

DEMENTIA SCREENING IN OLDER PEOPLE IN TANGERANG

Renata Komalasari¹, Desy Sihite²

¹Lecturer of Sekolah Tinggi Ilmu Kesehatan Tarumanagara, Jakarta, Indonesia

²Nurse staff, Siloam Hospitals Lippo Karawaci, Banten, Indonesia

Email: renata.komalasari@stikes.tarumanagara.ac.id

Abstract

Early recognition of dementia syndrome can result in earlier intervention, thus earlier prevention and better management of dementia. However, there is a difficulty with instruments to screen for dementia in developing country. Low education, illiteracy and innumeracy of the ageing population may be screened positive for dementia. The Rowland Universal Dementia Screening Assessment Scale (RUDAS) was developed for cognitive function measurement for multi-cultural population with strong reliability and validity and had been validated in countries across the world. However, the literatures had reported no dementia screening studies with the use of the RUDAS in the Indonesian community. This study was the first study to screen for dementia utilising the Rowland Universal Dementia Assessment in the Indonesian community, which was undertaken in 2016 in Bencongan Indah, a subdistrict of a city in Banten. This was a descriptive study to screen for dementia using the RUDAS in the Indonesian community. Data was collected using purposive sampling with inclusion criteria: adults age 60 and over, Indonesian-speaking participants, there was no apparent acute illness that could affect the performance of the test. The validity and reliability of the RUDAS were assessed prior to the main study on 35 participants who had similar characteristics with the study respondents. The Indonesian version of the RUDAS instrument was assessed for validity and reliability prior to the main study. This study showed that out of 60 elderly respondents of 60-74 years old in the study, half (50%) had mild to moderate cognitive impairment, as scored 22-26 on the RUDAS. However, the study lacked investigation of demographic factors affecting the RUDAS performance. Recommendations Further study validating the use of the Indonesian version of the RUDAS is warranted.

Keywords: *dementia screening, the Rowland Universal Dementia Assessment Scale, ageing population, older people*

INTRODUCTION

Indonesia, without doubt, is heading to an ageing population as it has more than seven percent (8.5%) people age 60 years old and over (Ministry of Health of Indonesia, 2016). Along with age, cognitive function of the elderly is deteriorating which in turn will affect memory, thinking, orientation, comprehension, calculation, learning capacity, language, and even judgement (World Health Organization, 2018).

These symptoms are known as a syndrome, more popularly known as dementia. Early dementia screening has long been suggested

for better management of dementia. Earlier counselling for future care can be started early on thus people with dementia and their carers may have more options for the health care of their loved ones. In addition, early detection of dementia can prevent progression of mild cognitive impairment to severe one or dementia. As a result, further difficulties caused by dementia in performing daily activities, such as paying bills, shopping or managing medications, can be prevented once declined memory detected.

Being a vast archipelago with 255.18 million population (Central Bureau of Indonesia, 2013), Indonesia is multicultural country with over 300 ethnic groups. Alzheimer Disease International recorded that Indonesia had around 1.2 million people suffered from dementia with Alzheimer Disease (AD) (Indonesian Neurologist Association, 2015). The Mini Mental State Examination (MMSE) is a widely used instrument for dementia screening, including in Indonesia. However, the performance of the MMSE has been reported to be affected by education and culture (Escobar et al., 1986). This has biased cognitive function measurement with older people from diverse cultural background and with low years of education, which characterized still many of the ageing population in Indonesia.

