**Introduction**

Many patients with mental health disorders (MHDs) suffer from more than one condition and present with a variety of needs over time, requiring the involvement and support of professionals with different expertise. Long-term care delivery needs to be appropriate to current patient needs, and coordinated among services, which describes a critically important concept known as continuity of care (CoC) ([Puntis, Rugkasa, Forrest, Mitchell, & Burns, 2015](#)). CoC can be defined as the “process involving the orderly, uninterrupted movement of patients among the diverse elements of the service delivery system” ([Bachrach, 1981](#), p.1449). CoC is a multidimensional phenomenon that brings together concepts such as longitudinality, individuality, comprehensiveness, flexibility, relationship, accessibility and communication ([Bachrach, 1981](#)). Patients' perspective is central, as all aspects of CoC will ultimately be filtered through their experience ([Weaver, Coffey, & Hewitt, 2017](#)). Clinicians and decision-makers increasingly recognize the necessity of promoting CoC as an essential feature of good quality care ([Burns et al., 2009](#)).

Better CoC was shown to be positively correlated with service satisfaction ([Joyce et al., 2010](#)) and with quality of life ([QoL](#)) ([Adair et al., 2005; Catty et al., 2011b; Sweeney et al., 2012](#)). On the one hand, younger age, elevated risk for suicide, treatment resistance, greater problem severity ([Joyce et al., 2010](#)), personality disorder, diagnosis of three or more psychiatric disorders ([Durbin, Goering, Streiner, & Pink, 2004](#)), and depression ([Adair et al., 2005](#)) were all associated with lower CoC. On the other hand, having a case manager, or psychiatrist, having met needs for income and housing support ([Durbin et al., 2004](#)), less severity of MHD and absence of comorbid substance use ([Adair et al., 2005](#)), as well as a strong therapeutic alliance, were associated with higher CoC ([Sweeney et al., 2012](#)).

Variables linked to CoC have yet to be regrouped into patient profiles. Identifying clusters of variables that describe patients with MHDs may be a useful approach for guiding treatment decisions among physicians and improving service planning. Cluster analysis was previously used to identify profiles of patients with MHDs ([Fleury, Grenier, Bamvita, Perreault, & Caron, 2011](#)), those with severe MHDs ([Fleury, Grenier, & Bamvita, 2015; Herman & Mowbray, 1991](#)), and with co-occurring severe MHDs and substance use disorders (SUDs) ([Luke, Mowbray, Klump, Herman, & Boots Miller, 1996](#)). However, no known study has attempted to use cluster analyses in evaluations of CoC.

The objective of this study was to create a typology of patients with MHDs to better understand their perceptions...
of CoC. A large sample of patients with multiple MHDs was recruited from community-based, primary care and specialized psychiatric services. Selected participants reflected a wider variety of needs and service use patterns, as compared with samples described in previous studies. While the present study focused on a clinical population in Quebec, it was anticipated that the findings would have relevance for populations in countries with similar reform objectives, such as the extension of mental health care into local communities, and promotion of CoC.

Methods
Setting, sample and procedures
The research took place in four health service networks. Three networks were located in urban areas and provided services for two sites (Montreal and Quebec City) and the other situated in a semi-urban area (Chicoutimi). The networks included hospital departments of psychiatry or psychiatric hospitals, as well as outpatient multidisciplinary primary care MH teams (including psychologists, social workers and other psychosocial clinicians); addiction centers; community-based services (e.g. day centers, crisis services, self-help groups and supported employment programs); public MH housing resources (e.g. intermediary residences, foster homes); and private clinics staffed by general practitioners or psychologists. A cross-sectional design was used. Data were collected between June 2013 and August 2014 during implementation of the Quebec Mental Health Reform (Fleury et al., 2016). This reform aimed to improve access to services, quality care and CoC by developing primary care and building integrated service networks.

The research ethics board of the Douglas Mental Health University Institute approved the study protocol. Study participants had to be between 18 and 70 years old, and diagnosed with at least one MHD according to the DSM-IV (American Psychiatric Association, 2000). Patients hospitalized for involuntary psychiatric treatment or affected by a severe intellectual disability were excluded from the study. Various recruitment strategies, including self-referral, were used. Information sessions and flyers describing the project were offered to mental health care providers and housing staff, who were asked to refer eligible clients to the research team. Participants provided written informed consent and authorization for research team members to access their medical files. Trained research assistants conducted two 90-minute interviews with each participant.

