**Abstract**

Introduction: There is little research around recovery career pathways and how they cluster together by individual and situational factors and over different time courses, based on the Betty Ford Institute characterisation of early, sustained and stable recovery.

Method: This paper uses a cluster analysis with data from the European Life in Recovery (LiR) survey to produce typologies of recovery careers around stages of recovery: early (<1 year), sustained (1-5 years), and stable (>5 years). A secondary aim was to explore evidence of national variations among clusters.

Results: Cluster analysis identified five typologies, broadly reflecting the three stages. ‘Early and Younger’ participants had the highest barriers and lowest strengths in recovery and were most likely to reside in Spain, Portugal and Poland. ‘Sustained but struggling to overcome barriers’ participants were characterized by high strengths in active addiction but most barriers in recovery and mainly resided in the Netherlands and Belgium. ‘Stable A: Employed, Parents with self-directed recoveries’reported higher barriers and lowest strengths in active addiction and were mainly from the Balkan countries. ‘Stable B: educated recovery veterans’ participants experienced the most barriers in active addiction but also the most strengths in recovery and were largely from the UK. ‘Mixed stages and older’ showed least barriers in recovery and highest strengths in active addiction and were also mainly from the UK.

Implications: Structural and cultural factors (possibly including location) are important in recovery journeys and that, while all recovery journeys are unique, there are clusters of characteristics broadly consistent with the Betty Ford Institute stages approach of early, sustained and stable recovery.

**Keywords: Life in Recovery; recovery; structural factors; international comparisons; addiction careers**

**Introduction**

While recovery remains a contested concept (White, 2007), consensus definitions have been developed by the UKDPC (2008) and the Betty Ford Institute Consensus group (2007). According to each of these definitions recovery is a journey that involves three broad areas of change: control over substance use (or sobriety); improvements in health and wellbeing, and active participation in society. The Betty Ford Institute group classifies recovery journeys into three stages: early recovery (up to one year); sustained recovery (between one and five years), and stable recovery (more than five years). Stable recovery is important as after five years of continuous sobriety individuals can be regarded as having ‘self-sustaining’ recovery (Best, Vanderplasschen, & Nisic, 2020). More recently, Ashford and colleagues (2019) have synthesised the core domains of recovery as improved physical and mental health and wellbeing, societal participation and citizenship, abstinence, sobriety or controlled substance use, a productive and meaningful life, and reaching full potential.

## According to the Surgeon General’s Report ‘Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health’ (2016), “There are many paths to recovery. People will choose their pathway based on their cultural values, their socioeconomic status, their psychological and behavioral needs, and the nature of their substance use disorder”. The report asserts a strong evidence-based for 12-step mutual aid groups and 12-step facilitation approaches, as well as support for educational settings and recovery housing, with other approaches lacking sufficient critical evidence. Similarly, in Sheedy and Whitter’s (2013) review of the evidence for recovery-oriented systems of care (ROSC), they argue that substance use disorders are most effectively addressed through a chronic care management model that includes longer term, outpatient care; recovery housing; and recovery coaching and recovery management check-ups.

Findings from the Life in Recovery (LiR) survey were first published in 2013 by the U.S. recovery advocacy organisation Faces and Voices of Recovery (FAVOR), in an attempt to understand the process of change from active addiction to recovery (Laudet,2013). This was the first national survey in the U.S. on recovery journeys, which used a cross-sectional, self-report survey to examine changes across five core life domains between time in active addiction and the period in recovery, and found marked gender differences in pathways to recovery in relation to elevated rates of criminal justice involvement in men, and higher levels of unresolved psychological and emotional health issues in women. One of the key concluding comments in the report was the multiple ways that people get well in the United States. The LiR surveys consistently showed that there are marked gains across a range of life domains and that the longer the person is in recovery the better/higher their recovery strengths in countries including Canada (McQuaid et al., 2017), Australia (Elms, et al., 2018; Best, 2015), the UK (Best et al., 2015), and Belgium and the Netherlands (Martinelli et al., 2020), although each national survey has shown differences in magnitude and patterns of change.

