Clinical variables and factors affecting duration of hospitalization in a sample of patients with affective and nonaffective psychoses

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Backgrounds
Duration of hospitalization (DOH) and length of stay in psychiatric hospitals are important factors affecting psychiatric patients and their families, in addition to their impact on the healthcare system policy and budget.
Objectives
The aims of this study were to identify the sociodemographic and clinical factors implicated in determining DOH and to study the effect of global functioning and insight on length of stay in psychiatric hospitals.
Patients and methods
A total of 129 inpatients diagnosed with affective and nonaffective psychoses were recruited from Minia Psychiatry Hospital. Data regarding their demographic and clinical manifestations were collected, including previous and current admissions. Their severity of illness was assessed with Positive and Negative Syndrome Scale, the level of initial functioning was evaluated by Clinical Global Impression Scale, and the details of their insight were measured by Scale to assess Unawareness of Mental Disorder.
Results
Female participants tended to have longer DOH than males, whereas males tended to have higher number of previous hospitalizations than females. Divorced and single patients had significantly longer DOH than married patients. DOH of current admission was found to increase with increasing severity of mental illness, decreased awareness of mental disorders, deceased awareness of achieved effects of medications, and decreased awareness of social consequences of mental illness. Number of hospitalizations was found to significantly increase with younger age at onset, longer duration of illness, higher number of previous episodes, whereas it was found to decrease with higher total number of received electroconvulsive therapies.
Conclusion
Sex and marital status have an effect on DOH. Increased severity of mental illness and disturbance of insight increase DOH and so does the initial decrease in global functioning.

Keywords:
duration of hospitalization, global functioning, insight, psychosis

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Introduction

Duration of hospitalization (DOH) and length of stay in psychiatric hospitals have a strong positive relationship with the cost of hospitalization. Therefore, duration of hospitalization in psychiatric hospitals has become an important factor, not only for patients but also for hospital administrators and healthcare providers (Ithman *et al.*, 2014).

The number of days spent by patients in psychiatric hospitals may be used as an indicator of efficiency of inpatient management, quality of care, and as an important factor in hospital resources for future administration (Iezzoni, 2004). Unnecessarily long hospitalization may be unacceptable, and psychiatrists should make treatment efficient to the utmost possible and shorten patients' length of stay (Adelufosi *et al.*, 2014).

Factors that determine DOH for psychiatric patients have become a subject of intense concern and have been considerably discussed by many hospitals and bill payers (McLay *et al.*, 2005). Factors that may be involved in DOH include some of the demographic variables such as age, sex, marital and employment status, type of admission, and place of residence (Herr *et al.*, 1991).

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Treatment variables include number of previous hospitalizations and received electroconvulsive therapy (ECT) sessions, psychotic features, and violent behavior necessitating restraints (Compton *et al.*, 2006). ECT has been adopted as an effective acute treatment for psychiatric illnesses that fail to respond to conventional treatment and it tended to shorten the duration of stay of patients in hospitals (American Psychiatric Association, 2001).

Implicated variables regarding diagnosis include a primary diagnosis of a psychotic or mood disorder, psychiatric symptom severity, co-morbid medical conditions, and level of functioning at admission (Blais *et al.*, 2003).

Several studies have found an association between diagnosis of schizophrenia or nonaffective psychoses and long duration of hospitalization. The chronic nature of psychotic disorders in comparison with mood disorders was offered as an explanation for this association (Lerner and Zilber, 2010 and Oladeji *et al.*, 2012).

However, substance abuse has been shown to be associated with shorter hospital admission but higher readmission rates (Blais *et al.*, 2003; Compton *et al.*, 2006).

Assessing predictors of DOH is the cornerstone of appropriate management for inpatient resources. Identifying factors associated with long hospitalization might help focus on psychiatric health budget, resulting in less frequency and shorter duration of psychiatric hospitalization (Iezzoni, 2004).

