

Nepali Version of Geriatric Depression Scale-15 - A Reliability and Validation Study

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ABSTRACT

Background: Geriatric depression is a significant problem in both the developed and the developing world. To identify this condition, Geriatric Depression Scale has been used in different languages and cultural settings; it has proved to be a reliable and valid instrument. However, the Geriatric Depression Scale-15 version in Nepali has so far not been validated.

Methods: The original 15-item version of the Geriatric Depression Scale-15 was translated into Nepali and administered by trained nurses to a target sample aged ≥ 60 years at Dhulikhel Hospital (n=106). Subsequently, the participants were blindly interviewed by a consultant psychiatrist for possible geriatric depression according to the ICD-10 criteria. Cronbach's alpha checked the reliability. Validity was assessed for three different cut-off points (4/5, 5/6, and 6/7); the related sensitivity, specificity, positive predictive value, and the negative predictive value of the scale were estimated.

Results: The mean participant age was 68.1 (± 7.2); males and females, 50.9% and 49.1%, respectively. Cronbach's alpha was 0.79. The optimal cut-off point was found to be 5/6 with sensitivity and specificity 86.3% and 74.5%, respectively.

Conclusions: Using a standard statistical protocol, a reliable and valid Geriatric Depression Scale-15-Nepali was developed with an adequate internal consistency and an optimal balance between sensitivity and specificity at cut-off point 5/6. The Geriatric Depression Scale-15-Nepali can serve as an appropriate instrument for assessing geriatric depression in epidemiological research as well as in primary health care settings in Nepal.

Keywords: Geriatric depression; internal consistency; sensitivity; South Asia; specificity.

INTRODUCTION

Global burden of disease (GBD) studies indicate declining mortality rates resulting in escalated geriatric populations and non-fatal disease burden.¹ Worldwide, depression is the third most disabling disease;¹ South Asia is no exception.² Depression is high among Nepali adults,³ however, geriatric depression is not estimated yet.

Geriatric depression is highly burdensome for the elderly;⁴ often it comes with pre-existing physical comorbidities, psychotic symptoms, and suicide risk;^{5,6} therefore, it is not easily detected by usual diagnostic means.⁷

Geriatric Depression Scale (GDS) was developed to identify this condition, originally with 30-items.⁸ A

15-items version (GDS-15) is also available.⁹ Both are efficient and sensitive.^{8,10}

GDS is translated into many languages,¹¹⁻¹⁵ and recommended for clinical and research purposes.^{16,21} However, the Nepali version is not fully validated. This study aims for a reliable and valid instrument for assessing geriatric depression (Nepali-translated version of GDS-15), applicable to epidemiology and primary care in Nepal.

METHODS

This study is a part of a larger project entitled Prevalence, associations, and family caregiver burden of geriatric depression in Kavre District: A community-based cross-sectional study and educational project. The study obtained ethical approval from the Institutional

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Review Committee of the Kathmandu University School of Medical Sciences, Dhulikhel Hospital (IRC-KUSMS). In addition, informed verbal consent was obtained from all participants.

The original shorter version of GDS-15 contains the 15 items with the highest correlation with the depressive symptoms.¹⁸ The absence of somatic items, omission of nonspecific complaints like fatigue and concentration problems, simplicity of the administration, and short time required for the completion, are important advantages of GDS-15.^{16,17} Moreover, any item that could increase defensiveness in the participants were avoided;¹⁸ elderly people can use it with ease. The 15-items are easy to comprehend and fit into one single page, which tend to maximize collaboration.

Each item covers the individual's experiences during the last week.²² Of the 15 items, 10 indicate the presence of depression if endorsed positively, while the rest (Nos. 1,5,7,11,13,) indicate depression when endorsed negatively. Maximum score is 15. GDS-15 takes five to seven minutes to complete. The original GDS-15 has a moderate internal consistency (Cronbach's alpha=0.82); the correlation between the originals, 30-item GDS and GDS-15, is 0.84.¹⁸ (Appendix 1)

APPENDIX 1. Geriatric Depression Scale (Short Form) [GDS-15]

S.N.	Questions	Answers	
1.	Are you basically satisfied with your life?	Yes	No
2.	Have you dropped many of your activities and interests?	Yes	No
3.	Do you feel that your life is empty?	Yes	No
4.	Do you often get bored?	Yes	No
5.	Are you in good spirits most of the time?	Yes	No
6.	Are you afraid that something bad is going to happen to you?	Yes	No
7.	Do you feel happy most of the time?	Yes	No
8.	Do you often feel helpless?	Yes	No
9.	Do you prefer to stay at home, rather than going out and doing new things?	Yes	No
10.	Do you feel you have more problems with memory than most?	Yes	No
11.	Do you think it is wonderful to be alive?	Yes	No
12.	Do you feel pretty worthless the way you are now?	Yes	No
13.	Do you feel full of energy?	Yes	No

14. Do you feel that your situation is Yes No hopeless?

15. Do you think that most people are Yes No better off than you are?

Directions: Following fifteen questions are related to one's mood. Please choose the best answer that describes how you felt over the past one week.

