PSYCHIATRY

Factors influencing the duration of hospitalization of patients with schizophrenia

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Abstract

Introduction. Severe mental disorders represent an important and large proportion of healthcare resource utilization and are associated with increased hospitalization rates and costs. Given the high percentage of total hospital days and costs associated with caring for people with psychotic disorders, a better understanding of the factors that determine the duration of hospitalization of patients with such disorders is imperative.

Purpose. The aim of the present study was to investigate socio-demographic, clinical and psychosocial characteristics of patients with schizophrenia, admitted to a Greek public psychiatric hospital, and the relationship between these characteristics and duration of hospitalization among these patients.

Methods. This is a cross-sectional study. The study sample consisted of 103 patients diagnosed with schizophrenia (F-20). The collection of data was performed by using the NEO-Five Factor Inventory, the Connor-Davidson Resilience Scale (CD-RISC25), Multidimensional Scale of Perceived Social Support, (MSPSS), Positive and Negative Syndrome Scale (PANSS), Global Assessment of Functioning scale (GAF) for assessing key personality factors, psychological resilience, social support, symptom severity and the severity of the disease, respectively. Descriptive analyses and inferential statistic methods were applied. Correlation between socio-demographic, psychosocial or clinical characteristics with the length of stay were explored. In addition, linear regression analysis was performed in order to examine predicting factors for the duration of hospitalization. All statistical analysis was performed using SPSS v.25.

Results. The mean age of the sample was 43.9 (SD = ±11.4) years, 67% of patients were men, and the mean length of hospitalization was 40.7 days. Factors found to be significantly associated with length of stay in the overall sample include the previous admissions (p=0.010), the type of admission (compulsory or voluntary) (p=0.017), bed rest (p=0.043) and duration of bed rest (p=0.002), and the existence of social support networks especially from friends (p=0.018).

Conclusions. Our findings indicate that basic psychosocial and clinical factors were associated with the duration of hospital stay. Duration of hospitalization results from a complex interface between characteristics and activities of the health system, patient, and clinician's influence on discharge timing, which requires additional study. Our findings further warrant the need for policymakers to consider socio-demographic status, psychosocial and clinical factors when allocating resources to hospitals caring for patients with severe mental disorders.

Keywords: schizophrenia, hospitalization, length of stay, predictors, psychosocial factors

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Introduction

Severe mental illness includes a range of chronic and often disabling conditions such as schizophrenia, bipolar disorder and other psychoses which are associated with significant morbidity and mortality. increased treatment costs and increased rates of inpatient treatment and hospitalization. Such diseases represent a significant proportion of healthcare resource utilization [1]. At the same time, the provision of mental health services and the motivations faced by their providers have changed radically in recent decades. Most health care systems in western countries have adopted deinstitutionalization strategies and shifted treatment from the secondary care environment to the primary care environment on a community level. This leads to significant reductions in both the average length of hospital stay and the total number of psychiatric beds [1].

Although some studies have shown that a short duration of hospitalization does not necessarily mean relapse in all patients, a concern related to shorter hospital stays and early discharge is the expected increase in inpatient readmission rates. Also, patients' stay in the hospital can be anti-therapeutic, weakening social support, and threatening the patients' living conditions and continued employment [2].

Given the high percentage of hospitalization days and the high cost associated with caring for people with psychotic disorders, a better understanding of the factors that determine the length of hospitalization of these patients is imperative for the design of payment systems [1].

Regarding the duration of hospitalization, it has been observed that the duration of hospitalization for some patients tends to be longer compared to other patients [2]. However, despite the importance of hospital care for mental health systems and those diagnosed with psychotic disorders, few studies have documented the individual and the hospital factors that affect the duration of hospitalization. For example, one study found that not only patient factors but also institutional characteristics including academic hospitals, public hospitals, and higher density of psychiatric beds, were associated with prolonged duration of hospitalization. On the other hand, higher hospital patient volume was associated with shorter duration of hospitalization [3].

Factors associated with the length of hospital stay include clinical factors such as general medical comorbidities, age, and severity of the disease, personal characteristics such as insurance and housing status, but also socio-demographic characteristics such as race and nationality [4].

