Anxiety and somatic symptoms among elderly patients with depression

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ABSTRACT

Aim of the study: This study aimed to evaluate the symptom profile, including anxiety and somatic symptoms among elderly patients with depression using the Geriatric depression scale (GDS-30), Beck Depression Inventory (BDI), Generalized anxiety Disorder -7 Scale (GAD-7) and Patient Health Questionnaire-15 (PHQ-15) scale. Additional aim was to carry out the factor analysis of symptoms reported on various scales.
Methodology: 83 elderly patients (age ≥60 years) with depression were evaluated on GDS-30, BDI, GAD-7 and PHQ-15.
Results: 60 subjects (72.28%) had GAD-7 score of ≥10, which is indicative of significant anxiety. On PHQ-15, 98.8% of patients had moderate to severe somatization. There was no correlation between severity of depressive symptoms (as assessed by GDS-30 and BDI) with anxiety and depressive symptoms except for significant correlation between BDI total score and GAD-7 total score (Pearson correlation coefficient-0.319;p = 0.003).Factor analysis of GDS-30 yielded a five factor solution and when the items of other 3 scales were added, the number of factors/symptoms clusters increased to 7.
Conclusion: The present study suggests that there is a higher prevalence of anxiety and somatic symptoms in elderly patients with depression and GDS-30 is unable to capture all the symptoms of depression among elderly in the Indian context. Hence, complete assessment of depression in elderly should include assessment of anxiety and somatic symptoms by using other scales like GAD-7,BDI-II and PHQ-15. There is a need to develop a new scale which will be helpful in capturing the entire symptom profile of depression among elderly.

1. Introduction

Depression in the late life needs special mention, as the symptom profile of geriatric depression is different from the other age groups (Hegeman et al., 2012). Studies which have compared geriatric depression with depression in young adults have revealed that elderly individuals with depression are less likely to show affective symptoms like worthlessness, guilt and dysphoria. Further when compared to young/middle aged individuals, elderly patients with depression more often experience cognitive symptoms(subjective memory loss and decreased concentration), somatic symptoms (Fiske et al., 2009), sleep disturbances, fatigability, loss of interest, hopelessness, worry about future (Christensen et al., 1999) and anxiety (Gottfries, 1998). Systemic reviews and meta-analysis on the phenomenology of depression in the elderly suggest that elderly with depression have predominant somatic symptoms, more agitation and hypochondriacal ideations (Hegeman et al., 2012; Shahpesandy, 2005).

One of the important differences between elderly and adult patients with depression is higher prevalence of anxiety among elderly (Jeste et al., 2006; Lenze et al., 2001; Schoevers et al., 2003, 2005). Some of the studies have estimated that about one-third of elderly patients with depression, if assessed properly have comorbid anxiety disorders, mainly in the form of generalized anxiety disorder (GAD) (Beekman et al., 2000; Lenze et al., 2000). Additionally, these studies suggest that higher prevalence of anxiety symptoms are also associated with more somatic symptoms (Lenze et al., 2000), more disability (Ormel et al., 1998), poorer psychosocial support and more suicidality (Jeste et al., 2006). Due to this close association of co-morbid depression and anxiety or depression with significant anxiety symptoms among elderly is also known as 'anxious depression' (Silverstone and Von Studnitz, 2003). This symptom profile has gained significance because of its association with high rates of service utilization, increased risk of medical co-morbidities, increased risk of suicidal ideations, more emotional distress and higher mortality rates(Flint and Rifat, 1997; Lenze et al., 2001). Studies also suggest that mixed anxiety depression is a more severe form of psychopathology and more specific to elderly women than males (Schoevers et al., 2003). Presence of subsyndromal but clinically significant anxiety symptoms in depression has also been acknowledged by Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) and it has suggested that a special 'anxious distress

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specifier' may be added to the diagnostic category of depressive disorders, in case patient has significant anxiety (American Psychiatric Association, 2013; Kupfer, 2015). Studies have also found that those elderly individuals who remain anxious during remission have increased risk for relapse (Flint and Rifat, 1997).

