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Length of Stay and Determinants of Long-Stay Hospitalization in Turkish Forensic Psychiatric Patients: A 1,200-Patient Retrospective Study

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ABSTRACT

Background

The international literature extensively addresses factors affecting length of hospitalization; however, comprehensive, large-scale studies examining long-stay hospitalization in inpatient forensic psychiatric services in Turkey remain limited. This article aims to investigate patient-level factors associated with long-stay hospitalization in forensic psychiatric services.

Method: This retrospective study analyzed data from 1,200 mentally disordered offenders discharged from forensic psychiatric units through review of medical records, legal files, and electronic documentation. The 80th percentile of length of hospitalization was defined as the threshold for long-stay hospitalization. Determinants of long-stay hospitalization were identified using binary logistic regression analysis.

Results: Binary logistic regression analysis revealed that psychotic spectrum disorder diagnosis (reference: intellectual disability) (OR = 2.68, $p < 0.001$), increased number of offenses (OR = 1.18, $p = 0.016$), and high offense severity (OR = 1.28, $p = 0.019$) increased the risk of long-stay hospitalization. Conversely, absence of prior forensic psychiatric hospitalization (OR = 0.54, $p = 0.009$), good compliance during hospitalization (OR = 0.08; $p < 0.001$), and treatment adherence before hospitalization (OR = 0.37; $p = 0.001$) reduced the risk of long-stay hospitalization. Marital status and substance misuse history were not significant in multivariate analyses.

Conclusion. Psychotic spectrum disorder, severe index offense, higher number of documented offenses, and existence of previous forensic psychiatric hospitalization were associated with long-stay hospitalization in forensic psychiatry. Treatment adherence before forensic hospitalization and good compliance during hospitalization were associated with a lower risk of long-stay hospitalization. This study revealed that patients with long stay hospitalization demonstrated different characteristics. Identifying factors associated with long-stay hospitalization will enable early recognition of high-risk groups regarding extended stays, and contribute to the design of targeted treatment goals and protective programs.

Keywords; Long-stay forensic hospitalization; forensic psychiatry; lenght of stay; psychosis;

Introduction

In forensic psychiatric care processes, there are various differences from the standard patient approaches applied in general psychiatry. In forensic services, where treatment is largely involuntary and personal liberties are substantially restricted, the primary aim is to reduce the risk of reoffending through effective treatment and risk management, and ultimately to ensure patients' safe reintegration into the community [1, 2]. There are variable findings regarding lengths of stay (LoS) in forensic psychiatry. Certain forensic patients require extended institutional care. However, it should not be assumed that prolonged LoS enhances treatment efficiency. In fact, the negative effects of unnecessarily extended treatment in restrictive conditions have been shown [3]. Furthermore, it has been reported that prolonged LoS constitutes a violation of human rights within the scope of the proportionality principle and highlighted that detention of persons with mental disorders must be strictly justified [4]. Additionally, long-term hospitalization has significant financial consequences and brings economic disadvantage [5]. The decisions clinicians make regarding how long individuals remain hospitalized are informed by a complex interplay of legal mandates, the imperative to ensure patient and public safety, and clinical assessments of therapeutic requirements. Active management of LoS is recommended as an integral component of the standard care model in forensic psychiatric service [6].

Forensic psychiatric care practices vary across countries with respect to the legal framework, the criteria for assessing criminal responsibility, whether the forensic hospitalization is predetermined, the presence of limits on LoS, whether courts are involved in discharge decisions, and whether forensic services are provided at different levels of security. These variables may influence LoS [2,7,8]. While mean LoS may be shorter in countries that have a maximum limit on the duration of compulsory admission [9], in systems without a time limit, such as the United Kingdom and France, LoS is determined on the basis of risk and clinical need [10,11,12]. The inadequate provision of high-security forensic psychiatric beds and legal considerations, which are defined as the sociopolitical dimensions of forensic psychiatric care, are known to exert an imprint on the LoS of forensic patients [13]. Moreover, the UK system involves a step-down transition across high, medium, and low levels of security, with patients transferred between settings as their risk decreases. In this model, LoS can be extended, partly because transfers depend on the availability of suitable step-down facilities [2]. A study comparing European Union (EU) countries reported a seventeen-fold difference in the LoS among countries [7]. Because of strucutural and juidical differences between systems, no consensus for defining long-stay hospitalization in forensic psychiatry [13].