The Canadian Centre on Substance Use and Addiction (CCSA, 2017) concluded that, while there are similarities to other national Life in Recovery surveys in broad patterns, there are also marked differences with, for instance, a much higher proportion of Canadian participants reporting successfully sustaining recovery at their first attempt (around 50%). The CCSA report also noted that there were marked variations within the sample in pathways to recovery and in the mechanisms of recovery used. The LiR survey was re-classified into the Strengths and Barriers Recovery Scale (SABRS) as an attempt to quantify the LiR tool into a replicable scale and to assess what levels of change in removing barriers and building strengths are achieved at which point in the recovery journey, with the original study showing marked gender differences in addiction and recovery career pathways (Best, Vanderplasschen, & Nisic, 2020). A second study (Best et al., 2021) went on to demonstrate that higher recovery strengths and lower recovery barriers when in recovery were associated with having intimate and familial relationships and with larger and more recovery-oriented social networks.

The aim of the current LiR analysis is to understand whether specific segments of the respondent population emerge and to describe the characteristics of any emerging grouping, based partly on the multiplicity of pathways to recovery. We seek to understand what are the ‘universal’ characteristics of recovery and what are shaped by local factors, while also testing the stage model developed by the Betty Ford Institute Consensus Group of early, sustained and stable recovery.

A hierarchical clustering approach has been adopted in the present study which has previously been developed in a variety of settings to assess the comorbid needs of patients accessing public health services (Nnoahamet al., 2020; Ng et al., 2018). This exploratory approach has been extended to understanding the comorbid needs of those in treatment (Sondhi & Leidi, 2021), use of poppers within the gay community (Demant and Oviedo-Trespalacios, 2020) and a segmentation of drinkers (Al-Hamdani et al., 2019). The present study extends the approach used by Bischof et al. (2003) examining clusters of people in natural recovery from alcohol addiction. There are two primary conceptual questions addressed in this paper:

1. Which (clearly distinct) clusters can be identified around the three recovery stages of early, sustained, and stable recovery based on SABRS data and demographic characteristics?
2. What are the individual level factors, including location, that generate clustered patterns of recovery pathways?

This approach should be considered exploratory through the generation of hypotheses (Everitt et al., 2011) where the aim is to uncover potential distinct groups and patterns.

**Design**

***Participants***

The REC-PATH study was a collaboration between researchers in the UK, Belgium (Flanders), and the Netherlands and was designed to assess what ‘Mechanisms of Behaviour Change for Recovery’ (MOBCR) are represented in recovery journeys across the participating sites, and how these differed by gender (Best et al., 2018). The study focused on participants’ experiences of engaging in five different MOBCR’s:

1. 12-step mutual aid groups
2. Other peer-based recovery support services
3. Community-based treatment including substitute prescribing
4. Residential treatment including residence in a therapeutic community
5. ‘Natural recovery’ which refers to those who are recovered or in recovery without support or involvement from specialist treatment or peer-based mutual aid (Best et al., 2018).

***Measures***

The aim of the SABRS measure (Best, Vanderplasschen, & Nisic, 2020) was to translate as many of the items of the LiR measure into a scale consisting of positive and negative experiences and events that could be characterized as positive and negative recovery capital. These items relate to five domains (health, legal, finance, work, and family) both during active addiction, using retrospective recall, and recovery. From the original 44 items in the U.S. LiR, two had been removed from the Australian and UK versions as they did not apply (‘did not have health insurance’ and ‘lost right to vote’). For the SABRS scale, items were removed if they could only apply based on a previous event (e.g. a professional licence can only be restored if you have had one in the first place). A total of 32 items were included in the final SABRS and 10 items were excluded. The items were then separated into strength and barrier items (15 strength items and 17 barrier items), both applying to the period of active addiction and recovery (Best et al, 2021). All items were endorsed if they applied to the respondent and so were coded as 0 or 1 based on yes/no answers (strengths scale ranged from 0-15, barriers scale ranged from 0-17). Four totals were then calculated based on the endorsement of items per scale, which were shown to have acceptable internal consistency (Nunnally et al., 1978):