For example, substance abuse has been associated with shorter hospital stays and higher patient readmission rates. Respectively, the factors that have been found to tend to prolong the duration of hospitalization include factors related to treatment (the number of previous hospitalizations and the need to use restrictions due to violent behavior), factors related to the diagnosis (the severity of psychiatric symptoms, the presence of concomitant pathological diseases, the outpatient treatment), and the functionality of individuals during the execution of their daily tasks and activities during their hospitalization [5]. Various demographic and clinical characteristics of patients have also been associated with the prolonged hospital stay. These characteristics include a primary diagnosis of psychotic or affective disorder [6,7], having medical comorbidity, being readmitted [8], involuntary admission, unemployment, lack of housing or a place of permanent residence, and female gender [9].

A study [10] among 385 patients found that patients without income, with a history of psychiatric admissions during the previous 2 years, with high scores on the Clinical Global Impressions Ratings and the Brief Psychiatric Rating scales, or with a diagnosis of schizophrenia or related disorders based on diagnostic criteria according to ICD-10, showed a longer duration of hospitalization. Another study found that older age and more recent readmission after discharge from previous psychiatric care were associated with longer hospital stays, whereas the recent experience of adverse life events and substance abuse were associated with shorter hospital stay [11].

Regarding the relationship between psychosocial factors and the duration of hospitalization, a study [11] showed that patients who were married or had a partner, had a shorter duration of hospitalization by 27.6 days and by 1.6 days in psychiatric and general hospitals, respectively. They also found that patients with a high school education or higher education level had a shorter duration of hospitalization by 29.2 days in psychiatric hospitals and by 0.6 days in general hospitals. They also estimated that patients who had some occupation remained 58.1 days less in psychiatric hospitals or 4.6 days less in general hospitals [11]. Another recent study found that unemployed patients spend about a day longer time in hospital compared to employed patients, and that the duration of hospitalization of single subjects is deemed to be nearly one and a half day longer compared to married ones. Similarly, this study found that divorced and widowed are predicted to spend about one and a half day and a couple of days, respectively, longer in hospital in comparison to married patients [12]. Other studies have shown that lack of social and family support, lack of accommodation [13], legal problems [14] and reduced social life functions [15] are associated with prolongation of duration of hospital stay.

Similar are the findings of other studies investigating the socio-demographic characteristics associated with increased length of hospitalization, which found that these factors included being single, insured in the national system, entitled to welfare benefits, or having housing problems. On the other hand, the results of studies regarding the effect of age, the existence of family ties, and social support as well as gender were contradictory, with their finding longer and shorter lengths of hospitalization in immigrants, older people, male patients, and in patients who had family ties and received social support [1].

A study [16] on the factors of hospitalization in five European countries found that homeless people, those receiving state benefits, those in social isolation, and patients with a diagnosis of schizophrenia with use of substances and a history of previous admission and involuntary admission were more likely to have a longer duration of hospitalization [16]. Another study conducted to identify the variables that may be related to the duration of hospitalization found that age had a significant effect on the duration of hospitalization. This study also found that patients who had undergone electroconvulsive therapy, as well as occupational therapy and patients with a previous hospitalization, had a longer duration of hospitalization [17]. Finally, for many patients it is not just a mental disorder but a combination of behavioral and functional factors that lead to a prolonged hospital stay [18].

Purpose

The purpose of this study was to investigate the relationship between demographic, clinical and psychosocial characteristics of patients diagnosed with schizophrenia and the duration of hospitalization and to outline the profile of these patients.

Design and the sample of the research

The patients of this study were selected randomly. The sample consisted of 103 patients with schizophrenia (F.20) who were treated at the Dromokaitio - Athens Psychiatric Hospital between January and March 2019. The selection of patients to participate in the present study was based on some specific criteria. Specifically, the inclusion criteria were a) adult patients with a primary diagnosis of the psychotic syndrome, b) new cases of hospitalization as well as cases of readmission due to recurrence, d) knowledge and understanding of the Greek language in order to complete the questionnaire. Cases of patients who did not meet the above criteria were excluded.