Conceptual framework
Variables were selected based on previous studies involving patient perceptions of CoC. Variables were regrouped into three categories based on Andersen’s (1995) Behavioral Model, in which service use is determined by predisposing
variables, factors, and enabling factors. Predisposing factors refer to patient characteristics that existed before appearance of the illness; while needs factors suggest different reasons for service use, and enabling factors include practical aspects and facilitators of service use. In this study, predisposing factors included age, gender, civil status, education, and type of accommodation. Needs factors encompassed diagnostic categories, number of MHDs and number and seriousness of needs as measured by the Montreal Assessment of Needs Questionnaire (MANQ; Tremblay, Bamvita, Grenier, & Fleury, 2014). Diagnoses were categorized as according to common MHDs (e.g. anxiety disorders, adjustment disorders, mood disorders), severe MHDs (e.g. psychotic disorders), personality disorders, alcohol use disorders and drug use disorders. Regarding enabling factors, QoL, help received (from relatives and from services), number of clinicians consulted (from different MH professions) and having a family physician were included. As this study used a cross-sectional design, distinction was not made between variables previously identified as predictors, versus outcomes, of CoC.

**Measures**

Four questionnaires, administered in English or French, were used to collect data. Table 1 provides a description of each instrument. Patient medical records provided additional data (e.g. diagnoses). The patient-rated scale of the Alberta Continuity of Services Scale for Mental Health (ACSS-MH; Joyce et al., 2010) measured CoC, the variable of interest. This instrument includes 43 items scored on five-point Likert scales. The total score ranges from 43 to 215, with higher scores indicating more positive perceptions of CoC (Durbin et al., 2004). Factor analysis with the ACSS-MH revealed three dimensions of CoC: Individualized Care (attentiveness to individual needs), Responsive System (coherent system characterized by good communications between providers) and Responsive Caregiver (responsiveness of a primary provider) (Joyce et al., 2010). The questionnaire was tested with service users from community and outpatient MH programs, including those with severe MHDs, and was found to have adequate psychometric properties (Adair et al., 2005; Durbin et al., 2004; Joyce et al., 2010). Two systematic reviews recommended use of the ACSS-MH to measure CoC in patients with MHDs, based on the measurement properties (Uijen et al., 2012) and comprehensiveness (Vandyk, Graham, VanDenKerkhof, Ross-White, & Harrison, 2013) of the instrument.

The MANQ (Tremblay et al., 2014) assessed perceived needs (number and seriousness). This questionnaire derives from the Camberwell Assessment of Needs (Phelan et al., 1995), and evaluates a total of 26 needs in five categories: basic (e.g. food, daytime activities); health (e.g. alcohol use, drug use); functioning (e.g. self-care, money); social (e.g. company, intimate relationships); and services (e.g. benefits, involvement in treatment decisions). The instrument uses eleven-point Likert scales. The total score for seriousness of needs ranges from 0 to 260. The MANQ was also used to measure help received from relatives and from services (with higher scores indicating more help received) with eleven-point Likert scales providing total scores from 0 to 10.

QoL was assessed using the Satisfaction with Life Domains Scale (SLDS; Baker, Jodrey, & Intagliata, 1992), a 20-item measure consisting of seven-point Likert scales. The total score ranges from 20 to 140, with higher scores

**Table 1. Instruments.**

| Name | Variables | Description | Cronbach’s alpha | References |
|------|-----------|-------------|------------------|------------|
| Alberta Continuity of Services Scale for Mental Health (ACSS-MH) | Continuity of services (access, team functioning, interpersonal aspects) 43 items Number of need areas (26 in five categories) Severity of needs Amount of help received from relatives Amount of help received from services | 5 point scale (1 to 5) Rating: 43 to 215; Higher = greater continuity of services Number of needs: Rating: 0 to 26 (obtained by summing the number of needs with a score superior to 0 on the analogue scale) Severity of Needs: 11 point scale (0 to 10) Rating: 0 to 260 (obtained by summing the severity scores for all areas of need), higher = higher severity of needs; Amount of help received from services: 11 point scale (0 to 10), higher = more help received; Amount of help received from services: 11 point scale (0 to 10), higher = more help received | 0.78 to 0.92 | Joyce et al. 2010, Tremblay et al. 2014 |
| Montreal Assessment of Needs questionnaire (MANQ) | Subjective quality of life 20 items | 7 point scale (1 to 7) Rating: 20 to 140; Higher = better quality of life | 0.92 | Baker et al. 1992 |
| Satisfaction with Life Domains Scale (SLDS) | Survey questionnaire for socio-demographic characteristics. Type and frequency of professionals and services used in previous 12 months 143 items | Descriptive only | N.A. | Gravel & Béland 2005 |
| Service Utilization Questionnaire (SUQ) | Higher quality of life | N/A | 0.92 | Baker et al. 1992 |