Different studies which have evaluated symptoms of depression among elderly have relied upon scales like Geriatric Depression rating scale (GDS), Hamilton Depression Rating Scale (HDRS) (Hegeman et al., 2012), Beck Depression Inventory (BDI-II) (Halpert et al., 1999) and Zung self –rating depression scale(Dunn and Sacco, 1989).The most commonly used scale to rate severity of depression among elderly is the GDS (Yesavage et al., 1982).Although the available data suggests that GDS is a good scale for assessment of depression among elderly, but some typical features of depression like somatic symptoms, anxiety symptoms, cognitive symptoms etc. are not evaluated adequately by using GDS. There by GDS does not provide full clinical picture of depression among elderly. Hence, there is a need to broaden the symptom profile to have a better understanding of whole range of symptoms of depression among elderly. Considering the fact that anxiety symptoms are quite common among elderly patients with depression and existence of close association of anxiety symptoms with somatic symptoms, it would be intriguing to understand the prevalence and correlation of these symptoms among elderly patients with depression. In this background, the present study aimed to evaluate the symptom profile of depression among elderly patients by using GDS-30, Generalized Anxiety Disorder-7 scale (GAD-7) and Beck Depression Inventory-II (BDI-II) and Patient Health questionnaire-15 item version (PHQ-15). Secondary aims of the study were to assess the correlation of severity of anxiety and somatic symptoms with severity of depression and to carry out the factor analysis of symptoms assessed by using different rating scales.

2. Materials & methods

The study was carried out at the psychiatry outpatient clinic of a tertiary care multispecialty teaching hospital in North India. The study was approved by the Institute Ethics Committee, and written informed consent was obtained from the participants.

All the new patients aged 60 or above, attending the psychiatric outpatients and diagnosed with depression as per International Classification of Diseases-10 (ICD-10) (World Health Organization, 1992) criteria by a qualified psychiatrist were eligible. Additional inclusion criteria involved duration of current episode to be more than 1 month. No specific exclusion criterion was kept for the study, so that the study sample is representative of population attending the clinic. However, patients who were uncooperative or were very sick, had history of mania/hypomania/mixed episode in the past and those with history of dementia or cognitive decline were excluded from the study. All the patients were rated on GDS, GAD-7, PHQ-15 and BDI-II.

2.1. Instruments

2.1.1. Geriatric Depression Scale-30-long form (Yesavage et al., 1982)

It is a 30 item self-rated scale with "yes" or "no" responses. Each item is rated as "0″or "1″ with total score ranging from 0 to 30. A score of ≤ 9 is considered as normal, a score of 10–19 indicates mild depression, and a score of 20–30 indicates severe depression. It has adequate and well-established reliability, validity and a high degree of internal consistency to assess depression among elderly (Yesavage et al., 1982). For this study, the 30 item Hindi version of GDS was used (Ganguli et al., 1999).

2.1.2. Beck Depression Inventory–II (Beck et al., 1996, 1961)

It is a 21 item self-rated questionnaire,developed to measure depressive symptoms and severity of depression in persons aged ≥ 13 years. The original version was developed in 1961 and subsequently it

has undergone multiple revisions. BDI-II (a revised form of BDI-IA) was published in 1996 which do not have items relating to body image,-weight loss, hypochondria, and working difficulty and its assessment of symptoms corresponds to the DSM-IV criteria (Beck et al., 1996).The questionnaire is intended to pick up symptoms corresponding to various somatic, cognitive, affective and vegetative symptoms of depression. Its time frame extends for 2 weeks similar to time frame of depression as per DSM-IV. It has been validated well across several patient population including older adults, adolescents and in medically ill patients (Smarr and Keefer, 2011).

2.1.3. Generalized Anxiety Disorder Questionnaire (GAD-7) (Spitzer et al., 2006)

It is a 7 items questionnaire developed to screen patients for anxiety and rate the severity of anxiety. Each item is rated on a 3 point scale with scores of 5, 10, and 15 taken as the cut-off points for mild, moderate and severe anxiety, respectively. The threshold score of 10 is considered to have a sensitivity of 89% and a specificity of 82% for GAD. Additionally, it is considered to be moderately good screen patients for panic disorder (sensitivity 74%, specificity 81%), social anxiety disorder (sensitivity 72%, specificity 80%) and post-traumatic stress disorder (sensitivity 66%, specificity 81%) (Spitzer et al., 2006).

2.1.4. The patient health questionnaire (PHQ-15)

It is a self-rated instrument which includes 15 items which are based on the prevalence of various somatic symptoms seen in patients presenting to the outpatient setting. Ratings are done by considering the last 4 weeks into account, and each item is rated as 0 (not bothered at all), 1 (bothered a little), or 2 (bothered a lot) with the total score ranging from 0 to 30. On the basis of the total score, the severity of somatic symptoms is graded as mild (0–4), moderate (5–9), and severe (≥ 10) (Kroenke et al., 2002). The full version of PHQ has been translated into Hindi and has been shown to have good psychometric properties (Avasthi et al., 2008). For the present study, the Hindi version of PHQ-15 was used. Out of the15 items, one item, was considered redundant (menstrual cramps or other problems with your periods) and was not included in the study. Hence, 14 items were used for this study (PHQ-14).