1. Recovery strengths in active addiction (0-15) [α=0.73]
2. Recovery barriers in active addiction (0-17) [α=0.72]
3. Recovery strengths in recovery (0-15) [α=0.80]
4. Recovery barriers in recovery (0-17) [α=0.79]

In addition to the 32 strength and barrier items, there were questions relating to home location, which were aggregated into five groups (United Kingdom, Netherlands/Belgium, Spain/Portugal, Poland and Balkans comprising Bosnia and Herzegovina, Serbia, Croatia and Montenegro. Demographic information included age, sex, education level, relationship status, number of dependent children and whether the respondent was a volunteer. Information was also asked on recovery status, including the age at first sought help and substances misused, including alcohol and tobacco. The reasons for stopping drug use, reasons for being in recovery and services currently being accessed were also included in the schedule. Further questions sought to determine the recovery status of each respondent (early, sustained and stable) and composite scores on individual’s addiction strengths/barriers and recovery strengths and barriers were calculated (details of each component is presented in Appendix 1).

***Procedure***

The Life in Recovery (LiR) survey was initially used as a recruitment screening instrument for the REC-PATH study (Best et al, 2018) and participants were recruited through convenience sampling in the United Kingdom, the Netherlands, and Flanders (Belgium). Parallel to this study, the LiR survey was also administered to recovery agencies and individuals in the Recovered Users Network (RUN), predominantly but not exclusively in Eastern Europe.

Ethical approval was obtained from Sheffield Hallam University in the UK, the University of Ghent in Belgium and IVO in the Neteherlands and the LiR survey was distributed through a link to Survey Monkey or Qualtrics which was sent out to an extensive range of recovery communities and treatment organization across all participating countries. Using the snowballing technique, the Survey Monkey or Qualtrics links were shared with others in drug addiction recovery by individuals through social media. In addition, hard copies were available for those who preferred this method of completion or who did not have access to the online version of the questionnaire (Best et al., 2018).

The data are based on self-report and the procedure for the REC-PATH study is described in Best et al. (2018) and in Martinelli et al. (2020). The recruitment procedure for the RUN sample is described in more depth in Best et al. (2020), with the RUN study method largely replicating the one used in the REC-PATH study and data collection for the RUN study occurring shortly after data collection for the REC-PATH study. Table 1 presents an outline of the gender and country of residence sample sizes.

INSERT TABLE 1 HERE

***Data Analysis***

The respondent population was segmented by way of a hierarchical cluster analysis in Stata v16 using Ward’s linkage method (Großwendt et al., 2019). Hierarchical cluster analysis has a long-standing history, and the method is considered exploratory as it assumes no a priori knowledge of how the clusters would form within the dataset and may provide some initial points in which to develop a theoretical understanding of recovery, and therefore should not be considered definitive (McLachlan & Peel, 2004). An agglomerative hierarchical method starts with each survey respondent considered as a potential cluster and moves iteratively to create clusters of people with similar characteristics until a stopping criterion is achieved where the derived clusters may be considered similar. Ward’s Linkage method links clusters that comprise the smallest increase in the error sum of squares in matrix form (Ward, 1963). The stopping rule for deriving the optimal number of clusters was established through examination of the F statistic (Calinski & Harabasz, 1974) and the Duda-Hart index (Duda et al., 2000). The clustering of groups is determined by each cluster’s proximity of distance to other individuals within that cluster. As the online survey comprised a mixture of variable types (e.g. nominal which included all of the SABRS items, and interval, such as employment status, recovery stage, and relationship status), the Gower Index of Similarity was utilised.