Research tools

The data collection tools included a questionnaire about the social, demographic, and clinical characteristics of the patients and the Greek version of the following scales:

NEO-Five- Factor Inventory (NEO-FFI): This is a questionnaire developed in 1989 [19] to assess key personality factors including: (a) neuroticism (the tendency experiencing negative emotions and psychological distress in response to stressors), (b) extraversion, (the degree of sociability, positive emotionality, and general activity), (c) openness to experience (levels of curiosity, independent judgment, and conservatism), (d) agreeableness (altruistic, sympathetic and cooperative tendencies), and (e) conscientiousness. Each of the 5 key personality factors consists of 12 items on a Likert 5-point scale. The answers range from 0 ("Strongly disagree") to 4 ("Strongly agree"). The total of items is 60. Almost half (28 out of 60) items of the scale have the opposite wording. The initial reliability of the questionnaire has been demonstrated within the context of North America with internal coherence values ranging from 0.68 to 0.86 while the same applies to adaptations developed for other cultures. This is an interculturally weighted questionnaire. The questionnaire has been adapted to Greek [20].

Connor-Davidson Resilience Scale (CD-RISC25): This is a short, reliable, and valid scale for assessing mental resilience. It is a self-report questionnaire, consisting of 25 sentences which the participants evaluate on a one-to-one scale with 5 Likert scores. Answers range from 0 to 4. The total scores of the scale range from 0 to 100 while the highest scores show higher durability. The validity of the results of the scale for the Greek population has been proven and the scale has been found to have excellent internal consistency (Cronbach's alpha 0.925) [21].

Multidimensional Scale of Perceived Social Support (MSPSS): The multidimensional scale of perceived social support is a frequently used 12-item questionnaire [22] developed in order to assess the subjective adequacy of an individual's social support. The questionnaire has been used extensively in both healthy and sick populations to assess the respondents' perceived social support. The psychometric properties of the scale have been tested in a number of countries with the scale showing good rates of internal cohesion. The questionnaire provides an assessment of three perceived sources of social support: Family, Friends, and Significant Others. Each item of the scale is rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) giving a total score of over 84 [23]. Higher scores indicate greater social support. The translation and cultural adaptation of the questionnaire into Greek language has been conducted while the internal consistency is excellent (Cronbach's alpha >0.90) [24].

Positive and Negative Syndrome Scale (PANSS): It is a 30-parameter evaluation scale designed to evaluate patients with schizophrenia and divided into three subcategories: a positive scale with seven positive symptoms, a negative scale with seven negative symptoms, and a 16-item general psychopathology evaluation scale. The scores of each subscale are independent of each other. For each of the 30 parameters examined, there is a definition and seven possible evaluation points which represent increasing levels of severity of psychopathology (1 = absence, 2 = minimal, 3 = mild, 4 = moderate, 5 = moderate-severe, 6 = severe, 7 = Extreme). The score is derived from the sum of the scores between the parameters with the possible scores ranging from 7–49 for the positive and negative scales and 16–112 for the general psychopathology assessment scale. The translation and adaptation of this scale into Greek has been carried out [25].

Global Assessment of Functioning Scale (GAF): This is a scale used in many countries to assess the severity of the disease in the mentally ill patient. It is constructed as a global measure for the evaluation of psychological, social, and occupational functionality covering the range from positive

mental health to severe psychopathology. It is a numerical scale ranging from 1 - 100 and evaluated on a continuum ranging from number 1, which represents the hypothetically weakest up to 100, a score that represents the supposedly healthiest person. The scale has been used in Greek patients with schizophrenia [26].

Procedure

This study employed a three-step procedure for data collection. In the first step all patients with admission diagnosis in schizophrenia spectrum (F.20.x according to ICD-10 manual) that were admitted in the Dromokaitio - Athens Psychiatric Hospital were evaluated upon admission with PANSS and GAF by a specialized psychiatrist. In the second step, the patients who maintained their initial diagnosis (schizophrenia) and whose symptoms were in remission and agreed to participate in the study completed the rest of the data collection tools with the help of the research team. Eligible patients were identified and approached in person by their psychiatrist. Those who provided consent were contacted by the researcher and were given more information regarding the study. Assessment of patient capacity to consent were made at several time points: firstly, by the psychiatrist who made the first contact and then again at subsequent meetings with the researcher, who was provided with the appropriate training. Any concerns regarding the patient's capacity to consent were discussed with each patient's psychiatrist. All participants were asked to provide written informed consent following discussion with the researcher.

