



An Investigation of Premature Discharges from Residential Addiction Treatment Centers in the United States in 2019

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Abstract

The purpose of this study was to identify predictors associated with the length of stay in patients prematurely discharged from residential addiction treatment facilities in the United States. This study sought to provide a more in-depth understanding regarding which patients may be at a greater risk for shortened length of stay and to help fill the gap in the literature pertaining to length of stay and related variables in prematurely discharged patients. The research methodology for this study was a quantitative, non-experimental design using pre-existing, secondary data from the Substance Abuse and Mental Health Administrations Treatment Episode Data Set-Discharge (TEDS-D) from the year 2019. The Treatment Episode Data Set-Discharge is a collection of data reported on a national level regarding discharges from substance abuse treatment facilities. Data analysis included an examination of the relationship between the predictor variables, the number of times a patient has been admitted to treatment, admission wait time, gender, and age, with the criterion variable, length of stay for an N = 49080. The data was *ex post facto*; therefore, this was a non-experimental design that utilized secondary analyses of pre-existing data to answer the research questions. A significant relationship was discovered to exist between the criterion/dependent variable, length of stay, and predictor/independent variables days waiting for admission, number of prior treatment episodes, and gender. When controlling for days waiting to include only those waiting one or more days for treatment admission, a subsequent significant relationship was found.

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This study examined variables that serve as predictive of length of stay in patients who prematurely discharged from residential addiction treatment facilities under the premise of having been administratively discharged or in the event that the patient left treatment against professional advice.

Keywords: substance abuse treatment; addiction; premature discharge.

1. Introduction

1.1. Problem Statement

There is not a clear understanding as to why patients prematurely discharge from residential addiction treatment facilities. The researchers in [1] found that patients who discharge from treatment programs pre-maturely showed significantly more subsequent detoxification episodes and they also found that the odds of mortality in the first two years, post-discharge, were significantly higher in the patients who discharged prematurely [1]. With an increased risk of mortality in patients who discharge prematurely from residential addiction treatment comes the need to identify who is at risk and what variables may predict premature discharge.

1.2 Purpose of the Study

The purpose of this study was to identify predictive factors associated with the length of stay in patients prematurely discharged from residential addiction treatment facilities in United States. There is a lack of evidence examining the relationship among the number of treatment episodes, wait time for admission, age, and gender, with length of stay in treatment. Given the mortality risk associated with unsuccessful treatment completion, addiction professionals could benefit from an exploration regarding admission history, admission wait time, age, gender, and length of stay in prematurely discharged patients in residential addiction treatment programs. This study aimed to provide a more in-depth understanding regarding which patients may be at a greater risk for shortened length of stay and to help fill the gap in the literature pertaining to length of stay and related variables in prematurely discharged patients.

2. Background

2.1 Addiction

Addiction in the United States has been characterized as being an “insidious and global health problem” [2:181]. Previous research has demonstrated that many adversities arise for individuals entering and/or discharging from residential addiction treatment [3]. Researchers in [4] found that high mental distress was a predictor of premature discharge, while motivation predicted a reduction in premature discharge risk. The authors in [5] reported that the outcome for patients who pre-maturely discharged from treatment was unfavorable and was found to be associated with an increased potential for relapse, legal issues, financial problems, health issues and readmission, as well as an increased cost to society particularly regarding crime, disease, and pain of loved ones. The authors in [6] found an association between delays in treatment entry and retention in care, continued alcohol and drug use and increased risks for negative public health and public safety consequences.

2.2 Residential Addiction Treatment

In the realm of addiction treatment, there exist multiple treatment platforms, all that cater specifically to the medical and clinical needs of each type of individual patient. Residential treatment is one of the most utilized treatment settings [7]. Residential treatment is defined as “24 hours per day medical care in a hospital facility in conjunction with treatment services for alcohol and other drug use” [7:33] in the form of either short-term (30 days or less) or long-term (more than 30 days). Engagement in post-residential treatment programs is important to reduce the probability of relapse once the patient discharges from the facility [8].

2.3 Substance Abuse and Mental Health Service Administration Treatment Episode Data Set-Discharges

The Substance Abuse and Mental Health Service Administration’s Treatment Episode Data Set pertains to those 12 years old and up and provides demographic information as well as data related to admission and discharges, drugs of choice, methods of use, how often an individual uses, and how many times they have been admitted to treatment [9].

