Predictors of successful move-on to more independent accommodation amongst users of the community mental health rehabilitation team: A prospective cohort study in inner London.

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KPKC, HK, and AI and participated in the study design. KK collected and collated the data which were analysed by KPKC. All authors were involved in the interpretation of the data. KPKC drafted the article, which was reviewed and revised by all authors. All authors approved the final version of the manuscript and agreed their accountability in ensuring that any questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

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Abstract

Purpose: In England, community mental health rehabilitation teams play a major role in supporting people with complex mental health needs to progress from inpatient to community settings and from more to less supported accommodation. We aimed to conduct the first study to investigate longitudinal outcomes for users of a community rehabilitation team and identify service user characteristics associated with successful progress along the rehabilitation pathway.

Methods: We used routinely collected clinical outcome data relating to all 193 users of a community rehabilitation team in inner London, transferred to the team between June 2013 and May 2018, with a cut-off data-collection date of 20th June 2019. We estimated the proportion who moved on to more independent accommodation successfully, with no breakdown in the placement. We conducted multivariable Cox proportional hazard regression to investigate associations between service user characteristics at transfer and successful move-on.

Results: Overall, 43/193 (23%) service users achieved successful move-on during a median follow-up of 51 months (IQR: 32 to 63). This was more likely for those who were residing in more highly supported accommodation (HR=3.90; 95% CI: 2.01 to 7.54) and those who had better functioning (HR=1.04, 95% CI: 1.02 to 1.06) at transfer, while those with a serious physical health condition were less likely to achieve successful move-on (HR=0.44, 95% CI: 0.21 to 0.95).

Conclusion: Most supported accommodation services aim to offer time-limited support, but most service users do not progress successfully to more independent accommodation within four years. Investment in interventions that improve functioning and physical health may facilitate successful move-on.

Keywords: mental health; community rehabilitation; move-on; physical health; functioning

Introduction

Around 20% of people who are diagnosed with severe mental health problems such as schizophrenia will develop longer term and complex needs, including treatment-refractory symptoms, co-morbidities and functional impairments that impact negatively on their ability to live independently [1,2]. Mental health rehabilitation services facilitate recovery for people with complex mental health needs through stabilising symptoms and enabling their skills for successful community living [3].

In England, rehabilitation services operate as a "whole system, integrated care pathway" which includes inpatient rehabilitation services and community rehabilitation teams provided by health services, and supported accommodation services and other voluntary sector services that facilitate social inclusion (such as vocational or peer support services). People progress along the rehabilitation pathway from more intensive to more independent settings as their needs are addressed and their functioning and confidence improve (from inpatient settings to higher, and then lower, supported accommodation in the community and, ultimately, to independent living) [3]. Two national research programmes in England have investigated the effectiveness of two of the main components of the pathway; inpatient rehabilitation services and supported accommodation services.

The REAL study – Rehabilitation Effectiveness for Activities for Life, investigated inpatient rehabilitation services and included a prospective cohort study which found that over half (56%) of those admitted to inpatient rehabilitation units were successfully discharged to the community within 12 months. This was associated with service users' social skills and engagement in activities and with the degree to which the service operated with a recovery orientation [4].

The QuEST study – Quality and Effectiveness of Supported Tenancies for people with mental health problems, investigated supported accommodation services and found that 41% of service users successfully moved on to more independent accommodation within 30 months. This was associated with two aspects of service quality, the promotion of people's human rights and the degree to which the service was recovery orientated. Service users with fewer unmet needs, fewer incidents of risk in their history and shorter lengths of stay in the supported accommodation service were more likely to achieve successful move-on [5].

Whilst these studies have identified characteristics of services and service users that are associated with successful rehabilitation in inpatient units and supported accommodations, there has been little research focusing on community rehabilitation teams. Over half the NHS trusts in England have at least one such team [6]. They provide care coordination and ongoing access to rehabilitation interventions to enable people to progress in their recovery in the community. They aim to facilitate users' transitions along the rehabilitation pathway, from the inpatient setting to supported accommodation, from higher to less supported accommodation, and on to an independent tenancy where appropriate. Team members assess and facilitate service users' access to the right supported accommodation, provide individualised clinical input with regard to specific treatments and interventions, and support and advise the supported accommodation staff to ensure that everyone works synergistically towards agreed goals that will assist the individual's recovery. This includes maximising users' benefits from medication, providing support and opportunities for the person to gain confidence in managing activities of daily living (such as shopping, cooking, cleaning, budgeting, and managing medication), helping them access and engage with community-based activities (leisure, educational courses, and employment opportunities), and supporting them to access physical health monitoring and interventions. Once a service user is able to manage in an independent tenancy, s/he is usually transferred from the rehabilitation team to a standard community mental health team or to primary care [7].

Despite their important contribution to the rehabilitation care pathway, no studies have been conducted in England to assess the effectiveness of community mental health rehabilitation teams and the factors associated with better outcomes for service users. We therefore conducted an evaluation of longitudinal outcomes for users of one community rehabilitation team in England. We aimed to estimate the proportion who achieved successful move-on to more independent accommodation and to identify service user characteristics associated with this.

Method

Study setting

The study was conducted in Islington, an inner London borough with a population of 206,125 [8]. High-level deprivation gives this area one of the highest estimated levels of psychiatric

morbidity in England [9]. Secondary mental health services are provided through Camden and Islington NHS Foundation Trust.