Studies from different countries have identified various sociodemographic, clinical, and forensic factors associated with long-stay hospitalization. Sociodemographic variables such as male gender, being single, and low educational level [3, 14, 15] psychosis disorder [16], violent offense and sex offense [16, 17, 18, 19, 20]. more severe offense [16, 20, 21], severity of offending history, assault on staff during hospitalization [2], less successful recovery score, patient need for higher therapeutic security level [22] have been associated with long-stay. However, findings regarding the factors associated with long-stay vary across studies.

Studies investigating LoS in large samples are limited in Turkiye, and there is no threshold value defining long-stay. A previous study demonstrated an association between offense severity and LoS. The mean LoS was reported as 22.02 months for patients who committed moderately severe and severe offenses and 13.21 months for those who committed mild and moderate offenses [23]. Considering that population-specific factors influence LoS, as also emphasized in the literature, and that different countries have different legal systems, hospital structures, and patient characteristics, large-sample studies in the Turkish forensic psychiatric population would be valuable. Determining the factors associated with prolonged stay in forensic psychiatric inpatient care in Türkiye would allow comparison with the international literature and may contribute to the early identification of groups at high risk for long-stay and to the design of treatment goals and prevention programs.

This study aimed to evaluate LoS in a large forensic psychiatric sample consisting of not criminally responsible patients, to determine a sample-based threshold for long-stay, and to investigate patient-level factors associated with long-stay. In line with these objectives, the findings may contribute to the early identification of groups at high risk for long-stay and to the design of treatment goals and prevention programs.

Method

Participants

In this retrospective study, the electronical/medical/legal records of 1233 male mentally disordered offenders who were discharged from the High-Security Forensic Psychiatry (HSFP) Unit of Adana City Hospital between October 2018 and October 2024 were reviewed. Patients with diminished criminal responsibility were not included in the study. Thirty-three patients were excluded because of insufficient file records, and 1200 patients were included. In all admissions at the hospital, detailed assessments are routinely performed as part of standard diagnostic and treatment protocols. The paper-based records and electronic records include clinicians' notes on interviews conducted with patients and their family members, judicial documents regarding the patients' criminal records, and notes on observations made by psychologists, social workers, and nurses during hospitalization. All paper-based and electronic records were examined in detail and documented using data forms developed by the authors. To reduce coding bias among the researchers, the data of the first 30 patients were coded together by the researchers in face-to-face sessions. The study was approved by the Clinical Research Ethics Committee of the hospital (Date:10.10.2024, Decision No:179). Informed consent was not obtained because of the retrospective design.

Diagnosis of Mental Disorders

Psychiatric diagnoses were determined based on the primary psychiatric diagnoses recorded in the electronic health record system. Diagnoses are coded according to ICD-10. Lifetime psychoactive substance misuse was defined as having a history of problems due to substance use. Lifetime substance misuse was considered a comorbid condition rather than a primary

diagnosis. For the regression analyses, diagnostic groups were recoded into three categories: psychotic spectrum disorders (comprising schizophrenia, atypical psychosis, schizoaffective disorder, delusional disorder, and substance-induced psychosis), mood disorders, and intellectual disability. Seventy patients were excluded from these analyses because their diagnoses did not fit into any of the defined diagnostic groups.

Study Variables

Sociodemographic variables were age, sex, years of education (more than 5 years / 5 years or less), marital status, having regular job, having children, and place to residence (rural/urban). Clinical variables included primary psychiatric diagnosis, duration of disorders, lifetime substance misuse, lifetime history of self-harm or suicide attempt, regular use of psychiatric medication prior to admission (adherence to previous treatment), and treatment compliance during hospitalization. Regular use of psychiatric medication prior to admission was determined by information provided by the patient and family together and medication records in the electronic prescription system. The criteria for assessing treatment compliance during hospitalization were determined through a literature review conducted prior to the study [17, 24]. It was determined by examining the presence of non-compliance with medication or medication refusal documented by the treatment team, non-compliance with ward rules, and whether the patient actively participated in rehabilitation activities. Compliant/non-compliant coding was based on an overall assessment of the file data rather than on a single instance of non-compliant behavior. Forensic variables comprised age at first offense, number of documented offenses, duration of the disorder at the time of the offense, and number of forensic hospitalizations.

Determination of Long-Stay Forensic Hospitalization

Various international studies have established different criteria for long-stay hospitalization depending on the security level of the inpatient ward, while some researchers have regarded hospitalizations lasting longer than two years as long-stay regardless of security level [2, 11, 13, 19]. There is no consensus on a time criterion for long-stay hospitalization in forensic units [13]. Based on a previous study that employed a distribution-based approach and used the 80th percentile of cross-sectional LoS as the threshold for long stay, the 80th percentile of LoS in the present sample (138 days) was taken as the long-stay threshold. LoS was coded dichotomously, with stays shorter than 138 days classified as short stay (0) and stays of 138 days or longer as long stay (1).