The original English version of the GDS-15 was translated independently into Nepali by two persons with high knowledge of both English and Nepali. The translations were reconciled, and linguistic amendments were made, ultimately resulting in a quality assured translation,²³ used for the validation purposes (Appendix 2).

APPENDIX 2 Geriatric Depression Scale (Short Form)- Nepali Version [GDS-15 Nepali]

निर्देशन: तलका १५ प्रश्नहरू व्यक्तिको मनस्थितिसँग सम्बन्धित छन् । कृपया ती प्रश्नहरूको उत्तर दिँदाखेरी गएको १ हप्ताको आफ्नो अवस्थालाई सम्झेर दिनुहोला ।

क्र.सं	प्रश्नहरू	उत्तरहरू	
१	के तपाईं आफ्नो जीवनसँग छु साधारणतया सन्तुष्ट हुनुहुन्छ?	छु	छैन
२	के तपाईंले आफ्नो धेरै जसो काम र इच्छाहरू छोड्नुभएको छ ?	छ	छैन
३	के तपाईंलाई आफ्नो जीवन शुन्य छ जस्तो लाग्छ ?	छ	हैन
४	के तपाईंलाई धेरै जसो समय अल्छी लाग्छ ?	हो	हैन
५	के तपाईं धेरै जसो समय राम्रो महसुस हुन्छ ?	हो	हैन
६	के तपाईंलाई केही नराम्रो नै हुन लागे जस्तो गरी डर लाग्छ ?	हो	हैन
७	के तपाईं धेरै जसो समय खुशी महसुस गर्नुहुन्छ?	हो	हैन
८	के तपाईं धेरै जसो समय असहाय महसुस गर्नुहुन्छ?	हो	हैन
९	के तपाईं बाहिर जान र काम गर्न भन्दा घरमै काम नगरिकन बसिरहन रुचाउनु हुन्छ?	हो	हैन
१०	के तपाईंलाई अरु मान्छेमा भन्दा बढी 'सम्भ्रना शक्तिमा समस्या' छ जस्तो लाग्छ ?	हो	हैन
११	के तपाईं अहिले बाँचिरहनुमा उमंग महसुस गर्नुहुन्छ ?	हो	हैन
१२	के तपाईं हालको समयमा आफू बेकार छु जस्तो लाग्छ ?	हो	हैन
१३	के तपाईं आफूलाई फुर्तिलो महसुस गर्नु हुन्छ ?	हो	हैन
१४	के तपाईं आफ्नो अवस्था निराशाजनक महसुस गर्नुहुन्छ ?	हो	हैन
१५	के तपाईंलाई आफू भन्दा अरु प्रायः सक्षम छन् जस्तो लाग्छ ?	हो	हैन

The participants were recruited consecutively from the general medicine out-patient department (OPD) of Dhulikhel Hospital during the month of December, 2018. The consenting Nepali speaking participants aged ≥ 60 years.

Exclusion criteria were disorientation, sensory impairment (major hearing loss or inability to speak), severe debilitating diseases, and those already diagnosed or under treatment for any psychiatric disorder. Participants who were unable to provide correct response to at least two of the three following items were considered disoriented: period of the day (morning, afternoon, or evening), place (hospital or home), and day of the week. With this selection procedure, we included 106 participants into the study.

The consenting participants were interviewed by one of the trained nurses about age, gender, locality, marital status, education, and occupation. The GDS-15 Nepali version was also incorporated into the interview.

Subsequently, the participants were referred to the Psychiatry OPD for interview by the consultant psychiatrist (first author) to establish their clinical depression status as per the International Classification of Diseases (ICD-10) criteria.²⁴ The GDS-scores were not revealed to the psychiatrist.

Reliability and validity analyses were carried out. Socio-demographic characteristics were presented in the descriptive statistics; mean (\pm SD) scores of GDS-15 were calculated.

The split-half method determined the Cronbach's alpha as a measure of the internal consistency. Alpha value ≥ 0.70 was set as the threshold for satisfactory reliability.²⁵

As for the validation process, the clinical diagnosis as per ICD-10 criteria was assessed by the consultant psychiatrist.²⁴ Three different cut-off points were tested (4/5, 5/6, & 6/7) to determine which would serve as the optimal cut-off point for case-finding in Nepal; 2x 2 tables estimated the diagnostic accuracy by calculating sensitivity [Se], specificity [Sp], positive predictive value [PPV], and the negative predictive value [NPV]; all used as indicators of validity.

