International Journal of Geriatrics and Gerontology

Al-Jadidi S, et al. Int J Geriatr Gerontol 6: 128.

www.doi.org/10.29011/2577-0748.100028

www.gavinpublishers.com

OPEN ACCESS

GAVIN PUBLISHERS

Research Article

The Usefulness of Rowland Universal Dementia Assessment Scale in Oman: A Cross Sectional Study

Saleha Al-Jadidi [1*], Maryam Alharrasi[2], Mandhar Almaqbali[3], Faiza Alkharusi[4], Naila Al Kharusi[4], Nura Al-Tai[4], Ahmed AlHanashi[5], Abdullah Alnabhani[6]

[1]Consultant Psychiatry and Geriatric, AlMasarra Hospital, Ministry of Health, Sultanate of Oman, Faculty and Education Member, Oman Medical Specialty Board, Clinic Director, SJMC, Sultanate of Oman

[2]Assistant Professor, Sultan Qaboos University, Sultanate of Oman

[3]Psychiatrist, Sohar hospital, Ministry of Health, Sultanate of Oman

[4]Psychologist, AlMasrra Hospital, Ministry of health Sultanate of Oman

[5]AlNahadha Health Center, Ministry of Health, Sultanate of Oman

[6]Psychiatrist, Nizwa Hospital, Ministry of Health, Sultanate of Oman

[*]**Corresponding author:** Saleha Al-Jadidi, Consultant Psychiatry and Geriatric, AlMasarra Hospital, Ministry of Health, Sultanate of Oman, Faculty and Education Member, Oman Medical Specialty Board, Clinic Director, SJMC, Sultanate of Oman

Citation: Al-Jadidi S, Alharrasi M, Almaqbali M, Alkharusi F, Al Kharusi N, et al. (2022) The Usefulness of Rowland Universal Dementia Assessment Scale in Oman: A Cross Sectional Study. Int J Geriatr Gerontol 6: 128. DOI: 10.29011/2577-0748.100028

Received Date: 09 January, 2022; **Accepted Date:** 24 January, 2022; **Published Date:** 28 January, 2022

Abstract

Dementia is decline in multiple cognitive domains and considered as a major cause of disability among elderly. Cognitive assessment is an essential part in evaluating patients attending geriatric clinic such as Mini-Mental State Examination (MMSE). However, this tool requires, individual to be at certain level of education, which may be difficult to perform among illiterate people. Moreover, the illiteracy rate in Oman was estimated to be 6% of the population **Aim:** The aim of this study is to assess the usability of Rowland Universal Dementia Assessment Scale (RUDAS) as assessment tool for dementia in Oman. **Objective** To establish the usefulness of the Rowland universal dementia assessment scale (RUDAS) in comparison with Mini -Mental State Examination (MMSE) and validating a simple and portable tool to screen for dementia among Omani population. **Methods**: Cross-Sectional study conducted at Al-Masarra hospital Geriatric unit OPD services from July 2020 to January 2021 to those who attending the OPD. **Results**: The RUDAS tool sensitivity was 95.3% and the specificity was 40.7%. While the MMSE sensitivity was 98% and the specificity was 32.7%. There is significant difference in both the sensitivity and specificity of both screening tools ($p<0.05$). RUDAS was more specific than the MMSE. Conclusion RUDAS is useful in assessing dementia in Omani population.

Introduction

Dementia is decline in multiple cognitive domains and considered as a major cause of disability among elderly [1]. Cognitive assessment is an essential part in evaluating patients attending geriatric clinic. Folstein Mini-Mental State Examination (MMSE) is a widely used tool to screen for cognitive impairment and to assess the severity of dementia [2]. However, MMSE score is influenced by age, gender, educational level, country of birth and language of the interview [3]. Furthermore, literal translation of the MMSE may produce items of different connotations and levels of difficulties [4]. In Oman, the illiteracy rate was estimated

