



Met and unmet needs of service users with substance use disorders: a latent class analysis

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Abstract

Purpose People with substance use disorders (SUD) have multiple associated health and social conditions that may lead to unmet needs, even among those receiving professional support. Furthermore, the fragmented nature of care provision may also contribute to unmet needs. Therefore, we assessed the needs of service users with SUD and identified their need profiles and their determinants. We aimed to identify possible gaps in care that were likely to hamper recovery pathways and to examine whether the care supply was tailored to users' needs.

Methods A convenience sample of 562 service users with SUD drawn from diverse mental health services in Belgium, including specialised services for SUD, were assessed using the Camberwell Assessment of Needs– Short Appraisal Schedule (Patient version). Additional indicators, including social integration, substance use behaviours, service utilisation, and well-being, were also collected. A Latent Class Analysis was performed to identify need profiles.

Results Three classes of need profiles were identified. The largest class comprised 40% of the sample and included individuals with few needs. The second class encompassed 35% of the sample and represented those whose needs were mainly met by professionals. The third class, accounting for 25% of the sample, included individuals with many unmet needs. Across classes, company, intimate relationships, and sexual expression were the most reported unmet needs. Poor social integration and subjective well-being were associated with more needs, either met or unmet. Females ($OR=2.76$, $p=0.025$), and those using social services ($OR=2.54$, $p=0.022$), homecare and outreach services ($OR=3.683$, $p=0.003$) were more likely to report met needs. In contrast, using multiple substances was associated with unmet needs ($OR=3.87$, $p=0.008$). There was no significant association between need profiles and the use of specialised services for SUD.

Conclusion Needs of people with SUD go beyond substance use and encompass social relationships. Although no major differences in need profiles were observed based on service utilisation, social integration and interpersonal relationships deserve greater attention from the perspective of the personal recovery of people with SUD.

Keywords Substance use disorders (SUD) · Needs assessment · Service use · Latent class analysis (LCA) · Social integration · Interpersonal relationships

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Background and objectives

Individuals with substance use disorders (SUD), which include alcohol and other drugs, have multiple associated health and social conditions [1–3]. For instance, the comorbidity between SUD and other mental health disorders (MHD) is widespread, with MHD being more prevalent among people with SUD than in the general population [4, 5]. Research findings report that 35–85% of individuals with SUD also experience another MHD, with rates varying depending on the type of substance and disorder [4–11].

A systematic review found that 35% of individuals with an alcohol use disorder had co-occurring major depression, whereas 50% of those with illicit drug use disorder had co-occurring anxiety disorder [10]. Beyond MHD, individuals with SUD often face housing instability, unemployment, and a high risk of infectious diseases [2, 3, 12]. These complex conditions may lead to various needs that require professional support. In this research, a need for care is defined as a perceived problem in a specific health or social domain, characterised by a lack of well-being or access to necessary support [13, 14].

Among individuals with SUD, only a small proportion receive professional support, specialised or non-specialised in SUD [12, 15, 16]. For instance, in Canada, research shows that 65% of individuals with SUD do not receive any care [15]. Literature attributes this care gap to various barriers, including a preference for self-managing symptoms, low perceived need for treatment, previous negative experiences with healthcare providers, and limited availability or accessibility of appropriate services [6, 17–19]. Yet, for those receiving professional support, a higher percentage turn to mental health services rather than to specialised services for SUD [20]. Moreover, studies suggest that those treated in specialised services tend to have lower incomes, psychiatric conditions, and more severe forms of SUD [20, 21].

Even among those receiving professional support, individuals with SUD may experience unmet needs [6, 15–19]. For instance, when controlling for service use, individuals with SUD are more likely to report unmet needs for mental healthcare than those with other diagnoses [15]. Given the multiple needs associated with SUD, it is necessary to adopt a holistic approach to care provision. This approach involves exploring all types of life needs to identify those that are insufficiently addressed, to improve overall care quality [22–29]. Such a comprehensive understanding of needs is central to the concept of personal recovery, which places individuals at the core of a process of growth, recognising that a full spectrum of needs must be addressed for them to lead happy, meaningful and contributive lives within their communities [28–32]. Therefore, needs assessments are recommended to provide person-centred and user-led care [23, 33], as well as to support individuals in their recovery journey and enhance their quality of life [28, 34]. However, there is no single standardised approach for assessing needs, and a variety of tools and methods are currently in use [27]. Several instruments, including the Camberwell Assessment of Need (CAN), Perceived Need for Care Questionnaire (PNCQ), and Montreal Assessment of Needs Questionnaire (MANQ), are available [27, 28, 35]. These vary by the respondent (service users or healthcare providers), target population (e.g., adults with MHD, or specific populations such as children, forensic people or the

elderly), and the domains assessed (needs for mental health, service needs, or general life domains).