References:

1. Bamvita, Grenier, & Fleury, 2014
2. Adair et al., 2005
3. Durbin et al., 2004
4. Joyce et al., 2010
5. Tremblay et al., 2014
6. Uijen et al., 2012
7. Vandyk, Graham, VanDenKerkhof, Ross-White, & Harrison, 2013
8. Phelan et al., 1995
9. Baker et al., 1992
10. Gravel & Béland, 2005
indicating better QoL. This self-report instrument was specifically designed to assess QoL in patients with chronic MHDs (Boyer et al., 2013). The SLDS focuses on subjective QoL, more closely associated with life satisfaction, rather than objective QoL, which is often used to describe social functioning (Caron, Mercier, Diaz, & Martin, 2005). Caron, Tempier, Mercier, and Leouffe (1998) reported QoL mean scores of 107.2 (SD = 20.3) and 111.1 (SD = 14.9) for psychiatric patients and the general population respectively, as one possible benchmark.

The Service Utilization Questionnaire (SUQ) is a 143-item questionnaire derived from the Canadian Community Health Survey Questionnaire (Gravel & Bélard, 2005). The SUQ provided descriptive information on various MH professionals consulted by participants.

**Analyses**

Univariate analyses included frequency distributions for categorical variables, and mean values for continuous variables. Clustering of variables was computed using the SPSS Statistics 24.0. package Two Step Cluster (IBM; Norusis, 2008). This program generates a pre-clustering of participants into small sub-classes (first step), followed by a clustering of the sub-classes into the appropriate number of classes based on specific statistical tests (second step). The variable of interest was continuity of care (CoC), operationalized according to the ACSS-MH. Variables were entered into the cluster analysis one by one, by categorical variables first followed by continuous variables. The Log-likelihood method was used to determine inter-subject distance. The number of classes was determined using the Schwartz Bayesian criteria and Log-likelihood method, which reflect the overall contribution of participants to inter-class homogeneity. The quality of the model was estimated as satisfactory using the class cohesion and separation test. Cluster analysis was performed based on the SPSS version of the SAS program, Latent Class analysis (LCA) (Clements 1954; Lazarsfeld, 1950). Both use Bayesian probabilities to determine the number of classes (Bayesian Information Criterion for LCA or Schwartz Bayesian criteria for Two Step Clustering). Comparison tests were conducted to assess statistical differences between classes for all variables included in the cluster model and between classes based on the three dimensions (Individualized Care, Responsive System, and Responsive Caregiver) of ACSS-MH score.

**Results**

A total of 339 participants were recruited. The response rate was 81% (61% in Montreal, 87% in Quebec City and 95% in Chicoutimi). After replacing missing values, data from 327 patients were used to carry out the analyses. Respondent/non-respondent comparisons on gender and age revealed no significant differences (Gender: Pearson’s Chi-Square: $X^2 (1,N = 327) = 0.522; p = 0.829$; Age: ANOVA t test: $F (2,326)= 620; p = 0.453$). Table 2 presents descriptive statistics for the sample. The majority of patients were aged 40 and over, and were single. Men and women were equally represented. Forty-seven percent had received some post-secondary education. The most prevalent MH diagnoses were common MHDs (58%); severe MHDs (38%); personality disorders (28%); alcohol use disorders (13%), and drug use disorders (14%). Many patients had more than one MHD (excluding SUDs), 1.8 (SD = 1.0) diagnoses on average. Most patients reported having a family physician and had consulted an average of 3.3 MH professionals (SD = 1.1). The mean ACSS-MH score for this sample was 132.3 (SD = 16.1). Table 3 presents findings for the cluster model produced by the data and the results for each class are summarized in Figure 1. ANOVA revealed significant differences in CoC scores between profiles [$F(4,326) = 6.18$, $p < 0.0001$]. After applying the Bonferroni correction, contrast analyses indicated significant differences in continuity between Classes 3 and 5 ($p = 0.001$), Classes 2 and 5 ($p = 0.002$), and between Classes 1 and 5 ($p = 0.001$), but not between the other pairs of classes. Tests confirming the cluster analysis indicated that predisposing, needs and service use variables differed significantly across classes (Table 4).

Class 1 patients reported significantly lower continuity scores than Class 5 patients. They were relatively older and more educated than patients in other classes, with the exception of Class 5 patients. They ranked third to highest on QoL. They had the lowest number, and least serious, needs. Nonetheless, Class 1 patients were not significantly different from those in Classes 2, 4 and 5. These patients had mainly common MHDs and lower than average numbers of identified MHDs. No drug use disorders were identified among members of this class. They reported the lowest scores on help received from relatives and the lowest scores on help from services, which were not significantly different than the results for Class 2 patients. Class 1 participants were labeled: "older adults with low needs, diagnosed with common MHDs, and reporting little help from relatives and services, with low CoC scores".