Our cohort comprised all 193 service users transferred to the care of the Islington community mental health rehabilitation team between June 2013 and May 2018. The team's eligibility criteria are that individuals have long term complex needs and functional impairment secondary to psychosis and reside in one of the two local community rehabilitation units within the borough or in 24-hour staffed supported accommodation (including residential care homes and supported housing).

The accommodation types served by the team include community rehabilitation units which are mental health rehabilitation treatment facilities for 11-15 people, providing a full multidisciplinary team with on-site staff 24 hours a day in a domestic environment that facilitates service users' confidence and abilities in managing their mental health and activities of daily living. These services are owned and run by the National Health Service and have an expected length of stay of 18-24 months, with the aim of supporting people to be able to move-on to a 24-hour supported housing tenancy. Residential care homes in the borough are run by the voluntary sector and provide a communal setting for 12-20 people who cannot manage in 24-hour supported housing and require on-site support 24 hours a day. All day to day needs are provided (e.g. meals, cleaning, assistance with personal care, and supervision of medication) and placements are not time-limited. Supported housing services are also provided by the voluntary sector and comprise self-contained, time-limited, individual or two-person apartments with on-site support staff available 24 hours a day to assist with shopping, cooking, cleaning and budgeting. Tenants are expected to be able to manage their personal care and medication with minimal input from staff. These projects have an expected length of stay of around two years.

The Islington community rehabilitation team provides care coordination and specialist interventions to people living in these three types of accommodation, including medication and physical health reviews, psychological interventions, occupational therapy, and social care interventions. The team aims to enable people to continue to progress in their rehabilitation and gain the skills to achieve their optimum level of independence. A key metric therefore is the proportion of people who progress from higher to less supported accommodation: i.e. from a community rehabilitation unit or residential care home to 24-hour

supported housing, and from 24-hour supported housing to less supported housing or an independent tenancy.

Data

The data for this study were derived from an existing database comprising routinely collected clinical outcome data pertaining to the service users of the team. All potential individual identifiers were removed from the database before analysis (see analysis section). As this was a secondary data analysis using anonymised, routinely collected data, no ethical approval for the study was required. Routine outcomes are assessed at the point of the service user's transfer to the team and every six months at planned care review meetings. The database included data on all service users transferred to the team between June 2013 and May 2018 and follow-up data added up to 20th June 2019. It included the following demographic and clinical details collected at the point of transfer into the team: age; gender; ethnicity; diagnosis (ICD-10 classification); length of contact with mental health services in years; and the number of hospital admissions prior to transfer to the team. The type of accommodation where the person was living at transfer to the team was also recorded, as well as whether they attended the transfer meeting, whether they were subject to a Community Treatment Order, whether they had a family member/informal carer, and whether they had any serious physical health problems (e.g. diabetes, heart disease, lung disease). Two standardised, routine outcome measures were completed by one of the clinicians in attendance at the transfer meeting and at subsequent six-monthly multidisciplinary review meetings: the Camberwell Assessment of Needs Short Appraisal Scale (CANSAS) [8] and the Life Skills Profile (LSP) [9,10]. The CANSAS assesses 20 domains of an individuals' life using three categories: "No Need" (no problem identified in this domain); "Met need" (no problem in this domain because support is being given); "Unmet need" (ongoing serious problem in this domain, whether receiving support or not) [10]. The LSP is a 39-item rating scale used to evaluate psychosocial functioning, with each item assessed on a scale of 0 to 4; higher scores indicating better functioning. The scale is made up of five subscales, namely, self-care, non-turbulence, social contact, communication and responsibility [11,12].

For the purposes of this study, we assessed service users' progress during the period from transfer to the community rehabilitation team until 20th June 2019 in terms of whether they moved on to more independent (less supported) accommodation and, if so, whether they

sustained their new tenancy. We also noted whether they were discharged from the community rehabilitation team (e.g. to another, less intensive community team or primary care) and we recorded any client deaths. We aimed to investigate the proportion who achieved successful move-on, i.e. sustained a move to more independent accommodation, without placement breakdown, for at least one year.

Statistical Analyses

The database was first reviewed by KK and any missing values or out of range entries were identified and rectified through case note review. Any potentially identifiable data values such as names or date of birth were then removed before the database was securely transferred to KPKC for analysis. Data were analysed using Stata statistical software (version 13). All variables were first examined using descriptive statistics, and the proportion of those who achieved successful move-on was calculated as a percentage.

We explored associations between service user characteristics and successful move-on through a series of regression analyses. As we were using an existing, routinely collected clinical dataset, service users entered the study at different time points according to their date of transfer to the team and remained under the care of the team for different lengths of time and thus the follow-up period varied for different service users. In addition, some service users died during our study period. In order to account for varying follow-up times and to allow for censoring (i.e. the time to our outcome of interest 'successful move-on' being unknown for some people who died prior to move-on or who died within a year of move-on), we used Cox proportional hazard regression to estimate the association between service users' characteristics and successful move-on instead of logistic regression [13]. Cox regression is a time-to-event analysis, and the outcome variable we used was time-to-successful-move-on, defined as the number of months from transfer into the team to the first successful move-on achieved.