In addition, some systems of care may be highly fragmented. In Belgium, the fragmentation of care provision may lead people with SUD to experience unmet needs despite the availability of multiple services. The Belgian healthcare system is based on a regulated market of autonomous care providers, both for-profit and not-for-profit, in which service users are free to choose their healthcare provider without a delimited catchment area or gatekeeping. Given the absence of formally defined care pathways for individuals with SUD and their multiple needs, they may seek support from various care providers who often do not collaborate. These include specialised services for SUD (in this paper, “specialised services”), and other services (in this paper, “generic services”), such as primary care, generic mental health care, and diverse social services. According to the Belgian Monitoring Centre for Drugs and Drug Addiction (2022), more than 27,000 new requests for treatment related to alcohol or illicit substance use were registered. Of these, 28.8% were registered in general hospital units, 25.4% in psychiatric hospital units, 32% in outpatient specialised services for SUD, and 6.5% in mental health centres. However, data regarding treatment demand in private practice settings, such as general practitioners or psychiatrists, were unavailable. Furthermore, medical, mental health and social care are organised from different levels of authority [36].

Therefore, in this study, we aimed to examine the met and unmet needs for care of individuals with SUD using mental health services, specialised in SUD or not. First, we identified the most reported met and unmet needs. Second, we identified service users’ need profiles. Third, we examined the determinants associated with these profiles, especially in terms of service utilisation.

Methods

This study is part of a broader national-level research project¹, aimed at examining how care is organised for people with SUD within mental health networks in Belgium.

Setting

Given the context described above, we hypothesised that service users who chose either generic or specialised services had different need profiles. Therefore, to maximise profile diversity, participants were recruited from varied types of services, including specialised services (therapeutic communities, crisis centres, outpatient substance use services,

¹ Substance Use and Mental Health care InTegration (SUMHIT) project, funded by the Belgian Science Policy Office.

low-threshold and harm-reduction services), generic mental health services (community mental health services, day centres, psychiatric wards in general hospitals, psychiatric hospitals, sheltered accommodation, outreach, and home care teams), and social and primary care services.

Population

Participants were recruited from five mental health networks across the country (three in Flanders, one in Brussels, and one in Wallonia) between May 2022 and September 2022. All services located within the mental health network territories and willing to participate were included in the study. We mainly relied on professionals from the participating services to recruit participants, although some researchers were also involved in the data collection when necessary. The eligibility criteria for study participants were: (1) being aged 18 years or older; (2) having or having had a SUD; (3) being able to complete a self-reported questionnaire in either French or Dutch; and (4) being able to provide informed consent. The survey was presented and proposed to service users during community meetings, therapeutic or social interviews, or waiting times. When participants had access to and the capacity to use a smartphone, tablet, or computer, they were asked to complete an online version of the questionnaire. When this was not feasible, participants completed the questionnaire on hard copy. While the questionnaire was designed to be self-administered, where required, professionals or researchers provided support and assistance to ensure proper understanding.

Measurements

We used several instruments designed to measure different indicators.

Needs for care were measured using the Camberwell Assessment of Needs-Short Appraisal Schedule (Patient version) (CANSAS-P) [37, 38]. The CANSAS-P is a shorter and self-administered form of the CAN, the most widely used instrument measuring the needs of people with MHD [13, 27, 39]. Among the 29 instruments that exist to measure the needs of people with MHD, the CAN allows a holistic assessment of needs, requires little time and training, and is available in a self-reported version [13, 27]. Therefore, it appeared to be a suitable choice for administration to individuals with SUD within mental health care services. Moreover, to our knowledge, this is the first time that this instrument has been used at a national level in Belgium with this population. Both the CAN and CANSAS-P consist of a scale assessing 22 life domains, in each of which respondents have to choose between having no needs (i.e. no serious problem), a met need (i.e. no serious problem or

moderate problem owing to a continuing intervention), or an unmet need (i.e. serious problem(s) independent of any intervention) at the time of completion of the questionnaire [13, 39, 40]. An additional item addressing needs related to justice was added by the study consortium as several people with SUD are involved in legal processes. This revised 23-item version of the CANSAS-P scale has been used in earlier research studies [41, 42].

Substance use behaviours were assessed using the Treatment Demand Indicator (TDI) [43]. Developed by the European Monitoring Centre for Drug and Drug Addiction, the TDI is already widely used in routine practice across European mental health and addiction services. It assesses the substances used, including the self-reported main problematic substance, and, for the latter, the frequency of use and route of administration.

