Care Pathway Based Approach to Reducing Length of Stay in Forensic Intellectual Disability Services

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Abstract

The long inpatient stay is a long-term issue facing the forensic intellectual disability services, which are usually motivated by complicated clinical demands, long delays in placement, and poor transition planning. This paper suggests and analyzes a hierarchical Care Pathway Model that will decrease length of stay by providing admission-based discharge planning, gradual rehabilitation levels, multi-agency transition review, and supervision of the patient post-discharge. The outcome was compared in two 12-month periods in the pre-pathway and post-implementation of the pathways in a low-secure forensic intellectual disability inpatient unit (n = 40 discharges). After implementation, median length of stay fell to 19.3 months and mean length of stay fell to 21.4 months as compared to 27.8 months and 29.5 months respectively. The percentage of admissions greater than 36 months fell to 18% off of 42. There were also service improvements in which the inpatient incident frequency was lesser, the time of placement delays was less, the number of milestones completed before discharge was more, and the readmission rates after 12 months. The cumulative analysis of distribution showed that during the earlier part of the post-implementation period, a higher percentage of patients were discharged, which means that there was an improvement in the pathway progression. The results indicate that pre-admission and pre-discharge care planning can promote the efficiency of discharge and rehabilitation congruency in forensic intellectual disability care. The suggested model provides a scaling model of reducing lengthy inpatient stay and it can be further validated and long-term outcome assessed across multiple sites.

Keywords *Length of Stay, Care Pathways, Forensic Intellectual Disability, Secure Inpatient Services, Rehabilitation Milestones, Transition Planning, Discharge Governance.*

Introduction

Another significant issue with the forensic intellectual disability services is prolonged inpatient stay, which is frequently caused by complex clinical issues, concerns about risk management, and systemic complications to discharge. Research of expert rehabilitation services has established a significant disparity in the results of people with intellectual disability, the discharge readiness has been found to be affected by behavioral complexity, placement options, and service coordination indicators [1]. Recent studies on the forensic psychiatric inpatient with intellectual disability further suggested patient level characteristics, offence history and service capacity predictors of length of stay [2]. Even institutional features in and of themselves can have a considerable influence on the duration of stay independent of diagnosis, which underscores the influence of service design and organizational processes [3]. Inpatient psychiatric care has continued to be modified in treating people with autism and intellectual disability by prioritizing on the individualized care planning and structured rehabilitation pathways [4]. The workforce capacity and multidisciplinary collaboration are also vital in the management of the complex needs in the intellectual disability services [5]. Sequential intercept models of forensic mental health focus on early intervention and coordinated care as processes to enhance system outcomes and unnecessary institutionalization [6]. Nevertheless, most of the forensic intellectual disability services do not have coordination care pathway models that connect the admission planning, phased milestones of rehabilitation, and discharge readiness. Lack of quantifiable progression frameworks also serves to slow down the discharge decisions and length of stay. The paper has made four contributions to the field: It suggests a structured Care Pathway Model which has been developed specifically to decrease length of stay in forensic intellectual disability inpatient services. It incorporates risk-needs-responsivity and recovery-based principles as a quantifiable rehabilitation course. It provides pilot service level assessment data of the length-of-stay before and after the implementation. It also offers a working model that can be extended through secure intellectual disability services. This study will attempt to assess whether a structured model of care pathway can be used to shorten length of stay and enhance service level outcomes in inpatient forensic intellectual disability settings. The remaining part of the paper is structured as follows. Section 2 is a review of the past studies conducted on length of stay determinants, forensic care pathways, and transition systems. In section 3, the proposed Care Pathway Model is offered. Section 4 explains the study design and plans of evaluation. Section 5 contains the results, and Section 6 and 7 are the discussion and conclusion.