2.4 Length of Stay

It has been reported that successful recovery from substance use disorders is related to an individual’s ability to remain in treatment (attrition) and “longer retention in treatment is associated with positive outcomes” [10:1]. Furthermore, individuals with substance use disorders (SUD) tend to have greater frequencies of hospitalizations, longer lengths of stay (LOS), and more unplanned readmissions compared to the general population of hospitalized patients” [11:2]. The researchers in [12] sought to identify predictive factors related to long-term residential addiction treatment retention. Using archival data, like the proposed study, they used an N = 2069 of admissions between 2010 and 2016. Using Hierarchical Regression Models, results from their study indicated “younger age, having less than a high school education, unstable living arrangements, greater prior month use of primary substances, less prior month use of alcohol, and prior year needle use preceding treatment, and longer recommended length of stay” [12:472] were all found to be predictive of length of stay (attrition) in residential addiction treatment.

2.5 Addiction Treatment Admissions

The authors of [13] discovered that, 20.2 million adults 18 years old and up had a past substance use disorder and of those adults, 16.3 million adults presented with alcohol use disorder while 6.2 million had an illicit drug use disorder and 2.3 million adults had both types of substance use disorder. This translated into four out of five adults presenting with alcohol use disorder, three out of ten with illicit drug use disorder and one out of nine with both disorders. For treatment, it was found that in 2014, 2.5 million adults 18 years and older within the US received treatment, comprising 1.0 percent of the entire adult population and 7.5 percent of those with a substance use disorder. They alluded to the long-lasting impact that substance use disorders can have on the lives of many Americans, as well as the social, economic, health and legal ramifications from lack of treatment, and found that treatment for substance use disorders might be a critical resource that ultimately may reduce social costs and improve public health. Although treatment has proven to be beneficial for those with substance

use disorders, very few Americans receive adequate treatment for their substance use disorders [13].

2.6 Addiction Treatment Wait Time

It was reported that “successful transitions from detoxification to substance use disorder treatment are associated with improved outcomes regarding a successful transition; many detoxification patients do not initiate treatment” [14:64]. However, researchers involved in this study did not address successful completion or unsuccessful completion of residential treatment regarding detoxification patients. The authors of [15] sought to explore metrics for two pre-admission processes (wait time and engagement while waiting) and interviewed program management and staff about program structures that may contribute to performance regarding those variables. They discovered that the average wait time for admission was sixteen days, with 60% of those veterans waiting more than seven days for admission to a substance use disorder treatment facility. They also found that engagement in outpatient services while waiting was found in approximately 54% of the waiting weeks. Additionally, they also found that efficient screening processes, effective patient flow, and bed availability were perceived to enable a shorter anticipatory waiting period for admission. Conversely, it was found that a lack of bed availability, poor staffing levels and length of stay of existing patients were perceived to elongate waiting times for admission. It was also found that accessible outpatient services, strong patient outreach and encouragement of pre-admission outpatient treatment were facilitators regarding pre-admission engagement, while poor staffing levels, socioeconomic barriers and low patient motivation were identified as specific barriers. Overall, it was suggested that utilizing this information may help to strengthen lower performance facilities regarding their pre-admission processes [15:1-11]. What researchers did not evaluate in this study was the relationship between pre-admission wait time and premature discharge that may provide guidance regarding those individuals at risk during the waiting period.

2.7 Age and Gender

The researchers in [12] also provided a review of the relationship between the demographic variables age and gender as predictive factors for treatment retention. They report that such variables are “impossible to modify” [12:474] and those previous findings remain highly inconsistent with some research showing female patients as being more likely to leave treatment early while other studies suggest gender does not play a role. Furthermore, they note that some studies show that age is not related to length of stay/treatment retention/attrition while others show being younger is a risk factor associated with leaving treatment early [12, 5, 16, 17].

The researchers in [18] conducted a retrospective review of client data (N = 172) to explore physical health problems presented in patients admitted to residential treatment programs. It was discovered that 80.7% of individuals admitted for treatment presented with a co-occurring physical health issue, with musculoskeletal issues being the most prevalent. “Odds for some physical health problems were related to client gender, age, and primary substance of concern. Male gender remained the strongest predictor of dental health problems when controlling for age and substance type” [18:250]. The findings of the study suggest the need to further explore age and gender variables as they may relate to treatment retention or premature discharge in specific treatment settings, as the proposed study seeks to investigate.

The authors of [19] also utilized the Substance Abuse and Mental Health Administration's Treatment Episode Data-Discharge data set to analyse the relationship between demographics and drug of choice in those with substance use disorders completing residential and outpatient addiction treatment in the United States (n = 318,924). They noted that a great deal of uncertainty exists regarding predictors of treatment completion. It was hypothesized that the positive impact of residential treatment on completion would differ across age, gender and racial/ethnic groups and that the impact of residential treatment on completion would differ for different substances of abuse, where residential treatment may have a greater effect on completion in abusers of drugs such as methamphetamine and heroin compared to alcohol and marijuana users. This study employed a retrospective analysis of TEDS-D data from the year 2011. The primary dependent variable was treatment completion, pertaining to the status of the patient reported by staff at their discharge. Independent variables included age, gender, race/ethnicity, education, employment, living arrangements, referral source, primary substance of use, frequency of use and number of substances reported upon admission. Researchers noted that the results of their study are consistent with prior research, as higher treatment completion rates are associated with older age. In this study, completion rates were not moderated by gender and were slightly moderated by age [19]. This study was most like the current study regarding research design and methodology; however, the results were inconsistent regarding age serving as a predictor. One difference was that the authors looked at patients who completed treatment, rather than those who discharged prematurely [19]. This is suggestive that there may be distinct differences in patient characteristics and predictors regarding premature discharge, as compared to successful treatment completion.