We first performed univariable Cox proportional hazards regression analysis to estimate the unadjusted association between each explanatory variable (service user characteristic) at transfer to the team and successful move-on. We then conducted a multivariable Cox regression model to identify the independent predictors of successful move-on. A forward selection procedure with the selection criterion of $p<0.10$ was adopted to select variables for

the multivariable model. Where predictors were highly correlated, the most clinically relevant one was selected for inclusion in the model to reduce collinearity. All hazard ratios (HR) were reported with a 95% confidence interval (CI). The results of Cox regression are valid only if the proportional hazards assumption holds [14]. Namely, the cox regression assumes that the hazard in one group is a constant proportion of the hazard in the other group. This assumption was tested via the Schoenfeld residual-based test for predictors included in the multivariable model [15].

Results

Descriptive data

All 193 services users who were transferred to the team between June 2013 and May 2018 were included in the study. At the point of being transferred to the team, they had a mean age of 52 years (standard deviation=13.6). The majority were male (134/193, 69%), white (99/193, 51%), with a primary diagnosis of schizophrenia (138/193, 72%). A total of 50 (26%) were living in a community rehabilitation unit at transfer, 25 (13%) were living in a residential care home and 118 (61%) were living in 24-hour supported housing. The amount of missing data at transfer was low; only four variables had observations missing that could not be populated from the case notes pertaining to 12 service users (6%) with one or more missing data value. Full details of service users' demographic and clinical characteristics at transfer to the team are presented in Table 1.

At 20th June 2019, 22 service users (11%) had died, all from natural causes and 44 (23%) had been discharged to a standard community team or to the care of their GP, while two thirds (127/193, 66%) remained under the care of the community rehabilitation team. The total follow-up time for all service users was 9106 person-months (median 51 months, interquartile range 32 to 63). Among the 193 service users, 58 (30%) moved from more to less supported accommodation over the follow-up period, of whom 45 (23% overall) achieved successful move-on. The incidence rate of successful move-on per 1000 person-months was 4.5 (95% CI: 3.7 to 6.6). The successful move-on rate differed between the three types of accommodation that service users were living in at transfer to the team: 52% (26/50) for users of community rehabilitation units, 4% (1/25) for those in residential care homes,

and 15% (18/118) for those in supported housing. Characteristics of those who achieved successful move-on and those who did not are detailed in Table 1.

Table 1 about here

Predictor Analyses

On the basis of the low rates of missing data, we conducted a complete-case Cox proportional hazard regression analysis to investigate the association between service user characteristics and successful move-on. We included 181 (94%) of the 193 service users in our original study population who had complete data for all variables at transfer to the team. This included all 45 (25%) who fulfilled the definition of successful move-on.

Univariable analysis

Table 2 shows the results of the univariable Cox regression unadjusted associations between service users' characteristics at transfer to the team and successful move-on. Accommodation type at transfer had the strongest association, with people residing in a community rehabilitation unit having a rate of successful move-on five times higher (HR= 5.76; 95% CI: 3.16 to 10.50; $p<0.001$) than people in residential care or supported housing. For every year increase in age, the rate of achieving successful move-on reduced by 3% (HR=0.97; 95% CI: 0.95 to 0.99; p=0.03). For every year increase in length of contact with mental health service, the rate reduced by 4% (HR=0.96; 95% CI: 0.93 to 0.98; p=0.001). Furthermore, service users with a history of a serious physical health problem were less likely to achieve successful move-on than those without (HR=0.45; 95% CI: 0.23 to 0.88; p=0.019). Service users who were rated as having higher LSP total and subdomain scores (better functioning) at transfer to the team were more likely to achieve successful move-on (see Table 2).

Table 2 about here

Multivariable analysis

Age at transfer to the team and length of contact with mental health services were found to be highly correlated with each other. As it is well known that younger age of onset of psychosis is associated with poorer prognosis, we selected age at transfer for the multivariate analysis.

The results of the multivariable model are shown in Table 3. Three independent predictors were found to be associated with successful move-on. Service users living in a community rehabilitation unit at transfer to the team had a rate of successful move-on almost four times (HR=3.90; 95% CI: 2.01 to 7.54; p<0.001) higher than those living in a residential care home or supported housing. In addition, for every unit increase in LSP total score at transfer, the rate of achieving successful move-on increased by 4% (HR=1.04, 95% CI: 1.02 to 1.06; p=0.001). Service users who had a serious physical health problem were less likely to achieve successful move-on than those without (HR=0.44, 95% CI: 0.21 to 0.95; p=0.036). These results indicate that service users who were residing in a community rehabilitation unit, had better psychosocial functioning and no serious physical health problems at transfer to the team were more likely to achieve successful move-on. We found no evidence of serious violations of the proportional hazards assumption with the predictors in the model based on the results in the Schoenfeld residual-based test.

Table 3 about here

Discussion

Our study is the first to investigate longer-term outcomes for users of a community rehabilitation team in England. Around one third moved on to more independent accommodation and around one fifth sustained this for at least 12 months. The median time service users were followed up in this study was over four and a quarter years. In England, most supported accommodation services are contracted to work with individuals for around two years. Our results show a clear divergence between the expected timeframe and reality, with the majority remaining in 24-hour supported settings for considerably longer than this. Almost a quarter (13/55) of those who did move on could not sustain their new placement subsequently. This suggests that unrealistic timeframes may pose risks to individuals who require longer-term higher support as it may be placing them and staff under inappropriate pressure to move-on prematurely.