The process Only six cases or 0.5% of the survey did not fit into one of the five emergent clusters. The segmentation was supplemented by the use of a multivariate analysis of variance (MANOVA) to determine any statistically significant differences between clusters.

**Results**

A summary of the characteristics of the LiR 2018 cohort (n=1313) is presented below (Table 1). Nearly two-thirds of the sample was recorded as male (65.0%, n=854) with an average age of 40.3 years (range 18-74). There was a wide geographical distribution of respondents ranging from just under one-third (31.4%, n=412) from Belgium/Netherlands, 27.7% (n=364) from the UK and one-fifth from the Balkan countries of Bosnia and Herzegovina, Serbia, Croatia, and Montenegro (20.0%, n=263). Smaller numbers were reported from Poland (6.0%, n=79) and Spain/Portugal (5.0%, n=66). Based on self-report, over half (57.1%, n=754) defined themselves as ‘in recovery’ with a further 19.1% (n=251) reported as being ‘recovered’ from their addiction. Furthermore, 40.8% (n=536) of the sample were recorded as in stable recovery with 35.9% (n=472) in sustained recovery and 23.2% (n=305) in early recovery. There was a wide range of substances reported ever used, ranging from tobacco (used by 77%, n=1,020), alcohol (68.3%, n=897) and cannabis (66.3%, n=871) to prescribed buprenorphine (13.9%, n=183). The final number of clusters was determined as five by using a stopping rule that combined two summary measures: maximising the pseudo-F statistic (3.14) and minimising the pseudo T-squared statistic (0.65). The number of participants in each group is presented in Table 2 and Appendix 1:

INSERT TABLE 2 HERE

The basic characteristics of the clusters are discussed below but outlined in full in Appendix 1. Univariate analysis of variance (ANOVA) tests showed that only two variables were not statistically significant (at p<0.05). These were ‘natural recovery’ (p=0.095; which was extremely uncommon in this sample) and ‘At what age did you first attempt to stop / seek help for your problem?’ (p=0.082). We assessed inter-cluster differences whereby the global F test indicated that some of the variables within our model have a statistically significant association with the five clusters and therefore can be shown to be distinct groupings (see Table 3 below).

INSERT TABLE 3 HERE

Table 4 shows the distinct differences in the trajectories of each of the clusters in terms of the number of strengths and barriers experienced in the addiction stage and the number of strengths and barriers experienced in their current stage.

INSERT TABLE 4 HERE

***Cluster 1, “Early and Younger”:*** (*n* = 271, 20.6%) This cluster reported the highest average rates of barriers in recovery (mean = 3.3) and the lowest average rates of strengths in recovery (7.9), consistent with the early days of recovery. In other words, this is the lowest functioning group in recovery, as would be expected for people primarily in the early recovery stage. This cluster was characterized by participants who were most likely to be male (80.8%), most likely to be primary-level educated only (25.8%), most likely to be single (66.8%) and most likely residing in Spain/Portugal (17.7%) or Poland (11.4%). This was the youngest cluster (mean age = 39.8) with the highest rates of ever using cocaine (69.0%), buprenorphine (28.4%), and methadone (46.5%). Participants in this cluster were most likely to report current issues with housing (11.4%), eviction (10.0%), and the criminal justice system (15.1%), suggesting ongoing barriers to their recovery journeys.

This cluster was the most likely grouping to have accessed 12-Step groups (50.0%), Therapeutic Communities/ Residential Rehabilitation (64.9%), and Medication-Assisted Therapy (17.7%). Cluster 1 was labelled the ‘Early and younger’ cluster as the grouping of participants who were most likely to be in the early stage of recovery (59.0%).

***Cluster 2, “Sustained but struggling (to overcome barriers)”*** (*n* = 287, 21.9%) This cluster was characterized by high strengths in addiction (mean = 5.3), with high levels of residual barriers in recovery (mean = 3.0).