The authors of [20] examined death records related to those patients who were discharged from a substance abuse treatment facility in Texas between the years of 2006 and 2013 (n = 6,537). This study was a retrospective cohort record-linkage study of 18–64-year-old patients whose records were matched to Department of State Health Services death records in Texas, acquiring information regarding age at discharge and age at reported death. In this study N = 199,225 patients whereby 6,537 died. The highest post-discharge standardized mortality ratios were associated with opioids, central nervous system depressants and alcohol. High standardized mortality ratios were associated primarily with women between the ages of 18 and 34 with opioid use disorder, women between 25 and 34 with alcohol use disorder and patients between 25 and 34 years of age with a central nervous system depressant use disorder [20], contributing to the idea that gender may serve as a predictor variable associated with premature discharge in the addiction treatment population.

2.8 Discharge from Residential Addiction Treatment

The researchers in [4] explored predictors of premature discharge from inpatient substance abuse facilities. They conducted a naturalistic, prospective cohort study (n = 454) to help contribute to the body of knowledge regarding predictors of premature discharge. Authors noted that patients in a longer-term inpatient facility have a much higher rate of premature discharge as compared to those patients in short-term facilities. It was noted that previous studies found relationships between premature discharge and age, mental health and drug use severity. The aim of this study was to identify “demographic, substance use and psychological factors that predict dropout” [4:1]. Results of this study indicated that premature discharge (treatment drop out) was higher in long-term facilities (51%, n =36) compared to short-term facilities (24%, n =96). The greatest predictor of

premature discharge was identified as higher mental distress while intrinsic motivation was found to be associated with a reduction in risk for premature discharge. They also found that there is a greater risk for premature discharge in those patients who did not utilize intravenous injection as their method of administration for drug use. Given the scarcity of large studies, Andersson and colleagues alluded to the need to conduct studies on a larger scale from a more diverse sample size to explore predictive variables associated with premature discharge from addiction treatment facilities [4].

3. Methods

3.1 Research Questions

1. What is the relationship between the number of previous addiction treatment admissions and length of stay in patients prematurely discharged from a residential addiction treatment facility?
2. What is the relationship between the number of days waiting to be admitted to a residential addiction treatment facility and length of stay in patients prematurely discharged from a residential addiction treatment facility?
3. What is the relationship between the age and length of stay for patients prematurely discharged from a residential addiction treatment facility?
4. What is the relationship between the gender and length of stay for patients prematurely discharged from a residential addiction treatment facility?

3.2 TEDS-D Variables

SAMHSA [9] defines the independent and dependent variables of this study as follows:

3.3 Independent Variables

The code for age is AGE: “Age at admission Calculated from date of birth and date of admission and categorized” [9:11].

The code for gender is GENDER: “Gender This field identifies the client's biological sex” [9:12].

The code for days waiting to enter treatment is DAYWAIT: “Days waiting to enter substance use treatment Indicates the number of days from the first contact or request for a substance use treatment service until the client was admitted and the first clinical substance use treatment service was provided [9:36].

The code for the number of prior treatment admissions is NOPRIOR: Previous substance use treatment episodes Indicates the number of previous treatment episodes the client has received in any substance use treatment program” [9:42].

3.4 Dependent Variable

The code for length of stay is LOS: “Length of stay in treatment (days) Describes the length of the treatment

episode (in days)” [9:38].

3.5 Methodology

The research methodology for this study was a quantitative, non-experimental design. The SAMHSA Treatment Episode Data Set-Discharge is a collection of data reported on a national level regarding discharges from substance abuse treatment facilities [9]. The data set offered demographic characteristics as well as characteristics associated with substance abuse regarding individuals 12 years of age and older from facilities that report to their states. The TEDS-D does not feature all discharges from all facilities in the United States and related territories, but only features data from those agencies that report. The facilities that report often include those that receive state and federal funding for their programs. Furthermore, the data presented in the TEDS-D represent discharges and not individual patients and/or clients, as those individuals may have been admitted to and discharged from facilities multiple times in any given year [9].