The successful move-on rate found in our cohort replicated the findings of a 5-year cohort study of users of inpatient and community based mental health rehabilitation services in North London which reported that 23% moved on successfully without readmission or placement breakdown [14]. A higher successful move-on rate (38%) was found in the large

national cohort conducted as part of the QuEST study that followed people living in supported accommodation services in England over a 30-month follow-up [5]. The lower rate we found could be due to the fact that we included users of community rehabilitation units as well as residential care and 24 hour supported housing services, whereas the QuEST study included residential care, supported housing and floating outreach service users; around 10% of residential care users, one-third of supported housing service users and two-thirds of floating outreach service users moved on successfully over 30 months. In other words, our cohort represented people at an earlier stage in the rehabilitation care pathway who were receiving a higher level of support and are likely to have had greater morbidity than the QuEST cohort. Furthermore, Islington is an inner London area with a high level of deprivation and psychiatric morbidity and this may also have influenced our results in that our cohort may have had greater morbidity than the national average [9].

We found that 11% of service users died due to natural causes during the study period, highlighting the known association between severe mental health problems and premature mortality [16,17]. This is a depressingly similar percentage to that reported ten years ago in the previous cohort study of mental health rehabilitation service users in North London, where 12% died of natural causes between 2005 and 2010 [18]. Since 2014, NICE guidelines have made recommendations regarding physical health care for people with severe mental illness [19]. Almost all of the Islington community rehabilitation team service users had received annual physical health checks and most had specific physical health care plans. The team also has a physical health matron whose role is to support service users to access physical health care screening and interventions, but sadly, the mortality rate remains high despite the improved awareness and implementation of better physical health care over recent years.

We identified three service user characteristics at transfer to the team that were associated with successful move-on: being in a community rehabilitation unit, having no history of severe physical health problems, and having higher functioning. The first of these might be explained by the fact that the community rehabilitation units are owned and run by the NHS and, as such, are viewed more akin to inpatient units than supported accommodation services. Service users do not have a tenancy in a community rehabilitation unit and there is a great deal of pressure on places. The system is highly focussed on moving people on to supported accommodation at the earliest opportunity. It is also the case that these units provide more

intensive and specialist support than residential care and supported housing services which may also explain the higher rate of successful move-on.

People with physical health problems (e.g., heart disease, lung disease, diabetes) were less likely to achieve successful move-on. This could be due to them needing additional support to manage their physical health problem(s) in addition to the support they need for their mental health problems, such as the management of more complex medication regimes and/or investigations (e.g. checking blood sugar for those with diabetes). This finding concurs with previous studies that have found that physical health problems increase the risk of poorer long-term outcomes for people with serious mental health problems [20,21].

Higher psychosocial functioning at transfer was found to be positively associated with successful move-on. It is expected that individuals who have better skills in managing their daily lives would be more likely to progress to more independent living than those with greater levels of functional impairment. Our finding concurs with that of a previous national cohort study in inpatient mental health rehabilitation services that identified a positive association between social skills and successful community discharge [4].

Limitations

The results should be interpreted with some caution given the limitations of our study design. Firstly, our observational study was only able to report associations between service user characteristics and successful move-on and could not confirm a causal relationship. Nevertheless, whilst our analyses were exploratory, we can have some confidence in our findings. The definition of our main outcome 'successful move-on' is clinically grounded and does not rely on subjective opinion. It is unlikely that there were errors in this variable given that the team were working closely with service users. We adopted a robust analysis method, namely the Cox regression, to account for the varying service user follow-up time and censoring in our dataset. Although our data were collected routinely as part of the team's ongoing service evaluation and are likely to reflect the clinical situation accurately, we were limited in only having variables that were pre-set prior to our study being designed. Therefore, we could not include other potential predictors of our outcome, such as medication adherence, clinical symptoms and cognitive functioning which have been found to be associated with longer-term outcomes for people with psychosis in previous studies [18,22,23]. Also, service

user variables such as subjective recovery goals and satisfaction with treatment may have influenced the outcome but were not available for this analysis [24,25]. Furthermore, our study was not sufficiently powered to detect the effects of other investigated explanatory variables on successful move-on in the multivariable model. There were only 45 successful move-on events observed over the study period and we were therefore only able to include four variables in the multivariable model [26]. To account for this issue, we used a forward selection method to identify the most significant predictors. Finally, our sample comprises users from one community rehabilitation team and therefore has limited generalisability to other settings. Nevertheless, our results are relevant to any provider of mental health rehabilitation services, whatever the model of care [27], in helping to inform the need for a focus on improving functioning and physical health for people with severe and complex mental health problems.