Patients and methods

The present study was carried out at Minia Psychiatry Hospital, the official Psychiatry Hospital in Minia Governorate. It provides services for psychiatric patients and patients of substance use with an inpatient capacity of 80 beds. The hospital includes outpatient clinics (Psychiatry, Neurology and Internal Medicine clinics), a hot-line clinic for addiction, and some special units – for example, pediatric psychiatry unit and electroencephalogram.

Participants of the study

All patients diagnosed with schizophrenia spectrum disorders (schizophrenia, schizoaffective, or schizophreniform disorders) or affective psychoses disorders (bipolar affective disorder type ? or psychotic depression), who were admitted to Minia Psychiatry Hospital, and discharged with improvement within the duration of 6 months (from 1 September 2015 to end of February 2016) were recruited. They were officially diagnosed with Structural Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. (DSM-V) Research Version. These patients were screened at admission and discharge by Positive and Negative Syndrome Scale (PANSS) to assess symptom severity. Patient awareness and insight of his or her mental illness and symptoms were assessed by the Scale to assess Unawareness of Mental Disorder, and the Clinical Global Impression Scale (CGI) was used to assess severity and improvement of the general condition and functioning.

Inclusion criteria

(1) Patients diagnosed with schizophrenia spectrum disorder or affective psychosis, with or without co-morbid substance use.
(2) Age range: 18–50 years.
(3) Both sexes.
(4) First or multiple admissions.

Exclusion criteria

(1) Patients admitted to the hospital for a reason other than treatment (e.g. forensic reasons).
(2) Patients discharged from the hospital against medical advice.
(3) Patients discharged for other medical or surgical co-morbidities.

Study tools

(1) PANSS (Kay*et al.*, 1987):
The PANSS ratings are based on all information pertaining to a specified period, usually the previous week. The information derives from both clinical interview and reports of primary-care staff or family members. The interview is semiformalized and facilitates direct observation of affective, motor, cognitive, perceptual, attention, and other mental functions (Kay *et al.*, 1987).
Data elicited by this assessment procedure are applied to the PANSS, a 30-item, seven-point rating instrument that has adapted 18 items from the Brief Psychiatric Rating Scale (Overall and Gorham, 1962) and 14 items from the Psychopathology Rating Schedule (Singh and Kay, 1975). Each item on the PANSS is accompanied by a complete definition as well as detailed anchoring criteria for all seven rating points, which represent increasing levels of psychopathology.

(2) CGI (Guy, 1976).
The CGI was developed for use in National Institute of Mental Health-sponsored clinical trials to provide a brief, stand-alone assessment of the clinician's view of the patient's global functioning before and after initiating a study medication.
The CGI provides an overall clinician-determined summary measure that takes into account all available history and clinical information. The CGI can track clinical progress across time by assessing two parameters: CGI-severity (the so-called baseline visit) and CGI-improvement (after medication has been initiated in comparison with the patient's baseline condition) (Guy, 1976).

(3) SUMD (Amador*et al.*, 1994).
This is the most comprehensive scale for the assessment of insight. It is used to evaluate awareness of illness, awareness of social consequences of illness, and attribution of illness symptoms. The scale is composed of 20 items (three items are general: (i) awareness of mental disorder, (ii) awareness of the achieved effects of medication, and (iii) awareness of the social consequences of mental disorder (Amador *et al.*, 1994).

Data analysis

The data collected were recorded on a separate file for each patient and were given codes; data analysis was performed using the Statistical Package of Social Sciences (Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.).

Results

Our final sample included 129 patients who were eligible according to inclusion and exclusion criteria of the study.

As shown in Table 1, schizophrenia is the most prevalent psychiatric disorder in admitted psychiatric patients; about half of admitted patients were diagnosed with schizophrenia (51.9%), followed by bipolar affective disorders (BAD) in manic episodes (23.3%), and then substance-induced schizophrenia (10.1%).

