Original Article

Assessing the Prevalence and Impact of Depression in Alzheimer's Disease: A Comparative Psychometric Analysis and Patient Outcomes. A comparative Scale Efficacy Analysis and Patient Outcomes

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ABSTRACT

Objective: The objective of this study was to evaluate the rate of depression in Alzheimer's patients with dementia, to evaluate the inter-rater reliability of the CSDD, and also to compare depression scores between the CSDD and GDS tools.

Study Design: A cross-sectional descriptive study.

Place and Duration of Study: This study was conducted at the Institute of Psychiatry, Benazir Bhutto Hospital, Pakistan fro m January 2023 to September 2023.

Methods: A cross-sectional descriptive survey was conducted on 45 patients diagnosed with Alzheimer's (dementia). The cognitive status of the participants was evaluated using the MMSE, while the participants' depression status was evaluated using the CSDD and GDS.

Results: The study included 45 patients with Alzheimer's disease, with a mean age of 73.5 years. The average time duration between the onset of the symptoms and diagnosis of the disease was 7.8 years. By administering Geriatric Depression Scale (GDS) the results showed that 57.8% of the patients had mild levels of depressive symptoms. While 86.4% of patients had probable major depression on informant rating, and 84% on patient ratings on the scale. When comparing the totals obtained with the GDS and the CSDD, it was found that the CSDD classified a higher number of patients as having probably major depression than did the GDS, therefore suggesting, that the CSDD could be a more sensitive instrument in detecting depressive symptoms in Alzheimer's patients than GDS. Patient-informant concordance on CSDD was confirmed with a correlation coefficient of 0.804 ($p < 0.01$) based on Kendall's Tau Correlation. Hence provided evidence that both informant and patient ratings are correlated and reliable.

Conclusion: Alzheimer's patients comprise elderly persons who are most likely to have dementia and depression. This study's results align with previous study findings and confirm that CSDD is a better tool to assess depression among dementia patients as compared to GDS.

Key Words: Alzheimer's disease, Depression, Dementia, Elderly.

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INTRODUCTION

Dementia and depression are psychiatric problems commonly encountered in neuropsychiatric practice among older adults. Alzheimer's disease (AD) is one of the main types of dementia and is a chronic disease that affects the central nervous system, and causes the patient to suffer from worsened cognitive ability, memory disorders, and behavioral modifications. Since the global population of people aged sixty years and above is rapidly growing, it is believed that the number of people with AD will also increase putting pressure on health facilities[1]. Depression identified in AD patients creates extra difficulties in treatment and aggravates the general outcome and the quality of life. Further, Alzheimer's disease accompanied by depression worsens the condition and damages the personal capacity of caregivers. Among the kinds of differential diagnosis, certain difficulties arise differentiating dementia from depression because

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certain symptoms are present both in the former and in the latter i.e., lack of interest, inability to experience pleasure, and cognitive impairment[2,3]. This is because the symptoms can be attributed to dementia causing the mood disturbances to be underdiagnosed or misdiagnosed instead of identifying a coexisting Major Depression Disorder (MDD)[4]. The diagnosis is essential as it determines the approach and the prognosis of the disease and also the quality of the patient's life. The Mini-Mental State Examination (MMSE) is a well-known neuropsychological test aimed at assessing distinct spheres of cognitive manifestations, memory, orientation in time and space, attention, speech, and visual constructional abilities. One of the most common tests for depression includes the Geriatric Depression Scale (GDS) which is a self-rated scale used by primary healthcare professionals for patients above sixty-five years of age. Although GDS deals with the cognitive symptoms of depression, it can sometimes give a wrong reading in demented patients, as research has identified that utilizing GDS for assessing depression in dementia may lead to a failure in the timely identification of depression in patients with AD, especially with moderate to severe dementia.

On the other hand, CSDD is more suitable for the assessment of depressive symptoms in dementia diagnosis as it was specifically developed for this purpose. Thus, by the increased use of both patient and informant ratings, the CSDD provides a more valuable assessment of this mood disorder within the population. Research has also shown that CSDD outperforms the GDS while screening the depressive symptoms in patients with AD irrespective of their cognitive status[5]. The current article aims to investigate the utility of the Cornell Scale for Depression in Dementia Informant Ratings as a surrogate measure, particularly in scenarios where ratings from patients are unavailable for certain reasons. The study also aims to establish the extent of reliability of the CSDD over the GDS in detecting depression among AD patients.

METHODS

The cross-sectional analysis research method was used to collect data accurately in present medical research at a specific point in time. The study was conducted at the Institute of Psychiatry, Benazir Bhutto Hospital, Pakistan, spanned from January 2023 to September 2023. The sample of 45 Alzheimer's was carefully selected via interview following ICD- 10 and utilizing assessment tools.

Inclusion Criteria: The Study strategically selected participants, focusing on patients aged above 65 who met the ICD-10 criteria for Alzheimer's disease. Informed consent was required to collect data and use it in the study.

Exclusion Criteria: Exclusion criteria were established to maintain Study integrity, excluding patients with serious co-morbid medical conditions like uremia, hepatic encephalopathy, congestive cardiac failure, anemia, chronic pulmonary disease, hypertensive encephalopathy, etc.