This was the cluster most likely to be secondary school educated (62.0%), to have been offending in the last 30 days (10.1%) and to reside in the Netherlands/Belgium (86.1%). This cluster was likely to be cohabiting (19.9%) or divorced (15.7%), and likely to be employed part-time (24.7%) or volunteering (38.3%). This grouping was likely to report financial issues as a motive to stop their drug use (55.1%) and cited mental health reasons to stay in recovery (91.3%). This grouping was characterized by the shortest time compared to other groupings from their first attempt to stop/seek help to their stated age (an average of four years).

Cluster 2 was labelled the ‘Sustained but struggling (to overcome barriers)’ cluster as the group with the highest proportion of participants in sustained recovery (ie between 1-5 years of recovery time)(54.4%), but with ongoing issues around addiction treatment needs, around mental health and around ongoing involvement with the justice system.

***Cluster 3, “Stable A: Employed, Parents with self-directed recoveries”*** (*n* = 257, 19.6%) This cluster was characterized by a high average number of barriers in addiction (mean = 9.1) and the lowest average of strengths in the active addiction phase (mean = 3.9). In other words, this was the group that was functioning worst while in active addiction.

Participants in this group were most likely to be educated to secondary school level (58.4%), to be married (45.9%) and with dependent children (54.5%), the most likely to be working full-time (63.4%) or part-time (25.3%) in the last 30 days, and were most likely to reside in the Balkans (53.7%). They were also characterized by the highest rates of ever using a number of illicit drugs (heroin (80.5%); amphetamines (68.9%); ecstasy (63.0%); cannabis (83.0%)), and high rates of ever using methadone (45.1%) and were the most likely to state that they were currently accessing no services (52.5%) and was the youngest cluster when they first attempted to stop/seek help for their problem (mean age = 24.6).

Cluster 3 in this study was labelled the **‘*Stable A: Employed, Parents with self-directed recoveries*’** cluster as the grouping who were most likely to be in stable recovery (ie to have more than five years of recovery time)(68.1%).

***Cluster 4, “Stable B: educated with the most marked transitions”***(*n* = 216, 16.5%) was characterized by the highest rates of barriers when in active addiction (9.8%), but with the highest rates of strengths in recovery (mean = 12.4). Cluster 4 had the highest proportion who had completed higher education (71.8%), and the most likely cluster to be cohabiting (22.2%), and were the most likely to reside in the UK (69.4%). This cluster was most likely to have used alcohol (77.8%) and crack cocaine (49.1%). This was the oldest cluster when they first attempted to stop/seek help for their problem (mean age = 45.4) with a short time from their first attempt to stop/seek help to their stated age (4.4 years).

This cluster was the most likely to use or access non-12-step recovery pathways (18.1%) and the most likely to have had more treatment episodes (mean = 2.9). Cluster 4 had the highest proportion of participants in stable recovery (73.6%) yet had come from the most problematic active addictions.

***Cluster 5 “*Mixed stages and older”** (*n* = 276, 21.2%) This cluster included participants with the highest average level of strengths in the active addiction phase (mean = 5.6), the lowest average of barriers in active addiction (mean = 7.7), and the lowest average number of barriers in the recovery phase (mean = 2.1).

This was the oldest cluster (mean age = 60.4) and participants were most likely to reside in the UK (46.7%), likely to have experienced higher education (70.7%), and the most likely cluster to be divorced (15.9%). Participants were most likely to be volunteering in the last 30 days (41.7%) and a large proportion reported ever using alcohol (72.5%).

Cluster 5 was labelled the ‘Mixed stages and older’ cluster as they were the only cluster which contained a mixture of recovery stages including those in sustained and stable phases.