Patients in Class 2 reported a low level of CoC, which was not significantly different from CoC scores for patients in Classes 1, 3 and 4. Most were women less than 55 years old. This class included the highest proportion of participants living in couples. Class 2 was noteworthy for the absence of personality or alcohol use disorders, and the lowest proportion of severe MHDs. Common MHDs were the main diagnoses reported and Class 2 participants ranked fourth on number of diagnosed MHDs. They were second on help received from relatives, but fourth on help received from services. They consulted very few MH professionals, but most had a family physician. Patients in this class were labeled: "women diagnosed with common MHDs often living in couples, receiving help mainly from relatives, but very little from services, and reporting low CoC".

Patients in Class 3 also reported low CoC scores. They were the second to youngest cluster in the sample. Most were single women. This class had the highest proportion of patients with post-secondary education. Class 3 participants also had the lowest QoL scores. This class was noteworthy
for the highest number and seriousness of needs reported, as well as the highest prevalence of personality and alcohol use disorders. Patients in Class 3 had the highest number of MHDs diagnoses, including a great proportion of common MHDs. They also accounted for the highest number of MH professionals consulted; yet the difference with Class 1 and 5 patients on this variable were not significant. Class 3 was labeled: “young women with high comorbidity, including personality disorders, alcohol use disorders, and common MHDs, presenting high needs, receiving help from a variety of professionals, and reporting low CoC”.

Patients in Class 4 ranked second, but above the average for other patients, in terms of CoC scores; while results were not significantly different than CoC scores for other classes. Class 4 was a middle-aged cluster, consisting of mainly single men, who were poorly educated, and living in supervised housing. Class 4 reported the second highest QoL scores. Patients in this class had the highest prevalence of severe MHDs, but lowest number of MH diagnoses. No common MHDs were identified. Class 4 patients reported below average levels of need, in both number and intensity. This class also had the highest percentage with a family physician, but the lowest number of MH professionals consulted. They were fourth in terms of help received from relatives, but second on help received from services. Class 4 was labeled: “men with severe MHDs living in supervised accommodations, with substantial help from services and high CoC”.

By contrast, Class 5 had the highest mean CoC scores (no significant differences with Class 4). Patients in Class 5 tended to be younger (<40 years old), exclusively men, single and poorly educated; they had the highest QoL scores among the classes. This class also had the highest prevalence of drug use disorders, and was second-to-highest for number of diagnoses. Patients in this class had more relatively serious needs (no significant differences with other classes), but reported fewer needs overall than other classes. They received the greatest amount of help from relatives (no significant differences with other classes), and from services, where significant differences were identified with Class 1 patients. Patients in Class 5 were labeled: “young men diagnosed with severe MHDs and SUDs with high QoL, high levels of help from relatives and services, and high CoC”.

Regarding the ACSS-MH dimensions, statistically significant differences were found between Responsive System and Responsive Caregiver only (Supplementary Table 1).

### Table 2. Participants characteristics (N = 327).

| Predisposing factors | Min. | Max. | Frequency/Mean | Percent/SD |
|----------------------|------|------|----------------|------------|
| **Categorical variables** |
| Age categories       |      |      |                |            |
| <40                  | 80   | 24.5 |                |            |
| 40-54                | 139  | 42.5 |                |            |
| 55 and over          | 108  | 33.0 |                |            |
| **Sex**              |      |      |                |            |
| Females              | 164  | 50.2 |                |            |
| Males                | 163  | 49.8 |                |            |
| **Civil status**     |      |      |                |            |
| Single               | 277  | 84.7 |                |            |
| In couple            | 50   | 15.3 |                |            |
| **Education**        |      |      |                |            |
| Secondary or less    | 174  | 53.2 |                |            |
| college or over      | 153  | 46.8 |                |            |
| **Housing**          |      |      |                |            |
| Supervised           | 55   | 16.8 |                |            |
| Autonomous           | 272  | 83.2 |                |            |
| **Needs factors**    |      |      |                |            |
| **Categorical variables** |
| Severe MHDs          | 123  | 37.6 |                |            |
| Common MHDs          | 188  | 57.5 |                |            |
| Personality disorders| 93   | 28.4 |                |            |
| Alcohol use disorders| 43   | 13.1 |                |            |
| Drug use disorders   | 45   | 13.8 |                |            |
| **Continuous variables** |
| Number of MHDs       | 0.0  | 6.0  | 1.8            | 1.1        |
| Number of needs (MANQ)| 0.0 | 21.0 | 8.5            | 4.4        |
| Seriousness of needs (MANQ)| 0.0 | 10.0 | 5.4            | 1.9        |
| **Enabling factors** |      |      |                |            |
| Have a family physician | 284 | 86.9 |                |            |
| **Continuous variables** |
| Quality of life (SLDS score) | 38.0 | 139.0 | 96.6 | 18.8 |
| Total help from relatives | 0.0 | 10.0 | 2.6 | 2.5 |
| Total help from services | 0.0 | 10.0 | 3.3 | 2.4 |
| Number of MH professionals consulted | 0.0 | 6.0 | 3.3 | 1.1 |
| **Variable of interest** |
| Continuity of care (ACSS-MH) | 67.0 | 195.0 | 132.3 | 16.1 |

