

## Relationship of Age, Gender and Routine Physiotherapy with Depression among Elderly People in a Multidisciplinary In-patient Geriatric Care Ward: A Cross-Sectional Study

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### ABSTRACT

**Background:** The number of elderly is continuous growing thus increasing the scope and demands for geriatric care in a multidisciplinary model. The medical conditions associated with ageing and various disorders pose a challenge to the palliative health care professionals, especially physical therapists who are responsible for addressing physical and functional dimensions of care. **Purpose:** The objective of this study was to assess the prevalence of depression among elderly people admitted in a hospital. **Materials and methods:** Fifty four elderly people with age and gender (male-20, female-34) were assessed by the physical therapist using Geriatric Depression Scale-Short form (GDS-SF: 15-item version), where a score >5 out of a total 15 suggested presence of depression. The patients were undergoing regular physiotherapy in terms of group physical activity, yoga, general mobility exercises, and breathing exercises. The setting included a physician, physical therapist, yoga therapist, dietitian, nurse, and a counselor. Data analysis was done for comparing the depression scores between genders and medical diagnoses, and then correlated with person's age using SPSS version 11.5 at 95% confidence interval. **Results:** The overall prevalence of depression among the study population was 66.7%. Overall, the depression scores among the study participants were low ( $8 \pm 3.82$ ). The depressed elderly had a score of  $10.11 \pm 2.76$  compared to non-depressed elderly ( $3.77 \pm 1.26$ ) which was statistically significant. There was no significant difference in GDS-SF (15) scores by gender (male- $8.1 \pm 4.66$ , female-  $7.94 \pm 3.31$ ), but was significant for medical diagnoses (gastro-intestinal, pulmonary, metabolic and musculoskeletal). **Conclusion:** There was a high prevalence of depression among the elderly and their depression scores were less, which might be attributed to their subclinical depression status. Those who underwent regular physical therapy had lesser scores than their counterparts. The study findings have important implications for designing future prospective designs of clinical trials on physiotherapy interventions for depression.

**Keywords:** Ageing; rehabilitation; end-of-life care; psychosocial factors; physiotherapy

### INTRODUCTION

According to World Health Organization [1], an elderly person is defined as one having age of 65 years or greater [2]. Years later, Denton and Spencer [3] confirmed either 60 or 65-years cut-off could be used as an entry point into old age using life table's method.

WHO estimated that there are 41 million elderly in India, making up 7% of the total population in 1991 [4]. The recent advancements in medical health care have led to a continuing rise in the number of elderly, leading to 'population aging' and increased hospital demands [5] and need for better health care delivery. Major problems identified among the elderly include

a range of medical diseases and disorders comprising of orthopedic, neurological, cardiac, pulmonary, metabolic and multi-systemic conditions that require multidisciplinary management to address biological, psychological and social aspects of care [6]. Rajan et al [7], in their National Sample Survey (NSS) found that the elderly in India had specific health-related concerns about general feeling, living arrangements, living support, social security, health, nutrition, their involvement in social and religious matters, views of old age homes and, particularly, life preparatory measures. Another recent NSS study by Husain and Ghosh [8] found that there is a steady worsening of health status among elderly and this might be attributable to the negligence in health care provision and policies in India.

Major issues that influence the accuracy of reported history, patient co-operation during assessment and treatment procedures, patient adherence to prescribed home programs are the psychosocial problems that often may be associated with the primary biomedical condition, either as a cause or effect [9].

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depression, fear, grief, social isolation, memory loss, bereavement, suicidal tendencies, dementia [10], frustration, disinheritance, suspicion, hopelessness, disregard inhuman treatment [11].