2.2. Statistical analysis

Statistical Package for the Social Sciences, Windows version 20 (SPSS-20, SPSS Inc., Chicago) was used for analysis. Continuous variables were analyzed in the form of mean and standard deviation (SD). Frequencies along with percentages were calculated for categorical variables. Pearson correlation was used to evaluate the association of severity of depression, anxiety, somatic symptoms. Principal component analysis was used for factor analysis to assess the minimum number of factors which could account for the high level of variance in the data. Varimax rotation was used to have the best fit of the data.

3. Results

The study included 83 patients diagnosed with depression. The mean age at the time of assessment was 66.39 (SD-6.39) years and the mean duration of education in years was 8.74 (SD-6.44) years. There was slight preponderance of females (55.4%) than males (44.6%). Majority of the patients were married (84.3%), were not on any paid employment (62.65%),were from nonnuclear families (71.1%), belonged to Hindu religion (79.8%) and came from urban background (55.4%). The age of onset of illness was 58.19 (SD- 13.00) years and mean total duration of illness was 99.33 (SD-136.01; range: 0.5–540) months. About three-fourth (N = 63) of the patients had at least one comorbid physical illness with some patients having more than one comorbid physical disorder. Common systemic physical illnesses included hypertension (N = 46), cardiovascular disease (coronary artery

disease and hypertension) (N = 14), diabetes mellitus (N = 19), hypothyroidism (N = 10), Parkinson's disease (N = 5) and renal failure (N = 1). Other physical illnesses included benign hypertrophy of prostate (N = 9). Cataract was seen in one fourth *(N = 20)* patients.

Co-morbid substance abuse was present in 21.68% of the sample, with alcohol dependence syndrome, currently abstinent (N = 11) being the most common diagnosis, followed by tobacco dependence syndrome currently using the substance (N = 1), benzodiazepine dependence syndrome, currently using alprazolam (N = 6).

Co-morbid psychiatric illness other than substance abuse was present in 8 patients (9.63%). Comorbid psychiatric diagnosis included agoraphobia (N = 6) and GAD (N = 2). Family history of mental illness was present in more than one fourth of the participants (N = 24; 28.9%). As per ICD-10, 50 (60.25%) patients were diagnosed with the first episode of depression and another 33 (39.75%) patients were diagnosed with recurrent depressive disorder (RDD). About one third (37.34%) were diagnosed with moderate depression and rest were diagnosed with severe depression. Psychotic symptoms were present in 22.8% (N = 19).

3.1. Symptom profile as per different scales

The prevalence of different symptoms as per the various scales is shown in Table 1 and 2. All the items of BDI-II, GAD-7 and PHQ-15 were recoded as 'present (1)' or 'absent (0)' to record the symptom profile. The mean GDS score was 18.20 (SD-2.45; range 12–23). More than one-third of the participants (*n* = 30; 36.1%) had severe depression as per GDS. As per BDI-II scores of the sample, about 50% of the sample (n = 42) had moderate depression and 43.4% had severe depression (n = 36). The mean BDI score was 33.38 (SD-7.46; range -17-50).The mean GAD-7 score of the sample was 12.16 (SD-4.37). On GAD-7, 60 subjects had scored ≥ 10, which is considered to be cut-off for diagnosis of GAD as per the GAD-7 scale.

When the symptom profile of patients with any physical co-morbidity (N = 63) and those without any physical co-morbidity (N = 20) was compared, very few significant differences emerged, suggesting that comorbid physical illnesses have minimal impact on manifestation of depression among elderly. Compared to those without physical co-morbidity those who had physical comorbidity, had higher prevalence of 'frequently getting upset over little things (GDS item number 24)' (p = 0.04), 'difficulty in making decisions (BDI-II item number 13)' (p = 0.002), 'constipation, loose bowels/diarrhea (PHQ-14 item number 11)' (p = 0.027).Similarly, when those with co-morbid hypertension (N = 46) with those without any physical comorbidity were compared, significant difference in prevalence of various symptoms was seen only on 7 of the 71 items included in all the scales. In both the comparisons, patients with and without any physical co-morbidity did not have significant difference on any of the GAD-7 items.