**Discussion**

This paper has found that clearly defined clusters exist which are distinguishable by recovery stage (largely supporting the Betty Ford Institute taxonomy of stages), strengths and barriers to recovery, demographic characteristics and variations in the transitions in strengths and barriers from active addiction to recovery. There is also evidence that national patterns in the clustering of recovery characteristics exist that provide preliminary support for the argument of cultural specificity of recovery pathways.

This study has extended the utilisation of hierarchical clustering approaches previously used in clinical settings for patients accessing public health services (Nnoahamet al., 2020; Ng et al., 2018) and for assessing the immediate needs of those in treatment (Sondhi & Leidi, 2021). The hierarchical clustering approach has revealed a number of distinct trajectories between the clusters, illustrating marked patterns of change in strengths and barriers at different stages of recovery. Four of the five clusters identified map onto the Betty Ford Consensus Group (2007) stage model (with one cluster each for Early and Sustained Recovery and two for Stable Recovery, and only the fifth ‘mixed’ group not fitting into this framework). Country of residence was a key marker in the distinct trajectories that emerged from the clusters, and may provide further support for the idea that recovery pathways are shaped in part by contextual factors such as access to mutual aid groups and to recovery-oriented specialist treatment provision (such as residential treatment), although much further research is needed to test this adequately.

Being educated, employed, having parental responsibility and being older appeared to be key supports for those in clusters at the stable stage of recovery (primarily Clusters 3 and 4, but also including some of those in cluster 5). Cluster 5 is slightly different as it straddles the Sustained and Stable stages, but appears to consist of people who are more akin to natural recovery in that they appear to have had both more strengths and fewer barriers to recovery in the active addiction phase. Whereas mental health, recent criminal justice involvement, having less time since stopping the use of drugs and first seeking help and being younger in age appeared to contribute to having a greater number of barriers in recovery, and not surprisingly, are mainly identified in those in early recovery in Cluster 1, ie for people early in their recovery journeys.

Cluster 1 is also the lowest functioning group in recovery as they had the lowest recovery strengths and the highest recovery barriers and so is akin to a ‘pains of recovery’ cluster in line with findings that demonstrate the existence of high barriers or pains of recovery and very low strengths of recovery in the early recovery stage (Best, et al., 2020; Patton et al., 2022). This pattern is to be expected given the recency from which the person has left behind a lifestyle that is also significantly marred by drug addiction, and where the challenges of prolonged withdrawal and changes in identity and lifestyle may be the most challenging.

The older and stable cluster with the strongest trajectory of growth (Cluster 4) showed the highest number of barriers in addiction and the highest number of recovery strengths at the recovery stage. It highlights the possibility of a ‘rebound’ effect, an inverse relationship between barriers and strengths in early and stable recovery (Patton, et al., 2022). The push and pull factors dynamically interact over time to enable a person’s life to rebound from one of addiction to increased well-being, human flourishing and contribution, and this group suggests that the Stable group outlined in the Betty Ford Consensus document should not be seen as a homogenous group (they are represented in three clusters in the current analysis) nor should we conceive of growth as ending at the five-year point.

The ’Sustained but struggling to overcome barriers’ (Cluster 2) represents the sustained stage of recovery as being ‘in transition’ within the recovery journey. That is, during the four-year duration of this stage, the number of barriers begins to reduce and the number of strengths increases, but given the estimated five-year duration to stable recovery, this may involve considerable ongoing pains of recovery and may require further analysis to test how linear this stage may be, and may involve continuing to address residual impacts of a drug-using lifestyle, including justice and health issues. This potentially explains why this cluster experiences the highest number of residual barriers in recovery which are related to for example, criminal justice involvement, and mental health. The sustained stage of recovery is a significant transition period which is crucial to help aid entry to stable recovery.

The magnitude of the transformation evident in cluster 4, rebounding from having the highest rates of barriers in addiction and yet evolving to attain the highest number of strengths in recovery appears to suggest that the depth of addiction deficits is not a barrier to recovery capital building in long-term and stable recovery. Despite cluster 3 being the lowest functioning group in active addiction coupled with low treatment engagement, they still reached stable recovery, and so whilst cluster 1 is the lowest functioning cluster in recovery at present, the trajectories in clusters 3, 4 and 5 also show that changes in strengths and barriers to recovery can reverse from early to stable recovery.