The point prevalence of depression among elderly population in a community-based sample was found to be 27% and, of the 27% reporting depressive symptoms, 19% were diagnosed as suffering mild dysphoria, 4% symptomatic depression, 2% dysthymia, 1.2% a mixed depressive and anxiety syndrome, and 0.8% major depression [12]. Jhingan, *et al* [13] found that amongst depressed elderly patients in India, only 28% of the patients had recovered, 30% had partially recovered, 23% had relapsed, 6% had been continuously ill, 11% had died, and 6% had comorbid dementia. Depression was also found to be the leading cause for the greater suicidal rates among the elderly compared to the national rates in India<sup>4</sup> and had a huge negative impact on the elderly person's quality of life [14,15].

Amongst many psychosocial factors, depression was considered as the single most important barrier to effective implementation of therapeutic programs in elderly population [16]. Major depressive disorder is a potentially debilitating condition that often is unrecognized or undertreated in the elderly [17] and its onset in old age bears a different prognosis than when occurring in middle age [18]. Depp and Jeste [19] concluded that the most frequent significant correlates of the various definitions of successful aging were age (young-old), nonsmoking, and absence of disability, arthritis, and diabetes. Moderate support was found for greater physical activity, more social contacts, better self-rated health, absence of depression and cognitive impairment, and fewer medical conditions. Gender, income, education, and marital status generally did not relate to successful aging. Among these and many other factors, depression was the only uncontrollable predictor variable that affected the quality of subjective and objective definitions of successful aging [20].

Ganguli *et al* [21] studied a community sample of 1554 elderly (above 55 years age) in North India for depression, using the Hindi version of Geriatric Depression Scale, and they found higher overall prevalence rates than in other countries. It was also associated with cognitive impairment and functional decline among the elderly. Prakash *et al* [22] found that 18% of their subjects had depression and 11% had other mental disorders. Patients with mental disorders had suffered more recent stressful life events. Among life events, conflicts in family (16%) and unemployment of self or children (9%) was reported by elderly psychiatric patients. Other reported life events in psychiatric diagnosed elderly

were conflict in family (7%), illness of self (6%) or family members (5%) and death of family members (5%) or close relatives (4%). Biswas *et al* [23] found that the prevalence of depression and common mental disorder was 31.5% in Vellore, India.

The objectives of this paper were (1) to evaluate the levels of depression amongst institutionalized elderly and (2) to assess the relationship of influencing factors such as age, gender, and physiotherapy intervention with the reported levels of depression.

## MATERIALS AND METHODS

This observer-blinded, cross-sectional study was approved by the Institutional Ethics Committee, Kasturba Medical College, Mangalore and was registered in Clinical Trials Registry- India, under trial registration number UTRN- 020846127-2001200876203.

We performed a convenient sampling of elderly people admitted in Kasturba Medical College Hospital, Attavar, Mangalore, and a written informed consent was obtained prior to their screening and participation in the study.

The elderly people were considered for participation in this study if they were age above 65 years, either gender admitted in Ashraya Geriatric Day Care Center of the *hospital*, with a mini-mental state examination score greater than 23/24 and absence of history of medically diagnosed neurological disorder. (Table 1)

The study setting was a multi-disciplinary in patient ward where the admitted elderly people undergo regular physiotherapy (group exercises-free active movements of all joints, breathing exercises- deep relaxed diaphragmatic breathing; balance training-unipedal stance, tandem stance and figure-of-8 walking; functional training- sit-to-stand, squatting, stairs climbing). The choice of physiotherapy intervention was done based upon patient's existing physical, mental, and functional status and it was routinely administered, ensuring that it should not cause any discomfort.

The selected participants were then administered Geriatric Depression Scale- Short Form (GDS-SF), a 15-item self-report or clinician-administered measure (each item has responses 'yes' or 'no') (Table 2) developed for evaluating depression and was previously studied for its model stability [25], suitability [26], acceptability [27], accuracy [28], screening performance [29], psychometric properties [30], construct validity [31], diagnostic validity [32], criterion based validity [33], reliability [33], for

use in elderly population in palliative care settings [34]. Ferraro and Cheminski [35] established the normative data for GDS-SF:15 where a score of >5 out of a total 15 suggested presence of depression. The elderly person's demographic data- age, gender, medical diagnosis and physiotherapy details- were also obtained. The outcomes were collected by postgraduate students in physiotherapy who were blinded from the study objectives.