Finally, in the third step after discharge, some additional data were recorded. These included the total number of hospitalization days and information on visits, on previous admissions, and on whether the patient was restrained during the hospitalization.

Ethical issues

To carry out the present research, the approval of the Scientific Council and the positive suggestion from the Board of Directors of Dromokaitio - Athens Psychiatric Hospital was secured. The participation was voluntary and anonymous, and the distribution and completion of the questionnaire took place after informing and securing the written consent of the patients. Specifically, patients who according to their psychiatrists had the capacity to consent to taking part in the present research and were able to: (a) make choices, (b) understand (retain and repeat) the given information, (c) appreciate (believe) its content, and (d) rationally process the information [27] were informed about the nature and purpose of the present study prior to their participation. The researchers explained the aims, methods and implications of the study to each and every participant patient, and written consent was taken before administering the questionnaire. Finally, the information collected was used solely for this work ensuring the confidentiality of the data and respecting the rules of ethics in research.

Statistical methodology

Data collected from patients were inserted into the statistical program S.P.S.S. 25 (Statistical Package for Social Sciences). Also, the results were evaluated, and the final results were revealed. Descriptive statistics were applied such as frequencies, mean and standard deviation while inferential statistics such as Student's t-Test, one-way ANOVA, Pearson correlation, and regression analysis with the Backward method were also performed.

Research results

The majority of the sample (67%) were men. The mean age was 43.9 years. A percentage of 77.7% were unmarried, 27.2% lived alone, 40.8% had completed High School, and 55.3% were retired. The socio-demographic characteristics are presented in table I.

Table I. Socio-demographic characteristics of the patients.

	Number	%
Sex		
Male	69	67.0
Female	34	33.0
Average age: 43.9 ±11.4		
Marital status		
Unmarried	80	77.7
Married	6	5.8
Divorced	17	16.5
Do you live alone?		
Yes	28	27.2
No	75	72.8
Educational status		
Primary school	23	22.3
Junior high school	42	40.8
Senior high school	17	16.5
University degree	18	17.5
Postgraduate / Doctoral	3	2.9
Profession		
Farmer	2	1.9
Freelancer	6	5.8
Employed (private sector)	12	11.7
Employed (public sector)	10	9.7
Unemployed	13	12.6
Household	2	1.9
Retired	57	55.3

A percentage of 87.4% of the patients had been hospitalized again in the past, the average of the total current hospitalization days was 40.7 days and 46.6% had been hospitalized more than 4 times in the past. The median duration of the disease years was 19.28. The majority of patients (70.6%) were admitted with involuntary hospitalization, while those who needed mechanical restrain stayed for 1.3 days (Table II).

The majority of patients rated from moderate to severe in the symptoms of psychopathology. More specifically, the score of positive subscale was 26.55, of the negative 26.10, and the score of the general psychopathology was 57.02. The average of the GAF was 35.7 (± 8.8) which means "Some reduction in the control of reality, communication

(e.g. reason that sometimes becomes irrational, vague or irrelevant), or major reduction in many areas, such as work or school, family relationships, judgment and thinking or emotional mood.

Table II. Hospitalization characteristics.

	Number	%
Have you been hospitalized in the past?		
Yes	90	87.4
No	13	12.6
Average total current hospitalization days: 40.7 ± 16.2		
Number of previous hospitalizations		
No	13	12.6
≤ 4	42	40.8
> 4	48	46.6
Years since the first diagnosis: 19 ± 10 years		
Comorbidity		
Yes	29	28.2
No	74	71.8
If Yes		
Heart Disease	11	10.7
Diabetes Mellitus	7	6.8
Thyroid Disease	11	10.7
Hospitalization type		
Involuntary	72	70.6
Voluntary	30	29.4
Mechanical restrain		
Yes	25	24.3
No	78	75.7
If yes, for how long (in days): 1.3 ± 0.7		
Visits		
Yes	86	83.5
No	17	16.5
If yes		
Daily	44	42.7
Weekly	42	40.8