Table 1 Individual diagnoses of patients according to structured clinical interview for DSM-V

Diagnosis	Exclusion [*n* (%)]
Schizophrenia	67 (51.9)
Substance-induced schizophrenia	13 (10.1)
BAD, manic episode	30 (23.3)
Substance-induced BAD manic episode	6 (4.7)
BAD, depressive episode	1 (0.8)
Schizoaffective disorder	4 (3.1)
Schizophreniform disorder	1 (0.8)
MDD with psychotic features	1 (0.8)
Substance-induced MDD with psychotic features	6 (4.7)
Total	129 (100)

BAD, bipolar affective disorders; DSM-V, *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed.; MDD, major depressive disorder.

Table 2 Comparison between schizophrenia and related disorders and mood disorders regarding sociodemographic characteristics

Variables	Diagnosis [n (%)]		*P* value
	Schizophrenia and related disorders (*N*=85)	Mood disorders (*N*=44)	
Age (mean±SD)	33.1±9.4	33.7±8.7	0.6
Sex			
Male	67 (78.8)	32 (72.7)	0.4
Female	18 (21.2)	12 (27.3)	
Occupation 1			
Currently working	40 (47.1)	23 (52.3)	0.5
Currently not working	45 (52.9)	21 (47.7)	
Occupation 2			
Never had a job	27 (31.8)	13 (29.5)	0.8
Skilled	18 (21.2)	8 (18.2)	
Manual	40 (47.1)	23 (52.3)	
Marital state			
Single	55 (64.5)	16 (36.4)	0.007*
Married	18 (21.2)	20 (45.5)	
Divorce	12 (14.1)	7 (15.9)	
Widow/widower	0	1 (2.3)	
Residence			
Urban	31 (36.5)	13 (29.5)	0.4
Rural	5463.5)	31 (70.5)	
Birth order (mean±SD)	2.9±1.8	2.8±1.8	0.8
Number of years of education (mean±SD)	9.6±5.04	7.7±5.5	0.04*

*Statistically significant.

As shown in Table 2, there were no statistically significant differences between the group of schizophrenia and related disorders and the group of mood disorders regarding sociodemographic characteristics, except in the domains of marital status (*P*=0.007), where the schizophrenia and related disorders group had more single patients (64%) in comparison with 36% of mood disorders, and in the domain of number of years of completed education (*P*=0.04), where the mean number years of completed education in the schizophrenia and related disorders group was 9.6 years whereas in the mood disorders group it was 7.7 years.

As shown in Table 3, all DOH variables are affected by marital state in which divorced patients had the longest durations in all variables followed by single patients and then married patients; the difference was statistically

significant regarding DOH of current admission (P=0.05). In addition, males had a higher number of previous admissions but females had longer DOH of current admission (P=0.01).

As shown in Table 4, DOH of current admission was significantly longer in patients with schizophrenia and related disorders than in patients with mood disorders (P=0.002). In addition, involuntary admission was related to longer DOH of current admission in comparison with voluntary admission (P=0.03).

As shown in Table 5, primary psychotic disorders had the longest DOH of current admission, followed by primary mood disorders and then both substance-induced psychotic disorders and mood disorders (P=0.001).

As shown in Table 6, the number of hospitalizations significantly increased with lower age at onset (P=0.03), longer duration of illness (P=0.001), and higher number of previous episodes (P=0.001), whereas it decreased with higher total number of ECTs (P=0.001). Regarding DOH of current admission, it increased with higher age at onset and decreased with longer duration of illness, higher number of previous episodes, and higher number of current and total ECTs without statistical significance.

As shown in Table 7, number of hospitalizations including current admission increased with higher severity of mental illness, poor global improvement, decreased awareness of mental disorders, decreased awareness of achieved effects of medications, and decreased awareness of social consequences of mental disorders. There was no statistical significance for any of them.

Table 3 DOH variables according to sex and marital status

	Mean±SD	P value
Number of hospitalizations		
Male	1.9±2.1	0.5
Female	1.6±2.6	
Number of hospitalizations		
Single	1.9±2.3	0.9
Married	1.8±2.4	
Divorced	1.7±1.6	
Widow	1±0.001	
Current DOH		
Male	36.5±14.5	
Female	45.5±22.1	0.01*
Current DOH		
Single	41.5±17.1	
Married	30.7±9.1	0.005*
Divorced	43.8±23.5	
Widow	28±0.01	

DOH, duration of hospitalization. *Statistically significant.