**Data analysis**

Comparisons between gender, diagnoses, and physiotherapy (cases) versus no physiotherapy groups (controls) for their depression total scores

on GDS-SF:15 were done using independent t-test. Correlation with age was done using Karl-Pearson correlation co-efficient. Odds' ratios were estimated after using Chi-square test for categorical association. All analyses were done at 95% confidence interval using statistical package for social sciences SPSS version 11.5 for Windows.

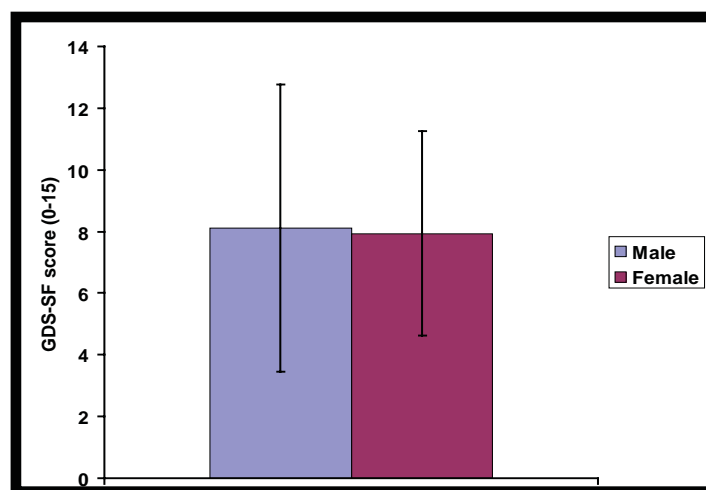
**RESULTS**

Amongst a total of 83 in patients screened between the years 2006 and 2010, 82 consented and, finally 54 were included (cases- 38 and controls- 16) for our assessment.

**Table 1. Overall demographic details of elderly people who participated in the study**

Variables		Value
Sample size		54
Age (years)		68.48 ± 12.17
Gender	Male	20 (37%)
	Female	34 (63%)
Clinical diagnoses	Cardiac	2 (3.7%)
	Dermatological	10 (18.5%)
	Gastro-intestinal	2 (3.7%)
	Metabolic	4 (7.4%)
	Musculoskeletal	8 (14.8%)
	Multiple disorders	14 (25.9%)
	Neurological disorders	8 (14.8%)
	Psychiatric	2 (3.7%)
	Pulmonary	2 (3.7%)
	Vascular	2 (3.7%)
Undergoing regular physiotherapy	Yes	38
	No	16

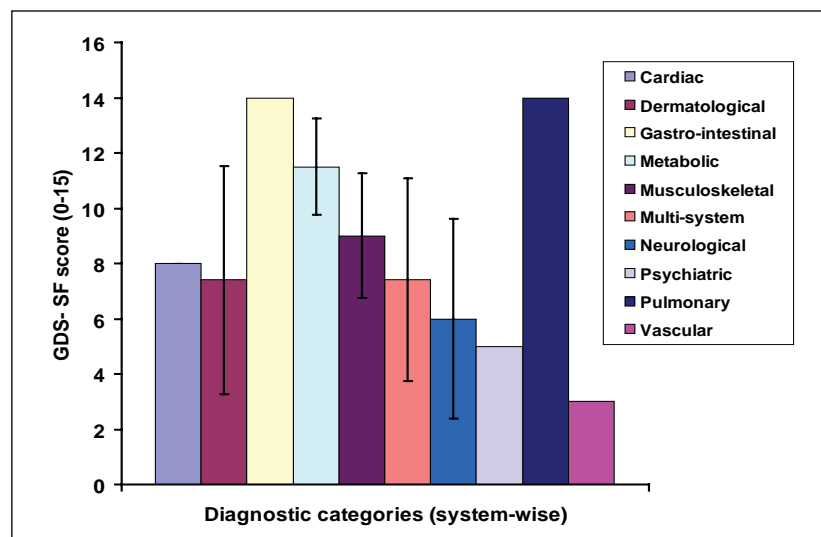
**Figure 1. Comparison of GDS-SF scores between genders**