Implications

This study offers the first evidence in evaluating the outcomes among users of a community mental health rehabilitation team which may guide clinicians in their assessments and inform the development of targeted interventions to support service users to achieve and sustain successful community living. The findings therefore have important clinical implications, the most central being that they suggest the need for greater flexibility in the expected timeframe that supported housing services work with people with severe mental health problems since a relatively small proportion achieve a successful move-on with the current expectation of two years. The high mortality rate was of obvious concern and occurred despite the recent improvements and additions to the team's approach to physical health care. Having a physical health problem was also found to be associated with not moving on successfully. These two findings suggest that greater efforts are required in identifying and responding to the physical health needs of this group. The finding that service users' functioning was associated with successful move-on is unsurprising, however it provides support for greater focus on interventions that can enable service users to gain skills in order to progress in their rehabilitation. It may also help services identify those who are likely to progress in their rehabilitation quicker and those more likely to need longer term support.

Conclusion

Community rehabilitation teams have an important role in the 'whole system rehabilitation care pathway', as they support people with complex mental health needs to progress from inpatient to community settings and from higher to less supported accommodation. Achieving successful move-on for this group is one of their main aims. We found that most service users do not move on to more independent accommodation within the expected two-year timeframe, indicating the need for greater flexibility in the system. High levels of physical health morbidity remain a major concern for this group and future research to develop interventions that can address this are needed. Assessment of functioning may help identify those who are likely to be able to progress through the rehabilitation system more easily and those likely to require longer term support.

Table 1

Service users' demographic and clinical characteristics at transfer to the team; whole sample, those who successfully moved on and those who did not

	Total N=193	Successful move-on N=45	Did not move-on successfully N=148
Age, year – mean (SD)	52 (13.6)	47 (11.5)	53 (13.9)
Gender – n (%)			
Female	59 (31)	8 (18)	51 (34)
Male	134 (69)	37 (82)	97 (66)
Ethnicity – n (%)			
White	99 (51)	20 (44)	79 (53)
Black	72 (37)	23 (51)	49 (33)
Asian	9 (5)	1 (2)	8 (5)
Mixed	10 (1)	1 (2)	9 (6)
Other	3 (1)	0 (0)	3 (2)
Diagnosis – n (%)			
Schizophrenia	138 (72)	36 (80)	102 (69)
Schizoaffective	42 (22)	8 (18)	34 (23)
Bipolar	5 (3)	0 (0)	5 (3)
Psychosis not otherwise specified	5 (3)	0 (0)	5 (3)
Delusion disorder	2 (1)	0 (0)	2 (1)
Depression with psychosis	1 (1)	1 (2)	0 (0)
Accommodation type – n (%)			
Community Rehabilitation Unit	50 (26)	26 (58)	24 (16)
Residential Care Home	25 (13)	1 (2)	24 (16)
24-hour Supported Housing	118 (61)	18 (40)	100 (68)
Length of contact with mental health services, mean (SD) years[a]	27.4 (12.8)	22.6 (12.1)	29.0 (12.7)
Mean (SD) admissions prior to transfer to the team	6.5 (5.3)	5.7 (5.2)	6.7 (5.3)
Attendance at the transfer meeting – n (%)	170 (88)	39 (87)	131 (89)
Subject to Community Treatment Order – n (%)	48 (25)	10 (22)	38 (26)
Has a carer – n (%)	59 (31)	18 (40)	41 (27)
Any serious physical health problems – n (%)	87 (45)	12 (27)	75 (51)
CANSAS score – mean (SD)[b]			
Met need	6.2 (3.1)	5.5 (3.0)	6.4 (3.2)
Unmet need	3.5 (3.0)	3.4 (2.9)	3.6 (3.0)
Total need (Met + Unmet)	9.7 (3.6)	9.0 (4.1)	10.0 (3.4)
LSP score – mean (SD)[c]			
Self-care subscale	28.3 (6.6)	30.2 (6.3)	27.7 (6.6)
Non-turbulence subscale	40.6 (6.7)	42.4 (6.2)	40.0 (6.7)
Social contact subscale	14.1 (4.3)	15.1 (4.8)	13.7 (4.2)
Communication subscale	19.7 (3.8)	20.9 (3.2)	19.3 (4.0)
Responsibility subscale	16.1 (3.1)	17.3 (2.8)	15.7 (3.1)
Total score	118 (19.1)	126.2 (17.2)	116.5 (19.1)

Note. N= number; SD= standard deviation; CANSAS= Camberwell Assessment of Needs Short Appraisal Scale; LSP= Life Skills Profile.

Table 1

Service users' demographic and clinical characteristics at transfer to the team; whole sample, those who successfully moved on and those who did not

	Total N=193	Successful move-on N=45	Did not move-on successfully N=148

[a] Length of contact with the mental health service: five observations (2%) missing in "Total"; two observations (4%) missing in "Successful move-on"

[b] For both CANSAS and LSP: Twelve observations (6%) missing in "Total"; Four observations (9%) missing in "Successful move-on"

Table 2

Univariable association between baseline characteristics and successful move-on by Cox proportional hazard regression (N=181)

Categorical Variables	Incidence Rate	HR [95% CI]	P-value
Gender			
Female	2.87	1	0.062
Male	5.86	2.07 [0.97 to 4.45]	
Ethnicity			
White	4.12	1	0.176
Other	5.89	1.50 [0.83 to 2.70]	
Diagnosis			
Schizophrenia	5.41	1	0.351
Other	3.67	0.70 [0.34 to 1.47]	
Accommodation type			
Supported Housing and Residential Care Home	2.68	1	<0.001
Community Rehabilitation Unit	12.95	5.76 [3.16 to 10.50]	
Attended the transfer meeting			
No	5.54	1	0.789
Yes	4.86	0.89 [0.38 to 2.10]	
Subject to Community Treatment Order			
No	5.09	1	0.761
Yes	4.47	0.90 [0.44 to 1.81]	
Has a carer			
No	4.15	1	0.068
Yes	6.90	1.75 [0.96 to 3.17]	
Any serious physical health problems			
No	6.53	1	0.019
Yes	2.96	0.45 [0.23 to 0.88]	