Se refers to the proportion of participants who scored for depression on the GDS-15, and in the ICD-10 interview. Sp was the proportion who had scores that did not indicate depression on the GDS-15, and who were not assessed to have depression according to the ICD-10. PPV is the probability that the participants have

depression according to the ICD-10 interview, given that they also had a positive test on the GDS-15. NPV is the probability that the participant did not have depression according to the ICD-10 interview, given that they also were scored as non-depressives on the GDS-15.

RESULTS

The mean age of the participants was 68.1 (\pm 7.2). The gender distribution was almost equal (males 50.9%; females 49.1%). Just more than three-fifths of the participants were from the urban community (62.3%), i.e., the study site (hospital) was located in the Dhulikhel Municipality. Almost four-fifths of the participants were married and lived together with their spouse (79.2%), and one-fifth was widowed (18.9%). Only a small percentage was separated (1.9%). Around three-fourths of the participants had no formal education (70.8%) and similar percentages were homemakers involved in the household works (71.7%) (Table 1).

Table 1. Distribution of demographic characteristics of the consecutive patient participants from the out-patient department of general medicine in Nepal (N=106).

Demographic variables	n (%)
Gender	
Male	54 (50.9)
Female	52 (49.1)
Residence	
Rural	40 (37.7)
Urban	66 (62.3)
Marital status	
Married and living together	84 (79.2)
Separated	2 (1.9)
Widow or widower	20 (18.9)
Education	
No formal education	75 (70.8)
Primary education	13 (12.3)
Secondary and above	18 (17.0)
Occupational status	
Employed	5 (4.7)
Business	18 (17.0)
Homemaker	76 (71.7)
Retired	7 (6.6)

The mean score of GDS-15 Nepali version of the whole sample was 6.2 (\pm 3.6), with values ranging from 0 to 14.

Table 2 below shows 2x2 tables of the outcome of the

ICD-10 diagnostic interviews and the caseness as found by the Nepali version GDS-15 with three different cut-off points. As per the GDS-15 scores, geriatric depression caseness at the cut-off points 4/5, 5/6, and 6/7 were 65.1%, 54.7%, and 45.3% respectively. As per the ICD-10 criteria, 51 (48.1%) were found to be depressed.

Table 2. Cross-tabulation of ICD-10 diagnosis and GDS-15 caseness with three different cut-off points to identify geriatric depression (N=106)

GDS-15 Scale	ICD-10 diagnosis		Total	GDS-15 caseness (%)	
	Case	No-case			
Cut off: 4/5	Case	50	19	65.1%	
	No-case	1	36		
Cut off: 5/6	Case	44	14	54.7%	
	No-case	7	41		
Cut off: 6/7	Case	39	9	45.3%	
	No-case	12	46		
Total		51	55	106	-

Cronbach's alpha of the Nepali version GDS-15 was found to be 0.79.

The numbers in Table 2 formed the basis for the computations of the values for Se, Sp, PPV, and NPV appearing in Table 3 when using the different three cut-off points. When the cut-off point 4/5 was used, GDS-15 got a high Se in comparison to the Sp (98.1 vs. 65.5). At cut-off point 5/6, Se and Sp were respectively 86.3% and 74.5%. However, the Sp was higher than Se (83.6 vs. 76.5) at the cut-off point 6/7.

Table 3. Sensitivity, Specificity, Positive predictive value, and Negative predictive value of GDS-15 with three different cut-off points to identify geriatric depression (N=106).

Cut-off point	Sensitivity	Specificity	Positive predictive value	Negative predictive value
4/5	98.1%	65.5%	72.5%	97.3%
5/6	86.3%	74.5%	75.9%	85.4%
6/7	76.5%	83.6%	81.3%	79.3%

DISCUSSION

We initiated this endeavor to enhance the pool of psychometrically sound and locally adapted inventories in Nepal, still a research naïve country. Our objective was to develop a Nepali version of the GDS-15 that is reliable and validated against the ICD-10 diagnosis of depression. The ICD-10 was chosen because it is the

most commonly used diagnostic system in Nepal. Our effort was reasonably successful; the chosen procedures brought out both a satisfactory reliability and validity.

Reliability of the GDS-15 Nepali version assessed through the internal consistency was adequate (Cronbach's alpha= 0.79),²⁵ and this alpha is in line with other reliability studies. A review of a large Asian community sample revealed the Cronbach's alpha to be in the range of 0.79-0.81.²⁶ Another review exploring reliability studies of GDS among the Asian immigrants in the US showed alpha values of GDS-15 in the range of 0.72-0.87.¹¹ Furthermore, the alpha value of GDS-15 among the South African geriatric out-patients was 0.79.⁷

For assessing the validity, we used Se and Sp analyses. Their values are related to the delineation of the cut-off points for case/non-case of the GDS-15.¹⁹ In principle, a caseness threshold should aim for the lowest misclassification rate.²⁷ The GDS scale is basically a screening instrument; depressed elderly as well as the non-depressed persons should both have good chances of being correctly identified.¹⁹ Ideally, only the true cases should score at or above the cut-off, while all the non-cases should remain below the cut-off.⁸ The goal is to get as close to this ideal as possible.