Violence Profile of the Current Offence (VPCO):

The VPCO (25) was used to assess the severity of the index offence (i.e., the offence leading to the current forensic psychiatric hospitalization). The scale has been adapted into Turkish [26].

Statistical analysis

Descriptive statistics were presented as means, standard deviations, minimum–maximum values, frequencies, and percentages. Patients with intellectual disability were excluded from the analyses of age at disorder onset. Normality of distribution was assessed using the Kolmogorov–Smirnov test. Depending on the distribution of the variables, Pearson or Spearman correlation analyses, the chi-square test, the Mann–Whitney U test, and the Kruskal–Wallis test were performed.

Since LoS does not have a normal distribution, it was analyzed as a continuous variable to minimize potential data loss. Non-parametric tests were used to examine associations between sociodemographic, clinical, and forensic variables and LoS. For regression modeling, LoS was dichotomized into short and long stay categories. A binary logistic regression model was constructed using independent variables identified for long stay in prior literature and in the univariate difference analyses. IBM Statistical Package for the Social Sciences (SPSS) for Mac OS, Version 26.0 software (SPSS Inc., Chicago, IL, USA) was used for statistical analyses of the study data [27]. The level of statistical significance was accepted as $p < 0.05$ (two-tailed).

RESULTS

The study population consisted of 1,200 male patients. In the long-stay group, there were 241 patients (20.1%) based on a 138-day threshold. The frequency of patients hospitalized for more than 2 years was 1.25%. The mean LoS for participants was 116.88 days (SD = 250.43, Median = 70 days). The majority of participants (46.8%) had a diagnosis of schizophrenia and atypical psychosis. 25.1% of the patients were married, 15.7% were employed in regular job, and 27.3% had a lifetime history of substance misuse (Table 1).

The mean age of patients at the index offense was 34.93 (SD = 12.83) years. According to index offense severity, 58.8% were moderate, and 6.9% were moderate-to-severe or severe. It was determined that 21.8% of patients received regular psychiatric treatment prior to hospitalization, and 68.1% had good treatment compliance during hospitalization. The prevalence of self-harm history, attempted suicide history, and prior forensic psychiatric hospitalization history was 12.3%, 4.8%, and 13.1%, respectively (Table 2).

Correlation Analysis

In Spearman correlation analyses, no significant relationship was found between LoS and participants' age ($p = 0.384$, $rs = -0.025$) and age at index offense ($p = 0.160$, $rs = -0.041$). A weak negative correlation was found between LoS and age at first offense ($rs = -0.075$, $p < 0.01$), a weak positive correlation with number of offenses ($rs = 0.227$, $p < 0.01$), a weak negative correlation with age at disorder onset ($rs = -0.187$, $p < 0.01$), and a weak positive correlation with offense severity ($rs = 0.146$, $p < 0.01$) (Table 3).

Difference Analysis

When examining LoS by diagnostic group, the mean LoS was 152.10 days (SD = 12.83) for psychosis spectrum disorders, 70.18 days (SD = 3.64) for mood disorders, and 89.43 days (SD = 8.74) for ID. A significant difference in LoS was observed across diagnostic groups ($H(2) = 100.509$, $p < 0.001$) (Table 4). Post hoc analyses revealed that patients diagnosed with psychosis spectrum disorder had significantly longer LoS compared to those with mood disorder ($U = 44303.500$, $z = -7.483$, $p < 0.001$) and ID ($U = 58370.500$, $z = -8.447$, $p < 0.001$). No significant difference was found between the mood disorder and ID groups ($U = 27601.500$, $z = -1.459$, $p = 0.145$).

Significantly longer LoS was found in patients without a partner ($U = 104081.500$, $z = -5.999$, $p < 0.001$), those without children ($U = 140734.500$, $z = -3.940$, $p < 0.001$), and those without regular employment ($U = 79380.500$, $z = -3.609$, $p < 0.001$). No significant association emerged between LoS and either education duration or place to residence.

Significantly longer LoS was found in patients with a history of substance misuse ($U = 111{,}767.000$, $z = -5.794$, $p < 0.001$), those who did not use medicine before hospitalization regulary ($U = 92{,}692.000$, $Z = -6.087$, $p < 0.001$), and those with a history of self harm ($U = 63{,}812.000$, $z = -3.556$, $p < 0.001$). No significant association was found between LoS and history of suicide attempt.