A more recently cognitive measurement tool was developed in Australia for multicultural population in Australia, called the Rowland Universal Dementia Assessment Scales (RUDAS), had been reported as a good alternative in measuring cognition (Storey et al., 2004). The RUDAS contained six items assessing body orientation, praxis, drawing, judgment, memory, and language with a total score of 30 points and scores below 23 suggesting dementia (Storey et al., 2004). In a

systematic review and meta-analysis involving 11 articles looking at validation of the RUDAS in various countries, a pooled sensitivity of 77.2% (95% CI 7.4 – 84.5) and a pooled specificity of 85.9% (95% CI 74.8 – 92.6) of the RUDAS was reported (Naqvi et al., 2015). The RUDAS had high inter-rater (ICC=0.99) and test-retest (ICC=0.98) reliabilities and excellent diagnostic accuracy (AUC = .95) (Storey et al., 2004), reflecting its strong ability to differentiate people with and without dementia. It is easy to administer, taking about 10 minutes to complete (Storey et al., 2004), and has been translated into more than 30 languages, including Chinese language (Chen et al., 2015), without need to change the content. Skilled and unskilled health care provider can administer the RUDAS after learning from a videotape with approximately 40 minutes duration (Storey et al., 2004). The RUDAS has been tested in four continents across the world, consisting of Australia, Europa, Africa and Asia (Naqvi et al., 2015). Compared to the MMSE, the RUDAS was found to be easier to learn and administer (Mateos-Alvarez, 2017) and the performance was not affected by gender ($p = 0.759$), whereas the MMSE was ($p = 0.004$) (Nielsen et al., 2012). In addition, years of education was not correlated with the RUDAS performance (r

= 0.083), but the MMSE was ($r = 0.432$, $p < 0.01$). Considering the benefits of the RUDAS over the MMSE, the RUDAS was used as an instrument in screening for dementia in the present study. This study was the first study to screen for dementia utilising the Rowland Universal Dementia Assessment in the Indonesian community, which was undertaken in 2016 in Bencong Indah, an area in the province of Banten, Indonesia.

METHOD

The study was undertaken from May to October 2016. Data was collected using purposive sampling with inclusion criteria: adults age 60 and over, Indonesian-speaking participants, there was no apparent acute illness that could affect the performance of the test. The original six-item of RUDAS was directly translated into the Indonesian language, then back-translated by an English teacher. The items of the instrument were verified by an

English language professional. The translated RUDAS was piloted on 35 individuals under normal field conditions to evaluate its burden and acceptability prior to the main study, and the Chronbach Alpha of the instrument was 0.60, showing that items had good reliability.

The Mochtar Riady Institute of Nanotechnology ethics committee approved the study protocol, and all subjects (or their proxies) gave informed written consent. The RUDAS was administered in some of the participant's home and some in a nursing home.

RESULT

Only one investigator administered the six RUDAS items. All items were administered sitting opposite the respondents to control for level of difficulty. Suggested cut-off point was 23, thus any scores of 22 or less provided an indication of developing dementia.

Table 1. Demographic characteristics of the respondents in the study (N = 60)

| Variable | | Frequency | Percentage (%) |
|--------------|--------|-----------|----------------|
| Gender | Male | 28 | 46.7 |
| | Female | 32 | 53.3 |
| Age | 60-64 | 23 | 38.3 |
| | 65-69 | 18 | 30.0 |
| | 70-74 | 19 | 31.7 |
| Total | | 60 | 100 |

Table 2. The Rowland Universal Dementia Assessment Scale Scores of the respondents (N = 60)

| RUDAS Scores | Frequency | Percentage (%) |
|--------------------------------------|-----------|----------------|
| 5-21 (Possible cognitive impairment) | 18 | 30 |
| 22-26 (Mild cognitive impairment) | 30 | 50 |
| 27-30 (Normal cognitive function) | 12 | 20 |
| Total | 60 | 100 |

Table 3. Memory Scores of the respondents on The Rowland Universal Dementia Assessment Scale (N = 60)

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 0 | 4 | 6.7 |
| 2 | 4 | 6.7 |
| 4 | 7 | 11.7 |
| 6 | 10 | 16.7 |
| 7 | 2 | 3.3 |
| 8 | 33 | 55.0 |
| Total | 60 | 100 |

The task given to assess for memory was the *4-item grocery recall*: The elderly was required to remember four grocery items (tea, cooking oil, eggs and soap), after a maximum of five learning trials (to ensure item registration). When the elderly was unable to recall any of the groceries, “tea” (the first item) was used as a prompt. There was no point given in the initial part of this task. Scores were given when respondents after the judgment task with maximum score of 8 points.