Further, when the symptom profile of those with first episode depression (N = 50) and those with RDD (N = 33) was compared, significant difference was noted only for 3 items.

3.2. Correlation of severity of depression, anxiety and somatic symptoms

When the relationship of severity of depression, anxiety and somatic symptoms was evaluated, there was significant correlation between BDI total score and GAD-7 total score (Pearson correlation coefficient-0.319;p = 0.003). No other significant correlations emerged.

3.3. Factor analysis of GDS-30, BDI-II, GAD-7 and PHQ-15

Principal component factor analysis was used to evaluate the various symptom clusters of depression in elderly.Varimax rotation was used to have the best fit of the data and optimum number of factors for each scale was established following the Kaiser–Guttman Rule. A loading of ≥0.4 for each item on various factors was considered

Table 1
Symptom profile as per GDS-30 and BDI-II.

Scale with items	Frequency (%) N = 83
GDS -30 items	
1. Often get restless and fidgety? -Yes	76 (91.6%)
2. Lack of feeling full of energy? - Yes	71 (85.5%)
3. Feeling that life is empty?- Yes	71 (85.5%)
4. Often get bored -Yes	71 (85.5%)
5. Feel helpless? -Yes	71 (85.5%)
6. Feel that your situation is hopeless? -Yes	70 (84.3%)
7. Frequently get upset over little thing? -Yes	70 (84.3%)
8. Dropped many of your activities?-Yes	70 (84.3%)
9. Do you prefer to stay at home? Yes	69 (83.1%)
10. Often feel downhearted and blue? -Yes	69 (83.1%)
11. Do you feel happy most of the time? - No	68 (81.9%)
12. Worry a lot about the past? -Yes	67 (80.7%)
13. Hard to get started on new projects? Yes	67 (80.7%)
14. Find life very exciting? -No	66(79.5%)
15. Think most people are better off? -Yes	66(79.5%)
16. Frequently worry about the future?-Yes	63(75.9%)
17. Feel pretty worthless?-Yes	62(74.7%)
18. Trouble concentrating? -Yes	62 (74.7%)
19. Bothered by thoughts? Yes	59 (71.1%)
20. Afraid that something bad will happen? - Yes	59 (71.1%)
21. Frequently feel like crying? -Yes	56 (67.5%)
22. Prefer to avoid social gatherings? - Yes	55(66.3%)
23. Problems with memory? -Yes	54 (65.1%)
24. Do you think it is wonderful to be alive? -No	32(38.6%)
25. Easy make decisions? - No	28 (33.7%)
26. Hopeful about the future? -No	26 (31.3%)
27. Satisfied with life? -No	24 (28.9%)
28. Mind clear as it used to be?- No	24 (28.9%)
29. In good spirits most of the time? - No	19 (22.95%)
30. Enjoy getting up in the morning? -No	19 (22.9%)
Mean GDS score	18.20 (2.45); range 12-23
Severity of depression as per GDS-30	53 (63.9%)
Mild depression (10–19)	30 (36.1%)
Severe Depression (20–30)	
BDI -21 items – 0-absent;1 –Present	Present (%)
1. No satisfaction with things as before	82(98.8%)
2. Loss of interests	80(96.4%)
3. Difficulty in decision making	80 (96.4%)
4. Extra effort at work	80 (96.4%)
5. Feel like a failure	79(95.2%)
6. Feeling critical of self for one's weakness/ mistakes	79(95.2%)
7. Loss of appetite	79(95.2%)
8. Feel sad	79 (95.2%)
9. Feeling more tired	79 (95.2%)
10. Discouraged about future	78(94%)
11. Unable to sleep	78(94%)
12. Feeling irritated	78 (94%)
13. Cry all the time	77(92.8%)
14. Feeling guilty	77 (92.8%)
15. Feeling disappointed in oneself	77 (92.8%)
16. Feeling of being punished	75 (90.4%)
17. Worried about health	71 (85.5%)
18. Loss of weight	66 (79.5%)
19. Thoughts of killing self	40 (48.2%)
20. Looking unattractive	3 (3.6%)
21. Loss of interest in sex	74 (89.2%)
Mean BDI score	33.38 (7.46);range 17-50
Severity of depression as per BDI-21	5 (6%)
Mild depression (14-19)	42 (50.6%)
Moderate depression (20-28)	36 (43.4%)
Severe Depression (≥ 29)	

significant. When any items had loading of ≥ 0.4 or above on more than one factor, it was included, in the factor where it had the highest loading. Scree plot was used to determine the optimal number of factors and the final factor solution.