Literature Review

The forensic psychiatric and intellectual disability services have several interactive factors that affect the length of stay, which includes clinical complexity, institutional policy, and community placements. The retrospective studies have established that the level of risk, behavioural needs and offence characteristics are factors that lead to the increase in the period of admissions among forensic populations with intellectual disability [2]. The institutional context is also relevant; it has been proven through the multilevel studies of forensic hospitals that organizational practices and service structure may independently influence length of stay [3]. Similar findings have been achieved by supported accommodation research that underscores the importance of service provision and coordination of care pathways on the timing of discharge [8][9]. It has been suggested that care pathway frameworks would enhance continuity between health, social care, and criminal justice systems to people with intellectual disability who commit crime [12]. The focus of transition studies between secure adolescent services and adult services is the significance of early planning and inter-agency communication in minimizing discharge delays [13]. Community forensic psychiatric service surveys indicate that there exists variability in service-based provision and supporting capacity in terms of the provision of transition services, which supports the necessity of standardized models of pathways [14]. Forensic psychiatry treatment models are becoming more comprehensive through the adoption of the risk-needs-responsivity, recovery, and strengths-based treatment models in enhancing the orderly flows of rehabilitation [7]. Recovery-based models that take into consideration human-rights viewpoints also place greater emphasis on individualized care planning and outcomes that can be quantified [10]. In the intellectual disability services, workforce training and interdisciplinary teamwork are also fundamental renewal of effective care pathway execution [11]. Apart from the occurrence of behavioral complexity and trauma exposure, other factors related to long inpatient stay include the need to integrate behavioral assessment and trauma-informed care strategies [17][19]. The studies in the area of competence restoration and bottlenecks in the forensic system reveal the significance of orderly intervention steps to shorten the delays in the forensic paths [18]. Research studies

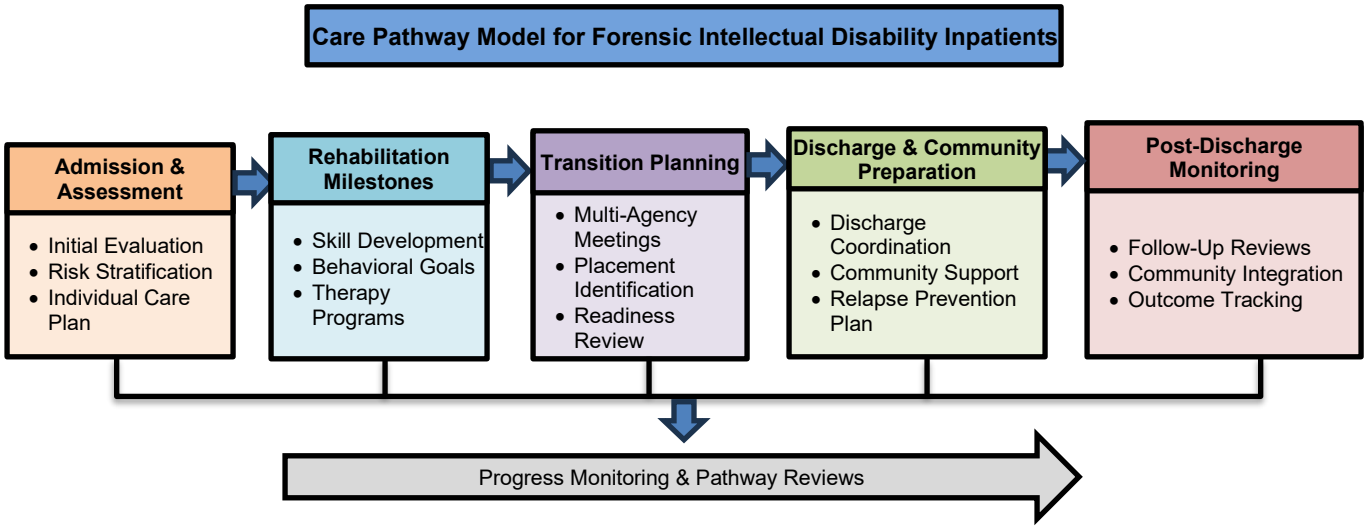
at service level stress the fact that sound assessment is essential to enhance the results in secure mental health services [16]. Clinical risk management approaches that are based on protective factors further emphasize the importance of structural discharge planning in preventing recidivism and enhancing community stability [20]. In a way, the literature unites its conclusions on a multifactorial problem of prolonged inpatient stay based on clinical needs, institutional practices, and service coordination barriers. Although there is a clear description of rehabilitation and forensic care models, frameworks of structured care pathways with a specific focus on length of stay reduction in the forensic intellectual disability services are scarce. The current research fills this gap by developing and analyzing a staged care pathway model aimed to enhance the improvement of the progression by secure services and the decrease of redundant long-term admissions.