Min: Minimum; Max: Maximum; MHDs: Mental health disorders; MANQ: Montreal Assessment of Needs Questionnaire; SLDS: Satisfaction with Life Domains Scale; MH: Mental health; ACSS-MH: Alberta Continuity of Services Scale-Mental health.
### Table 3. Cluster analysis of perceived continuity of care among participants with mental health disorders.

| Class 1  | Class 2  | Class 3  | Class 4  | Class 5  | Combined |
|----------|----------|----------|----------|----------|----------|
| (N = 62; 19.0%) | (N = 58; 17.7%) | (N = 82; 25.1%) | (N = 84; 25.7%) | (N = 41; 12.5%) | (N = 327; 100.0%) |
| **Predisposing factors** | **Predisposing factors** | **Predisposing factors** | **Predisposing factors** | **Predisposing factors** | **Predisposing factors** |
| Age categories | Age categories | Age categories | Age categories | Age categories | Age categories |
| <40 | 0.0% | 0.0% | 19 | 23.8% | 32.8% | 28 | 35.0% | 34.2% | 5 | 6.3% | 6.0% | 28 | 35.0% | 68.3% | 80 | 100.0% |
| 40–54 | 1 | 0.7% | 1.6% | 36 | 25.9% | 62.1% | 44 | 31.7% | 53.7% | 48 | 34.5% | 57.1% | 10 | 7.2% | 24.4% | 139 | 100.0% |
| 55 and over | 61 | 56.5% | 98.4% | 3 | 2.8% | 5.2% | 10 | 9.3% | 12.2% | 31 | 28.7% | 36.9% | 3 | 2.8% | 7.3% | 108 | 100.0% |
| **Sex** | **Sex** | **Sex** | **Sex** | **Sex** | **Sex** |
| Females | 34 | 20.7% | 54.8% | 45 | 27.4% | 77.6% | 57 | 34.8% | 69.5% | 28 | 17.1% | 33.3% | 0 | 0.0% | 0.0% | 164 | 100.0% |
| Males | 28 | 17.2% | 45.2% | 13 | 8.0% | 22.4 | 25 | 15.3% | 30.5% | 56 | 34.4% | 66.7% | 41 | 25.2% | 100.0% | 163 | 100.0% |
| **Civil status** | **Civil status** | **Civil status** | **Civil status** | **Civil status** | **Civil status** |
| Single | 47 | 17.0% | 75.8% | 33 | 11.9% | 56.9% | 75 | 27.1% | 91.5% | 82 | 29.6% | 97.6% | 40 | 14.4% | 97.6% | 277 | 100.0% |
| In couple | 15 | 30.0% | 24.2% | 25 | 50.0% | 43.1% | 7 | 14.0% | 8.5% | 2 | 4.0% | 2.4% | 1 | 2.0% | 2.4% | 50 | 100.0% |
| **Education** | **Education** | **Education** | **Education** | **Education** | **Education** |
| Secondary or less | 22 | 12.6% | 35.5% | 32 | 18.4% | 55.2% | 31 | 17.8% | 37.8% | 56 | 32.2% | 66.7% | 33 | 19.0% | 80.5% | 174 | 100.0% |
| College or over | 40 | 26.1% | 64.5% | 26 | 17.0% | 44.8% | 51 | 33.3% | 62.2% | 28 | 18.3% | 33.3% | 8 | 5.2% | 19.5% | 153 | 100.0% |
| **Housing** | **Housing** | **Housing** | **Housing** | **Housing** | **Housing** |