To better understand the user profiles accessing the service types, we used an adapted and simplified version of the Client Service Receipt Inventory (CSRI), an instrument aimed at collecting data on service utilisation [44]. Contacts with the following services or professionals within the last twelve months were investigated: hospital units for physical, mental, or substance-related conditions; general practitioners (GPs); outpatient mental health care (psychologists, psychiatrists, mental health services, and day centres); specialised SUD care; emergency departments; social services; homecare and outreach services; and self-help services.

Well-being was assessed using the WHO-5 Well-Being Index, a widely used and validated scale composed of five simple questions. Measuring subjective psychological well-being, this index ranges from 0 (low level of well-being) to 25 (high level of well-being) [45].

Social integration was assessed using the Social Integration Index (SIX), a tested and validated index providing a concise and holistic overview of accommodation status, family situation, working status, and friendship [46]. The index ranges from 0 (low level of social integration) to 6 (high level of social integration).

Ethical clearance

Ethical committee approval was obtained from the *Comité d’Ethique Hospitalo-Facultaire des Cliniques Saint-Luc-UCLouvain, Bruxelles* (registration number B4032021000133, April 29, 2022). All participants consented to participation.

Statistical analyses

Descriptive statistics were computed for sociodemographic and substance use characteristics of the sample, as well as for self-reported needs. Specifically, frequencies and

percentages were calculated for categorical and binary variables, and the mean and standard deviation were used for quantitative variables. Using Latent Class Analysis (LCA), a probabilistic statistical technique designed to detect latent subgroups within a given population based on participants' responses to specific variables [47], we aimed to identify subgroups of individuals with similar patterns of needs and predictors of class membership. These predictors encompass socio-demographic characteristics, social integration, substance use behaviours, service utilisation, and well-being. A three-step approach was used to ensure that class estimation was not associated with the predictive variables [47–49]. First, classical LCA (without covariates) was performed. In LCA, a one-class model is first estimated and then classes

Table 1 Socio-demographic and substance use characteristics of the sample

Characteristics	N=562 ^a
Language	
French-speaking	245 (43.6%)
Dutch-speaking	317 (56.4%)
Type of recruitment service	
Generic mental health services	298 (53.0%)
Specialised addiction services	261 (46.5%)
Age	42.3 (11.4)
Male	405 (72.3%)
Income	
Salary	80 (14.3%)
Social benefits	441 (78.9%)
Other	38 (6.8%)
Education level	
Primary education	171 (30.9%)
Secondary education	281 (50.8%)
Postsecondary education	101 (18.3%)
SIX	2.9 (1.6)
Well-being	13.2 (5.4)
Main problematic substance	
Alcohol	270 (52.3%)
Opiates	52 (10.1%)
Cocaine	90 (17.4%)
Stimulants other than cocaine	21 (4.1%)
Hypnotics	17 (3.3%)
Hallucinogens	2 (0.4%)
Cannabis	62 (12.0%)
Volatile inhalants	2 (0.4%)
Multiple substance use	265 (47.2%)
Route of administration	
Ingestion	234 (52.7%)
Inhalation	130 (29.3%)
Sniffing	49 (11.0%)
Injection	17 (3.8%)
Other	14 (3.2%)
Frequency of use	
Less than 4 times a week	224 (50.8%)
At least 4 times a week	217 (49.2%)

^a n (%); Mean (SD)

are added until the model with the best fit is reached. Theoretical interpretability and the Bayesian Information Criterion (BIC) were used to select the best model fit (the lower the BIC, the better the fit) [47]. Based on this information, a 3-class model was chosen (BIC=18 151), compared with a 2-class (18 297) and a 4-class model (18 537). This model had an entropy of 0.83, which indicates that it accurately defines classes [47]. In the second step, each individual is assigned to the class with the highest posterior probability, and the global misclassification matrix is estimated. Finally, the latent class model with the assigned class as the single observed variable and covariates was estimated to predict class membership (multinomial logistic regression). The following covariates were included in the model: age, sex, level of education, SIX index of social integration, multiple substance use, main category of problematic substance, service utilisation within the last twelve months, and WHO-5 score of well-being. These variables were included in the model based on several criteria: their univariate significance, an improvement in BIC, or their relevance to the research question. The procedure was implemented in R using the poLCA package (for the first two steps) and Stata (for the third step). Out of the 562 participants, those with at least one missing value for variables included in the analysis were excluded. 507 participants were included in the LCA without covariates, and 417 were included in the multinomial logistic regression.

Results

The survey resulted in a total of 562 questionnaires. 261 were completed by service users recruited from specialised services and 298 by service users in generic services. Of the 562 respondents, 243 were recruited from outpatient services, and 313 from inpatient services.