Continuous Variables	HR [95% CI]	P-value
Age	0.97 [0.95 to 0.99]	0.003
Length of contact with mental health service, year	0.96 [0.93 to 0.98]	0.001
Number of admissions prior to transfer to the team	0.97 [0.90 to 1.03]	0.338
CANSAS score		
Met need	0.96 [0.86 to 1.06]	0.427
Unmet need	0.94 [0.84 to 1.05]	0.276
Total need	0.93 [0.85 to 1.01]	0.095
LSP score		
Self-care sub-score	1.09 [1.03 to 1.15]	0.003
Non-turbulence sub-score	1.08 [1.00 to 1.15]	0.023
Social contact sub-score	1.09 [1.01 to 1.18]	0.024
Communication sub-score	1.18 [1.05 to 1.32]	0.004
Responsibility sub-score	1.26 [1.11 to 1.45]	0.001
Total score	1.04 [1.02 to 1.07]	<0.001

Note. N=number of service users included in the analysis; Incidence rate= incidence rate of successful move-on per 1000 person-months; HR= hazard ratio; CI= confidence interval; CANSAS= Camberwell Assessment of Needs Short Appraisal Scale; LSP= Life Skills Profile.

Table 3

Multivariable Cox regression model with forward selection of predictors of successful move-on (N=181)

	HR [95% CI]	P-value
Accommodation type		
Supported Housing and Residential Care Home	1	<0.001
Community Rehabilitation Unit	3.90 [2.01 to 7.54]	
Any serious physical health problems		
No	1	0.036
Yes	0.44 [0.21 to 0.95]	
LSP total score	1.04 [1.02 to 1.06]	0.001

Note. N= number of service users included in the analysis; HR= hazard ratio; CI= confidence interval; LSP= Life Skills Profile.

References

1. Craig TK, Garety P, Power P, Rahaman N, Colbert S, Fornells-Ambrojo M, Dunn G (2004) The Lambeth Early Onset (LEO) Team: randomised controlled trial of the effectiveness of specialised care for early psychosis. BMJ (Clinical research ed) 329 (7474):1067. doi:10.1136/bmj.38246.594873.7C

2. Morgan C, Lappin J, Heslin M, Donoghue K, Lomas B, Reininghaus U, Onyejiaka A, Croudace T, Jones PB, Murray RM, Fearon P, Doody GA, Dazzan P (2014) Reappraising the long-term course and outcome of psychotic disorders: the AESOP-10 study. Psychol Med 44 (13):2713-2726. doi:10.1017/s0033291714000282

3. Joint Commissioning Panel for Mental Health (2012) Guidance for commissioners of rehabilitation services for people with complex mental health needs. London: Joint Commissioning Panel for Mental Health

4. Killaspy H, Marston L, Green N, Harrison I, Lean M, Holloway F, Craig T, Leavey G, Arbuthnott M, Koeser L, McCrone P, Omar RZ, King M (2016) Clinical outcomes and costs for people with complex psychosis; a naturalistic prospective cohort study of mental health rehabilitation service users in England. BMC Psychiatry 16:95. doi:10.1186/s12888-016-0797-6

5. Killaspy H, Priebe S, McPherson P, Zenasni Z, Greenberg L, McCrone P, Dowling S, Harrison I, Krotofil J, Dalton-Locke C, McGranahan R, Arbuthnott M, Curtis S, Leavey G, Shepherd G, Eldridge S, King M (2019) Predictors of moving on from mental health supported accommodation in England: national cohort study. Br J Psychiatry:1-7. doi:10.1192/bjp.2019.101

6. Killaspy H, Marston L, Omar RZ, Green N, Harrison I, Lean M, Holloway F, Craig T, Leavey G, King M (2013) Service quality and clinical outcomes: an example from mental health rehabilitation services in England. Br J Psychiatry 202 (1):28-34. doi:10.1192/bjp.bp.112.114421

7. Kalidindi S, Killaspy H, Edwards T (2012) Community psychosis services: The role of community mental health rehabilitation teams: Faculty Report (FR/RS/07). London: Royal College of Psychiatrists.,

8. Office for National Statistics (2011) 2011 census. Retrieved from www.statistics.gov.uk/census2011, London: Office for National Statistics.