The male elderly (8.1 ± 4.66) had higher scores of depression than their female counterparts (7.94 ± 3.31) which was not signifi-

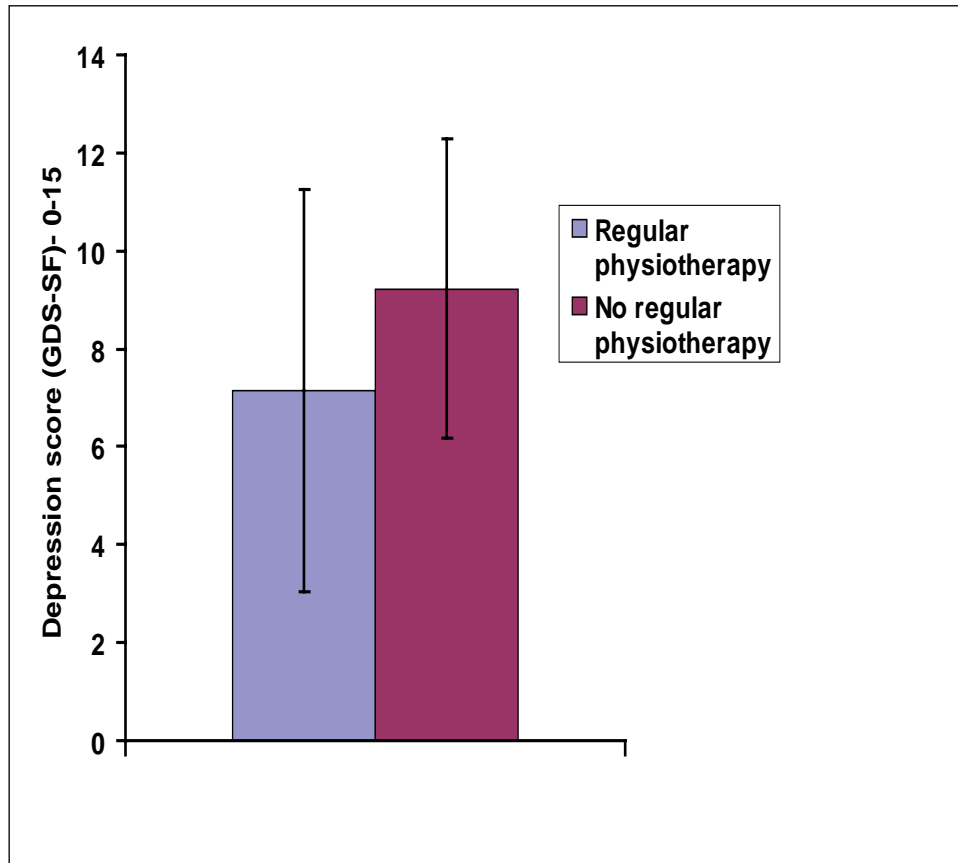
**Table 2. Geriatric depression scale- short form (GDS-SF) items and their responses**