The average neuroticism value was 21.8, which means patients are likely to be safe, resilient, and generally relaxed even under stressful conditions. The average value of the extroversion factor was 21.04, which means people tend to be introverted, restrained, and serious and prefer to be alone or with a few close friends. The average value of the openness to experience factor was 19.72, which means people who traditionally prefer what is known in the novel and their emotional responses may be relatively obscure. The average value of the agreeableness factor was 31.33, which means people who are likely to be difficult, skeptical, proud, and competitive, tend to express their anger directly. The average value of the conscientiousness factor was 24.84, which means people who are not very well organized and sometimes careless and prefer not to make plans, do not necessarily have plans or moral principles and are less strict in keeping them. All factors were rated as mediocre except for the optional/cooperative factor which was higher. The average value of the Family factor was 20.35, which means high support from the family. The average value of the Friends factor was 16.20, which means moderate support. The average value of the Significant Others factor was 21.16 which means high support. The majority of the sample sometimes agrees with the resilience questionnaire statements. The mean value of the Resilience scale was 2.2 ± 0.5, which means that the patient sample is characterized by moderate resilience.

The total days of current hospitalization increase as the Positive Subscale and the General subscale of the Positive and Negative Syndrome Scale increase. They also increase as the scale of overall appreciation of functionality, conscientiousness, social support from family, social support from friends, social support from significant others, and resilience decrease (Table III).

Table III. Correlation of questionnaire scales with total days of current hospitalization.

Psychosocial variables	Total days of current hospitalization
Positive Subscale	0.481**
General Subscale	0.312**
GAF	-0.508**
Conscientiousness	-0.250*
Family	-0.517**
Friends	-0.233*
Important Others	-0.407**
Resilience	-0.350**

*p<0.05, **p<0.001

Linear model of current hospitalization duration depending on the socio-demographic characteristics of patients

In order to investigate the socio-demographic characteristics of psychotic patients and their state of health and their relationship with the duration of the current hospitalization, multiple linear regression with backwards method was performed. The duration of the current hospitalization was set as a dependent variable. The socio-demographic characteristics of the psychotic patients as well as the variables related to their state of health were set as independent variables (Table IV).

The model showed a positive relationship between the number of previous hospitalizations, the existence of mechanical restrains, and the duration of the latter with the duration of the current hospitalization, as well as a negative relationship between the type of hospitalization with the duration. More specifically, we observed the following: As the number of previous hospitalizations increases, so do the days of the current hospitalization. Individuals who were voluntarily hospitalized had a shorter duration of hospitalization. As the days of protective mechanical restraint increase, so do the days of hospitalization. The existence of visitations decreases the duration of hospitalization.

Table IV. Linear model of duration of current hospitalization (a).

	Unstandardized Coefficients		P	95.0% Confidence Interval for β	
	β	SE		Lower Bound	Upper Bound
(Constant)	-19.325	30.830	0.532	-80.604	41.954
Number of previous hospitalizations	9.383	3.554	0.010	2.320	16.447
Hospitalization type	-7.727	3.184	0.017	-14.054	-1.399
MR	12.635	6.147	0.043	0.417	24.854
Days under MR	12.550	3.920	0.002	4.758	20.341
Visits from family/ friends	9.649	4.006	0.018	0.221	2.409

R^2 = 0.629, R^2 adj = 0.396, F= 4.076, p =0.001, SE: Standard Error, MR: Mechanical restrain.

Table V. Linear Model of Duration of current hospitalization (b)

	Unstandardized Coefficients		P	95.0% Confidence Interval for β	
	β	SE		Lower Bound	Upper Bound
(Constant)	57.759	11.644	0.000	34.649	80.870
Positive Subscale	1.239	0.182	0.000	0.876	1.601
Neuroticism	-0.555	0.246	0.027	-1.044	-0.066
Goodwill /Collaboration	0.431	0.163	0.010	0.107	0.755
Family Support	-1.329	0.274	0.000	-1.872	-0.785
Durability	-11.287	2.683	0.000	-16.612	-5.961

R^2 = 0.743, R^2adj = 0.552, F= 23.902, p =0.001, SE: Standard Error

Linear Model of Duration of current hospitalization depending on the psychosocial characteristics of patients

In order to investigate the psychosocial characteristics of psychotic patients and their relationship with the duration of the current hospitalization, multiple linear regression was performed. The duration of the current hospitalization was set as a dependent variable and the psychosocial characteristics of the psychotic patients were set as independent variables (Table V).