| Supervised | 8 | 14.5% | 12.9% | 6 | 10.9% | 10.3% | 14 | 25.5% | 17.1% | 23 | 41.8% | 27.4% | 4 | 7.3% | 9.8% | 55 | 100.0% |
| Autonomous | 54 | 19.9% | 87.1% | 52 | 19.1% | 89.7% | 68 | 25.0% | 82.9% | 61 | 22.4% | 72.6% | 37 | 13.6% | 90.2% | 272 | 100.0% |
| **Needs factors** | **Needs factors** | **Needs factors** | **Needs factors** | **Needs factors** | **Needs factors** |
| Severe MHDs | 5 | 4.1% | 8.1% | 2 | 1.6% | 3.5% | 17 | 13.8% | 20.7% | 68 | 55.3% | 81.0% | 31 | 25.2% | 75.6% | 123 | 100.0% |
| Common MHDs | 58 | 30.9% | 93.6% | 57 | 30.3% | 98.3% | 57 | 30.3% | 69.5% | 0 | 0.0% | 0.0% | 16 | 8.5% | 39.0% | 188 | 100.0% |
| Personality disorders | 16 | 17.2% | 25.8% | 0 | 0.0% | 0.0% | 62 | 66.7% | 75.6% | 15 | 16.1% | 17.9% | 0 | 0.0% | 0.0% | 93 | 100.0% |
| Alcohol use disorders | 2 | 4.7% | 3.2% | 0 | 0.0% | 0.0% | 29 | 67.4% | 35.4% | 1 | 2.3% | 1.2% | 11 | 25.6% | 26.8% | 43 | 100.0% |
| Drug use disorders | 0 | 0.0% | 0.0% | 1 | 2.2% | 1.7% | 21 | 46.7% | 25.6% | 1 | 2.2% | 1.2% | 22 | 48.9% | 53.7% | 45 | 100.0% |
| Number of MHDs | 1.7 | 1.0 | 1.4 | 0.6 | 2.7 | 1.2 | 1.2 | 0.7 | 2.0 | 0.6 | 1.8 | 1.1 |
| Number of needs (MANQ) | 7.2 | 3.9 | 8.1 | 3.6 | 11.0 | 4.5 | 7.7 | 4.3 | 7.7 | 4.6 | 8.5 | 4.4 |
| Seriousness of needs (MANQ) | 4.7 | 2.1 | 5.3 | 1.8 | 6.2 | 1.4 | 5.2 | 1.8 | 5.3 | 2.1 | 5.4 | 1.9 |
| **Enabling factors** | **Enabling factors** | **Enabling factors** | **Enabling factors** | **Enabling factors** | **Enabling factors** |
| Quality of life (SLDS) | 99.5 | 17.6 | 96.7 | 18.7 | 86.6 | 18.5 | 101.1 | 17.2 | 103.1 | 17.1 | 96.6 | 18.8 |
| Total help from relatives (MANQ) | 2.0 | 2.4 | 3.3 | 2.4 | 2.9 | 2.3 | 2.2 | 2.4 | 3.3 | 2.9 | 2.7 | 2.5 |
| Total help from services (MANQ) | 2.2 | 1.8 | 2.8 | 1.8 | 3.7 | 2.2 | 3.9 | 2.5 | 3.9 | 3.0 | 3.3 | 2.4 |
| Number of MH professional consulted | 3.1 | 1.3 | 4.8 | 1.2 | 3.7 | 1.0 | 3.1 | 0.8 | 3.3 | 1.2 | 3.3 | 1.1 |
| Have a family physician | 57 | 20.1% | 91.9% | 55 | 19.4% | 94.8% | 73 | 25.7% | 89.0% | 74 | 26.1% | 88.1% | 25 | 8.8% | 61.0% | 284 | 100.0% |
| **Variable of interest** | **Variable of interest** | **Variable of interest** | **Variable of interest** | **Variable of interest** | **Variable of interest** |
| Continuity of care (ACSS-MH) | 128.9 | 18.6 | 129.0 | 13.6 | 129.6 | 15.7 | 135.4 | 13.9 | 141.1 | 16.4 | 132.3 | 16.1 |