This study focused on those discharges from residential addiction treatment facilities in the entire United States. Furthermore, to analyse only those discharged from residential addiction facilities, the service setting at discharge labelled REHAB/RES, SHORT TERM (30 days or fewer) under value 4 will be isolated along with REHAB/RES, LONG TERM (more than 30 days) under value 5 will be isolated [9:34]. Given the nature of the Treatment Episodes Data Set, the methodology is appropriately quantitative for this study.

3.6 Design

This research study used a quantitative, non-experimental research methodology with a correlational design in which no human subject was affected. This methodology analysed data in two manners. First, descriptive statistics were produced to better understand demographic data including age and gender.

Next, inferential statistics were used to analyze the subject’s data, specifically, the number of prior treatment episodes, the number of days waiting to enter treatment and the length of stay in residential addiction treatment for those prematurely discharged from treatment. The data was *ex post facto*; therefore, this was a non-experimental design that utilized secondary analyses of pre-existing data to answer the four research questions.

3.7 Population and Sample Selection

The sample data for this study was selected based on the inclusion criterion. The inclusion criteria included the patients who were discharged from a short-term/long-term residential addiction treatment facility, and patients who dropped out of treatment or were terminated by the treatment facility.

The code for the type of treatment service at time of discharge is SERVICES D: “Type of treatment/service setting at time of discharge Rehabilitation/Residential – short term (30 days or fewer): Typically, 30 days or fewer of non-acute care in a setting with treatment services for alcohol and other drug use and dependency” [9:34] and Rehabilitation/Residential—long term (more than 30 days): “Typically, more than 30 days of non-acute care in a setting with treatment services for alcohol and other drug use and dependency; may include

transitional living arrangements such as halfway houses [9:34]. The code for the reason for discharge is REASON: Reason for discharge “This field indicates the outcome of the treatment episode/event or the reason for transfer or discontinuance of treatment” [9:37]. The selection criteria included category 2, indicating Dropped out of treatment and category 3, terminated by facility.

3.8 Data Collection

The data from the subjects in this study were provided from the 2019 TEDS-D data set, available publicly by the Substance Abuse and Mental Health Administration. It consists of a one-year cycle of patients. Patient data was from all census regions of the United States and pertained only to those discharged from a residential addiction treatment facility.

3.9 TEDS-D Public Domain Disclosure

The data set was extracted from the pre-existing 2019 TEDS-D data published by the Substance Abuse and Mental Health Administration. According to SAMHSA, permission to use such data is not required, as the following is stated in the corresponding 2019 report: “All material appearing in this document is in the public domain and may be reproduced or copied without permission from SAMHSA. Citation of the source is appreciated” [9:ii].

3.10 Data Analysis

A secondary analysis of pre-existing data was implemented to answer the research questions since the utilization and analysis of pre-existing data is a cost-effective approach to answering new research questions [21].

A correlation of all the variables was performed to see what if any of the variables had a significant correlation. All analyses were performed with a level of statistical significance to be set at $p < .01$. All necessary assumptions appropriate for correlation and regression analyses were identified for this study and were checked through the appropriate statistical methods [22].

3.11 Assumptions, Limitations, Delimitations

3.12 Assumptions of the study

This study held the following assumptions:

1. Research questions were developed based on knowledge of the pre-existing data set.
2. This research design may be replicated by others.
3. Given the limitation that patients may have been reported twice, since they may have been admitted to residential treatment multiple times within the year 2019, the TEDS-D data sample is somewhat representative of the population of interest.

4. SAMHSA disclosed adequate and appropriate methodology regarding protection of individual health information under the requirements of HIPPA and no individual personal health information may be traced or discovered from the TEDS-D data set [9].

3.13 Limitations of the study

SAMHSA's determined limitations for the 2019 TED-D data set are:

The TEDS is an admission-based system and therefore TEDS admissions and discharges do not represent individuals. For example, an individual admitted to and discharged from treatment twice within a calendar year would be counted as two admissions and two discharges [9].

The data presented in this report provide information on treatment in specific service types, derived from linked pairs of admission/discharge records. The data do not necessarily represent complete treatment episodes, which may include stays in multiple types of service and would require analysis of series of linked pairs of records [9].

The primary, secondary and tertiary substances of abuse reported to the TEDS are those substances that led to the treatment episode and not necessarily a complete enumeration of all drugs used at the time of admission [9].

The way an admission is defined may vary from state to state such that the absolute number of admissions is not a valid measure for comparing states [9].

States continually review the quality of their data processing. As systematic errors are identified, revisions may be enacted in historical TEDS data files. While this system improves the data set over time, reported historical statistics may change slightly from year to year [9].

States vary in the extent to which coercion plays a role in referral to treatment. This variation derives from criminal justice practices and differing concentrations of abuser subpopulations [9].

Public funding constraints may direct states to selectively target special populations, for example, pregnant women, or adolescents [9].