The model showed that as the Positive Subscale increases, the number of days of hospitalization of patients will increase (β=1.239, p=0.001). As Neuroticism increases, patients' hospitalization days will decrease (β=-0.555, p=0.027). As agreeableness increases, patients' hospitalization days will increase (β=0.431. p=0.010). As Social Support from the Family increases, the days of hospitalization of the patients will decrease (β=-1.329, p=0.001). As the Resilience increases, the patients' hospitalization days will decrease (β=-11.287, p=0.001).

Discussion

The aim of this study was to investigate the psychosocial characteristics of psychotic patients hospitalized in a public hospital as well as the relationship between these characteristics and the duration of their treatment.

The analysis of the data showed that as the total days of current hospitalization increase, the score for the Positive Subscale and the General Subscale increases while it decreases for the scale of the overall assessment of Functionality (β=-0.217, p=0.001), the Benefit (β=-0.121, p=0.021), Family Support (β=-0.105, p=0.001), Social Support from Friends, Social Support from Important Others (β = -0.059, p = 0.041) as well as Durability (β=-0.011, p=0.001). On the contrary, we found that as the score for Neuroticism increases, patients' hospitalization days will decrease (β=-0.555, p=0.027) in contrast to the increase in the factor of Goodwill / Cooperation factor which was associated with an increase in hospitalization days of patients (β=0.431, p=0.010).

In particular, in terms of analyzing the results obtained from the PANSS Positive and Negative Syndrome Scale questions, most patients rated the psychopathology questions from moderate to severe, while the sum of the psychopathology scores showed that participants had positive and negative psychopathology as well as general.

From the multiple linear regression that we carried out to investigate the prognostic factors that affect the Positive Subscale of patients, it was found that as the total days of current hospitalization increase, the scores of the Positive Subscale also increase (β=0.151, p=0.00). Married individuals have an increased chance of a Positive Subscale when compared to unmarried individuals (β=1.529, p=0.039). In addition, the Connor-Davidson Resilience Scale showed that married individuals had increased

Resilience compared to unmarried individuals (β=0.129, p=0.018) while the NEO-FFI questionnaire scores showed that individuals had increased Consciousness scores compared to unmarried individuals (β=2.620, p=0.007).

Similarly, with the findings of our study, the presence of Positive Symptoms has been associated with increased duration of hospitalization in other studies [4,28]. In the present study, marital status was not found to be related to the duration of hospitalization in contrast to the findings of other studies. For example, in a systematic review of the duration of hospitalization of adult psychiatric patients in US psychiatric settings and the factors influencing it. This systematic review included 20 studies and found that marital status was associated with a shorter duration of hospitalization [29]. Similarly, a recent study found that divorced and single patients had significantly longer duration of hospitalization when compared to married patients, a finding which could be explained by the better social support in married patients than single and divorced patients, making their duration of hospitalization shorter [30]. According to another study, having an excellent/ good relationship with intimate partners, irrespective of the marital status, is associated with shorter length of hospitalization, a finding that is likely to be related to the impact of quality of relationship with the patients' relatives on mental disorders [31].

Regarding gender, the results from the scores for the Multidimensional Social Support Scale indicate that women have a lower chance of Social Support from Friends as compared to men (β=-1.882, p=0.048), while from the scores of the Connor-Davidson Resilience Scale it was found that women had a lower chance of Resilience as compared to men (β=-0.2232, p=0.012). Regarding the duration of hospitalization, in the present study, gender was not found to be a prognostic factor for the duration of hospitalization of patients with schizophrenia. Similarly, other studies [32,33] investigating the effects of gender on psychiatric care found no correlation between the duration of hospitalization and sex. The results of other studies on the effect of gender on hospitalization are also contradictory. In particular, a recent study [9] aiming to investigate factors related to the length of hospital stay in the UK's inpatient services, found that males were associated with longer hospital stays. The findings of other authors [29] who conducted a systematic review of the duration of hospitalization of adult psychiatric patients and the factors influencing it, were different. This systematic review found that females were associated with increased length of hospital stay, while such a relation was not observed in 6 of the 8 studies with a smaller sample of patients [29].