In this study, 5 factor analysis were carried out, i.e., separate factor analysis were done for GDS-30 items, BDI-II items, GAD-7 items PHQ-15 items. For the combined factor analysis of all the 4 scales, all the items of GDS-30 were retained but those items which were common for

Table 2
Symptom profile as per GAD-7 and PHQ-15 scales.

GAD 7 items -0-absent ;1-Present	Present (%)
1. Feeling nervous, anxious, or on edge?- Yes	79 (95.2%)
2. Not being able to stop or control worrying? -Yes	77(92.8%)
3. Trouble relaxing? -Yes	77 (92.8%)
4. Being so restless that it is hard to sit still?-Yes	73(88%)
5. Feeling afraid as if something awful might happen? -Yes	73 (88%)
6. Worrying too much about different things?-Yes	71(85.5%)
7. Becoming easily annoyed or irritable? -Yes	70(84.3%)
Mean GAD score	12.16 (4.37);range 1-20
Severity of anxiety as per GAD-7	23 (27.7%)
Score ≤ 5 – Mild anxiety	32 (38.6%)
Score ≥10- Moderate anxiety	28 (33.7%)
Score ≥15-Severe anxiety	
PHQ-14 Items – 0 –absent;1-present	
1. Trouble sleeping	80 (96.4%)
2. Nausea, gas, or indigestion	75 (90.4%)
3. Feeling tired or having little energy	75 (90.4%)
4. Constipation, loose bowels, or diarrhoea	69 (83.1%)
5. Pain in arms, legs, or joints	60 (72.3%)
6. Headache	60 (72.3%)
7. Feeling that heart is racing	58 (69.9%)
8. Back pain	56 (67.5%)
9. Shortness of breath	54(65.1%)
10. Dizziness	47(56.6%)
11. Pain in stomach	41(49.4%)
12. Chest pain	34 (41.0%)
13. Pain during sexual intercourse	28 (33.7%)
14. Fainting	19 (22.9%)
Mean PHQ 14 Score	12.72 (4.11) ;3-25
Severity of somatization	1 (1.2%)
Mild (0-4)	20(24.1%)
Moderate (5-9)	62(74.7%)
Severe (> 10)	
Psychotic symptoms	19 (22.8%)
Delusions: Present	15 (18.1%)
Hallucinations : Present	8 (9.6%)

other scales, i.e., BDI, GAD-7 and PHQ-15 were excluded from the factor analysis. None of the items of GAD-7 was common with any of the items of other 3 scales, while 7 items of BDI and 2 items of PHQ-15 were common with GDS-30. Hence, these items were not included in the final combined factor analysis to avoid overlap of same items.

For the purpose of factor analysis, data on GAD-7, BDI-II and PHQ-15 were used as present (Score 1) or absent (Score 0) to match with the GDS-30. Negatively worded GDS-30 items were given weightage of 1 if these symptoms were present in the patients.

Null hypothesis was tested using Bartlett's test of sphericity and the Chi-square value. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used to evaluate whether, factor analysis was an appropriate method for analyzing the data.KMO values for each scale and the different combinations of all the scales are given in Table 3.

The various factor models which were accepted for different scales are given in Table 4.

For GDS-30, a five-factor model was considered. Based on the loading of various items, these factors were named as low mood (Factor 1), anxiety-cognitive (Factor 2), anxiety-somatic(Factor 3), distress

(Factor 4) and social withdrawal (Factor-5).For BDI-II, a four-factor model was considered for BDI-II. Based on the various items, these factors were named as negative attitude towards self (Factor 1), self-critical and somatic (Factor-2), vegetative symptoms(Factor 3) and dysphoria (Factor 4).For GAD-7, initially, a 2-factor solution was considered, however, the second factor, loaded only 2 items; hence, one-dimensional factor model was considered. Based on the various items, this factor was named as Anxiety cognitive-worry (Factor 1). For PHQ-15, a three factor model was considered. Based on the loading of various items, these factors were named as aches and pain (Factor 1), somatic anxiety and tiredness (Factor 2) and miscellaneous (Factor 3).

Based on multiple factor analysis, a 7-factor model for the combined data was found to be suitable, which explained 43.64% of the total variance.Two items of GAD-7, 9 items of GDS-30 and 2 items of BDI-II did not load on any of the factors in the final model (Tables 4 and 5). The various items of these factors were named as Factor-1 (Core depressive), Factor-2 (Depressive cognition), Factor-3 (Anxiety–Worry-Somatic), Factor-4 (Hopelessness), Factor-5 (Somatic-Pain), Factor-6 (Suicidality –Dysphoria) and Factor-7 (Somatic anxiety).