Some states have no opioid treatment programs (OTPs) that provide medication- assisted therapy using methadone and/or buprenorphine. See the TEDS state-by-state crosswalk for information regarding data collected by each state [9].

Lastly, if a treatment facility utilized paper charts to track data, there may be estimated data rather than completely accurate accounts. Lastly, the data may be limited in accurately representing the population, as treatment facilities that do not receive federal funding do not necessarily have to report to SAMHSA [9].

3.14 Limitations to secondary analysis

Since this study utilized secondary analysis of pre-existing data, one limitation was that the researcher

conducting this study did not personally collect the data for the sole purpose of this study but used data that was already reported on to answer new research questions. Furthermore, the researcher did not have control over the quality of the data collected in the TED-D data set. Lastly, although this is the most current and complete TEDS-D data set, there may have been changes within this population regarding the variables of interest and these changes may not have been reflected in this sample.

Furthermore, data featured in this data set may have been incomplete given the responsibility of only certain facilities to report their discharge data to SAMSHA due to their reception of government or state funding. This data set did not represent all treatment facilities within the United States. Lastly, this data set did not include information pertaining to patient-specific spirituality or religious affiliation, creating a void in the individualized stories of patients admitted to residential addiction treatment.

According to the authors of [22], regarding the disadvantages associated with secondary data, a disadvantage or possible limitation is that the data collected was not done to address the research question or hypothesis of the researcher and at times, variables of interest were simply not present in the data set. Furthermore, the data may not provide insight regarding the population subgroup of interest. Another disadvantage may be that the data set was cleansed in such a way that identifying information is not available, this limiting certain control options regarding variables. Lastly, another limitation identified was that the researchers analyzing the data were not involved in the data-collection procedures, making them potentially unaware of glitches in the process that may be relevant to interpreting the data set [22].

3.15 Delimitations of the study

Since the population of interest includes those who discharged prematurely from a residential addiction treatment facility, only data from the following discharge categories were utilized for this study: Left Against Professional Advice and Terminated by Facility. The data reported in the following categories were not utilized: Successful Completion, Transfer, Death, Incarcerated and Other.

Since the population of interest includes those who discharged prematurely from short or long-term residential addiction treatment facilities, only data from the following treatment/service settings were utilized for the study: Rehab/residential, short-term, and Rehab/residential, long-term [9].

4. Results

4.1 Descriptive Data

Selecting those patients that meet the inclusion criteria for the study yielded a sample of N = 49080. All data that were absent or missing from the data set (noted as -9) had been removed along with any outliers present. Tables are included to summarize the selection criteria for the study.

4.2 Data Analysis Procedures

Normality of the primary variables (length of stay, number of prior treatment episodes, number of days waiting to be admitted, age, and gender) was deemed adequate. Each research question was answered and includes skewness and kurtosis values, and a response to the null hypothesis (H_0) presented followed by Pearson Correlation tables specific to the variable identified in the associated research question. The data set used included all United States Census Regions listed in [9] for an $N = 49080$. Categories were adjusted to include Service Setting at Discharge categories Four: Residential Short-Term and Five: Residential Long-Term as well as Reasons for Discharge categories Two: Dropped Out of Treatment and Three: Terminated by Facility.

The Research Questions for this study were:

1. What is the relationship between the number of prior treatment episodes and length of stay in patients prematurely discharged from a residential addiction treatment facility?
2. What is the relationship between the number of days waiting to be admitted to a residential addiction treatment facility and length of stay in patients prematurely discharged from a residential addiction treatment facility?
3. What is the relationship between the age and length of stay for patients prematurely discharged from a residential addiction treatment facility?
4. What is the relationship between the gender and length of stay for patients prematurely discharged from a residential addiction treatment facility?

Table 1: Statistics.

		Length of stay in treatment (days)	NOPRIOR	GENDER	DAYWAIT	AGE
N	Valid	49080	49080	49080	49080	49080
	Missing	0	0	0	0	0
Mean		17.41	.58	1.40	.68	6.69
Median		14.00	1.00	1.00	.00	6.00
Std. Deviation		12.502	.494	.490	1.032	2.251
Skewness		.168	-.308	.410	1.682	.290
Std. Error of Skewness		.011	.011	.011	.011	.011
Kurtosis		-1.592	-1.905	-1.832	2.163	-.436
Std. Error of Kurtosis		.022	.022	.022	.022	.022

To determine if there was a relationship between the dependent variable, Length of Stay, and independent variables, Number of Prior Treatment Admissions and Days Wait to Enter Treatment, data were cleansed and isolated from the SAMHSA TEDS-D publicly available data set with all negative data points and outliers removed prior to analysis.