to be 6% of the population (UNESCO institute for statistics 2015). Moreover, in geriatric population in Oman is 6% more in females, with present more than 80%, while in elderly men equaled to 22% [5]. In Oman, increase presentation of illiteracy in elderly due to lack of schools and other education resources before 1970. Hence, cognitive assessment of this age group requires a good screening tool with cross-cultural, linguistic and psychometric properties. In Oman: AlMasarra Hospital, total number of Dementia requested to date are 3098 and those who actively attending in OPD are 1000+ cases. Moreover, dementia cases at AlMasarra Hospital Geriatric representing 76% of total patients seen in Geriatric unit [6]. Rowland universal dementia assessment scale - RUDAS [7] is a simple tool to detect dementia that is valid across various cultures and can be translated easily to different languages [7]. There are positive studies conducted in Australia, European countries and India assessing the usefulness of RUDAS in dementia [8-10]. Moreover, up to our knowledge, this is the first study in Middle East study /Oman, assessing the usefulness of RUDAS in dementia. In a study done by Storey, et al. used the 6-item RUDAS show that the tools not affected by gender, years of education, differential performance factors and preferred language [7]. "The area under the ROC curve for the RUDAS was 0.94 (95% CI 0.87-0.98). At a cut-point of 23 (maximum score of 30), sensitivity and specificity were 89% and 98%, respectively. Inter-rater (0.99) and test-retest (0.98) reliabilities were very high [8]." Another study title Usefulness of the Rowland Universal Dementia Assessment Scale in South India, which was done by Lype, et al. aim to compare the sensitivity and specificity of MMSE and RUDAS [11]. The conclusion shows that RUDAS had "a similar sensitivity but better specificity than MMSE, but did have an educational bias [9]." A prospective international cross-sectional multi-center study across five Western European countries done by Nielsen TR, et al. found the RUDAS have high diagnostic accuracy in multicultural sample (sensitivity 0.80, specificity 0.90) [5].

Up to our knowledge, this first study in Middle East / Oman to assess the usefulness of the Rowland Universal Dementia Assessment Scale (RUDAS) among Omani elderly population. Validating a simple and portable tool to screen for dementia and other cognitive disorders will help the treating doctors to monitor the progress of the disease and the response to medical intervention.

Methodology

Type of study

A cross sectional study conducted at Al-Masarra hospital (tertiary hospital) Geriatric unit OPD from July 2020 to Jane 2021 to those who attending the OPD visits. Objective to establish the usefulness of the Rowland Universal Dementia Assessment Scale (RUDAS) among Omani elderly population through a comparison with MMSE and DSM 5 criteria for neurocognitive disorder. The total active dementia population attending AlMasarra at Hospital who are currently attending the outpatient clinic are 1000 patients. We have based our sample calculation to meet this aim. We based our sample size and population on the need of the psychometric analysis that we will use to achieve this aim and on the previous literature published on the same topic [5,9]. To achieve adequate sample size for the psychometric analysis explained in result section. The study was approved by Ministry of Health Research Ethic Committee, Muscat Governorate.

Sample size

The total sample size in this study will be 300 patients, which will be sufficient for running both types of factor analysis [12]. 50% with neurocognitive disorders (Alzheimer Disease, Vascular dementia, Fronto-Temporal Dementia, Lew Body Dementia, other non-specific Dementias) Mild to severe degree Another 50% the control group without neurocognitive disorder. The sample will be collected by simple random, number the OPD attendees and enrolled participates with odd numbers (1, 3, 5, 7...etc.) and leave the even numbers. Inclusion criteria, patients with major neurocognitive disorder and apparent normal without neurocognitive disorder Exclusion criteria substance misuse.

Data analysis

SPSS version 20 will be used for analysis. For descriptive purposes, categorized variables will be described as percentages with confidence intervals. Continuous variables will be presented as mean with standard deviation or median with inter-quartile range. To assess relations between variables: as univariate analysis, we will use chi-square, t-test, ANOVA or non-parametric test according to nature of data. The result will listed after completion of the study; however, we anticipate that, the positive result of usefulness/ usability of RUDAS in assessment dementia. In addition, such result of this study may help psychiatrists, physicians and other health professionals to screen for cognitive impairment in elderly from different cultures and various educational level. In addition, validating a simple and portable tool to screen for dementia and other cognitive disorders will help the treating doctors to monitor the progress of the disease and the response to medical intervention. The results will be presented in comparison of two groups.

Results

Sample and Sampling Technique

The sample in this descriptive study included patients with major neurocognitive disorder-dementia. Inclusion criteria was patients with dementia above the age of 60 years old, attending the outpatient clinic at (Al-Masrra hospital) in the northern of Oman. We also recruited patients who apparently normal without dementia/diagnosed with other disorders to be a comparison group (control). We excluded patients with severe concomitant chronic disabling diseases who cannot fill up the assessment tool such as those with terminal heart failure, terminal cancer, and end stage renal diseases.