Significantly longer hospitalizations were observed in patients with more than one forensic hospitalization ($U = 59879.00$, $z = -5.434$, $p < 0.001$) and those who committed more severe offenses ($U = 140315.500$, $Z = -3.893$, $p < 0.001$). LoS for patients with non-violent or minimal offenses (VPCO levels 0-1) was 86.46 ± 4.75 days, while those with more severe offenses (VPCO levels 2-4) had a LoS of 132.84 ± 10.70 days. Conversely, patients with good treatment compliance during forensic hospitalization ($U = 73970.500$, $z = -14.693$, $p < 0.001$) presented significantly shorter LoS.

Binary Logistic Regression Analysis

A binary logistic regression model was constructed using independent variables identified for long stay in prior literature and in the univariate difference analyses ($p<0.001$). Age was added to the model to control for potential confounding effects. To prevent multicollinearity issues, only one of the highly correlated variables was included in the model. LoS was dichotomized into short (<138 days) and long stay (≥138 days) categories. In the regression model, LoS was the dependent variable. The independent variables were patients' marital status (single/divorced/widowed (0), married (1)), age continuous variable, regular treatment prior to hospitalization (yes (1), no (0)), treatment compliance during hospitalization (1: good compliance, 2: non-compliance), repeated forensic hospitalization (single hospitalization: 0, more than one: 1), severity of offense (continuous variable), and number of offenses

(continuous variable). The model was found to be significant (χ^2=336,089; $p < 0.001$). The Hosmer-Lemeshow test yielded $p = 0.532$. The Cox and Snell R^2 value and Nagelkerke R^2 value were 0.257 and 0.401, respectively. All variables used in the model explained between 25.7% and 40.1% of the variability in long stay. Considering that LoS may be influenced by multiple factors, these Pseudo R^2 values can be considered adequate. The overall classification accuracy was 83.5%; for predicting short-term hospitalizations, it was 92.0%; for predicting long-term hospitalizations, it was 51.3%.

Effect size was calculated using the formula ((1-Exp(B))*100). In the model, the significant effect of marital status (OR = 1,571, %95 GA [0.973–2.536]) on substance misuse history (OR = 0,708, %95 GA [0.469–1.069]) disappeared. Age was not significantly associated with long stay (p=0.860)

Patients with a psychotic spectrum disorder, which is the most important risk factor, had a 168% increased risk of long stay compared to ID (OR = 2,679, %95 GA [1,652–4,343], $p < 0,001$). There was no significant difference between having a diagnosis of mood disorders and ID regarding the long stay (OR = 1.225, %95 GA [0.632–2.372]). Receiving regular treatment before forensic hospitalization was found to decrease the likelihood of long-term hospitalization by 63.3%. (OR = 0.367, %95 GA [0.207–0.651], p = 0.001) (Table 5).

Receiving regular treatment before forensic hospitalization (OR = 0.367, %95 GA [0.207–0.651], p = 0.001) and absence of repeated forensic hospitalization (OR = 0.540, %95 GA [0.340–0.857], p = 0.009) were found to decrease the likelihood of long-term hospitalization by 63.3% and 46%, respectively. The likelihood of long-term hospitalization increases by 85.2% in the presence of a history of repeated forensic hospitalization. A higher number of offenses was found to increase the likelihood of long stay by 18.4%. (OR = 1.184, %95 GA [1.033–1.358], p = 0.016). An increase in offense severity was found to be associated with a 28.1% increase in long stay (OR = 1.281, %95 GA [1.042–1.574], p = 0.019). Good compliance during hospitalization, which was the most important protective factor, reduced the likelihood of long-stay hospitalization by 92.1%. (OR = 0.079, %95 GA [0.055–0.114], p < 0.001) (Table 5).

DISCUSSION

This is the first large-scale study in Turkey to examine LoS in a large sample of forensic psychiatric inpatients and to evaluate independent factors related to long-stay forensic hospitalization. Additionally, a sample-specific long-term hospitalization threshold of 138 days was determined based on the 80th percentile of the LoS distribution. The mean LoS found in our study was 116.88 days, which is shorter than the hospitalization length reported in the forensic literatüre [18, 28, 29]. LoS in forensic wards is influenced by the legal framework. Additionally, the existence of different security-level forensic services provides step-down transitions and is an important structural factor influencing LoS [2, 30]. In fact, in many countries, high-security units are designed for long-term hospitalizations, while low-security

units are designed for short-term hospitalizations [3, 12]. Forensic psychiatry wards are not organized according to security levels in Turkey. Additionally, the number of available beds is restricted [31]. These different structural characteristics may have contributed to shorter LoS.

