzheimer dan demensia lainnya mampu merasakan ketika orang lain baik kepada mereka.*	0.600	Valid	0.763	Reliable
16	I feel frustrated because I don't know how to help people with Alzheimer's disease and other dementias. *Saya merasa frustrasi karena saya tidak tahu bagaimana membantu orang dengan penyakit alzheimer dan demensia lainnya.*	0.673	Valid	0.780	Reliable
17	I can't imagine having to take care of people with Alzheimer's disease and other dementias. *Saya tidak bisa membayangkan seandainya harus merawat orang dengan penyakit alzheimer dan demensia lainnya.*	0.670	Valid	0.775	Reliable
18	I am amazed at the ability of people with Alzheimer's disease and other dementias to cope. *Saya kagum dengan kemampuan orang dengan penyakit alzheimer dan demensia lainnya dalam mengatasi masalah.*	0.420	Valid	0.772	Reliable
19	Now we can do a lot to improve the lives of people with Alzheimer's disease and other dementias. *Sekarang kita dapat melakukan banyak hal untuk memperbaiki kehidupan orang dengan penyakit alzheimer dan demensia lainnya.*	0.534	Valid	0.764	Reliable
20	Difficult behavior, perhaps a form of communication in people with Alzheimer's disease and other dementias. *Tingkah laku yang menyulitkan, mungkin merupakan bentuk komunikasi pada orang dengan penyakit alzheimer dan demensia lainnya.*	0.577	Valid	0.790	Reliable

The Indonesian DKAS and DAS instruments have good validity and reliability values. The DKAS instrument also has good validity when translated into Chinese, Japanese, and Spanish. The DKAS instrument in Chinese has a Cronbach alpha of 0.93 [28]; in Japanese, it has a Cronbach's alpha of 0.79 [27] and in Spanish, it has a Cronbach's alpha of 0.89 [27].

The reliability of the Indonesian DKAS and DAS were conducted using Cronbach's Alpha. The DKAS questionnaire has a Cronbach's Alpha of 0.713, while the DAS questionnaire has a Cronbach's Alpha of 0.779, which means it has an acceptable Cronbach's Alpha value if the results is >0.60 [29].

Meanwhile, the DAS instrument was also translated into several languages, such as Croatian, Turkish, and Greek. The reliability test value using Cronbach Alpha showed a good score of 0.847 in Croatian [19], 0.84 in Turkish [30], and 0.74 in Greek [18].

This suggests that the DKAS and DAS are research tools with well-proven internal consistency and are suitable for measuring knowledge and attitudes to assess understanding of dementia and developing effective educational programs in the care of dementia patients.

Conclusion

DKAS Indonesia is valid and reliable. In addition, all items in the DKAS questionnaire indicate

that this questionnaire can be considered reliable and valid. The Indonesian DKAS and DAS can be used to assess nursing students' knowledge and attitudes toward PwD.

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