4. Discussion

The present study evaluated the symptom profile of elderly patients with depression using 4 standardized instruments at the psychiatric outpatient setting. The study did not exclude any patient with comorbid physical illnesses, because existing data suggest that physical co-morbidity among elderly patients with depression does not have any impact on symptom profile (Grover et al., 2017). Findings of the present study also support these observations.

GDS-30 is a scale,which has been specifically designed and validated across several studies to assess depression in the elderly (Dennis et al., 2012). However, recent studies have highlighted that GDS does not take in to account common somatic symptoms like loss of appetite and sleep disturbances as well as both psychic and somatic anxiety symptoms like worry, restlessness, palpitations, nervousness, being fidgety etc (Mehra et al., 2017; Smarr and Keefer, 2011). Though studies have supported the use of GDS to assess depression in elderly individuals with certain physical illnesses like Parkinson's disease (PD) (Goodarzi et al., 2016; Williams et al., 2012), yet at the same time, some studies show that GDS is insufficient to take care of the somatic symptoms of PD which are recorded in other commonly used scales like BDI-II (Ertan et al., 2005; Leentjens et al., 2000). Thereby, it is likely that the complete symptom profile of depression in elderly is missed if only GDS-30 is used. The present study suggests that the symptom profile of depression among elderly patient goes beyond the symptoms described in GDS-30.

Present study shows that anxiety symptoms are highly prevalent in elderly patients with depression. The commonly noted anxiety symptoms as assessed by GAD-7 included feeling nervous, anxious, or on the edge" (95.2%) followed by "not being able to stop or control worrying" (92.8%) and "trouble relaxing) (92.8%). These symptoms indicate not only a significant distress to the sufferer but also provide support to the diagnostic category of anxious depression/ anxious distress specifier as per previous studies (Beekman et al., 2000; Lenze et al., 2000; Silverstone and von Studnitz, 2003) and DSM-5 (Kupfer, 2015).

Table 3
Initial Matrices for various factor analyses.

Scale	KMO Value	Approximate Chi-square Value	DF	Significance (P-value)	Number of factors in the initial analysis	Total percentage of variance explained
BDI	0.470	817.002	210	< 0.001	8	75.334
GDS	0.583	890.542	435	< 0.001	11	70.989
GAD-7	0.620	179.233	21	< 0.001	2	57.379
PHQ-14	0.615	228.841	91	< 0.001	5	62.214
GDS + BDI + PHQ-14+GAD-7	0.346	3371.524	1953	< 0.001	22	80.442

Table 4
Factor model depicting the percentage of variance explained.

Factor models of different scales	Initial unrotated factor solution			Final rotated factor solution			Factor structure
		% of variance explained			% of variance explained		
	Eigen value	Individual	Cumulative	Eigen value	Individual	Cumulative	
4 factor model of BDI							
Factor 1	4.051	19.292	19.292	3.423	16.300	16.300	Item 2,4,5,6,7,13
Factor 2	2.435	11.597	30.890	2.555	12.165	28.465	Item 8,9,17
Factor 3	2.216	10.555	41.444	2.365	11.261	39.726	Item 1,16,19,21
Factor 4	1.677	7.984	49.429	2.037	9.702	49.429	Item 3,10,11,14,18
5 factor model of GDS							
Factor 1	5.859	19.531	19.531	4.895	16.315	16.315	Items 1,5,7-10,11,15,19,27,29
Factor 2	2.393	7.976	27.507	2.670	8.900	25.215	Items 2,18,20,22,23
Factor 3	2.077	6.923	34.430	2.127	7.091	32.306	Items 16,21,26
Factor 4	1.729	5.765	40.195	2.047	6.822	39.129	Items 13,24,25
Factor 5	1.571	5.236	45.431	1.891	6.302	45.431	Items 4,12,17
One factor model of GAD-7							
Factor 1	2.889	41.275	41.275	2.889	41.275	41.275	Items 2-7
3 Factor model of PHQ-14							
Factor 1	2.769	19.775	19.775	2.474	17.671	17.671	Items 1-7
Factor 2	1.911	13.647	33.423	2.052	14.658	32.328	Items 9,10,13,14
Factor 3	1.596	11.399	44.822	1.749	12.493	44.822	Items 8,11,12
7 Factor model of GDS + BDI + GAD-7+PHQ-14							
Factor 1	8.854	12.297	12..297	8.527	8.527	8.527	GDS-Items 1,3,4,5,7-11,15,19,27
Factor 2	4.612	6.406	18.703	4.190	5.820	14.347	GDS - Item 2 BDI – Items – 2-8
Factor 3	3.689	8.889	27.592	4.168	5.789	20.136	GAD-7 items- 2,3,6,7 GDS Items -29 BDI Items-19,20,21 PHQ 14 Items -10,12
Factor 4	3.145	6.368	33.960	3.653	5.073	25.209	GDS-Items 20-23 BDI – Items 16 PHQ15- Items -9
Factor 5	3.131	4.030	37.990	3.476	6.828	32.037	PHQ Items – 2-7
Factor 6	2.916	3.050	41.040	3.396	5.716	37.753	GDS Items – 14,24,25 BDI Items -9
Factor 7	2.425	2.602	43.642	3.181	5.889	43.642	GAD -7 Item - 5 GDS Items – 4 PHQ -14 Items -8,11,13