The sociodemographic and substance use characteristics of the respondents are presented in Table 1. Participants had a mean age of 42 years, and 72.3% were male. The majority had some level of secondary education (50.8%) and had received social benefits (78.9%). On average, respondents had a rather low level of social integration (2.9 out of 6) and a moderate level of subjective well-being (13.2 out of 25). The three most prevalent self-reported main problematic substances were alcohol (52.3%), cocaine (17.4%), and cannabis (12%). Among the respondents, 47.2% reported using multiple substances. Only 3.8% of the respondents reported injection as the route of administration for the main problematic substance. Almost half of the sample (49.2%) reported using the main problematic substance at least four times a week.

On average, service users reported needs in eight domains, either met or unmet, and unmet needs in four domains. Almost all respondents (97%) reported at least one need domain and 81% reported at least one unmet need domain. Self-reported need domains are shown in Fig. 1. The domains of needs were ranked in descending order of the proportion of unmet needs. The most frequently reported need domains, either met or unmet, were psychological distress (69.1%), psychotic symptoms (55.5%), physical health (54.2%), alcohol use (53.5%), and money (49.5%). Three of the most frequently reported unmet need domains were related to interpersonal relationships: intimate relationships (39.7%), company (28.5%), and sexual expression (27%). In addition, daytime activities (30.6%) and physical health (28.7%) were also important unmet needs domains.

Three classes of need domains were identified. A graphical representation of these classes is presented in Fig. 2. Class A was the largest, comprising 40.4% of the total sample ($n=205$). This class represented service users who were more likely to report no need in most domains than service users in the two other classes. Therefore, we named this class “service users with few reported needs”. Although they reported fewer needs, service users in this class reported met needs regarding alcohol use (41%), psychological distress (40.9%), and intimate relationships (18%). Class B comprised 34.7% of the sample ($n=176$) and gathered service users who were more likely to report met needs. We named it “service users with reported met needs”. The most frequently reported met needs in this class were related

to psychological distress (73.2%) and psychotic symptoms (62.9%). However, service users in this class also reported unmet needs regarding intimate relationships (48.6%) and sexual expression (35.5%). Class C comprised 24.9% of the sample ($n=126$) and included service users who were more likely to report unmet needs in several domains. We named it “service users with many reported unmet needs”. In this class, service users reported unmet needs regarding psychological distress (72.6%), daytime activities (66.6%), and intimate relationships (62.7%). Figure 3 shows the probability of reporting an unmet need in each domain for each class. The domains of needs were ranked in descending order of the likelihood of an unmet need in class C.

The results of the multinomial logistic regression are presented in Table 2. We found significant differences in the composition of classes when covariates were included in the model. Higher levels of social integration and well-being increased the likelihood of belonging to the class with fewer reported needs compared to the two other classes. Considering the class of service users with few reported needs as a reference, being a woman ($OR=2.765$, $p=0.025$), contact with social services during the last twelve months ($OR=2.545$, $p=0.022$), and contact with homecare and outreach services ($OR=3.683$, $p=0.003$) increased the likelihood of belonging to the class with reported met needs. Using multiple substances increased the likelihood of belonging to the class with many reported unmet needs ($OR=3.870$, $p=0.008$), whereas a higher level of education decreased the likelihood of belonging to the latter class ($OR=0.215$, $p=0.007$).