The aim of this study is to assess the usability of the RUDA's assessment tool. The total dementia population attending Al-

Masarra Hospital who were currently attending the outpatient clinic were 1000 patient. We have based our sample calculation to meet this aim. We based our sample size on the need of the psychometric analysis that we used to achieve this aim and on the previous literature published on the same topic [5,9]. To achieve adequate sample size for the psychometric analysis explained in the next section we recruited 250 patients. To account for possible missing data, we recruited an extra 50 patients. The total sample size in this study was 300 patients (150 cases and 150 controls) which was sufficient for running the analysis.

Statistical Analysis

Data was tested for normality and accuracy prior to the actual analysis using skewness, kurtosis, and histograms. Categorical data was presented in percentages and continues data was presented as means and standard deviations. Independent sample t-test was used to examine the mean difference between the control and the case group in terms of formal education. Cases and controls were classified as tested positive or tested negative based on the recommended cut off point (24 for MMSE and 23 for RUDAS). Sensitivity and specificity were calculated for both tests. McNemar's test was used to examine difference in the specificity and sensitivity. Significance was set at .05. All analysis was carried out using SPSS version 23.

Results

The screening test was administered to 150 patients with dementia (cases), and 150 patients with non-dementia (controls). The mean age in the cases group was 76.08 years (8.30), and 69.03 years (6.56) in the control group. Both groups were nearly equal in terms of gender variations, mostly unmarried, unemployed, uneducated and have existing comorbidities with their mental health disorders. Most of the sample was on treatment for their condition. Characteristics of both groups are presented in Table 1.

		Cases				**Controls**			
Characteristic		Mean	SD	Frequency	%	Mean	SD	Frequency	%
Age		76.08	8.30			69.03	6.56		
Gender									
	Male			70	23.3			60	20.0
	Female			79	26.3			90	30.0
Marital Status									
	Married			71	23.7			86	28.7
	Unmarried			229	76.3			214	71.3
Employment									
	Employed			0	0.0			2	0.7
	Unemployed			300	100.0			298	99.3
Educational Status									
	Educated			149	49.7			48	16
	Uneducated			151	50.3			225	84
Comorbidities									
	Have no comorbidities			28	9.3			29	9.7
	With comorbidities			272	90.7			271	90.3
Treatment									
	On treatment			278	92.7			300	100
	Not on treatment			22	7.3			0	0
Years since Diagnosed		3.05	2.68			10.77	12.85		

Table 1: Sample Characteristics.

The t test showed no significant difference between the cases and controls in terms of level of education (P=0.46). Mean RUDAS and MMSE scores for the two groups are presented in Table 2.

	N	Minimum	Maximum	Mean	Std. Deviation
RUDAS Score (Case)	150	0	27	11.25	6.693
MMSE Score (Case)	150	0	27	10.87	6.679
RUDAS score (Control)	150	4.00	30.00	21.4000	5.11872
MMSE score (Control)	150	6.00	64.00	21.2733	6.62910
Note: Case: Dementia patients, Control: Non- Dementia patients					

Table 2: Comparison between case and control in RUDAS and MMSE scores

The RUDAS tool sensitivity was 95.3% and the specificity was 40.7%. While the MMSE sensitivity was 98%, and the specificity was 32.7% presented in Table 3. We found significant difference in both the sensitivity and specificity of both screening tools ($p<0.05$). RUDAS was more specific than the MMSE. While marginal difference was detected in terms of sensitivity, where MMSE was more sensitive.

			Positively screened for Dementia	Negatively screened for Dementia	
MMSE	24 or less	Count	147	101	248
		% Within for specificity and sensitivity	98.0%	67.3%	82.7%
	above 24	Count	3	49	52
		% Within for specificity and sensitivity	2.0%	32.7%	17.3%
Total		Count	150	150	300
		% Within for specificity and sensitivity	100.0%	100.0%	100.0%

Table 3: Specificity and Sensitivity for the MMSE screening tool.

Discussion

This is the first case control study that compared the score of RUDAS to the MMSE in the Middle East. The study was conducted in a tertiary care hospital that receives referrals from around the country. Therefore, the sample represents a heterogeneous elderly population living in different parts of Oman (Table 4).

			Positively screened for dementia	Negatively screened for Dementia	
RUDAS	23 or less	Count	143	89	232
		% Within for specificity and sensitivity	95.3%	59.3%	77.3%
	above 23	Count	7	61	68
		% Within for specificity and sensitivity	4.7%	40.7%	22.7%
Total		Count	150	150	300
		% Within for specificity and sensitivity yes no have dementia	100.0%	100.0%	100.0%

Table 4: Specificity and Sensitivity for the RUDAS screening tool.