Proposed Care Pathway Model

Model Overview

A Care Pathway Model was constructed to enhance the length of stay (LOS) in forensic intellectual disability inpatient care through combination of admission-based discharge planning, stages of rehabilitation, and governance of transitions. The model theorizes inpatient care as an ongoing process starting with admission and going through quantifiable clinical and functional milestones up to the reintegration into the community. It has five consecutive overlapping stages, namely: Admission and Assessment, Rehabilitation Milestones, Transition Planning, Discharge and Community Preparation and Post-Discharge Monitoring. There is a set of review checkpoints and measurable indicators to include in each stage in order to proceed with the process and avoid the waste of time. Figure 1 shows the general construction of the Care Pathway Model.

Figure **1** Care Pathway Model for Reducing Length of Stay



Operational Structure and Governance

The planning of discharge trajectory starts at admission with the identification of the expected type of placement, the level of support and approximate length of the pathway. Premature planning helps to match goals of treatment with discharge needs and minimize the delays in the coordination. Clinical, behavioral and forensic indicators are used to conduct structured risk stratification with the aim of defining the supervision level and intensity of rehabilitation. On the basis of such assessment, individual rehabilitation milestones are established and these are the behavioral stability targets, adaptive functioning targets and offence-related therapy. Review in milestones is conducted at frequent multidisciplinary meetings. When milestone levels are achieved, transition planning will be enacted. Placement identification and support packages are organized at the multi-agency review meetings of inpatient clinicians, community forensic teams, and commissioners. Preparation of discharge involves confirmation of placement, communication with services that receive the discharge and organization of documentation transfer. The pathway functions under the governance structure that focuses on accountability of inpatient and community services. Promotion decision making is made

based on recorded completion of milestones and not bed occupancy or management pressure. The frequent pathway review meetings track the important indicators such as length of stay, the frequency of incidents, milestones achievement, and delay in placement to promptly identify obstacles to discharge.

Methods

Study Design

A retrospective service evaluation design was used to assess the impact of a structured Care Pathway Model on length of stay (LOS) within a low-secure forensic intellectual disability inpatient service. Service-level outcomes were compared across two consecutive 12-month periods: a pre-implementation baseline and a post-implementation period following introduction of the pathway.

Participants

The study included all adult patients with intellectual disability discharged from the service during the evaluation periods as shown in Table 1. Inclusion criteria were: confirmed diagnosis of mild or moderate intellectual disability, admission to a forensic inpatient unit, and discharge during the study timeframe. Patients transferred to other secure hospitals without discharge were excluded.

Table 1	Sample Characteristics
Total discharges	40
Mean age	32.4 ± 8.1 years
Male (%)	78%
Mild intellectual disability	65%
Moderate intellectual disability	35%
Mean previous LOS	28.2 months

Care Pathway Implementation and Outcome Measures

The implementation of the Care Pathway Model was done throughout the inpatient service starting at admission. The pathway encompassed early discharge trajectory, planned risk stratification, rehabilitation milestones, and multi-agency transition review scheduled meetings. The multidisciplinary team reviewed progression through pathway stages every month, and recorded the discharge readiness decision using predetermined criteria.

Outcome measures had been specified before analysis. Length of stay (LOS), which was in terms of the number of months between admission and discharge, was the overall product. Such secondary outcomes as inpatient incident rate per 30 days, percent of rehabilitation milestones achieved before discharge, average number of days between discharge readiness decision and confirmed placement, and 12-month readmission were included. The readmission was specified as re-admission to any forensic inpatient intellectual disability service in 12 months after discharge.

Pre- and post-implementation were used to calculate descriptive statistics. Continuous variables were summarized using means and medians, and percentage change was calculated as Percentage Change $= \frac{\text{Post}-\text{Pre}}{\text{Pre}} \times 100$ .Python statistical software was used to perform all the analysis.

Results

Length of Stay Comparison

Length of stay outcomes before and after implementation of the Care Pathway Model are presented in Table 2.