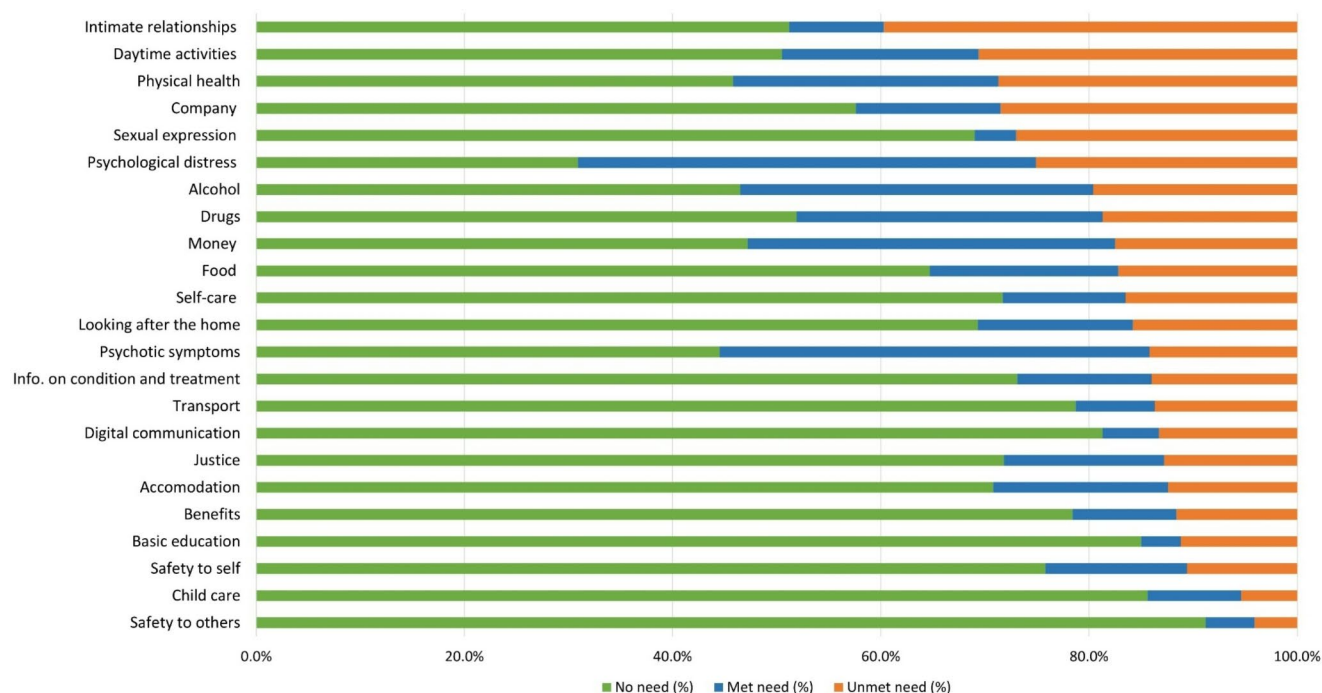
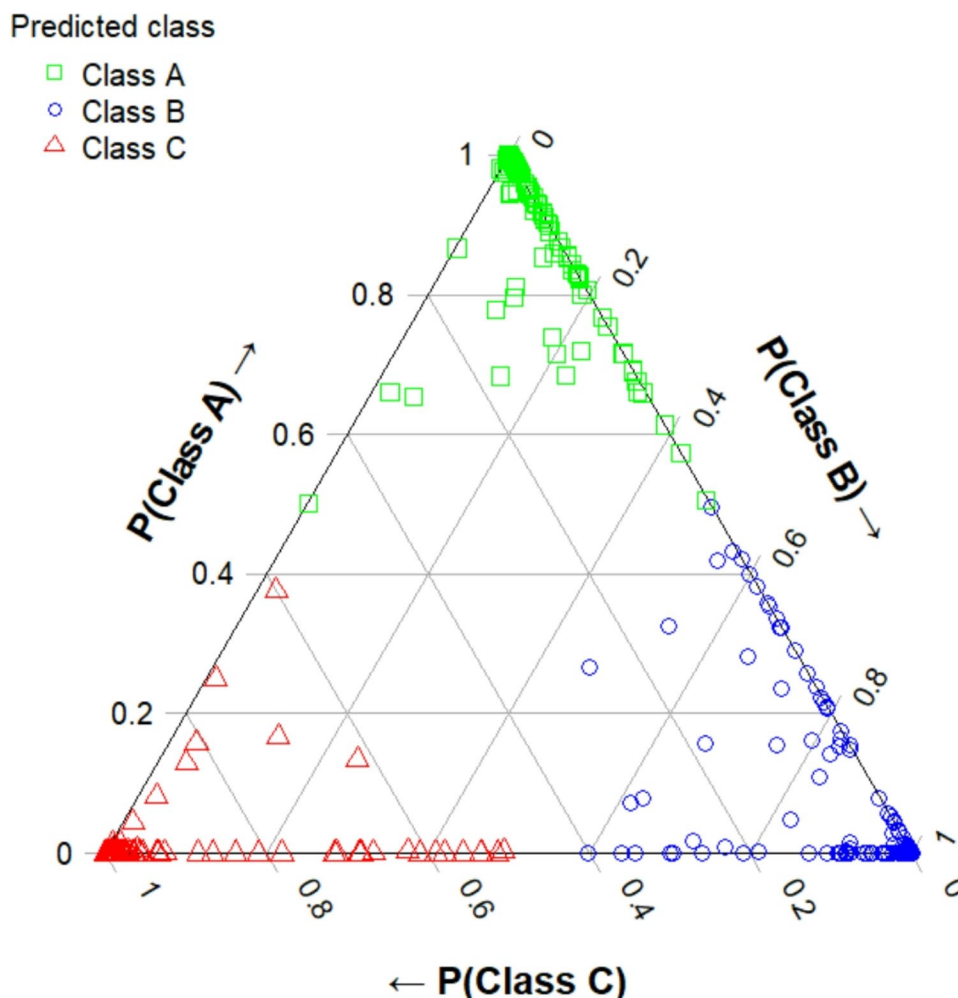


Fig. 1 Self-reported needs within the sample ($n=562$)

Fig. 2 Graphical representation of predicted classes



In addition, hospitalisation for physical problems within the last twelve months decreased the likelihood of belonging to the class with reported met needs ($OR=0.435$, $p=0.030$).