*: Percentages in rows; **: Percentages in columns; MHDs: Mental health disorders; MANQ: Montreal Assessment of Needs Questionnaire; SLDS: Satisfaction with Life Domains Scale; MH: Mental health; ACSS-MH: Alberta Continuity of Services Scale-Mental health.
| Age categories | Total sample | Class 1 vs 2 | Class 1 vs 3 | Class 1 vs 4 | Class 1 vs 5 | Class 3 vs 2 | Class 3 vs 5 | Class 2 vs 4 | Class 2 vs 5 | Class 3 vs 4 | Class 5 vs 4 |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Civil status | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| <0.0001<sup>a</sup> | 0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Education | 0.032 | 0.063 | 0.491 | 0.034 | 0.759 | 0.262 | 0.418 | 0.013 | 1.000 | 0.111 | 0.036 |
| <0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> | 0.0001<sup>a</sup> |
| Housing | 0.0001<sup>a</sup> | 0.346 | 0.775 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | 0.042 | <0.0001<sup>a</sup> | 0.165 | 0.009 | 0.001 | 0.109 |
| <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Severe MHDs | 0.0001 | 0.441 | 0.036 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | 0.003 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | 0.490 |
| Common MHDs | 0.0001<sup>a</sup> | 0.366 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Personality disorders | 0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | 0.246 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Alcohol use disorders | 0.0001<sup>a</sup> | 0.496 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Drug use disorders | 0.0001<sup>a</sup> | 0.483 | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> | <0.0001<sup>a</sup> |
| Number of MHDs | 0.0001<sup>c</sup> | 0.180 | <0.0001<sup>c</sup> | 0.009 | 0.598 | <0.0001<sup>c</sup> | <0.0001<sup>c</sup> | 0.837 | <0.0001<sup>c</sup> | <0.0001<sup>c</sup> | <0.0001<sup>c</sup> |
| Number of needs (MANQ) | 0.0001<sup>c</sup> | 1.000 | <0.0001<sup>c</sup> | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Seriousness of needs (MANQ) | 0.0001<sup>c</sup> | 0.671 | <0.0001<sup>c</sup> | 0.649 | 0.758 | 0.017 | 0.165 | 1.000 | 1.000 | 0.002 | 1.000 |
| Quality of life (SLDS) | 0.0001<sup>c</sup> | 1.000 | <0.0001<sup>c</sup> | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Total help from relatives (MANQ) | 0.002 | 0.033 | 0.274 | 1.000 | 0.068 | 1.000 | 0.042 | 1.000 | 0.367 | 0.089 |
| Total help from services (MANQ) | <0.0001<sup>c</sup> | 0.467 | <0.0001<sup>c</sup> | <0.0001<sup>c</sup> | 0.012 | 0.096 | 1.000 | 0.021 | 0.288 | 0.999 | 1.000 |
| Number of MH professional consulted | 0.003<sup>c</sup> | 1.000 | 0.060 | 1.000 | 0.999 | 0.046 | 0.524 | 1.000 | 0.999 | <0.0001<sup>c</sup> | 0.978<sup>c</sup> |
| Have a family physician | <0.0001<sup>c</sup> | 0.718 | 0.559 | 0.450 | <0.0001<sup>c</sup> | 0.359 | <0.0001<sup>c</sup> | 0.240 | <0.0001<sup>c</sup> | 0.851 | <0.0001<sup>c</sup> |
| Continuity of care (ACSS-MH) | <0.0001<sup>c</sup> | 1.000 | 1.000 | 0.122 | 0.001 | 1.000 | 0.001 | 0.147 | 0.002 | 0.165 | 0.569 |

<sup>a</sup>Pearson.
<sup>b</sup>Fisher.
<sup>c</sup>ANOVA t test.

MHDs: Mental health disorders; MANQ: Montreal Assessment of Needs Questionnaire; SLDS: Satisfaction with Life Domains Scale; MH: Mental health; ACSS-MH: Alberta Continuity of Services Scale-Mental health.
Responsive System was significantly different for Class 5 versus Classes 1, 2, and 3. Significant differences were found on Responsive Caregiver between Class 1 versus Classes 4 and 5, between Class 2 and Class 5 patients, and between Class 3 versus Class 4 and 5 patients (Supplementary Table 2).

Discussion

This research aimed to develop a typology of patients with MHDs and including a robust measure of CoC that would inform clinical practice and health care planning. Overall, it is important to note that CoC was weaker in our study than in previous studies using the same instrument (Adair et al., 2005; Durbin et al., 2004). Only Class 5 patients were significantly different from others (Class 1, 2, and 3) based on higher CoC scores. Class 4 scores were above average as compared with the three other classes (Class 1, 2, and 3) that revealed very similar, and lower, levels of CoC. Our research took place in the context of a major health system reform that may have negatively influenced patient perceptions of CoC because of the ongoing implementation of new service structures. For instance, community-based services were reorganized, leading to the displacement of many service providers to new locations with different functions. Some MH professionals had to take on new roles and communication between service providers might have been more challenging, which could also help explain why differences between classes were found for the Responsive System and Responsive Caregiver dimensions.