How Can Be Define Long-Stay in Turkish Forensic Psychiatry Services

The definition of long-stay hospitalization in forensic units differs according to countries' health and legal systems. In a review conducted in the UK, the frequency of long-term hospitalization in forensic services was reported to be between 13.1-52% [10], 28.3% in France [11], 25% in Romania [29], and in other studies, long-term hospitalization was reported in one-third [19], and one-fifth [13] of forensic admissions. In our study, 138 or more hospitalization days constituted 20.1% of participants, while the frequency of hospitalization longer than 2 years was only 1.25%. This difference suggests that the 138-day threshold obtained through evaluation of hospitalization data from 1200 patients, rather than directly adopting the generally used 2-year duration in the literature, represents an important starting point for defining long-term hospitalization in Turkey and for developing comparable criteria in future research.

Psychiatric Diagnosis and Substance Misuse

The study demonstrated that psychiatric diagnosis significantly influences long stay in forensic units. Specifically, patients with psychosis spectrum disorders had a substantially higher risk of long stay compared to those with ID (OR:2.68). This finding is consistent with existing literature documenting the association between psychosis spectrum disorders and prolonged hospitalization [10, 11, 32, 33]. The shorter hospitalization duration in patients with mood disorders compared to those with psychosis spectrum disorder is also consistent with previous findings [19, 20]. The independent association between psychosis spectrum disorder diagnosis and long-stay hospitalization even after adjustment for other significant variables suggests that psychosis patients have different rehabilitation and risk management needs compared to other diagnostic groups.

History of substance misuse disorder was not associated with long-term hospitalization after controlling for other important variables. In our study, the frequency of substance misuse history was 34.89% in the psychosis spectrum, 29.26% in mood disorder, and 12.77% in ID. The higher rate of substance misuse history in patients with psychosis spectrum disorder [34, 35] suggests that diagnostic groups may play a confounding role in this relationship. Eckert et al. (2017) identified the absence of substance use disorder as an important protective factor. In the short-stay group, substance abuse history was detected less frequently. However, the researcher marked no significant difference between lifetime substance dependence disorder history and length of hospitalization [22]. In another study conducted in Switzerland, history of substance use disorder was associated with long-stay hospitalization [33]. Several studies have reported no significant association between substance use disorder and long-stay hospitalization [3, 19, 36]. The different findings in studies may be related to how substance dependence history is defined (abuse or dependence) and whether confounding factors are controlled. However, it has been reported that substance use disorder comorbidity in forensic psychiatric patients is an important risk factor in terms of risk of dangerousness, more severe psychopathology, and repeated offending [37, 38]. Substance misuse is quite important in forensic psychiatry in both assessment and diagnostic processes; therefore, the study results should be interpreted as not eliminating the importance of substance use in risk assessment.

Comprehensive and prospective research controlling for confounding factors is needed to clarify the relationship between substance-related mental disorder and length of hospitalization in the forensic psychiatric patient population.

Sociodemographical Variables

Studies demonstrate inconsistent results regarding the relationship between sociodemographic variables and LoS. While some studies associate male gender, being unmarried, and low educational level with prolonged hospitalization [3, 14, 15], other research indicates that age, gender, nationality, years of education, and number of children have no significant effect on LoS [18, 36]. In a study conducted in Germany, no significant relationship was found between gender, nationality, employment status, and homelessness and LoS, whereas a significant relationship was established between not graduating from school and age at forensic admission and LoS [34]. In our study, although being unmarried was associated with prolonged hospitalization in the univariate analysis, this relationship disappeared in the multivariate analysis. This result may indicate that the observed association between marital status and LoS in univariate analysis was confounded or mediated by other variables. Similar results regarding marital status exist in the literature [11, 14, 36]. In our study, participants' age, place of residence (rural/urban), and educational status showed no significant associations with LoS. Although age at disease onset was significantly associated with LoS, this relationship was relatively weak. Lack of regular employment, however, was significantly associated with prolonged hospitalization.

Forensic Variables

In the study, an increase in offense severity (mild/moderate) was associated with a 28.1% increased risk of long-stay hospitalization (OR = 1.281). The relationship between offense severity and long stay has been reported in previous studies [3, 20, 39, 40]. Given that patients with high offense severity are perceived as posing an elevated risk to others, clinicians tend to adopt a more cautious approach, which may prolong the forensic hospitalization [39, 41]. Some theoretical frameworks advocate that the severity and type of the offense should be considered in determining the duration of forensic treatment [42]. Given the multiple associations identified in our study, it is evident that the assessment of LoS and the recovery process in forensic psychiatric patients should extend beyond evaluations based solely on offense severity. The literature indicates that approaches prioritizing offense severity carry the risk of psychiatric care shifting away from therapeutic objectives and adopting a punitive structure [43]. In Turkey, the fact that return to society consists of both clinicians' discharge decisions and judicial authorization at the same time may also influence the duration of hospitalization; however, this relationship requires further investigation. It has been reported that excessively restrictive and prolonged institutional care settings do not always produce more effective risk management outcomes [16, 44].