Discussion

Main results

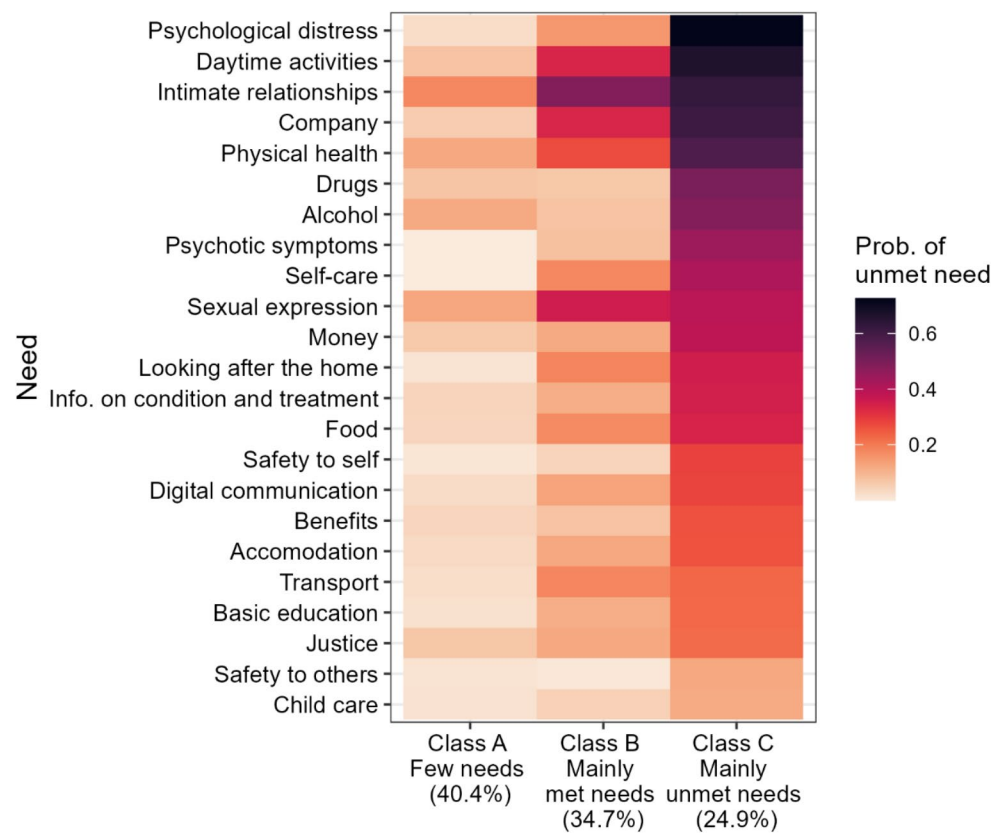
In this cross-sectional study including 562 service users, we identified three classes of need profiles: a class with few needs, a class with several needs that were met, and a third class with several unmet needs. We observed that psychotic symptoms, psychological distress, and alcohol use were among the most self-reported met need domains. In addition, across the three classes, unmet needs regarding intimate relationships, sexual expression, and company were the most frequently reported. These findings reassuringly indicate that services could meet the needs for which they were established, i.e. substance use and mental health needs. However, services might be more limited regarding

interpersonal relationship needs (company, intimate relationships, and sexual expression).

There was no significant association between a specific need profile and the use of specialised services. However, the use of social, homecare, and outreach services was associated with the class of service users reporting mainly met needs. Notably, we did not use the type of recruitment service as a criterion, considering that participants recruited from generic services may have used specialised addiction services within the last 12 months and vice versa. Nonetheless, while these results do not confirm the existence of major differences in need profiles based on service utilisation, they reveal gaps in treatment and support regarding supportive interpersonal relationships, which are a key component of personal recovery.