Pearson’s Correlation analyses reveal statistically significant results for the dependent variable, LOS, and both independent variables NOPRIOR $p < .001$; $r = -.090$ at an alpha level of 0.01 and DAYWAIT $p < .001$; $r = .130$ at an alpha level of 0.01. The null hypotheses for both Research Questions One and Two were rejected, indicating acceptance of both alternative hypotheses: There is a significant relationship between the number of prior treatment episodes and length of stay for patients prematurely discharged from a residential addiction

treatment facility, and also a significant relationship between the number of days of waiting to be admitted and length of stay for patients prematurely discharged from a residential addiction treatment facility.

A significant relationship was also discovered between two independent variables, NOPRIOR and DAYWAIT $p < .001$; $r = .078$ at an alpha level of 0.01.

Table 2: Correlations.

		Length of stay in treatment (days)	NOPRIOR	DAYWAIT
Length of stay in treatment (days)	Pearson Correlation	1	-.090**	.130**
	Sig. (1-tailed)		<.001	<.001
	N	49080	49080	49080
NOPRIOR	Pearson Correlation	-.090**	1	.078**
	Sig. (1-tailed)	<.001		<.001
	N	49080	49080	49080
DAYWAIT	Pearson Correlation	.130**	.078**	1
	Sig. (1-tailed)	<.001	<.001	
	N	49080	49080	49080

** . Correlation is significant at the 0.01 level (1-tailed).

To determine if there was a relationship between the dependent variable, Length of Stay, and independent variables, Age and Gender, data were cleansed and isolated from the SAMHSA TEDS-D publicly available data set with all negative data points and outliers removed prior to analysis.

Table 3: Correlations.

		Length of stay in treatment (days)	AGE	GENDER
Length of stay in treatment (days)	Pearson Correlation	1	.007	-.039**
	Sig. (1-tailed)		.069	<.001
	N	49080	49080	49080
AGE	Pearson Correlation	.007	1	-.110**
	Sig. (1-tailed)	.069		<.001
	N	49080	49080	49080
GENDER	Pearson Correlation	-.039**	-.110**	1
	Sig. (1-tailed)	<.001	<.001	
	N	49080	49080	49080

** . Correlation is significant at the 0.01 level (1-tailed).

Pearson’s Correlation analyses revealed statistically significant results for the dependent variable, LOS, and one of independent variables, GENDER with $p < .001$; $r = -.110$ at an alpha level of 0.01, but no significance was revealed for AGE with $p = .069$; $r = .007$ at an alpha level of 0.01. Thus, the null hypotheses for research question three was accepted indicating no significant relationship between the age and length of stay for patients prematurely discharged from a residential addiction treatment facility. The null hypothesis was rejected for research question four, indicating a significant relationship between gender and length of stay for patients prematurely discharged from a residential addiction treatment facility. When the independent variable, days waiting to enter treatment was adjusted to exclude those with a wait time of 0 days, with an adjusted $N = 19853$, a stronger relationship was found between the independent variable, DAYWAIT and the dependent variable, LOS $p < .001$; $r = .195$ at an alpha level of 0.01.

Table 4: Descriptive Statistics.

	Mean	Std. Deviation	N
Length of stay in treatment (days)	18.43	12.760	19853
DAYWAIT	1.67	.985	19853

Table 5: Correlations.

		Length of stay in treatment (days)	DAYWAIT
Length of stay in treatment (days)	Pearson Correlation	1	.195**
	Sig. (1-tailed)		<.001
	N	19853	19853
DAYWAIT	Pearson Correlation	.195**	1
	Sig. (1-tailed)	<.001	
	N	19853	19853

** . Correlation is significant at the 0.01 level (1-tailed).

5. Discussion

It is important to note that of the reported N = 1,722,503 discharges in the United States for the year of 2019, only N = 725,929 or 42.1% were successful, with 25.1% of those being characterized as having dropped out of treatment and 5.5% due to having been terminated by the treatment facility. The remaining 27.2% were due to transfers, incarcerations, death, or other reasons. Those with no prior treatment experience consisted of 37.5% while 54.6% had been to treatment one or more times in their life, and the remaining 7.9% of such data was either missing or was not collected for the year of 2019. The question remains, who is leaving early and how can treatment professionals attempt to anticipate these premature discharge events and work to reduce them? The current study sought to explore those variables that may be associated with how long patients remain in treatment before leaving against medical advice or through termination by the facility.