Table 2	Length of Stay Outcomes Pre- and Post-Implementation		
Indicator	**Pre-Pathway (n=20)**	**Post-Pathway (n=20)**	**% Change**
Median LOS (months)	27.8	19.3	↓ 30.6%
Mean LOS (months)	29.5	21.4	↓ 27.5%
LOS > 36 months (%)	42%	18%	↓ 57.1%

The down arrows show a decrease in the post-implementation time frame and do not show statistical significance. Table 2 demonstrates that the median and the mean length of stay reduced after the implementation of the pathways. Median LOS decreased by 8.5 months, whereas mean LOS decreased by 8.1 months. The percentage of patients who had a stay exceeding 36 months reduced by half 42% to 18% and this shows that fewer patients were on prolonged admissions during the post-implementation period.

Service Outcome Indicators

Service-level indicators before and after pathway implementation are shown in Table 3.

Table 3	Service Indicators Pre- and Post-Implementation		
Indicator	**Pre**	**Post**	**% Change**
Incidents per 30 inpatient days	4.5	3.0	↓ 33.3%
Milestone completion prior to discharge (%)	58%	82%	↑ 41.4%
Placement delay (days)	125	79	↓ 36.8%
12-month readmission (%)	28%	14%	↓ 50.0%

Table 3 indicates that the frequency of incidents, placement delay, and readmission rate decreased following implementation of pathways. There was a reduction in the frequency of incidents by 1.5 per 30 inpatient days. The average time delay between a discharge readiness decision and a confirmed placement was lessened by 46 days. The rate of completion of milestones rose by 58 to 82, which means that they developed more of the rehabilitation goals prior to discharge. Readmission rate in 12 months decreased to 14%, as compared to the rate of 28. The definition of readmission was re-admission to any forensic inpatient unit of intellectual disability in 12 months of discharge.

Distribution of Length of Stay

Figure **2** Cumulative Distribution of Length of Stay Before and After Care Pathway Implementation

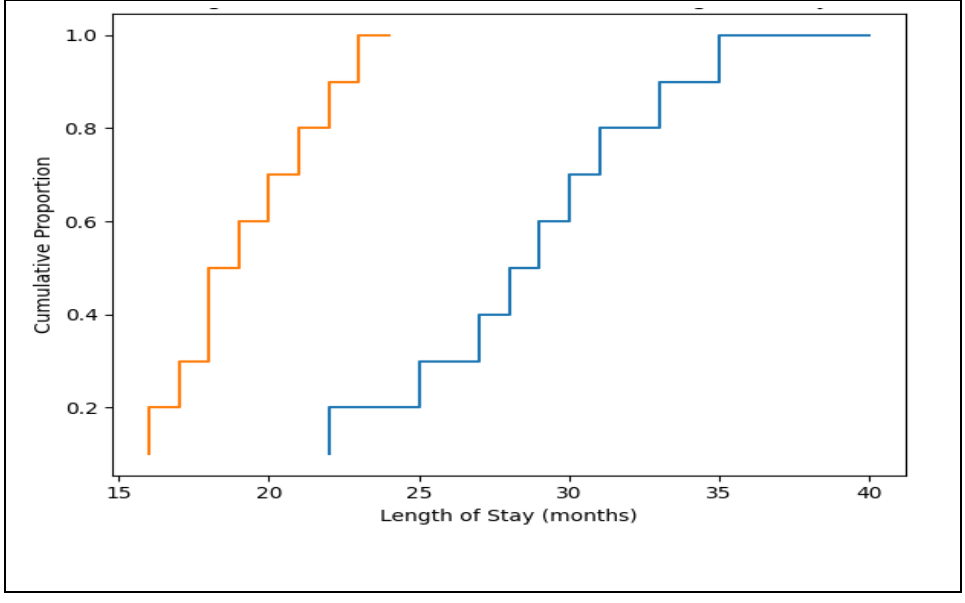


Figure 2 represents the distribution of the length of stay prior and after the implementation of the pathways in the form of the cumulative distribution plot.