Table 4 Duration of hospitalization variables according to diagnosis and type of admission

	Diagnosis			Type of admission		
	Schizophrenia and related disorders	Mood disorders	*P* value	Voluntary admission	Involuntary admission	*P* value
Number of hospitalizations	1.6±2.2	2.3±2.2	0.1	3.5±3.8	1.7±2.1	0.07
DOH of current admission	41.9±17.5	32.2±14.0	0.002*	24.5±8.5	39.3±19.0	0.03*

DOH, duration of hospitalization. *Statistically significant.

Table 5 Comparison between primary psychotic and mood disorders and substance-induced psychotic and mood disorders regarding admission variables

Diagnosis	Primary psychotic disorder	Substance-induced psychotic disorder	Primary mood disorder	Substance-induced mood disorder	*P* value
Number of hospitalizations	1.5±2.2	2.3±2.1	2.3±2.5	2.1±1.8	0.3
DOH of current admission	44.1±17.6	28.8±8.9	33.4±13.9	29.4±14.8	0.001*

DOH, duration of hospitalization. *Statistically significant.

Table 6 Correlation of duration of hospitalization variables with some illness and electroconvulsive therapy-related variables

DOH variables	Age at onset of illness	Duration of illness	Number of previous episodes	Number of ECT current admission	Total number of ECTs
Number of hospitalizations *r* (*P*)	−0.18 (0.03)*	0.26 (0.001)*	0.31 (0.001)*	0.08 (0.6)	−0.36 (0.001)*
DOH of current admission *r* (*P*)	0.001 (0.9)	−0.004 (0.9)	−0.04 (0.5)	−0.007 (0.8)	−0.13 (0.8)

DOH, duration of hospitalization; ECT, electroconvulsive therapy. *Statistically significant.

Table 7 Correlations of hospitalization variables with Clinical Global Impression Scale and Scale to assess Unawareness of Mental Disorder

DOH variables	Severity of illness on admission	Global improvement on discharge	Efficacy index	Awareness of mental disorder	Awareness of achieved effects of medications	Awareness of the social consequences of mental disorders
Number of hospitalizations [*r* (*P*)]	0.02 (0.7)	–0.17 (0.05)*	–0.06 (0.4)	–0.06 (0.1)	–0.06 (0.4)	–0.002 (0.9)
DOH of current admissions [*r* (*P*)]	0.05 (0.5)	0.34 (0.001)*	0.10 (0.1)	0.17 (0.05)*	0.18 (0.04)*	0.10 (0.2)

DOH, duration of hospitalization. *Statistically significant.

DOH of current admission increased with increasing severity of mental illness, decreased awareness of mental disorders, deceased awareness of achieved effects of medications, and decreased awareness of social consequences of mental illness, as well as with higher global improvement scores. There was statistical significance for only global improvement score and achieved effects of medications (P=0.001 and 0.04, respectively).

As shown in Table 8, it was found that the independent variable affecting number of hospitalizations was the number of ECTs (β=0.67, P=0.001) followed by age, age of onset, and duration of illness.

As shown in Table 9, the independent variables affecting DOH of current admission were blunted affect on admission (n1a) (β=0.40, P=0.01*), followed by emotional withdrawal on admission and preoccupation on admission.

Table 8 Regression analysis for variables affecting number of hospitalizations

	β	Significance
Sex	0.14	0.08
Age	0.55	0.3
Age of onset	0.50	0.3
Duration of illness	0.28	0.4
Number of previous episodes	0.01	0.9
Number of ECT	0.67	0.001*
n7[a]	0.02	0.7
g10[b]	0.02	0.7

ECT, electroconvulsive therapy; PANSS, Positive and Negative Syndrome Scale. [a]*n*, negative subscale items of PANSS. [b]g, general psychopathology subscale items of PANSS.