Interpretation of findings and consistency with the literature

Our findings align with previous studies that assessed needs for care among individuals recruited in various mental health

Fig. 3 Probability of self-reported unmet need across classes**Table 2** Association of service users' characteristics with class-membership probability ($n=417$, reference = class A "few reported needs")

Characteristics	Class 2 « reported met needs »			Class 3 « many reported unmet needs »		
	OR	95% CI	<i>p</i> -value	OR	95% CI	<i>p</i> -value
Age	0.992	[0.96–1.02]	0.605	1.011	[0.97–1.05]	0.589
Sex, female (ref= male)	2.765	[1.14–6.71]	0.025	0.923	[0.34–2.54]	0.877
Education level (ref= secondary)						
Primary	1.710	[0.72–4.04]	0.222	0.815	[0.3–2.2]	0.686
Postsecondary	1.223	[0.49–3.04]	0.665	0.215	[0.07–0.66]	0.007
SIX index	0.759	[0.58–0.99]	0.039	0.756	[0.58–0.98]	0.033
Well-being score	0.805	[0.74–0.87]	<0.001	0.681	[0.61–0.76]	<0.001
Hospitalisation for physical problems (ref=no)	0.435	[0.21–0.92]	0.030	0.460	[0.19–1.1]	0.080
Hospitalisation for other problems (ref=no)	0.828	[0.35–1.97]	0.668	1.025	[0.39–2.68]	0.960
Contact with a GP (ref=no)	1.249	[0.37–4.24]	0.721	0.697	[0.21–2.37]	0.562
Contact with an outpatient mental health service (ref=no)	1.323	[0.38–4.57]	0.658	0.964	[0.27–3.41]	0.954
Contact with an outpatient specialised addiction service (ref=no)	0.968	[0.46–2.05]	0.931	1.067	[0.46–2.49]	0.881
Contact with a social service (ref=no)	2.545	[1.15–5.65]	0.022	0.704	[0.29–1.69]	0.432
Contact with emergency services (ref=no)	1.250	[0.56–2.8]	0.589	0.934	[0.38–2.28]	0.880
Contact with self-help services (ref=no)	2.104	[0.8–5.57]	0.134	0.190	[0.01–3.9]	0.281
Contact with homecare and outreach services (ref=no)	3.683	[1.54–8.83]	0.003	0.747	[0.25–2.25]	0.604
Multiple substance use (ref=no)	2.249	[0.87–5.81]	0.094	3.870	[1.43–10.46]	0.008
Main problematic substance category (ref= alcohol)						
Cannabis	1.656	[0.51–5.33]	0.398	0.983	[0.2–4.94]	0.984
Cocaine	1.689	[0.5–5.74]	0.402	2.842	[0.81–9.96]	0.103
Opiates	1.385	[0.34–5.59]	0.647	2.312	[0.57–9.41]	0.242
Other	0.653	[0.17–2.47]	0.529	0.569	[0.11–2.98]	0.504

care settings, using either the CAN or CANSAS-P tools [23, 24, 33, 39, 50, 51]. The number of unmet needs reported in the literature ranges from 2.3 in individuals with affective and psychotic disorders recruited in outpatient mental health services in the Netherlands [50], to 6.2 in those recruited in community-based mental health crisis stabilisation units [24]. In this context, our finding of 4.0 unmet needs among individuals with SUD recruited from diverse mental health and addiction services appears consistent with the literature. The significant level of unmet needs related to interpersonal relationships among people with SUD suggests persistent social isolation that is insufficiently addressed by available services. Several studies have reported similar findings [23–25, 33, 34, 51]. Research indicates that social isolation is more severe among those with SUD or MHD compared to the general population [52], and is associated with poor mental health and quality of life [53]. Social isolation hinders recovery from SUD, as developing meaningful relationships and community connections is essential for personal recovery, understood here as the unique experience through which people with SUD or MHD overcome their conditions to lead fulfilling and engaged lives within their communities [30, 32, 54–58]. The relationship between social isolation and SUD is both complex and bidirectional. On the one hand, social isolation among people with SUD may also arise from the inherent characteristics of the disorder, making it difficult to maintain interpersonal relationships. On the other hand, social isolation, particularly when fuelled by stigma, can reinforce SUD. People with SUD are among the most stigmatised in society [52, 59], and face stigma at multiple levels, including self-stigma, among healthcare professionals, and within the general population [53, 60]. This may adversely affect life opportunities, healthcare utilisation, and social integration [59]. Given its significant impact, social isolation should be prioritised from clinical and public health perspectives. Although not all responsibility falls to healthcare professionals, they should focus more on these needs during treatment and referral. Professionals should encourage social contact in everyday contexts while avoiding dependence on professional care. These findings highlight the importance of building recovery capital, which includes individual, social, and community resources that support personal recovery and human growth [61]. Policy actions are needed to reduce negative attitudes towards people with SUD, particularly among healthcare professionals. One example is the incorporation of stigma-related education and training for care professionals, especially those in mental healthcare, primary care, and social support roles. Our findings highlight specific vulnerability factors associated with unmet needs, such as the use of multiple substances, poor social integration, and low subjective well-being, in line with previous research [22, 24, 62, 65]. The