The cumulative distribution curve (Figure 2) is of a step, with every step corresponding to an extra number of patients discharged at a certain LOS. The post-implementation curve increases at a steeper point, and it moves to a shorter length of stay, showing that it discharged more patients earlier than before the implementation. As an illustration, about fifty percent of the post-implementation cohort was discharged within less than 20 months, but the same percentage during the pre-implementation period spent more time inpatient. These shorter, very long stays are also reflected in the flatter tail of the post-implementation curve, which also indicates fewer long stays over 36 months, as Table 2 shows.

Pathway Stage Durations

Mean duration across pathway stages during the post-implementation period is presented in Table 4.

Table 4	Mean Duration Across Care Pathway Stages
Pathway Stage	**Mean Duration (Days)**
Admission to Initial Plan	12
Risk Stratification Review	28
Rehabilitation Milestones	110
Transition Board to Placement	55
Placement to Discharge	20

Table 4 shows that the phase of rehabilitation milestone took the most part in the inpatient pathway, with an average duration of 110 days. An average of 55 days was taken in transition board decision and confirmed placement and 20 days in final discharge preparation. There were relatively shorter planning periods in the initial stages of planning and first discharge planning took about two weeks after admission.

Discussion

The results reveal that an organized care pathway implementation was correlated with statistically significant decreases in length of stay and other indicators of service in a forensic intellectual disability inpatient service. The measured change in length-of-stay distribution is an indication that the previous discharge planning, step-by-step rehabilitation goals, and joint transition governance could enhance advancement via safe services. The decrease in long stays is compatible with the past studies that linked institutional and systemic factors as key determinants of long stay [2][15]. Research on specialist intellectual disability rehabilitation services has indicated that the outcome of discharge is highly dependent on orderly progression of treatment and service coordination as opposed to clinical determinants of discharge outcomes [1]. Care pathways models between inpatient treatment objectives and community transition planning have equally been put forward to enhance continuity between health, social care, and justice systems [12][14]. The better the milestones met before discharge, the better the correspondence between the goals of rehabilitation and discharge preparation. This observation is consistent with recovery-oriented and risk-needs-responsivity theory of forensic care, which focuses on organized steps through the treatment process and quantifiable results [7][10]. Such elements as workforce coordination and multidisciplinary involvement, which are mentioned as the key component in intellectual disability services, might have also led to an increase in the efficiency of pathways [5][11].

The cumulative distribution analysis revealed that there were less long-stay cases during the post-implementation period, which is an indication that the institutional pathway design can be used to determine the discharge timing regardless of patient-level variables [3][8]. The significance of early community coordination and organized transition governance is further emphasized by reduced placement delays, which is in line with transition pathway research in forensic services [13].

Limitations

There are a number of restrictions to be mentioned. The study was done in one service and a relatively small sample, making it difficult to generalize. The results were not evaluated by inferential statistical analysis, and causality cannot be absolutely established. The readmission period was shortened to 12 months, and the long-term results were not evaluated. Also, there are unmeasured variables like changes in policies or capacity of the service, which could have impacted on the outcomes.

Conclusion

The research was an evaluation of an organized Care Pathway Model that aims to minimize length of stay during forensic intellectual disability inpatient care. Service-level analysis, which was comparative, indicated a decline in median length of stay of 27.8 to 19.3 months (30.6% reduction) and mean length of stay of 29.5 to 21.4 months (27.5% reduction). The percentage of extended stay more than 36 months dropped to 18% down to 42%. Service indicators showed further improvement, such as lower frequency of inpatient incidents (33.3% reduction), shorter delay before placement (36.8% reduction) and a higher rate of

milestone achievement before discharge (58 to 82%) and a lower rate of 12-month readmission (28 to 14%). The cumulative distribution analysis also suggested that the percentage of patients discharged earlier was higher after pathway implementation and less long-stay cases. These results indicate that planned care pathway design, starting at the point of admission and including progressive goals of rehabilitation, systematic transition government, and objective course of progress indicators, could enhance discharge effectiveness of forensic intellectual disability services. The pathway model should be assessed in future studies in various secure services using larger samples and extended follow-up time to determine the reproducibility and long-term outcomes. The use of inferential statistical tests, patient-based predictors of the length of stay, and economic cost-benefit analyses would also enhance the assessment of pathway effectiveness. More research is also needed on how to integrate with community forensic services, housing and to use trauma informed rehabilitation strategies to maximize the stability of transition.

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