Most of the participants are unemployed because the retirement age in Oman is at 60 years. Moreover, more than two thirds of them are unmarried mostly due to death of spouse and more than half of the participant in case and control groups were uneducated as formal education in Oman had started in 1970 when most of them had possibly started to work.

The present study showed high level of sensitivity of RUDAS to detect cases of neurocognitive disorder. This finding is consistent with many previous studies that evidenced the ability of RUDAS to identify patients with neurocognitive disorder [6,9,10]. For example, Storey, et al. demonstrated sensitivity rate of RUDAS as 89% across multiple cultures [6]. Similarly, Lype, et al. showed high sensitivity of RUDAS at 23 as cut off point among Indian population [9].

Compared to MMSE, RUDAS had almost similar sensitivity but higher specificity in the studied population. Nevertheless, the specificity for both tests are low, 40.7% for RUDAS and 32.7% for MMSE. Advanced age of the studied population and presence of multiple medical and mental comorbidities in both groups had resulted in a lower specificity in both test. More importantly, lack of formal education in the control group had possibly decreased the ability of the RUDAS test to rule out false positive cases of neurocognitive disorder. This is in contrast with many previous studies that showed high levels of specificity for MMSE and RUDAS [5,9]. This could be contributed to the difference in the studied population in term of education and presence of comorbidities in the control group. When the scare is intended for screening purposes, sensitivity is more important than sensitivity [8]. The geriatric clinic at Al Masarra Hospital is the only geriatric clinic in Oman that receives referral from all medical centers across the country. There is no finical burden on patients to attend the clinic, which is the case in other geriatric clinics (Government Funded) in Oman. Based on this observation, we can assume that the findings can be generalized to other geriatric clinics in Oman.

The study has some limitations. The design of the study was cross-sectional which might cause misdiagnosis of dementia and could be avoided in longitudinal studies. In addition, the selection of control group from geriatric clinic patients might restricted the ability of the researchers to choose the candidates. There were also big variations in the educational level of the control group compared to the cases group as only 16% of the control group where educated compared to 49.7% in cases group.

References

1. Marvardi M, Mattioli P, Spazzafumo L, Mastriforti R, Rinaldi P, et al. (2005) The Caregiver Burden Inventory in evaluating the burden of caregivers of elderly demented patients: results from a multicenter study. Aging Clin Exp Res 17: 46-53.
2. Folstein MF, Folstein SE, McHugh PR (1975) "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 12: 189-198.
3. Anderson TM, Sachdev PS, Brodaty H, Trollor JN, Andrews G (2007) Effects of sociodemographic variables on Mini-Mental State Exam scores in older Australians. Am J Geriatr Psychiatry 15: 467-476.
4. Manly JJ, Espino DV (2004) Cultural influences on dementia recognition and management. Clin Geriatr Med 20: 93-119.
5. Nielsen TR, Segers K, Vanderaspoilden V, Bekkhus-Wetterberg P, Bjørkløf GH, et al. (2019) Validation of the Rowland Universal Dementia Assessment Scale (RUDAS) in a multicultural sample across five Western European countries: diagnostic accuracy and normative data. Int Psychogeriatr 31: 287-296.
6. Al-Masarra Information System.
7. Storey JE, Rowland JTJ, Basic D, Conforti DA, Dickson HG (2004) The Rowland Universal Dementia Assessment Scale (RUDAS): a multicultural cognitive assessment scale. Int Psychogeriatr 16: 13-31.
8. Kurlowicz L, Wallace M (1999) The Mini-Mental State Examination (MMSE). J Gerontol Nurs 25: 8-9.

9. Naqvi RM, Haider S, Tomlinson G, Alibhai S (2015) Cognitive assessments in multicultural populations using the Rowland Universal Dementia Assessment Scale: a systematic review and meta-analysis. CMAJ 187: E169-E175.

10. Oman National Statistic Center

11. Lype T, Ajitha BK, Antony P, Ajeeth NB, Job S, et al. (2006) Usefulness of the Rowland Universal Dementia Assessment Scale in South India. J Neurol Neurosurg Psychiatry 77: 513-514.

12. Sapnas KG, Zeller RA (2002) Minimizing sample size when using exploratory factor analysis for measurement. J Nurs Meas 10: 135-154.