Discussion

Duration of hospitalization has attracted much clinical and research attention during recent years (Ithman *et al.*, 2014). The current study aimed at assessing this important issue in an Egyptian sample of inpatients with affective and non-affective psychoses. This might be reflected on improving management programs (Niehaus *et al.*, 2008; Yussuf *et al.*, 2008).

Schizophrenia was the most common diagnosis in our sample (51%), followed by bipolar affective disorder in manic episodes (23.3%); this was in agreement with a previous Egyptian study, which found schizophrenia to be the most common chronic psychosis in Egypt and accounts for the majority of in-patients in mental hospitals (Okasha, 2004).

These figures may be explained by the aggressive, suicidal, or homicidal behavior, delusions, or poor insight found in schizophrenia and BAD patients during manic episodes, necessitating hospitalization. In addition, schizophrenia is still the diagnosis that has the greatest influence on hospitalization decisions (Slagg, 1993; Schnyder *et al.*, 1999; Way and Banks, 2001; Wingerson *et al.*, 2001; Giampieri *et al.*, 2002).

Our sample showed male predominance in both groups as males represented 78.8% of schizophrenia and related disorders and 72.7 of mood disorders.

The majority of schizophrenia and related disorders patients (64.5%) were single, whereas 45.5% of mood disorders patients were married. This was similar to the results of other studies (Pacheco *et al.*, 2010). This could be explained by the tendency of patients with schizophrenia and related disorders to display a younger age at onset, higher severity of illness, more impairment in occupational and social functioning, and poor judgment and insight when compared with those with mood disorders.

It seems that affective and nonaffective psychoses affect occupational functioning to a comparable degree, as 52.9% of nonaffective psychotic patients and 47.7% of affective psychotic patients were currently not working and about 30% of both groups never had a job. This might be explained by psychological barriers imposed by severe mental illness to professional inclusion (Laberon, 2014). In addition, cognitive dysfunction in both affective and nonaffective psychoses may affect occupational functioning (Lewandowski *et al.*, 2013) through difficulty getting or maintaining a job.

Table 9 Regression analysis for variables affecting duration of hospitalization of current admission

	β	*P*
Sex	0.0	0.6
p1[a]	0.1	0.1
p2	0.1	0.3
p3	0.02	0.8
p4	0.07	0.6
p7	0.03	0.8
n1[b]	0.40	0.01*
n2	0.25	0.2
n3	0.11	0.3
n4	0.04	0.8
n5	0.06	0.5
n6	0.04	0.7
n7	0.17	0.1
g2[c]	0.07	0.4
g3	0.04	0.7
g7	0.11	0.4
g8	0.12	0.3
g10	0.03	0.8
g11	0.19	0.2
g13	0.11	0.5
g14	0.10	0.4
g15	0.21	0.1
g16	0.01	0.8
CGI global improvement	0.14	0.2
SUMD awareness of effects of medications on admission	0.09	0.3

CGI, Clinical Global Impression Scale; PANSS, Positive and Negative Syndrome Scale; SUMD, Scale to assess Unawareness of Mental Disorder. [a]p, positive subscale items of PANSS. [b]*n*, negative subscale items of PANSS. [c]g, general psychopathology subscale items of PANSS.

Females tended to have longer DOH than males, whereas males tended to have higher number of previous hospitalizations than females. This was in contrast to the results of Goldstein (1988) and Angermeyer *et al.* (1990) who found that men with schizophrenia tended to spend more time in the hospital than women with schizophrenia.

This could be explained by the fact that families of female patients in our culture are very reluctant to take the decision of admission of female patients 'due to stigma' unless symptoms are very severe. This leads to fewer admissions but longer DOH. In addition, the possibility of stigma to the family may lead to avoiding health facilities that lead to worsening the severity of illness and prolonged DOH (Fraser, 2003). Furthermore, Hodgson *et al.* (2001) and Heeren *et al.* (2002) found that the shorter the length of stay at hospital, the more is the readmission for psychiatric patients.

Divorced and single patients had significantly longer DOH than married patients. This could be explained by the better social support in married patients than single and divorced patients making their DOH shorter. This is in agreement with Ithman *et al.* (2014) who found that increased social support in the form of marriage might facilitate discharge and Ismail *et al.* (2012) who found that living alone may predict longer DOH.