In the study, both the number of documented offenses (OR = 1.184) and a history of previous forensic hospitalization (OR = 1.852) were found to be independently associated with long-stay hospitalization. A higher number of offenses and the presence of previous forensic psychiatric hospitalization can be evaluated as indicators of recidivism. Consistently with our findings, a higher number of offenses has been associated with long-stay hospitalization [17], and

recidivism has been linked to psychosis, mood disorders, substance use, and offense severity previously [38, 45, 46]. The findings from our study demonstrate that the association between the number of offenses committed in the past and a history of previous forensic psychiatric hospitalization with prolonged hospitalization remains significant independently of other variables. One of the primary objectives of forensic psychiatric treatment is to prevent recidivism (reoffending). Therefore, clinicians tend to assess the risk of reoffending as higher in patients with a high number of past offenses and consequently maintain these patients in the treatment process for longer durations.

Treatment Engagement

In our study, receiving regular psychiatric treatment (treatment adherence) prior to current hospitalization was found to be independently associated with a lower risk of long stay hospitalization (OR = 0.367). In the literature, regarding the relationship with length of hospitalization, treatment compliance during hospitalization has been predominantly evaluated, whereas findings concerning adherence to treatment before current hospitalization have been more limited. However, there is one study in the literature that showed a relationship between compliance with previous psychiatric treatment and length of hospitalization [41]. Irregular treatment adherence in the past may influence clinicians' assessments of mental disorder progression and future treatment compliance. However, it should be considered that clinical characteristics of the disorder and other factors such as access to healthcare services may also play a role in this association.

In our study, psychiatric treatment compliance during hospitalization was evaluated comprehensively through assessment of medication compliance, compliance with ward regimes, and participation in rehabilitation activities. Good treatment compliance during hospitalization was found to be strongly associated with a lower risk for long-stay hospitalization (OR = 0.079). Páv and colleagues found non-compliance with ward or therapeutic regimes (such as occupational therapy) to be associated with long-stay hospitalization; however, they did not identify a significant relationship regarding medication compliance specifically [17]. In other studies, treatment non-compliance has also been associated with a decreased probability of conditional discharge [24, 47, 48]. In another study, no association was found between treatment compliance and prolonged hospitalization. However, the notably high frequency of treatment compliance in the population examined in the study may have decreased the detection of an existing relationship [49]. Differences between studies may be related to the characteristics of treatment settings and the methods used to evaluate ward compliance.

The importance of treatment compliance in forensic psychiatric discharge decisions is related to its role in reflecting clinical improvement and risk management. Insufficient ward regime compliance is associated with post-discharge adjustment problems [17], may be an indicator of clinical instability, serves as an indicator of the patient's capacity to comply with rules, and should be evaluated as a risk factor regarding recidivism [47]. Furthermore, treatment compliance is evaluated in close relationship with insight, and both treatment compliance and insight are important clinical factors in assessing the risk of recidivism [50]. However, the fact that ward compliance was not evaluated using a structured scale is a significant limitation of this study. Furthermore, the extended duration of observation for non-compliant behaviors during long-stay hospitalization may have contributed to bias toward classifying these patients

in the non-compliant group. However, when determining non-compliance, the raters conducted a more general compliance assessment rather than coding a single non-compliant behavior directly as poor compliance. Studies evaluating ward compliance using structured scales will shed light on this issue.

Strengths and Limitations

The strengths of our study include a large sample size, extended research period, and the fact that it was conducted at a center that admitted patients from different regions. This circumstance enabled the study sample to encompass patients from a wide geographic area and diverse socioeconomic backgrounds. The definition of long-stay based on the LoS distribution in the sample and the examination of related independent variables through multivariate analyses contribute to the limited literature in Turkey.

An important limitation of our study is that it included only male patients. Although studies in the forensic literature are generally conducted with male samples [14, 22], this methodology limits the generalizability of the findings to the entire forensic population. Another limitation is the retrospective design of the study. Because of this retrospective approach, variables such as treatment compliance could not be evaluated using structured scales, instead based on information documented in existing clinical records.