5.1 Prior Treatment Episodes

The current study found a significant relationship between the number of prior treatment episodes and length of stay for patients prematurely discharged from a residential addiction treatment facility. The slogan relapse is part of recovery is often reiterated through the walls of addiction treatment facilities, with the goal of reducing the burden of guilt and shame associated with relapse and/or multiple admissions to treatment and to encourage clients to remain. It should be noted that multiple admissions do not necessarily indicate a relapse episode. As such, the current study identified a significant relationship between the number of prior treatment episodes and the length of stay in residential treatment for those who dropped out or were terminated by the facility suggesting that those individuals who have been through treatment before may stay longer before discharging against medical advice or being terminated. Regarding addiction treatment re-admissions, researchers in [23] examined predictability of readmission as related to stages of change and treatment eagerness in the adolescent population. With an n = 546, approximately 12% of their sample were re-admitted for a second treatment episode, with an average time of three months between treatments. Their findings suggested that readiness to change and/or level of motivation when discharged from treatment was not associated with likelihood of re-

admission for subsequent addiction treatment [23]. Perhaps an investigation of readiness to change and level of motivation may serve as important in examining length of stay in those considering discharging prematurely from addiction treatment, rather than regarding their re-admission status. Given the apparent revolving door of treatment admissions within the addiction treatment population, and the difficulty in identifying predictor variables associated, there exists a clear need to further investigate these events, as the number of drug related deaths in the United States continues to climb. The systematic review of publications pertaining to addiction treatment drop-out and predictive factors conducted by [5], noted that one of the most consistent factors related to favorable outcomes in addiction treatment programs is treatment completion. This review demonstrated an increased potential for relapse, legal issues, financial problems, health issues and readmission, as well as an increased cost to society particularly regarding crime, disease, and pain of loved ones [5]. Under the premise of such work, it was important to explore the relationship between prior treatment episodes and length of stay in those who prematurely discharged from short-term residential addiction treatment facilities. It may be important to conduct a comparative analysis of those who successfully complete treatment and those who discharge prematurely from addiction treatment, with consideration of other variables such as drug of choice, insurance coverage, and spiritual/religious affiliation.

5.2 Number of Days Waiting for Admission

The current study found a significant relationship between the number of days of waiting to be admitted and length of stay for patients prematurely discharged from a residential addiction treatment facility. While the current study examined those individuals who waited to enter treatment, who were successfully admitted, and who prematurely discharged, it did not look at those waiting for admission and not entering treatment, as such data was not available but may be worth capturing to further inform unsuccessful treatment episodes. However, a significant relationship was discovered between wait time for admission and length of stay in patients who prematurely discharge against medical advice or due to termination from a residential treatment facility. When the number of days waiting to enter treatment was adjusted to include only those waiting one day or more, an even stronger relationship was discovered, suggesting that wait times for admission may serve as critical learning periods or period of significant anticipation for those individuals preparing to enter residential addiction treatment of who eventually discharge prematurely against medical advice or through termination. Researchers in [24] found that the median times between an individual's request for addiction treatment and their clinical assessment was six days (n = 1822). They found that attrition rates regarding addiction treatment within the U.S. are high with 75-80% of individuals seeking treatment disengaging in their treatment throughout enrollment and treatment. As a result of their study, they emphasized a necessity for changes within the treatment infrastructure to improve attrition rates, particularly regarding women [24]. Since the current study did not find a significant relationship between the number of days waiting to enter short-term residential addiction treatment and the length of stay in patients who prematurely discharge, there is a clear need to further explore attrition rates in various aspects of the United States' addiction treatment infrastructure. With consideration of variables such as Stage of Change, co-occurring diagnoses, polysubstance use, and spiritual/religious affiliation, there is an apparent need to further explore how such variables may be related to treatment retention, completion, and readmittance.

5.3 Age

The current study did not find a significant relationship between the age and length of stay for patients prematurely discharged from a residential addiction treatment facility. It was hypothesized that younger clients may be more likely to prematurely discharge from treatment given developmental dispositions for decision making and long-term goal setting, however, no significant relationship was discovered between age and length of stay in clients who prematurely discharged. The researchers in [5] utilized a systematic review of risk factors related to drop-out from addiction treatment. Researchers explored a total of 122 studies made up of 199,331 participants. Of these studies, 91% examined patient factors including age, sex, education, marital status, substance use, co-occurring disorder, and cognitive functioning as it relates to drop-out. Only 4% of the examined studies considered risk factors associated with the treatment program, for example, duration of treatment, treatment setting, and methodology and patient/staff specifics. In their study, younger age was found to be associated with drop-out across many different studies [5]. The findings were not consistent with this current study, as age was not found to have a significant relationship with length of stay. Researchers in [25] explored repeated addiction treatment for patients in Sweden. The addiction treatment system in Sweden is free and underexplored by researchers. Characteristically, the treatment system in the country of Sweden is universal and free for all citizens, unlike that of the United States. They identified predisposing, enabling and need factors associated with the number of addiction treatment episodes (n = 12,009). Per this study, 4.3 treatment episodes was identified as the reported average for patients. Utilizing linear regression, older age and being male were found to be predisposing factors associated with more voluntary treatment episodes, when compared to younger, female patients. Inconsistent with the findings of the current study, age was shown to be related to length of stay in those who left against professional advice. Consistent with the findings of this study, where gender was shown to have a significant relationship with length of stay, new questions emerge in terms of understanding predictor variables associated with the addiction treatment experience regarding the number of addiction treatment episodes as well as variables such as length of stay, with the intention of painting a more adequate picture of risk factors associated with premature discharge [25]. Given the findings, there may be relevance in exploring treatment specific interventions with an understanding that age is an important factor to consider in addressing multiple treatment episodes as well as treatment completion. Furthermore, it may be appropriate to consider drug of choice as well as polysubstance use as it may be related to age and discharge status. A more comprehensive investigation of premature discharge against specific age groups may serve as beneficial in determining risk factors.