DOH of current admission for schizophrenia and related disorders (41.9 days) was found to be significantly longer than for mood disorders (32.2 days) and was similar to the results of other studies (Thompson et al., 2004; Fekadu *et al.*, 2007; Lerner and Zilber, 2010 and Oladeji *et al.*, 2012). These studies generally found that a diagnosis of schizophrenia or nonaffective psychoses is a predictor of long hospital stays. The chronic nature of psychotic disorders compared with mood disorders might explain this finding (Addisu *et al.*, 2015). However, the rapid response of BAD patients to available treatments that are proven to be effective makes their DOH shorter compared with nonaffective psychotic patients (Karamustafalıoğlu *et al.*, 2014). Another explanation is that patients suffering from schizophrenia do not receive proper treatment in the community leading to increased hospital stays (Mitchell and Malone, 2006).

Other studies have also revealed that schizophrenia is related to longer DOH (Addisu *et al.*, 2015) with a mean of DOH for schizophrenia around 28 days and for BAD around 23–25 days. These figures are shorter than what were found in our study. These differences could be explained by methodological differences, severity of symptoms, and psychopathology in our sample or the nature of the hospital where we conducted our study in, because it is a governmental hospital, free of charge with little pressure for fast turnover by insurance companies as in western societies in an effort to reduce costs (Leigh, 2011).

Moreover, absence of accepted DOH guidelines for psychiatric in-patients may reflect the differences in psychiatrists' practice styles (Figueroa *et al.*, 2004).

In agreement with Blais *et al.* (2003), Adegunloye *et al.* (2009), and Ithman *et al.* (2014), involuntary admission in our study was associated with significantly longer DOH (39.3 days) than voluntary admission (24.5 days).

Regarding substance misuse, DOH in substance-related psychiatric disorders (affective or nonaffective psychoses) was found to be significantly shorter than that in primary psychiatric disorders; this is consistent with the results of other studies (Herr *et al.*, 1991;

Huntley *et al.*, 1998; Blais *et al.*, 2003; Compton *et al.*, 2006; Zhang *et al.*, 2011).

Number of hospitalizations was found to significantly increase with younger age at onset (P=0.03), longer duration of illness (P=0.001), and higher number of previous episodes (P=0.001), whereas it was found to decrease with higher total number of ECTs (P=0.001). Our results are consistent with the results of other studies (American Psychiatric Association, 2001; Suominen *et al.*, 2007).

DOH of current admission was found to increase with higher age at onset and decrease with longer duration of illness, higher number of previous episodes, and higher number of current and total ECTs taken during the whole course of illness. The American Psychiatric Association (2001) reported similarly regarding ECT, suggesting that that the prompt effectiveness of ECT shortened the DOH of patients.

Number of hospitalizations including current admission was found to increase with higher severity of mental illness, poor global improvement, decreased awareness of mental disorders, decreased awareness of achieved effects of medications, and decreased awareness of social consequences of mental disorders.

In agreement with Martin-Carrasco *et al.* (2012) and Moreschi *et al.* (2015), DOH of current admission was found to increase with increasing severity of mental illness, decreased awareness of mental disorders, deceased awareness of achieved effects of medications, and decreased awareness of social consequences of mental illness; thus, suggesting that patients with more severity of illness and impairment of insight are expected to spend more time hospitalized.

Regression analysis for variables affecting number of hospitalizations revealed that the independent variables affecting number of hospitalizations were number of ECTs followed by age, age of onset, and duration of illness. This was consistent with other studies (American Psychiatric Association, 2001).

Regression analysis for variables affecting DOH of current admission revealed that the independent variables affecting it were blunted affect followed by emotional withdrawal and preoccupation on admission. These findings are in agreement with Patel *et al.* (2015) who found that negative symptoms were associated with longer DOH and more frequent admissions. This might be explained by persistence and poor response of negative symptoms to available treatments.

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Conflicts of interest
There are no conflicts of interest.

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