9. Glover GR, Robin E, Emami J, Arabscheibani GR (1998) A needs index for mental health care. Social psychiatry and psychiatric epidemiology 33 (2):89-96. doi:10.1007/s001270050027

10. Phelan M, Slade M, Thornicroft G, Dunn G, Holloway F, Wykes T, Strathdee G, Loftus L, McCrone P, Hayward P (1995) The Camberwell Assessment of Need: the validity and reliability of an instrument to assess the needs of people with severe mental illness. Br J Psychiatry 167 (5):589-595. doi:10.1192/bjp.167.5.589

11. Parker G, Rosen A, Emdur N, Hadzi-Pavlov D (1991) The Life Skills Profile: psychometric properties of a measure assessing function and disability in schizophrenia. Acta psychiatrica Scandinavica 83 (2):145-152. doi:10.1111/j.1600-0447.1991.tb07381.x

12. Rosen A, Hadzi-Pavlovic D, Parker G (1989) The life skills profile: a measure assessing function and disability in schizophrenia. Schizophrenia bulletin 15 (2):325-337. doi:10.1093/schbul/15.2.325

13. Clark TG, Bradburn MJ, Love SB, Altman DG (2003) Survival analysis part I: basic concepts and first analyses. Br J Cancer 89 (2):232-238. doi:10.1038/sj.bjc.6601118

14. Bradburn MJ, Clark TG, Love SB, Altman DG (2003) Survival analysis Part III: multivariate data analysis -- choosing a model and assessing its adequacy and fit. Br J Cancer 89 (4):605-611. doi:10.1038/sj.bjc.6601120

15. Grambsch PM, Therneau TM (1994) Proportional hazards tests and diagnostics based on weighted residuals. Biometrika 81 (3):515-526
16. Thornicroft G (2011) Physical health disparities and mental illness: the scandal of premature mortality. Br J Psychiatry 199 (6):441-442. doi:10.1192/bjp.bp.111.092718
17. Thornicroft G (2013) Premature death among people with mental illness. BMJ (Clinical research ed) 346:f2969. doi:10.1136/bmj.f2969
18. Killaspy H, Zis P (2013) Predictors of outcomes for users of mental health rehabilitation services: a 5-year retrospective cohort study in inner London, UK. Social psychiatry and psychiatric epidemiology 48 (6):1005-1012. doi:10.1007/s00127-012-0576-8
19. National Institute for Health and Care Excellence (2014) Psychosis and schizophrenia in adults: Prevention and management (Clinical guideline [CG178]). Retrieved from https://www.nice.org.uk/guidance/cg178
20. Nakanishi M, Tanaka S, Kurokawa G, Ando S, Yamasaki S, Fukuda M, Takahashi K, Kojima T, Nishida A (2019) Inhibited autonomy for promoting physical health: qualitative analysis of narratives from persons living with severe mental illness. BJPsych open 5 (1):e10. doi:10.1192/bjo.2018.77
21. Simunovic Filipcic I, Filipcic I (2018) Schizophrenia and Physical Comorbidity. Psychiatria Danubina 30 (Suppl 4):152-157
22. Lim C, Barrio C, Hernandez M, Barragan A, Yamada AM, Brekke JS (2016) Remission of symptoms in community-based psychosocial rehabilitation services for individuals with schizophrenia. Psychiatric rehabilitation journal 39 (1):42-46. doi:10.1037/prj0000154
23. Wykes T, Dunn G (1992) Cognitive deficit and the prediction of rehabilitation success in a chronic psychiatric group. Psychol Med 22 (2):389-398. doi:10.1017/s0033291700030336
24. Moran GS, Baruch Y, Azaiza F, Lachman M (2016) Why do mental health consumers who receive rehabilitation services, are not using them? A Qualitative Investigation of Users' Perspectives in Israel. Community Ment Health J 52 (7):859-872. doi:10.1007/s10597-015-9905-1
25. Moran GS, Westman K, Weissberg E, Melamed S (2017) Perceived assistance in pursuing personal goals and personal recovery among mental health consumers across housing services. Psychiatry research 249:94-101. doi:10.1016/j.psychres.2017.01.013
26. Peduzzi P, Concato J, Feinstein AR, Holford TR (1995) Importance of events per independent variable in proportional hazards regression analysis. II. Accuracy and precision of regression estimates. J Clin Epidemiol 48 (12):1503-1510. doi:10.1016/0895-4356(95)00048-8
27. Hornik-Lurie T, Zilber N, Lerner Y (2012) Trends in the use of rehabilitation services in the community by people with mental disabilities in Israel; the factors involved. Israel journal of health policy research 1 (1):24. doi:10.1186/2045-4015-1-24

Table

Table 1

Service users' demographic and clinical characteristics at transfer to the team; whole sample, those who successfully moved on and those who did not