In the present study, it was also found that the subjects who were voluntarily hospitalized had a lower Positive Subscale score when compared to the subjects who were hospitalized involuntarily (β=-2.620, p=0.043), but increased scores of General Subscale, when compared to the latter (β=4.286, p=0.040). It was also found that the subjects who were hospitalized voluntarily had reduced Resilience (β=-0.287, p=0.003) but also increased scores for the factor Neuroticism of the NEO Five-Factor Inventory questionnaire as compared to the individuals who were hospitalized involuntarily (β=3.624, p=0.002). Finally, the type of hospitalization was found to be related to the duration of hospitalization of patients. The relationship between the type of hospitalization (voluntary-involuntary) with the duration of hospitalization has been demonstrated in other studies. In a retrospective study [28] the researchers found that involuntary hospitalization was associated with longer hospital stays. In another study [34] researchers found a very important correlation between the status of involuntary admission and the duration of hospitalization, with its duration ranging from 14.3±10.6 days of hospitalization among involuntarily admitted patients as compared to 10.3±10.0 days among those who entered voluntarily [34]. Involuntary admission was associated with a longer hospital stay during current admission than involuntary admission [30].

Another finding of the present study is that people who did not have other health problems had an increased chance of Social Support from Friends when compared to people who had other health problems (β=4.374, p=0.049). Also, in the present study, the increased Social Support from Friends was found to be associated with a reduced duration of hospitalization. In general, it has been found that psychotic patients tend to have fewer friends and social relationships when compared to the general population but also when compared to those suffering from other mental and physical disorders. It is also widely acknowledged that having friends provides emotional and practical support to the mentally ill helping them cope with the stresses of life. Relationships with friends can have a positive effect on both physical and mental health, improving health behaviors and facilitating the search for and provision of psychological benefits for depression self-efficacy, self-esteem, coping mechanisms as well as morale [35]. The above could provide an explanation for the relationship we found in the present study between Social Support from Friends and reduced length of hospital stay.

In the present study we also found that as the duration of the illness increases, the chances of Social Support from Family (β=-0.105, p=0.041), from Friends (β=-0.143, p=0.016) and from Significant others (β=-0.168, p=0.003), as well as the scores of the Resilience scale also decrease (β=-0.026, p=0.001). Other studies [36] found that social support from the family was a predictor of the duration of hospitalization. In particular, they found that the length of hospital stay among patients with poor family support was four times higher than among those receiving good family support. Research also shows that people with long-term disorders are more likely to have limited social networks and, consequently, limited access to social

support outside of those provided by mental health services [37]. In particular, the characteristics of certain psychotic disorders, including both negative and positive symptoms, can force individuals to withdraw from social networks or create difficulties in maintaining relationships. This reduction in social networks may lead to less resilience during the crisis thus possibly contributing to the creation of a vicious cycle of worsening of psychotic symptoms and social withdrawal [38]. Moreover, regarding factors related to support, one recent study suggests that individuals coming from or going to a less supportive home setting would have a significantly longer length of hospitalization, as individuals referred to care by family members tend to have significantly shorter duration of hospitalization when compared to those referred by more distal support agencies. It is also mentioned that patients discharged to non-home community support services have increased length of hospitalization due to the fact that they are waiting for a placement to become available [39].

From the results of the present study, no correlation was found between the existence of physical and psychiatric comorbidity with the duration of hospitalization. This finding is consistent with that of one recent study which found a lack of association between long hospital stays and medical comorbidities [40]. On the other hand, this finding contradicts those of other researchers [31,41] who found that the mean length of hospital stay was significantly longer for patients with concomitant physical diagnoses as compared to those without. This finding could be related to the additional medical and social burden as a consequence of the physical illness complicating the mental disorder or vice versa [31].

In the present study, we also found that as age increases, the chances of Social Support from Friends increase, and so does the Resilience. In contrast, age was not found to be associated with patients' length of hospitalization, a finding that contrasts with those of other studies [42] according to which older age was associated with longer hospital stay. Similarly, older ages were associated with longer hospital stays in psychiatric patients in hospitals in Sweden and Finland [43].