Data Collection: The data collection procedure involves administering Mini-Mental State Examination (MMSE), Coronell's scale for depression in dementia (CSDD), and Geriatrics Depression Scale (GDS) on the patients of Alzheimer's disease. Participants were diagnosed to have AD based on ICD-10 criteria. At first, dementia was ruled in by administering MMSE on the sample of 45; 19 males and 26 females. Those scoring 25/30 or below on MMSE were considered suitable for the study. Potential participants were then assessed for depression using the Geriatrics Depression Scale (GDS) were applied to them. Coronell's scale for depression in dementia (CSDD) was applied to patients and informants both.

Statistical Analysis: The data analysis was done by using SPSS V-26. At first, the normality of the data was checked on the data set. The data set was not normally distributed, so non-parametric tests were applied to the present data set. To check the concordance between patient and informant's rating Tau W concordance correlation was applied. The Tau Kendal non-parametric test examined the association between the data set.

RESULTS

The study aimed to investigate the concordance between the Cornel Scale for Depression in Dementia informant and patient version and to cross-comparison between the scores of the Geriatric Scale for Depression and the Cornel Scale for Depression in Dementia. For investigation, concordance analysis and mean comparison were performed.

Table No. 1: Demographic characteristics of the sample (N=45)

Age	%
58 to 64	2(4.4%)
65 to 74	22(48.9%)
75 to 84	17(37.8%)
85 to 95	4(8.9%)
Gender	
Male	19(42%)
Female	26(57.8%)

The demographics tables show the age ranges and gender of the participants. There were 2(4.4%) between age 58 to 64, 22(48.9%) between age 65 to 74, 17(37.8%) between age 75 to 84 and 4(8.9%) between age 85 to 95. There were 19(42%) male and 26(57.8%) female participants in the study.

Agreement Analysis: As the below table shows, the null hypothesis of concordance was retained but with no association. This could be because of the small sample size. Overall, concordance was found between the informant's and resident's ratings on CSDD.

Table No. 2: Kendall's W Coefficient of Concordance

Hypothesis Test Summary			
Null Hypothesis	**Test**	**Sig.**	**Decision**
The distributions of CSDD_informant and CSDD_patient are the same.	Related-Samples Kendall's Coefficient of Concordance	.090	Retain the null hypothesis.

Association Between Both Raters:

Table No. 3: Kendall's Tau Correlation

Variables	1	2
1. CSDD (informant)	1.000	.804**
2. CSDD (patient)	.804**.	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

In Kendall's tau correlation analysis investigating the association between the responses on CSDD by patient and informant, a strong and statistically significant positive association was observed, $\tau = .804$, $p < 0.01$. This indicates that the responses of the patient and informant are strongly associated with each other.

Scales Comparison on Depression Severity

Table No. 4: Ranges with GDS, CSDD

Ranges	GDS %	CSDD Informant %	CSDD Patient %
Normal/Absent	19(42.2%)	-	1(2.2%)
Mild	26(57.8%)	6(13.3%)	6(13.3%)
Moderate/ Probable MD	-	39(86.4%)	38(84%)

The table above shows the frequencies of ranges of the scale. It can clearly be seen that GDS has the frequency of 19(42.2%) on normal range whereas CSDD only has 1(2.2%) in the absent category rated by the patient, 26(57.8%) on mild GDS when CSDD has 6(13.3%) and 6(13.3%) on informant and patient-rated respectively. No responses are counted on GDS on Moderate though on CSDD there are 39(86.4%) by informant rated and 38(84%) by patient rated calculated.