Table 4. Body Orientation Scores on The Rowland Universal Dementia Assessment Scales

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 2 | 2 | 3.3 |
| 3 | 5 | 8.3 |
| 4 | 8 | 13.3 |
| 5 | 45 | 75.0 |
| Total | 60 | 100 |

To assess body orientation, the respondent was asked to respond to the following commands (in the order stated):

1. “Show me your right foot”.
2. “Show me your left hand”.
3. “With your right hand, touch your left shoulder”.
4. “With your left hand, touch your right ear”.
5. “Point to or indicate my left knee”.
6. “Point to or indicate my right elbow”.
7. “With your right hand, point to or indicate my left eye”.
8. “With your left hand, point to or indicate my left foot”.

Although there are 8 parts, this item has a maximum score of 5 points. A high percentage (75%) of the respondents scored 5 on the body orientation task.

Table 5 Praxis Scores on the Rowland Universal Dementia Assessment Scales (N=60)

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 0 | 1 | 1.7 |
| 1 | 13 | 21.7 |
| 2 | 46 | 76.7 |
| Total | 60 | 100 |

This question has a maximum score of 2 points. To assess for praxis domain, the elderly was asked to imitate a motor task, beginning by placing both hands palm down on the table (or the lap). One hand was then placed in a fist (in the vertical

position) while the other remained palm-down. Both hands were then simultaneously alternated between the two positions. After learning the task, the respondents were asked to maintain it at a moderate (walking) pace for approximately 10 seconds.

Table 6 Drawing Scores on the Rowland Universal Dementia Assessment Scales (N=60)

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 0 | 44 | 73.3 |
| 1 | 8 | 13.3 |
| 2 | 2 | 3.3 |
| 3 | 6 | 10.0 |
| Total | 60 | 100 |

Table 7 Judgement Scores on the Rowland Universal Dementia Assessment Scales (N=60)

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 0 | 11 | 18.3 |
| 1 | 5 | 8.3 |
| 2 | 22 | 36.7 |
| 3 | 1 | 1.7 |
| 4 | 21 | 35.0 |
| Total | 60 | 100 |

For drawing task, the respondents were required to copy a large line drawing of a cube. This question has a maximum of 3 points. Whereas for *crossing the road* task, the elderly was asked to describe how he or she would go about safely crossing a very busy street or similar thoroughfare where

there was no pedestrian crossing. If the patient did not address two necessary components (looking for traffic and safety), a prompt – “is there anything else you would do?” was used. This question has a maximum of 4 points.

Table 8. Language Scores on the Rowland Universal Dementia Assessment Scales (N=60)

| Scores | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| 1 | 1 | 1.7 |
| 2 | 3 | 5.0 |
| 3 | 2 | 3.3 |
| 4 | 9 | 15.0 |
| 5 | 8 | 13.0 |
| 6 | 10 | 16.7 |
| 7 | 5 | 8.3 |
| 8 | 22 | 36.7 |
| Total | 60 | 100 |

In *animal generation*, which was delivered to assess for language, the respondents were asked to name as many new animals as

DISCUSSION

This study provided description of cognitive function of older people in a small district in Banten province in Indonesia with the use of the Rowland Universal Dementia Assessment Scale (RUDAS) as a dementia screening tool. The study showed that amongst 60 older people involved in this study, half (50%) of them scored 22-26 on the RUDAS scale, indicating mild cognitive impairment. Similar findings were reported in a previous dementia screening study in Cijengir area, a sub-district in the Banten province (Komalasari & Kumalasari, 2014). Involving 150 older people age 56 up to > 65 years old, the study showed that more than half of the respondents (61.3%; n = 92) was indicated to have mild to moderate cognitive impairment, as measured with the Montreal Cognitive Assessment (MoCA), whereas 22% and 16% respectively had had severe and no cognitive impairment (Alzheimer Disease International, 2015).