The analysis of the results of the present study did not find any correlation between the existence or frequency of visiting and the duration of hospitalization, a finding that contradicts the finding of other studies according to which frequent visits by family members during patients' psychiatric hospitalizations were associated with short hospital stays [40].

Another finding of the present study is that people who have been treated in the past more than 4 times are less likely to have a Global Assessment of Functioning Scale when compared to people who have been treated in the past less than 4 times, and that the number of previous hospitalizations is a prognostic factor for the duration of hospitalization. This finding is consistent with other results according to which an increased number of previous admissions may be a predictor of longer hospital stay. Also, in agreement with our findings, the increase in functional loss due to mental disorder is associated with longer periods of inpatient care [4].

Our study has some limitations related to the small sample size and the fact that the data collection took place in a single psychiatric structure. These limitations are likely to have an impact on the generalizability of our study findings. The small sample size might also explain why we failed to find relationships between the duration of hospitalization and gender as well as between the duration of the hospitalization and marital status. Moreover, the possibility of patients continuing their treatment in different institutions should not be ignored. This may cause a limitation in the duration of hospitalization variable. Also, when considering diagnosis, we only looked at primary diagnosis and did not include secondary diagnosis, and, according to a study, illness severity could relate to the length of hospitalization as it is related to the clinician's perceived need for hospitalization and should be included in future research if possible [9]. Moreover, we did not collect data on the treatments that patients received in hospital, something which might have explained the association of predictor variables with the length of stay. Finally, not all known predictive factors for the length of stay were evaluated. Such factors include characteristics of hospitals (number of healthcare professionals employed, distance from the patient's place of residence to hospital), previous violence/forensic history, having an emergency admission or weekend admission, and being admitted from another institution among others.

Despite these limitations, our findings help clarify the complex nature of the duration of hospitalization of the mentally ill. Furthermore, the fact that our findings reproduce the results of earlier adds some degree of confidence to our findings.

Conclusions

The present study highlights and supports the importance of some psychosocial variables as predictors of the duration of hospitalization for patients with psychotic disorders. Specifically, it was found that the number of previous hospitalizations, the type of hospitalization, the mechanical restrain, the days of mechanical restrain as well as the existence of social support networks and specifically the social support from friends are prognostic factors for the duration of hospitalization. The increased duration of hospitalization was also found to be associated with increased scores on the Positive and General subscale of the PANSS Positive and Negative Syndrome Scale with a decreased Consciousness score on the NEO-FFI questionnaire as well as with an increase in the resilience scale Conor-Davidson.

As pressures are growing to minimize the costs of

psychiatric inpatient treatment [44], such findings may provide useful information about possible estimators or predictors of the duration of hospitalization for patients with psychotic disorders, would guide future mediation research, and help to design and improve utilization of psychiatry admission facilities optimally and restructuring psychiatric inpatient units, accordingly. Additionally, our findings point to the need for implementing treatments and interventions aimed at mitigating factors affecting the length of stay. For example, our finding that as Social Support from the Family increases, the days of hospitalization of the patients will decrease, indicates that interactions with family members is a malleable factor that can be targeted for early intervention and point to the need for incorporating social support-oriented strategies and family-based treatments. Such interventions have been associated with improvements in clinical, social and family functioning and are expected to reduce the need for intensive medical and social care and, thereby, produce economic benefits for service providers [45]. What's more, our finding that as resilience increases, the patients' hospitalization days will decrease, suggests that personalized treatments aimed at resilience can promote rehabilitation and help patients obtain functional recovery, which is difficult to achieve by relying only on pharmacological treatment [46].

Moreover, understanding the factors related to long-term hospitalization is important for a better understanding of the use of mental health services, while the observed-predicted length of hospitalization can be used as an indicator of ineffectiveness provided that the appropriate limits have been selected. However, understanding how factors affect the duration of hospitalization is a complex process which is influenced by several factors such as the psychiatric structure, the study period, the size and composition of the sample, the analysis methodology, as well as the way to define long-duration hospitalization.

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