CONCLUSION

This study examined the length of hospitalization among 1200 male mentally disordered offenders. A diagnosis of psychotic spectrum disorder, more severe index offense, a higher number of documented offenses, and a history of previous forensic psychiatric hospitalization were found to be independently associated with long-stay forensic hospitalization. Treatment adherence before hospitalization and good treatment compliance during hospitalization were associated with a lower risk of long-stay hospitalization. These variables will provide clinicians with a basis to distinguish the long-stay group and use in their clinical assessments when making discharge decisions.

The fact that patients requiring long-stay hospitalization constitute a distinct population with specific characteristics highlights the necessity of a specialized care process. The results of our study provide important guidance regarding the objectives of forensic psychiatric treatment. Specialized intervention strategies should be planned for the long-stay group.

Our findings demonstrate that treatment adherence before forensic hospitalization and treatment compliance during hospitalization are important determinants of LoS. This suggests that forensic psychiatric care should focus not only on past offense history and clinical diagnosis, but also on the patient's characteristics throughout the treatment process. In particular, examining the relationship between treatment adherence before hospitalization and treatment compliance during hospitalization with long-stay hospitalization through prospective research may contribute to identifying intervention areas that could affect LoS.

Declarations

Ethics approval and and consent to participate
The study was approved by the Clinical Research Ethics Committee of the hospital. (Date:10.10.2024, Decision No:179). All research procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was not obtained because of the retrospective design.

Consent for publication: Individual consent was not obtained due to the retrospective design; however, all patient data were de-identified and anonymized.

Availability of data and materials:

The data that support the findings of this study available on request from the corresponding author. The data are not publicity available due to privacy or ethical restrictions.

Author Contributions: S.Ç.K. and B.K.D. conceptualized the study and designed the research protocol. B.K.D. provided overall supervision of the project. S.Ç.K. and B.K.D. secured resources and managed materials for the study. S.Ç.K. and B.K.D. collected and processed the data, performed the statistical analysis, and interpreted the findings. S.Ç.K. conducted the comprehensive literature search. S.Ç.K. and B.K.D. wrote the manuscript, prepared tables and performed critical review of the final version.

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Table 1. Sociodemographic and Clinical Characteristics of the Patients	
Feature	Patient Group
Age (years) (Mean ± STD)	39.07±12.93
Length of stay (days), (Mean ± SD / Median)	116.88±250.43 / 70
Psychiatric Diagnosis of the patients n (%)	
Schizophrenia and atypical psychosis	562 (46.83%)
Mood disorders	212 (17.7%)
Intellectuel Disability	282 (23.5%)
Delusional disorder	26 (2.2%)
Drug induced psychosis	30(2.5%)
Schizoaffective disorder	18 (1.5%)
Organic mental disorders	43(3.6%)
Other Specified	27 (2.3%)
Number of forensic psychiatry settings hospitalization, >1 times, n/%	157(13.1%)
Place of residence n (%)	
Rural area	43 (3.6%)
Town and district	588 (49.0%)
City	569 (47.4%)
Place to live n (%)	
Home	1091 (90.9)
Residential care facility	84 (7.0%)
Prison, homeless	25 (2.1%)
Marital status married n/(%)	301(25.1%)
Having at least one child	417 (34.8%)
Educational status	
No literate	199(16.6%)
Literate	93(7.8%)
<5 years	313(26.1%)
5-8 years	258(21.5%)
8-12 years	232 (19.3%)
>12 years	104 (8.7%)
Having regular job Yes, n/%	188 (15.7%)
Having regular income Yes, n/%	831 (69.3%)
Substance use disorder history , Yes, n/%	327 (27.3 %)

Table 2. Clinical and Forensic Characteristics of the Patients	
Feature	**Patient Group (n=1200)**
Age at disorder onset (years), mean ± SD / median[1]	26.82 ± 11.12/33
Age at index offense (years), mean ± SD / median	34.93 ± 12.83/ 31
Age at first documented offense (years), mean ± SD / median	33.61± 12.86/31
History of self-harm behavior, n (%)	148 (12.3%)
History of suicide attempt, n (%)	58 (4.8%)
Number of documented offenses, n (%)	
1	855 (71.3%)
2	211(17.6%)
3	91(7.6%)
≥4	43(3.6%)
Previous forensic psychiatric hospitalization, n (%)	157 (13.08%)
History of imprisonment, n (%)	132 (11.0%)
Regular psychiatric treatment before admission, n (%)	262(21.8%)
Good inpatient treatment adherence, n (%)	817 (68.1)
Index offense severity, n (%)	
Nonviolent (0)	169 (14.1%)
Minimal violence (1)	244 (%20.3)
Moderate violence (2)	705 (%58.8)
Moderately severe violence (3)	51 (%4.3)
Severe violence (4)	31 (%2.6)
Note: For binary variables, only the "Yes" category is presented. [1] Excluding patients with intellectual	