Age of the respondents in the present study was equally distributed in three different age categories (around 30% respectively in 60-64, 65-69, 70-74 age categories),

possible in one minute. This item has a maximum score of 8 points.

however there was no investigation of correlation between age of the respondents and the performance of the RUDAS. In the original RUDAS study in Australia, age was reported to significantly affect the RUDAS performance ($p = 0.04$) (Storey et al., 2004). However, other RUDAS study from Australia showed that age was not influencing the RUDAS scores ($p = 0.5$) (Rowland et al., 2016); ($p = 0.65$) (Basic et al., 2009a). With regards to gender, more females than males were involved in the study (53.3% versus 46.7%). Further, dementia is not part of normal ageing, however the literature suggested an association between older-old age and lower performance of some cognitive measurement tools (Chaaya et al., 2015). The present study lacked assessment of correlation between age category and the RUDAS scores. A RUDAS study in Arab involving 232 older people from the communities, community-based primary care clinics and hospital-based specialist clinics showed that the number of people with moderate dementia was higher in older age group (the number of elderly with moderate dementia was 7 in the 65-74 age

group; 18 in 75-84 age group and 20 in 85+ age group) (Chaaya et al., 2015).

That gender was not significantly affecting the RUDAS performance was reported in the original RUDAS validation studies in Australia ($p = 0,18$) (Storey et al., 2004); (no value co-efficient reported) (Rowland et al., 2016); $p = 0.48$ (Basic et al., 2009a). Further, the cultural background of the respondents was not assessed in the present study. However, it should be reported that they were coming from diverse cultural background, including Chinese, Javanese, Sundanese, and eastern parts of Indonesia. CALD (culturally and linguistically diverse) status was reported to affect the performance of RUDAS in the original RUDAS study in Australia ($p < 0.05$) (Storey et al., 2004). Many older people in Indonesia used their mother languages in daily communication. The use of RUDAS can facilitate this because it was designed for multicultural population.

Further, this study did not assess the education years of the respondents. Years of education was not affecting the RUDAS scores ($p = 0.2$) (Storey et al., 2004); (no value coefficient reported) (Rowland et al., 2016); $p = 0.44$ (Basic et al., 2009a), making the RUDAS a good alternative as a

dementia screening instrument particularly for older people in Indonesia which consisted of many older people with low literacy and numeracy levels due to short years of education. Many of the Indonesian's older population had short years of education and some of them had very low level of literacy. Less education, innumeracy and illiteracy had been reported to give false positive result in dementia screening (Iype et al., 2006).

This study was lacking on validating the instrument before it can be used. However, the investigator was able to test the Chronbach alpha of the instrument, which was 0.60, showing that items had good reliability. It can be concluded that the study lacked assessment of important demographic data of the respondents to be analysed for confounders affecting the performance of the RUDAS of the Indonesian version. In addition, small sample of the study ($n = 60$) renders inability of the study results for generalizability in other settings. The present study used the RUDAS as a cognitive measurement tools to determine people with dementia. The RUDAS had been tested for use with multicultural older population in Asian countries, including Malaysia (Shaaban et al., 2013), Thailand

(Limpawattana et al., 2012), Taiwan (Chen et al., 2015), and South India (Iype et al., 2006). There is a need for validating the RUDAS as dementia screening tool in the Indonesian community.

CONCLUSIONS

This study has provided dementia screening results with older people in an area in Banten province, which is an area of 45-minute drive from the capital city of Indonesia, Jakarta. This study showed that half of older people in the area had mild cognitive impairment, as scored 22-26 on

the Rowland Universal Dementia Assessment Scales (RUDAS). The limitations of this study included lack of important demographic factors affecting the RUDAS performance and the use of small sampling, limiting generalisability of the study findings. While the measurement tool was initially piloted on 35 older people before being used with the study respondents, it did not go through a proper validation testing incorporating more varied validity and reliability measures, warranting further validation study of the RUDAS in the future.

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