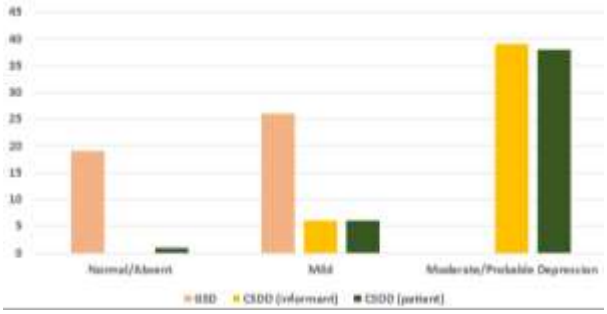

Figure No. 1: Depression Scales on Severity

DISCUSSION

The present examination supports that AD patients show elevated rates of depressive markers by employing the CSDD and the GDS, with notable identification rates. Such findings are in agreement with prior studies that revealed that depression often concomitantly is present in elderlies with AD [6]. Prior work in this area has also confirmed the present findings that depressive symptoms are frequently unrecognized in patients with dementia possibly due to the use of general assessment instruments like the GDS [7]. The CSDD identifies 17 patients with probable major depression, compared with 11 patients diagnosed by the GDS, thus agreeing with previous findings that the CSDD is a more appropriate tool for diagnosing depression in dementia [8]. According to another study that CSDD, made for the demented elderly, is better at detecting depression in this group particularly when there is impaired cognition. Compared to the GDS, which was originally designed for use in the general geriatric population, even though the GDS is useful in screening for depression, it cannot be used effectively in patients with cognitive decline, as it was pointed out in several studies [9]. These assertions are supported by the present study, as 84 % of the patients had probable major depression according to the CSDD, informant report, while 86.4% according to the caretaker, compared with 57.8 % on GDS [10]. As for the extent to which patients and informants agreed with each other, the correlation coefficient yielded by the present study was 0.804, $p < 0.01$ when CSDD scores from the two sources were compared, which supports the use of both measures. previous findings have also stressed the importance of involving caregivers in the evaluation of depression to counter potential confusion in the patient's perception stemming from the cognitive decline observed in dementia [11]. These results are in agreement with Zubenko et al., who utilized CSDD with a discordant sample and noticed a high degree of concordance between informants and patients [12]. Further, in line with CSDD detecting depressive symptoms more regularly than GDS, in another study showed that the GDS underestimates depressive symptoms in dementia patients, particularly moderately to severely dementing individuals. This disparity is significant as failing to address depression can lead to major symptoms of AD becoming worse, increased caregiving demands, and a worse general outcome for patients with AD. Therefore, in line with the foregoing findings of this study, the paper has thereby provided credence to earlier findings on the comparative understanding of the two scales, pointing to the observation that the CSDD is more positive and sensitive for the diagnosis of depression among Alzheimer's patients than the GDS. By showing a high

concordance between both patient and informant scores in this study, this work aligns with a rising body of literature calling for the use of multi-source assessment in diagnosing and treating depression in dementia. These results emphasize the need for differential diagnosis of dementia and assessment of other forms of cognitive impairment with the help of the tools specific to this pathology in order not to harm this patient population.

CONCLUSION

Studies showed that depressive symptoms are more likely to get screened better in Alzheimer's patients, using the CSDD scale is more accurate to screen major depression than GDS. That is why the multiple instrumental diagnosis increases the probability of diagnosing depression in dementia.

Limitations: The study involved 45 patients and used purposive sampling, which hinders the generalization of results across a population. Furthermore, the sample excluded patients with co-morbid conditions, and therefore the generalization of study results should be done with caution.

Future Findings: The study should be extended to give a broader population in the future and examine the effects of depression treatment in Alzheimer's patients in the long run. This has a suggestion that the positive weighted value of integrating different diagnostic tools with the view of the caregivers merits further Study for enhancing the patient care solutions.

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Author's Contribution:

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REFERENCES

1. Prince M, Wimo A, Guerchet M, Ali GC, Wu YT, Prina M. World Alzheimer Report 2015: The Global Impact of Dementia. Alzheimer's Disease Int 2015. Available at https://www.alzint.org/u/WorldAlzheimerReport2015.pdf
2. Alexopoulos GS, Meyers BS, Young RC, Campbell S, Silbersweig D, Charlson M. Vascular depression' hypothesis. Archives General Psychiatr 1997;54(10):915-922.
3. Enache D, Winblad B, Aarsland D. Depression in dementia: epidemiology, mechanisms, and treatment. Current Opinion Psychiatr 2011; 24(6): 461-472.
4. Harwood DG, Ownby RL. Beliefs about Alzheimer's disease and dementia. The Journals of Gerontology Series B: Psychological Sciences Social Sciences 2000;55(4):P223-P233.
5. Barca ML, Engedal K, Laks J, Selbæk G. A 12-month follow-up study of depression among nursing-home patients in Norway. J Affective Disorders 2010;120(1-3):141-148.
6. Banerjee S, Hellier J, Dewey M, et al. Sertraline or mirtazapine for depression in dementia (HTA-SADD): a randomised, multicentre, double-blind, placebo-controlled trial. Lancet 2011;378:403-411.
7. Olin JT, Katz IR, Meyers BS, et al. Provisional diagnostic criteria for depression of Alzheimer disease: rationale and background. Am J Geriatr Psychiatr 2002;10:129-141.
8. Starkstein SE, Jorge R, Mizrahi R, Robinson RG: The construct of minor and major depression in Alzheimer's disease. Am J Psychiatr 2005;162: 2086-2093.
9. Kaufer DI, Cummings JL, Christine D, et al. Assessing the impact of neuropsychiatric symptoms in Alzheimer's disease: the Neuropsychiatric Inventory Caregiver Distress Scale. J Am Geriatr Soc 1998;46:210-215.
10. Lyketsos CG, Lopez O, Jones B, Fitzpatrick AL, Breitner J, DeKosky S: Prevalence of neuro-psychiatric symptoms in dementia and mild cognitive impairment: results from the cardiovascular health study. JAMA 2002; 288:1475-1483.
11. Harwood DG, Barker WW, Ownby RL, Duara R: The behavioral pathology in Alzheimer's disease scale (BEHAVE-AD): factor structure among community-dwelling Alzheimer's disease patients. Am J Geriatr Psychiatr 2000;8:213-216.
12. Zubenko GS, Zubenko WN, McPherson S, et al. A collaborative study of the emergence and clinical features of the major depressive syndrome of Alzheimer's disease. Am J Psychiatr 2003; 160:857-866.

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