The hierarchical clustering approach included a comparison between countries and as such extends the reach to consider the impact of structural factors at the level of the country in which the recovery journey is taking place. The five clusters had distinct differences between them including country of residence, with Clusters 1 and 2 in particular linked to specific countries and regions suggesting that there are systemic factors (that may include lack of availability of peer mutual aid groups) that may be a barrier to recovery progress. While this is inevitably tentative at this stage, and we don’t know anything about the country of residence during addiction (only at the time of completion of the questionnaire), this provides interesting early indications that there are contextual factors that shape pathways to recovery and we should not assume universality in how this is achieved. An earlier analysis of the SABRS data by Best et al (2021) has also suggested that there may well be cultural/national differences in recovery pathways. Prospective comparative research is essential in the area of recovery capital (Best and Hennessey, 2021) as part of a broader assessment of recovery pathways for different groups and populations, and will be essential to extend our understanding of the cultural parameters for addiction recovery.

The results of this study should take into account the following limitations. Hierarchical clustering as a method assumes no a priori knowledge of the structure of the dataset, and due to the likelihood of overlap across segments, this may include variability in how the data are interpreted. Therefore, different interpretations of the datasets may exist.

Being ‘in recovery’ was self-defined by participants at the time of answering the survey. There is no consensual definition of recovery, but participants’ subjective definitions may have affected how they answered the survey, making it difficult to draw objective conclusions on their meaning of recovery. This process also means that those in the stable clusters will only comprise those who still see themselves as in recovery at that stage of their journey and so we are unable to comment on those who have lapsed or have rejected the recovery label.

However, Valentine (2010) defined recovery as something personal and that ‘you are in recovery if you say you are’. Allowing participants’ own interpretations of whether they are in recovery could be seen as a strength. Further, when answering the survey, participants in recovery looked at their addiction phase in retrospect, and therefore it is possible that participants were subject to inaccurate responses. However, a real strength of this study is the similar proportion of participants that fell into each cluster, as this resulted in five distinct groupings. Further, another strength is that only six cases or 0.5% of those surveyed did not fit into one of the emergent clusters demonstrating the ability of the method to differentiate between these populations. While this is based on self-report, this paper offers a preliminary model for testing in other settings using other methods to assess recovery pathways.

Differences in the clusters relating to the stage of recovery reveal a minimum of a five-year period is needed for consolidated changes to have occurred in the number of barriers and strengths evident in the lives of participants. The profile of strengths and barriers are distinctly different at different stages of recovery and therefore regular reviews of recovery plans are needed to monitor the important changes occurring but moreover need to take into account and plan for the potency of longer-term push and pull relationships between strengths and barriers. Similarly, research evaluations of the effectiveness of treatment, rehabilitation or related interventions that focus on short term follow up windows are unlikely to accurately reflect the dynamic push and pull interactions operating between barriers and strengths at different stages within the recovery journey.

The findings in this present study describe five distinct clusters of participants that differ in recovery stages, ranging from earliest in recovery to most stable in recovery. The identification of these clusters not only increases understanding of characteristics and associations between the groupings, but provides a way to individualise recovery supports, with the potential for improving outcomes for those in recovery from substance addictions. Creating multiple pathways helps people to move away from narrow views of ‘the right way’ and should form the basis for a more sophisticated model of change over time. A person possesses more recovery strengths and fewer recovery barriers across a range of life domains the longer they are in recovery, therefore, future research is needed into how residual barriers and those evident in early recovery can be overcome sooner and more effectively, including an exploration of potential push and pull dynamics interacting at different stages of the recovery journey.

**Disclosure of interest**

There are no conflicts of interest for any of the authors.

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