A low cut-off point of GDS-15 will raise the Se and increase the chance that an elderly depressive person will be treated, but there is at the same time the risk of starting unnecessary treatment in non-depressive patients. On the other hand, a high cut-off point will increase the Sp and have the opposite effect; depressive patients will not get the required treatment.²¹ Cut-off points should be chosen so that the values of Se and Sp are as close to each other as possible and with a low number of false positives and negatives. Actually, high levels of the Se and the NPV are favorable for screening purposes, but such approach may lead to relatively low Sp and PPV.⁹

Scientific studies of GDS have been divided on what is the best cut-off point for identifying geriatric depression caseness. No studies have recommended one suitable cut-off point for GDS-15, except for the Canadian geriatric affective disorders clinic study; it regarded 5/6 as the optimal cut-off point, with Se 85% and Sp 74%.²⁸ A Brazilian Mental Health Unit Study of GDS-15 validated against ICD-10, as in our research, revealed different values of Se, Sp, PPV and NPV, in a range of variable cut-off points.⁹ Their Se and Sp at cut-off point 5/6 were 85.4% and 73.9% respectively,⁹ almost identical to the findings in our study (86.3 and 74.5%). A primary care study in New York showed Se and Sp of GDS-15 at cut-off

5 to be 92% and 81% respectively.²⁹ The validation study of a large Asian community showed overall Se and Sp of GDS-15 at cut-off 5 to be 97% and 95% respectively, analyses were also done using other cut-off points.²⁶

Limiting the number of false positive cases is essential for any epidemiological study. Furthermore, assessing relative risks of an untreated illness as well as the side-effects of treatment are also important aspects to consider for any psychiatric inventory in clinical settings. The goal of any validity study should thus be to select a cut-off point, which would balance well both Se and Sp. The validation of the Nepali version of GDS-15 aimed to address these concerns above.

Considering our obtained values of Se, Sp, PPV and NPV at three different cut-off points (Table 3), the best balance of Se and Sp was found at cut-off 5/6. At cut-off 4/5, Se and PPV were high, but it was at the expense of a relatively low Sp and PPV, which increased the chances of getting more false positive cases. With regard to the cut-off point 6/7, Se was lower than Sp, which could miss out many of those with geriatric depression and deny adequate treatment to them. Accordingly, the cut-off point 5/6 appears to be optimal in Nepal, and we suggest the use of this cut-off point in the future when administering Nepali version of GDS-15.

Our study has certain limitations. Although the validation study should preferably have been done using a relatively large population sample, we were not able to do so due to resource (psychiatrist manpower) constraints. Moreover, this was a single-center study; and the participants were recruited consecutively; they formed a convenience sample. By some researchers, consecutive selection of the participants is considered to be the best method for validating any research instrument.¹⁹ In addition, by using the general medicine out-patient clinic as the study site, and also, by allowing not only the patients but also their attendants ≥ 60 years to participate in the study, we tried to minimize the selection bias as far as possible. Even so, all types of bias inherent in any cross-sectional study cannot be completely ruled out.

Another limitation is related to the administration of the instrument. Although GDS was originally designed as a self-rating scale, we had to use the face-to-face interview approach to record adequately the responses from the participants. It was unavoidable as almost three-fourths of the participants were without any formal education. In a country with a low literacy rate,³⁰ to aim solely for self-rating inventories would limit the utility of the instrument. The original validation by the designers of the GDS was also done through oral administration,⁸

and rater-administration has been considered to be the acceptable and the preferred method for the elderly population.²¹

Apart from these limitations, the study has some strengths. All our participants were included both in the screening (administration of GDS-15) as well as in the clinical ICD-10 interviewing process. Furthermore, the ICD-10 interviewer was blinded with regard to the GDS-15 score. Using face-to-face interviews helped in providing a reasonable accuracy in the diagnosing of depression. We excluded the cognitively or sensory impaired participants because previous studies clearly pointed out that GDS is not suitable for such patients.^{19,26} Using the ICD-10 diagnosis as the validation criterion has probably enriched the study.

CONCLUSIONS

Using a standard statistical protocol, we were able to develop a reliable and valid Nepali version of GDS-15 with an adequate internal consistency, and balanced Se and Sp at a cut-off point of 5/6. The GDS-15 Nepali with a threshold or cut point of 5/6 can be recommended for use not only for screening geriatric depression in epidemiological population-based studies, but also for diagnosing this condition in primary health care settings.

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