Table 5
Factor structure of combined scales.

Factors	Loading of various items of different factors
Factor-1 Core depressive	Not satisfied with life, Feel empty, Often get bored, Hopeless about the future, Lack of good spirits most of the time, Afraid that something bad will happen, Lack of happiness, Feel helpless, Often get restless and fidget, Does not think it is wonderful to be alive, Does not find life very exciting, Does not enjoy getting up in morning
Factor-2 Depressive Cognition	Dropped many of your activities, Discouraged about future, feel like a failure, No satisfaction with things as before, feeling guilty, Feeling of being punished, Feeling disappointed in oneself, Feeling critical of self for one's weakness/mistakes
Factor-3 Anxiety –Worry-Somatic	Not being able to stop or control worrying, Worrying too much about different things, becoming easily annoyed or irritable, Feeling afraid as if something awful might happen, Not easy to make decisions, loss of weight, worried about health, loss of interest in sex, shortness of breath, Constipation, loose bowels/diarrhoea
Factor-4 Hopelessness	Hard to get started on new projects, Does not feel full of energy, Feel that situation is hopeless, Think most people are better off, Unable to sleep, Feeling that heart is racing
Factor-5 Somatic-pain	Pain in stomach, Back pain, pain in arms, legs or joints, Headache, Chest pain, Dizziness
Factor-6 Suicidality -Dysphoria	Thoughts of killing self, Frequently upset over little things, Frequently feel like crying, Problems with memory
Factor-7 Somatic-anxiety	Being so restless that it is hard to sit still, Often get bored, Fainting, Pain during sexual intercourse, Nausea, gas or indigestion
Items which did not load on any of the factors	GAD-7 : Feeling nervous, anxious or on edge, Trouble relaxing GDS-30: Bothered by thoughts, Prefer to stay at home, Frequently worry about future, Often feel downhearted and blue, Feel pretty worthless, Worry a lot about the past, Trouble concentrating, Avoid social gathering, Mind as clear as it used to be BDI-21: Looks unattractive, loss of appetite

Additionally, when GAD-7 scale was applied to the sample, 60 (72.3%) subjects scored more than 10 and screened positive for GAD.Previous studies also suggest that GAD is one of the most common psychiatric comorbidity among elderly patients with depression, seen in 28–65% of the patients (Lenze et al., 2001; Parmelee et al., 1993). Subsyndromal anxiety symptoms suggestive of GAD have also been reported to increase disability, proneness for suicidality, higher somatic symptom load when compared to elderly individuals with depression without anxiety symptoms (Jeste et al., 2006; Lenze et al., 2000; Schoevers et al., 2003). This suggests that identification of anxiety symptoms in

elderly with depression is of utmost importance as it is an essential symptomatology of geriatric depression.

Present study also shows that somatic symptoms are also present in majority of the elderly patients with depression. The common somatic symptoms in the present study as assessed by BDI-II were "unable to sleep" (94%), "feeling more tired" (95.2%), "loss of appetite"(95.2%), "loss of weight" (79.5%) and "worried about health"(85.5%).In the present study, as per PHQ-15 scale, most common somatic symptoms were "Trouble sleeping" (96.4%), "Feeling tired or having little energy" (90.4%), "Nausea, gas or indigestion"(90.4%), "Constipation,loose motions or diarrhea" (83.1%), "Pain in arms, legs or joints" (72.3%) and "Headache" (72.3%). Previous studies which have used PHQ-15 scale among elderly have also reported similar findings (Mehra et al., 2017). Additionally, studies which have used HDRS to assess depression in elderly also have reported higher prevalence of somatic symptoms in elderly when compared to non-elderly adults (Hegeman et al., 2012). Findings of the present study also highlight the same fact that there is a high prevalence of somatic symptoms among elderly with depression which are not assessed by using GAD-30 only. This finding suggests that GDS alone may not be sufficient to record all the symptoms of depression among elderly. In the present study, higher percentages of subjects were diagnosed with severe depression as per the BDI-II, when compared to GDS (43.4% vs 36.1%). This difference could be attributed to inclusion of more number of somatic symptoms in BDI.

