

## Depression as a Predictor of Length of Hospital Stay in Elderly Patients Admitted to Ain Shams University Hospitals

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### Abstract

**Background:** Depression among the physically ill is common and frequently under-diagnosed. Elderly patients with depressive symptoms are at higher risk of hospital admission for non psychiatric conditions and are more likely to have longer hospital stays and worse hospital outcomes, compared with non depressed patients.

**Objectives:** The aim of this study was to find out if depression can be considered a predictor of prolonged hospital stay in elderly patients.

**Design:** A prospective cohort study. Participants: 205 consecutive patients 60 years and over both males and females. **Settings:** Ain shams university hospitals. **Measurements:** All participants were assessed using comprehensive geriatric assessment including Geriatric depression scale (GDS) and the length of stay was registered. **Results:** Depressed patients had longer length of hospital stay compared to non depressed patients and the least length of hospital stay was for cases with no risk on GDS scale compared to other groups and the difference is highly significant statistically ( $p < 0.001$ ).

**Conclusion:** length of hospital stay is significantly longer among depressed elderly.

**Key words:** Depression –Length of hospital stay– Elderly

### Introduction:

Older people are the most frequent users of health services, and the progressive aging of the world's population may lead to a saturation of available services. Therefore, we must find ways to reduce preventable admissions to hospital and uncover the factors associated with potentially preventable use of health service [1].

In many countries increasing medical costs is an urgent issue, and one of the main contributing factors is length of stay (LOS) in hospital. Patients in geriatric wards generally have a long LOS and reducing that time is one way of reducing medical costs, not necessarily only for administrative reasons, but also from the clinical point of view because unnecessarily long hospitalization may result in a decline in the ability to perform activities of daily living (ADL) or contracting infectious diseases. On the other hand, the hospital environment may not be protective to an elderly, but rather dangerous, with enforced bed rest, undernourishment, and development of iatrogenic illness [2] [3].

Depression among the physically ill is frequently under-diagnosed in contrast with overt psychotic symptoms and/or disorders such as delirium, hallucinations, delusions, manic symptoms and schizophrenia [4].

Prina *et al.* reported that elderly patients with depressive symptoms were at higher risk of hospital admission for non psychiatric conditions and were more likely to have longer hospital stays and worse hospital outcomes, compared with non depressed participants. These results highlight the potential to target this high-risk group to reduce the burden of health care costs in the elderly [5].

### Methodology:

#### Study design and setting:

This is a prospective cohort study on 205 elderly patients admitted to inpatient 'geriatric and non-geriatric' acute care in Ain Shams University

Hospitals in the period between March 2012 and March 2013.

**Selection of patients:**

205 consecutive patients 60 years and over both males and females admitted to Ain Shams University Hospitals were involved in the study after obtaining informed oral or written consent from patient himself or first degree relative.

**Exclusion criteria:**

Patients who refused to participate (after explaining the aim of our work) were excluded from the study.

**Methodology:**

All participants were assessed using comprehensive geriatric assessment including the following:

**Sociodemographic data:** Including age, gender, marital status, educational level, special habits, living arrangement and educational level of caregiver if present.

**Medical history:** Including number of comorbidities, number of previous hospitalizations, cause of current admission, living at home or nursing home, recorded complications during admission, ICU admission and duration and number of consultations during admission.

**Psychological assessment:** Including Geriatric Depression Scale-15(GDS), using the Arabic version. A score of 5 or more out of 15 is considered depression.

**Length of hospital stay:** from day of admission to day of discharge was noted.

**Statistical methods:**

The data was collected, coded and entered to a personal computer (P.C.) IBM compatible 2.6 GHZ. The data was analyzed with the program (SPSS) statistical package for social science under windows version 15.0

The tests used are:

Student t test

Pearson Correlation coefficient (r) test

One way Analysis of variance (ANOVA)

**Results:**

The sample comprised 205 participants 109 (53.2%) were males and 96(46.8%) were females. The participants' age ranges from 61-81 years with mean age 67.2 years.

The descriptive data of the studied sample are shown in table (1) 43.9% of the patients are

illiterate, 53.2% of the patients are married, 53.7% are smokers, 48.3% are living with their spouses, and 38.1% of the caregivers are illiterate.

Application of GDS revealed that 104 participants (50.7%) were at risk of depression and 81 (39.5%) were not. Meanwhile GDS could not be performed among 20 patients.

The least length of hospital stay was for cases with no risk on GDS scale compared to other groups and the difference is highly significant statistically (table 2).

**Discussion:**

The aim of this study was to find out if depression was associated with prolonged hospital stay in elderly patients.

A sample of 205 elderly patients from Ain Shams University Hospitals were recruited in this study.

Several studies found depression to be related to longer LOS. For instance, *Prina et al.* in a cohort study in Australia, found that the presence of clinically significant symptoms of depression (GDS greater than 7) in older men was associated with increased risk of hospital admission, higher number of readmissions and longer use of hospitals. These associations remained statistically significant after adjustment for several confounding variables. [5]

Again, Wong et al. found a relation between depression and increased length of hospital stay and number of admissions in an older population in southern China. The presence of clinically relevant depressive symptoms was independently associated with increased episodes of hospital admission and increased length of stay for all cause hospitalization in those with and without chronic conditions at baseline [7].

Finally, in a longitudinal study by *Prina et al.* involving an older Dutch population, longer length of hospital stay and higher rates of admission and inpatient death were reported among depressed patients. However, only length of stay was associated with depression after adjustment for sociodemographic variables and comorbidities[8].

In the current study not only correlated was depression to longer LOS but also the relation was highly significant. Several potential reasons can be proposed to explain this correlation: Treatment adherence is known to be poor among patients with mood disorders, leading patients to arrive to hospital at a more acute or severe stages of their illness and potentially increasing length of stay. Depressive symptoms in older adults also could aggravate chronic diseases and disability. This could influence older people's ability to look after themselves, leading to poorer self-perceived health, an increase in unexplained physical symptoms and, consequently, a rise in medical admissions and prolonged hospitalizations.

**Conclusion:** depression is a predictor of prolonged hospital stay in elderly.

**conflict of interest: none**

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Table (1) Distribution of education, marital status, living arrangement and education of care giver of studied patients:

N=205	No.	%
<b>Education</b>		
Illiterate	90	43.9
Read write	64	31.2
Primary to secondary	50	24.4
University	1	0.5
<b>Marital status</b>		
Married	109	53.2
Widow	93	45.5
Single	3	1.5
<b>Smoking</b>		
Non smokers	95	46.3
Smokers	110	53.7
<b>Living arrangement</b>		
Spouse		
Son or daughter	99	48.3
Brother or sister	87	42.4
Paid caregiver	9	4.4
Alone	2	1.0
	8	3.9
<b>Caregiver educ.</b>		
Illiterate	75	38.1
Read write	37	18.8
School	71	36.0
University	14	7.1

Table (2) Relation between depression on admission and the mean hospital stay

	Mean hospital stay in days	SD	F	P
depressed N=104	10.3	3.6	13.4	0.000
Not depressed N=81	8.9	3.0		
Couldn't be assessed N=20	13.5	4.8		

\* P<0.01 highly significant