5.4 Gender

The current study found a significant relationship between gender and length of stay for patients prematurely discharged from a residential addiction treatment facility. A significant relationship was discovered between gender and length of stay in those individuals prematurely discharging from residential addiction treatment facilities against medical advice or due to termination. This finding suggests a need for further inquiry regarding gender-specific treatment characteristics as they relate to leaving treatment early or successfully completing treatment. Identification of such information may help better inform gender-specific treatment planning with the goal of securing successful completing and discharge from residential treatment programs and

ultimately reducing the mortality rate associated with premature discharge. Researchers in [26] examined gender differences regarding treatment retention of patients with co-occurring disorders characterized as substance abuse and mental health disorders, respectively. The findings suggested that women with co-occurring disorders were more likely to remain in treatment longer than men. Regarding men, results of the Cox regression analysis revealed that age, ADHD diagnosis, location of the facility and Addiction Severity Index employment subscale composite scores were associated with treatment retention. Men with more employment issues were less likely to remain in treatment. The Cox regression analysis regarding retention for women revealed associations of retention with cocaine use, depression, geographical location, ASI alcohol subscale composite scores and readiness to change. Women with a cocaine dependency were 41% less likely to remain in treatment as compared to those with an alcohol dependency. Women diagnosed with depression were 92% more likely to remain in treatment as compared to those women presenting with a mood disorder. Women who scored in the pre-contemplative or contemplative stage of change were less likely to remain in treatment as compared to those women who scored in the action or maintenance stages of change [26]. While the current study did find a significant relationship between gender and length of stay, further exploration is needed to fully grasp the gender-specific characteristics associated with treatment outcomes.

5.5 Implications

Since a significant relationship between the number of prior treatment episodes and length of stay was discovered for those prematurely discharging, future analyses or inquires may look at those who successfully complete treatment after having been to treatment multiple times compared to those who discharge prematurely. Other variables to consider include successful completion of outpatient treatment programs compared to residential programs for those specific primary drug-of-choice categories present in the TEDS-D data set, as the withdrawal and craving experience differs depending upon the drug of choice at time of admission. Since a significant relationship between the days waiting to enter treatment and length of stay was discovered for those prematurely discharging, future analyses or inquires may look at pre-program admission engagement options for individuals waiting for admission with the goal of successfully increasing treatment admissions. Since a significant relationship between gender and length of stay was discovered for those prematurely discharging, future research initiatives may consider examining gender-specific predictors associated with treatment completion as well as unsuccessful treatment completion to better inform critical periods of care and to increase treatment completion outcomes and reduce mortality rates associated with premature discharge. Lastly, given the onset of the COVID-19 Pandemic and the unique challenges individuals living with substance use disorders and treatment-specific challenges that emerged, a comparison of pre-pandemic data with pandemic-specific data for 2020 and 2021 may offer further insights regarding how to better prepare/plan for global emergencies while providing effective, successfully, and well-informed treatment for substance use disorders in the United States.

5.6 Conclusion

The purpose of this study was to identify factors associated with the length of stay in patients prematurely discharged from residential addiction treatment facilities in the United States. Findings from the current study revealed significant relationships between independent/predictor variables number of prior treatment episodes,

days waiting to enter treatment, and gender and dependent/criterion variable, length of stay in patients discharged prematurely from residential treatment due to termination or leaving against medical advice. No relationship was found to exist between age and length of stay, however when the number of days waiting to enter treatment was adjusted to exclude those waiting 0 days for admission, a stronger relationship was discovered between days waiting and length of stay. Overall, findings from the current study indicate the need to further consider the full treatment picture of individual patients seeking residential addiction treatment and to further investigate the variables against those who leave treatment prematurely and those who complete treatment to better inform the predictive nature of the variables found to have a significant relationship with length of stay in treatment. In coming to understand predictive factors associated with premature discharge, providers may fine-tune best practices for reducing premature discharge and ultimately post-premature discharge mortality rates.

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