Table 3. Spearman Correlations Between Length of Stay and Clinical and Forensic Variables							
	1	2	3	4	5	6	7
1. Length of stay	1.000						
2. Age	-.025	1.000					
3. Age at first documented offense	**-.075****	.886**	1.000				
4. Number of documented offenses	**.227****	.037	-.190**	1.000			
5. Age at index offense	-.041	.945**	.933**	.007	1.000		
6. Age at disorder onset	**-.187****	.643	.656**	-.070*	.679**	1.000	
7. Index offense severity	**.146****	.044	.049	.009	.044	-.068*	1.000
Note. Values are Spearman's rank correlation coefficients (r_s). p < .05; p < .01. Bold values indicate correlations with length of stay that were reported as statistically significant *p < .05, **p < .01.							

Table 4. Comparison of Length of Stay Across Sociodemographic, Clinical, and Forensic Characteristics			
Characteristic / Category	**n / Mean rank**	**Statistic**	**p**
Marital status			
Married	301 / 496.79	U = 104081.5	<.001
Single, widowed, divorced	899 / 635.23		
Having children			
Yes	417 / 546.49	U = 140734.5	<.001
No	783 / 629.26		
Education			
≤5 years	605 / 588.90	U = 172970.5	.263
>5 years	594 / 611.30		
Psychiatric diagnosis			
Psychotic spectrum disorders	636 / 651.06	H = 100.509	<.001
Mood disorders	212 / 467.28		
Intellectual disability	282 / 446.37		
Regular job			
Yes	188 / 516.74	U = 79380.5	<.001
No	1012 / 616.06		
Place of residence			
Rural, town, district	632 / 611.95	U = 172293.5	.228
City	569 / 587.80		
History of substance use disorder			
Yes	327 / 695.20	U = 111767.0	<.001
No	873 / 565.03		
Regular treatment before admission			
Yes	262 / 485.29	U = 92692.0	<.001
No	938 / 632.68		
History of self-harm behavior			
Yes	148 / 695.34	U = 63812.0	<.001
No	1052 / 587.16		
History of suicide attempt			
Yes	58 / 683.88	U = 28282.0	.060
No	1142 / 596.27		
Index offense severity			
Nonviolent/minimal (VPCO level 0-1)	413 / 546.75	U = 140315.5	<.001
Moderate to severe (VPCO level 2-4)	787 / 628.71		
Previous forensic psychiatric hospitalization			
Yes	157 / 740.61	U = 59879.0	<.001
No	1043 / 579.41		
Inpatient treatment adherence			
Good	817 / 499.54	U = 73970.5	<.001
Poor	382 / 814.86		

Table 5. Multivariable Logistic Regression Analysis of Factors Associated with Long-Stay Hospitalization								
Step 1.								
Variable	B	S.E	Wald	df	p	Odds Ratio Exp (B)	95% Confidence Interval for Exp(B)	
							Lower	Upper
Marital status (unmarried vs. married)	.452	.244	3.418	1	.064	1.571	.973	2.536
Age (years)	-.002	.009	.031	1	.860	.998	.982	1.015
History of substance use disorder	-.345	.210	2.696	1	.101	.708	.469	1.069
Diagnosis			19.564	2	.000			
Diagnosis (1)	.985	.247	15.964	1	.000	2.679	1.652	4.343
Diagnosis (2)	.203	.337	.361	1	.548	1.225	.632	2.372
Good inpatient treatment compliance	-2.536	.187	183.589	1	.000	.079	.055	.114
Index offense severity	.248	.105	5.541	1	.019	1.281	1.042	1.574
Receiving regular treatment before admission	-1.001	.292	11.785	1	.001	.367	.207	.651
Number of documented offenses	.169	.070	5.849	1	.016	1.184	1.033	1.358
No previous forensic psychiatric hospitalization	-.617	.236	6.849	1	.009	.540	.340	.857
Constant	-.864	.525	2.706	1	.100	.421		

Note. SE = standard error; OR = odds ratio; CI = confidence interval. The dependent variable was prolonged hospitalization (≥138 days). The last category of categorical variables is used as the reference. Reference categories were intellectual disability for psychiatric diagnosis (1 = psychotic spectrum disorders, 2 = mood disorders, 3 = intellectual disability); poor compliance for inpatient treatment (1 = good, 2 = poor); receiving regular treatment before admission (1 = yes, 2 = no); previous hospitalization for forensic psychiatric hospitalization history (0 = no, 1 = yes); married for marital status (0 = unmarried, 1 = married); and no history of substance use for substance use history (1 = yes, 2 = no).