The low CoC scores may also be explained in terms of the large proportion of patients affected by common MHDs in our sample, and, in turn, the greater association with poorer CoC than with severe MHDs (Adair et al., 2005; Catty et al., 2011a). Sustained efforts have been made in the past to facilitate integrated care for patients with severe MHDs, whereas CoC for patients with common MHDs has been insufficiently addressed. The difference in CoC scores between patients with common versus severe MHDs also corresponds with findings from previous studies using the Andersen Behavioral Model, and highlights the importance of needs factors in service use (Graham, Hasking, Brooker, Clarke, & Meadows, 2017). However, certain needs variables in our study, namely number and seriousness of needs, did not show a consistent pattern of results in relation to CoC.

The overrepresentation of poorly educated men in Classes 4 and 5 is a finding consistent with the literature on severe MHDs (Song & Singer, 2001). Class 5 patients were more affected by SUDs as compared with those in Class 4, who were mainly affected by severe MHDs. While Class 5 participants reportedly received substantial help from both relatives and services, Class 4 participants received more help from services than from relatives. The fact that an important proportion of patients in Class 4 were living in supervised housing may have facilitated CoC, even with little help from relatives. Developing strong therapeutic alliances through regular access to MH professionals in the context of supervised housing may help address the social needs of patients (Junghan, Leese, Priebe, & Slade, 2007), another condition associated with better CoC (Poremski et al., 2016; Sweeney et al., 2012).

However, perceived CoC among patients in Classes 1, 2 and 3 was relatively lower than for the others, especially Class 5. As mentioned previously, all three classes included a majority of patients affected by common MHDs. These clusters also included more women, which is consistent with data on mood and anxiety disorders (Hasin, Goodwin, Stinson, & Grant, 2005; Somers, Goldner, Wartaich, & Hsu, 2006). Older age (a predisposing factor) appeared to be a distinctive feature of Class 1 patients. Older people with MHDs are more reliant on family caregivers (Oliver, 2015), while maintaining a support network may be challenging (Broese van Groenou, Hoogendijk, & van Tilburg, 2013). While they shared common features, Class 2 patients were distinguished from those in Class 1 by their higher prevalence of couple relationships and help received from relatives.

The emerging profile for Class 3 illustrates different challenges in obtaining continuous mental health care, reflected particularly in the higher number and seriousness of needs for this group. While Class 3 patients received considerable help from services, their level of SUD comorbidity and the large proportion of participants with personality disorders may explain the poor CoC scores for this group, which is also consistent with findings from previous studies (Adair et al., 2005; Durbin et al., 2004; McCallum, Mikocka-Walus, Turnbull, & Andrews, 2015; Staiger et al., 2011). Taken together, our results suggest that Class 3 presented characteristics often associated with high users of MH services (Huỳnh, Ngamini Ngui, Kairouz, Lesage, & Fleury, 2016).

Limitations

A number of limitations need to be acknowledged. First, both younger and older patients were underrepresented in our sample, suggesting that differences across age groups may have been obscured. Similarly, the regrouping of variables into categories may have resulted in an over-simplification or over-generalization of our findings. Moreover, it would have been interesting to include physical disorders as a possible factor influencing service use and CoC. As well, patients under involuntary hospitalization were excluded from the study; even though they are among the most seriously ill and least stable in terms of service use and CoC. These exclusion criteria and the recruitment methods (e.g., self-referral) may have introduced inclusion bias. Another limitation was the decision to measure CoC exclusively from the patient perspective. Measurement errors may have occurred due to potential memory bias among patients completing the ACSS-MH. Finally, it is important to mention that cluster analyses remain at a rather exploratory level and present certain limitations, as there are as yet no statistical criteria for assessing their generalizability (Bonin, Fournier, & Blais, 2009).
Conclusions
Our study is unique as the first attempt to include patients with multiple clinical needs within a typology that used a robust measure of CoC. Cluster analyses revealed five profiles of patients suffering from MHDs, based on predisposing, needs and enabling factors, in which perceived CoC differed. Among the five profiles identified, two classes had higher CoC scores while three reported lower CoC. While certain strategies to promote CoC have proven successful in patients with severe MHDs, additional research is needed to understand CoC in relation to other clinical populations. Our study points to the need for MH service planning and delivery better adapted to patient profiles in order to improve CoC. Patients with common MHDs seemed to be greatly affected by the lack of services. Our study also highlights problems in CoC related to heavy service users. Findings suggest a need for further deployment of integrated treatment models. Finally, it should be noted that the differential effects.

Disclosure statement
No potential conflict of interest was reported by the authors.

Funding
This study was funded by the Fonds de la recherche en santé du Québec (FRSQ), grant number 22367.

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Funding
This study was funded by the Fonds de la recherche en santé du Québec (FRSQ), grant number 22367.
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