Scale- items	Responses Number of people (%)
Item-1	Yes-40 (74.1%) No-14 (25.9%)
Item-2	Yes-26 (48.1%) No-28 (51.9%)
Item-3	Yes-32 (59.3%) No-22 (40.7%)
Item-4	Yes-38 (70.4%) No-16 (29.6%)
Item-5	Yes-28 (51.9%) No-26 (48.1%)
Item-6	Yes-20 (37%) No-34 (63%)
Item-7	Yes-32 (59.3%) No-22 (40.7%)
Item-8	Yes-34 (63%) No-20 (37%)
Item-9	Yes-40 (74.1%) No-14 (25.9%)
Item-10	Yes-30 (55.6%) No-24 (44.4%)
Item-11	Yes-20 (37%) No-34 (63%)
Item-12	Yes-28 (51.9%) No-26 (48.1%)
Item-13	Yes-22 (40.7%) No-32 (59.3%)
Item-14	Yes-36 (66.7%) No-18 (33.3%)
Item-15	Yes-32 (59.3%) No-22 (40.7%)
Total GDS-SF interpretation	Normal- 18 (33.3%) Depressed- 36 (66.7%)
Total GDS-SF corrected score (mean SD)	8 ± 3.82

**Figure 2. Comparison of GDS-SF scores between clinical diagnoses**

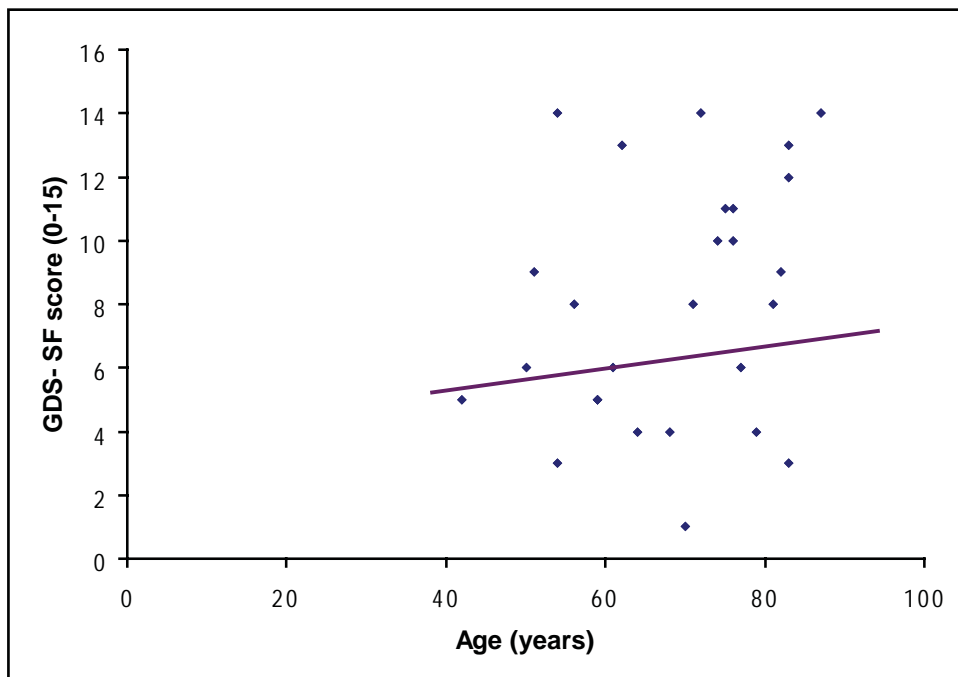
The elderly people with gastro-Intestinal problems and pulmonary conditions had highest GDS-SF depression scores

**Figure 3. Comparison of depression scores between elderly people who underwent regular physiotherapy versus who did not**