	Total N=193	Successful move-on N=45	Did not move-on successfully N=148
Age, year – mean (SD)	52 (13.6)	47 (11.5)	53 (13.9)
Gender – n (%)			
Female	59 (31)	8 (18)	51 (34)
Male	134 (69)	37 (82)	97 (66)
Ethnicity – n (%)			
White	99 (51)	20 (44)	79 (53)
Black	72 (37)	23 (51)	49 (33)
Asian	9 (5)	1 (2)	8 (5)
Mixed	10 (1)	1 (2)	9 (6)
Other	3 (1)	0 (0)	3 (2)
Diagnosis – n (%)			
Schizophrenia	138 (72)	36 (80)	102 (69)
Schizoaffective	42 (22)	8 (18)	34 (23)
Bipolar	5 (3)	0 (0)	5 (3)
Psychosis not otherwise specified	5 (3)	0 (0)	5 (3)
Delusion disorder	2 (1)	0 (0)	2 (1)
Depression with psychosis	1 (1)	1 (2)	0 (0)
Accommodation type – n (%)			
Community Rehabilitation Unit	50 (26)	26 (58)	24 (16)
Residential Care Home	25 (13)	1 (2)	24 (16)
24-hour Supported Housing	118 (61)	18 (40)	100 (68)
Length of contact with mental health services, mean (SD) years[a]	27.4 (12.8)	22.6 (12.1)	29.0 (12.7)
Mean (SD) admissions prior to transfer to the team	6.5 (5.3)	5.7 (5.2)	6.7 (5.3)
Attendance at the transfer meeting – n (%)	170 (88)	39 (87)	131 (89)
Subject to Community Treatment Order – n (%)	48 (25)	10 (22)	38 (26)
Has a carer – n (%)	59 (31)	18 (40)	41 (27)
Any serious physical health problems – n (%)	87 (45)	12 (27)	75 (51)
CANSAS score – mean (SD)[b]			
Met need	6.2 (3.1)	5.5 (3.0)	6.4 (3.2)
Unmet need	3.5 (3.0)	3.4 (2.9)	3.6 (3.0)
Total need (Met + Unmet)	9.7 (3.6)	9.0 (4.1)	10.0 (3.4)
LSP score – mean (SD)[c]			
Self-care subscale	28.3 (6.6)	30.2 (6.3)	27.7 (6.6)
Non-turbulence subscale	40.6 (6.7)	42.4 (6.2)	40.0 (6.7)
Social contact subscale	14.1 (4.3)	15.1 (4.8)	13.7 (4.2)
Communication subscale	19.7 (3.8)	20.9 (3.2)	19.3 (4.0)
Responsibility subscale	16.1 (3.1)	17.3 (2.8)	15.7 (3.1)
Total score	118 (19.1)	126.2 (17.2)	116.5 (19.1)

Note. N= number; SD= standard deviation; CANSAS= Camberwell Assessment of Needs Short Appraisal Scale; LSP= Life Skills Profile.

Table 1

Service users' demographic and clinical characteristics at transfer to the team; whole sample, those who successfully moved on and those who did not

	Total N=193	Successful move-on N=45	Did not move-on successfully N=148

[a] Length of contact with the mental health service: five observations (2%) missing in "Total"; two observations (4%) missing in "Successful move-on"

[b] For both CANSAS and LSP: Twelve observations (6%) missing in "Total"; Four observations (9%) missing in "Successful move-on"

Table 2

Univariable association between baseline characteristics and successful move-on by Cox proportional hazard regression (N=181)

Categorical Variables	Incidence Rate	HR [95% CI]	P-value
Gender			
Female	2.87	1	0.062
Male	5.86	2.07 [0.97 to 4.45]	
Ethnicity			
White	4.12	1	0.176
Other	5.89	1.50 [0.83 to 2.70]	
Diagnosis			
Schizophrenia	5.41	1	0.351
Other	3.67	0.70 [0.34 to 1.47]	
Accommodation type			
Supported Housing and Residential Care Home	2.68	1	<0.001
Community Rehabilitation Unit	12.95	5.76 [3.16 to 10.50]	
Attended the transfer meeting			
No	5.54	1	0.789
Yes	4.86	0.89 [0.38 to 2.10]	
Subject to Community Treatment Order			
No	5.09	1	0.761
Yes	4.47	0.90 [0.44 to 1.81]	
Has a carer			
No	4.15	1	0.068
Yes	6.90	1.75 [0.96 to 3.17]	
Any serious physical health problems			
No	6.53	1	0.019
Yes	2.96	0.45 [0.23 to 0.88]	

Continuous Variables	HR [95% CI]	P-value
Age	0.97 [0.95 to 0.99]	0.003
Length of contact with mental health service, year	0.96 [0.93 to 0.98]	0.001
Number of admissions prior to transfer to the team	0.97 [0.90 to 1.03]	0.338
CANSAS score		
Met need	0.96 [0.86 to 1.06]	0.427
Unmet need	0.94 [0.84 to 1.05]	0.276
Total need	0.93 [0.85 to 1.01]	0.095
LSP score		
Self-care sub-score	1.09 [1.03 to 1.15]	0.003
Non-turbulence sub-score	1.08 [1.00 to 1.15]	0.023
Social contact sub-score	1.09 [1.01 to 1.18]	0.024
Communication sub-score	1.18 [1.05 to 1.32]	0.004
Responsibility sub-score	1.26 [1.11 to 1.45]	0.001
Total score	1.04 [1.02 to 1.07]	<0.001

Note. N=number of service users included in the analysis; Incidence rate= incidence rate of successful move-on per 1000 person-months; HR= hazard ratio; CI= confidence interval; CANSAS= Camberwell Assessment of Needs Short Appraisal Scale; LSP= Life Skills Profile.

Table 3

Multivariable Cox regression model with forward selection of predictors of successful move-on (N=181)

	HR [95% CI]	P-value
Accommodation type		
Supported Housing and Residential Care Home	1	<0.001
Community Rehabilitation Unit	3.90 [2.01 to 7.54]	
Any serious physical health problems		
No	1	0.036
Yes	0.44 [0.21 to 0.95]	
LSP total score	1.04 [1.02 to 1.06]	0.001

Note. N= number of service users included in the analysis; HR= hazard ratio; CI= confidence interval; LSP= Life Skills Profile.