greater complexity of the situations faced by people using multiple substances and lacking social integration poses additional challenges in accessing appropriate support, as their multiple needs may be more challenging to address in fragmented care systems. In addition, stigma from healthcare professionals towards people with SUD can unconsciously influence access to care, particularly in systems where providers can autonomously accept or refer patients [63–65]. This unconscious bias, where “good patients” are seen as having higher cultural capital and socio-economic status, while “bad patients” are viewed as having more complex, non-clinical issues requiring holistic care, can lead to inequities in care based on the perceived manageability rather than their actual needs [64]. This underscores the importance of re-examining the organisation of care to ensure access is driven solely by users’ needs. Additionally, females were more likely than males to report met needs. The mixed effect of sex on reported needs could stem from differences in service utilisation. While SUD impact more domains among females, they are more likely to seek support from primary and mental health care services rather than specialised addiction services [66–70]. The use of social, homecare, and outreach services was associated with the class of “mainly reported met needs”. The key role of social services was also highlighted in another study, which demonstrated a positive association between the use of social services and social integration [71]. Our results suggest that homecare and outreach services are important care options for people with SUD. Although intensive home care services inspired by the Assertive Community Treatment model have shown benefits in treatment engagement [72, 73], they are rarely used for SUD care in Belgium. Therefore, enhancing the capacity and accessibility of outreach and homecare services for SUD is critical. This includes specialised training for professionals to effectively address SUD, while also eliminating exclusion criteria related to substance use to access such services. Also, the role of these services should be strengthened within mental health services networks through increased awareness and collaboration. For instance, formalised partnerships should be established between outreach services and other services. Overall, improving the use of social, homecare, and outreach services is essential for providing comprehensive and continuous care to people with SUD.

Limitations

This study has several limitations. First, convenience sampling was employed to assess service capacity for meeting users’ needs, potentially introducing selection bias, especially considering the entire population with SUD. Specifically, we may have missed those disconnected from services

and those with more severe SUD profiles who were unable or unwilling to complete the questionnaire and who, therefore, may have had more unmet needs. However, it is generally recognised that service users frequently experience more severe situations than those not using services [74, 75]. Additionally, we did not collect or have access to data regarding the severity of the participant's SUD. Nevertheless, the literature suggests that needs for care are good predictors of quality of life, social functioning and symptom severity [14]. Moreover, the study was limited to five catchment areas, which may not fully represent the national context, although the characteristics of the sample are typical of large urban areas, such as high cocaine and opiates use, frequent use of specialised services, and lower socioeconomic status. The study areas included Brussels and Antwerp, the two major urban centres in Belgium. Another limitation is that only 77.6% of participants reported needs related to alcohol or substance use, despite the inclusion criteria of having or having had SUD. This discrepancy could be due to the 30-day timeframe of the CANSAS-P scale, or the reliance on self-reported data, which can lead to under-reporting. Self-reported data may also affect the accuracy of service utilisation or substance use reports [76, 77]. However, factors such as the recall period or questionnaire design can influence the reliability of these data [76]. To mitigate recall bias and maintain a user-friendly questionnaire, information on the frequency and intensity of service use was not collected. Nonetheless, self-reported measures of needs and substance use are reliable and crucial in the monitoring of mental health conditions, including SUD [78–81]. When assistance was needed to complete the questionnaire, precautions were taken to ensure it did not influence participants' responses; however, we cannot entirely rule out the possibility of some effect. The cross-sectional design limits the ability to identify causal relationships between profiles and covariates, particularly regarding service use. The moderate sample size of the study also limits the robustness of the multinomial logistic regression analysis. Finally, social integration measurement may be underestimated for inpatient service users, who often reported living in an institution instead of autonomous accommodation, especially during long institutional stays.

Conclusion

People with SUD have complex and multiple needs that go beyond substance use. Assessing the needs of this vulnerable population allows for identifying possible gaps in their care and recovery barriers. While there were no major differences in need profiles based on service utilisation, social integration poses a major challenge for people with

SUD. This finding is supported by the association between a poor level of social integration and a higher number of needs, either met or unmet, as well as by the high proportion of unmet needs regarding interpersonal relationships, even in people with few needs reported. Improving service users' social integration and connection to the community, whether through employment, housing, or relationships, is an essential component of the personal recovery approach. However, the professional environment often has only limited resources to address the real social needs of people with SUD. Therefore, solutions may only be possible by enriching opportunities in natural environments.

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Data availability Data are available on request due to privacy/ethical restrictions.

Declarations

Ethical standards All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Approval was obtained from the *Comité d'Ethique Hospitalo-Facultaire des Cliniques Saint-Luc-UCLouvain, Bruxelles* (registration number B4032021000133, April 29, 2022).

Consent to participate Informed consent was obtained from all individual participants included in the study.

Competing interests The authors declare no competing interests.

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