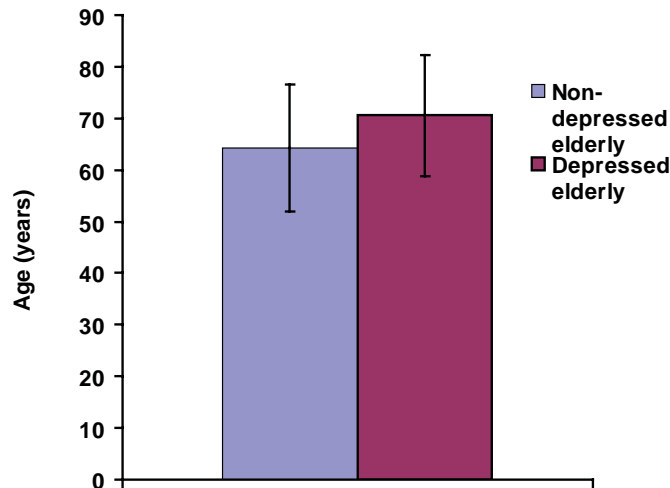


The depression score of elderly people who did not undergo regular physiotherapy ( $9.43 \pm 3.46$ ) were higher than those who underwent regular physiotherapy ( $7.39 \pm 3.85$ ), but this difference was not statistically significant ( $p=.076$ ).

**Figure 4. Relationship between age and depression (GDS-SF score)**



There was a statistically significant ( $p=.04$ ) but weak positive correlation ( $r=.280$ ) found between age and depression scores on GDS-SF.

**Figure 5. Comparison of age between depressed and non-depressed elderly people**

The age of depressed elderly ( $70.61 \pm 11.73$  years,  $N= 36$ ) was more than the non-depressed elderly ( $64.22 \pm 12.23$  years,  $N= 18$ ), but was not statistically significant ( $p= .069$ ).

**Table 3. Geriatric Depression Scale-short form (GDS-SF) categories (normal or depressed) and association with regular physiotherapy**

		Underwent regular physiotherapy N (%)	
		Yes	No
Geriatric depression score- short form (GDS-SF) category N (%)	Normal	17	1
	Depressed	15	21
Total		32	24

Odd's ratio for elderly people who underwent physiotherapy to have lesser depression score was 23.8 ( $17 \times 21 / 15 \times 1$ ).

## DISCUSSION

Geriatric services are the need of the hour [36] in a brave, new, transparent health world [37]. The real challenges of caring for the elderly in 2030 will involve: (1) making sure society develops payment and insurance systems for long-term care that work better than existing ones, (2) taking advantage of advances in medicine and behavioral health to keep the elderly as healthy and active as possible, (3) changing the way society organizes community services so that care is more accessible, and (4) altering the cultural view of aging to make sure all ages are integrated into the fabric of community life [38].

The reason this study utilized GDS-SF instead of Depression Anxiety Stress Scales and Post-traumatic Stress Disorder Checklist, which are frequently recommended for mental health screening, is that the Geriatric Depression Scale accurately predicts a diagnosis of depression in community cohorts [39]. The reason why this study found higher depression scores for elderly people with pulmonary disorders was due to higher prevalence of pulmonary disorders

disorders also scored higher on depression scores since the association of physical disability with depression was well known [41], especially for lower limb problems since they impair mobility and balance. The second highest score for depression was in those elderly with metabolic disorders which reiterated the findings of Bove *et al* [42] that psychosocial factors influence the metabolic parameters in elderly.

Promotion of psychosocial health of the elderly is often regarded as played by psychological counselors and social workers [43], and targeted cognitive rehabilitation programs produce long-term improvements in psychosocial functioning in elderly population [44].

One of the hypothetical mechanisms for depression in elderly people was vascular disease, which disrupts mood regulation circuits in the brain, thereby decreasing its ability to respond to stressful events [45]. Depression in turn has direct influence on immune mechanisms [46] and it can thus indirectly cause other systemic illnesses, as observed in this study population.

Elderly inpatients have a wide spectrum of

medical and treatment profiles [47]. Future studies of depression in old age should include all patients with clinical depression.

## CONCLUSION

There was a high prevalence of depression among the elderly and their depression scores were less, which might be attributed to their subclinical depression status. Those elderly who underwent regular physical therapy had lesser scores than their counterparts. The study findings have important implications for designing future prospective designs of clinical trials on physiotherapy interventions for depression.

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### Conflicts of interest:

None identified and/or declared.

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