Many studies in the past have evaluated the factor structure of GDS-30 and these suggest that items of GDS load on to 2–9 factors (Brown et al., 2007; Chiu et al., 1994; Incalzi et al., 2003; Salamero and Marcos, 1992). This wide variation in number of factors across different studies possibly reflects variation in the type of factor analysis (exploratory factor analysis vs. confirmatory factor analysis) and cultural difference in manifestation of depression (Kim et al., 2013). Studies which have evaluated the factor structure of the Hindi version of GDS-30 (GDS-H) have reported a 4 factor structure for GDS (Kim et al., 2013; Mehra et al., 2017). Meta-analysis of all the available factor analysis studies (N = 26) of GDS-30 suggests 3 factors namely dysphoria, social-withdrawal –apathy-cognitive impairment and positive mood to be the most common factors across different studies (Kim et al.,2013). A recent Indian study which included elderly patients with first episode depression came up with a 4 factor solution, i.e., negative mood (Factor 1), social withdrawal-anxiety-cognitive (Factor 2), dysphoria (Factor 3), and miscellaneous (Factor 4) (Mehra et al., 2017).However, the present study suggests a 5 factor structure of GDS namely negative/low mood (Factor 1), anxiety-cognitive (Factor 2), somatic (Factor 3), distress/dysphoria (Factor 4) and social withdrawal (Factor-5). Overall, it can be said that the factor structure of GDS-30 in the present study, is similar to many previous studies, in terms of clustering of symptoms.

An important thing to note in the present study is that when items of all the 4 scales were included in the factor analysis, it resulted in a 7 factor model. While Factor 1 comprised items only from GDS-30 items, Factor-2 to 4 loaded items from other scales. This finding further supports the view that GDS-30 may not sufficient to assess the whole range of symptoms of depression among elderly. A previous study from this centre attempted to evaluate the factor structure of GDS-30 and PHQ-14 among elderly patients with depression and had come up with a 4 factor solution (Mehra et al., 2017). When one compares the factor structure of the present study with this study, certain similarities are evident. First, in both the studies symptom profile of depression extended beyond GDS-30. Second, factor-1 in both the studies included items from GDS-30 only, although higher number of items was included in the factor-1 in the present study when compared with the previous study. Third, the somatic symptoms emerged as a separate factor in both the studies. However, the previous study did not include BDI and GAD-7 items into the factor analysis. Accordingly, it can be said that findings of the present study extend the observations of the previous study further.

We are well aware of the limitations of our study. Firstly, there is a difficulty in generalizing the study findings to community samples as the study sample was restricted to a clinic attending population at a tertiary health care centre. Secondly, cross-sectional assessment was done at the initial visit and it is well known that a longitudinal assessment can yield a better understanding than a single cross-sectional assessment. The assessment of the symptom profile of depression was limited to GDS-30, BDI-II, GAD-7 and PHQ-15, though it is not unknown that many other symptoms like obsessive-compulsive symptoms and cognitive symptoms could not have been picked up by these scales. The study did not include a control group. In future, studies with a larger sample size, longitudinal design, with study sample from the primary care are required to overcome these limitations.

To conclude, present study suggests that GDS-30 may not be sufficient to assess the whole symptom dimensions of depression among elderly. Elderly patients with depression have high prevalence of anxiety and somatic symptoms. GDS-30 has a five factor solution. However, the number of factors/symptoms clusters increased to 7, when items from other scales are included into the factor analysis. Accordingly, clinicians assessing elderly patients with depression, must assess comorbid anxiety symptoms and/or disorder and presence of somatic symptoms must also be given due importance. While prescribing psychotropics too, these factors must be considered as some of the antidepressants are known to be associated with paradoxical anxiety (Doraiswamy, 2001) and some antidepressants are associated with better treatment response in presence of anxiety (Diefenbach and Goethe, 2006) and somatic symptoms (Somashekar et al., 2013).

Conflict of interest

None.

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