Quality of Life in Patients with Substance Use Disorders Admitted to Detoxification Compared with Those Admitted to Hospitals for Medical Disorders: Follow-Up Results

John-Kåre Vederhus[1], Are Hugo Pripp[2] and Thomas Clausen[1,3]

[1]Addiction Unit, Sørlandet Hospital HF, Kristiansand, Norway. [2]Oslo Centre for Biostatistics and Epidemiology (OCBE), Oslo University Hospital, Oslo, Norway. [3]Norwegian Centre for Addiction Research, University of Oslo, Oslo, Norway.

ABSTRACT: Quality of life (QoL) in patients admitted to a general hospital was compared with those admitted to a detoxification unit for the treatment of substance use disorder (SUD). This study combines data from two separate data collections: a cross-sectional study in a general hospital unit (somatic sample, $N = 519$) and a follow-up study in a detoxification unit (SUD sample, $N = 140$). A total of 659 patients recruited during 2008–2013 were included in this study. All patients completed a generic QoL questionnaire at inclusion, and the SUD sample also completed it at the six-month follow-up. SUD patients experienced comparably low physical QoL and had significantly lower psychological, social, and existential QoL domain scores when compared with the somatic sample. Mental distress and having a SUD were the major factors explaining variations in QoL, with both influencing QoL negatively. In the SUD sample, QoL improved moderately at the six-month follow-up with less improvement for the domain *relationship to a partner*. To facilitate the recovery of SUD patients, clinicians must view their patients' situation holistically and invest efforts into the different life domains affected by poor QoL.

KEYWORDS: detoxification, Norway, quality of life, substance-related disorders

Background

Substance use disorders (SUDs) are serious clinical conditions with the potential to cause major health and emotional impairments in individuals.[1,2] Because SUDs affect the wide range of life domains, addiction researchers are beginning to move beyond traditional ways of measuring treatment outcomes with a sole focus on substance use. Hence, a widened focus includes measurement of life status and treatment benefits from the patients' perspective. In general, it often takes the form of a quality of life (QoL) questionnaire that measures satisfaction with life in broader life domains.[3] Such measures do not necessarily focus on problems specifically attributed to the SUD; they can be considered as generic measures of functioning and the individual's personal perception of health regardless of the person's *objective* health status.[4]

Compared with the QoL of normative samples, clinical SUD samples score significantly lower on physical and mental components than general populations.[5–7] Observational studies also indicate that respondents with a SUD have significantly lower social and role functioning than those without a SUD and show that living alone (without a partner) is negatively associated with QoL.[7–9] The detrimental effect on QoL in individuals with a SUD increases with greater SUD severity.[8] Thus, the QoL varies within different samples with SUDs: outpatients typically have less severe SUD, and detoxification samples seem to have the most severe QoL impairments.[5] An US-based study showed that respondents from detoxification centers reported surprisingly low scores in the physical health domain. In fact, the scores were at the level of patients with chronic somatic diseases, including arthritis and lung diseases.[6] The mental health scores of SUD patients, however, are generally lower than those of samples with chronic somatic diseases and are comparable on average to clinically depressed samples.[6,10] Psychiatric comorbidity and alcohol abuse are also the strong determinants of poor QoL within samples that have chronic somatic disorders, eg, in patients with chronic obstructive pulmonary disease.[11]

The Short-Form Health survey, the most common tool used to measure QoL, focuses on health-related QoL, ie, the patient's perception of how his or her health status affects physical, psychological, and social functionings.[3] For example, social functioning is measured as a consequence of health with questions like: "During the past 4 weeks, how much of the time has your physical health or emotional problems interfered

with your social activities (like visiting with friends, relatives, etc.)?" In contrast, an overall QoL measure, such as the QoL-5, focuses on the patient's satisfaction with life in general, and QoL is not measured only as a reflection of the individual's health.[12,13] In addition to include a more generic view of relationships such as the quality of the relationship to others and not only social functioning as a consequence of health, the QoL-5 also includes relationship with oneself. According to the developers' background theory of integrative QoL, this item refers to existential QoL such as ontological health.[12,14]

Previous research highlights how a SUD touches on important existential themes, such as meaning–meaninglessness, connectedness–loneliness, and responsibility–guilt.[15] Imperative to this, important treatment goals may include the need to experience coherence in life, restore dignity, and attain a sense of community and attachment with others.[16] Because SUD affects this wide range of life issues from the mere physical to the deep existential ones, overall QoL measures are arguably more suitable for the addiction field than health-related measures of QoL.[3]

Objectives. This study examined the QoL of patients with SUD admitted to a detoxification unit. The QoL-5, which is an overall QoL measure, was used.[14] To put their QoL into perspective, we compared their QoL with that of a somatic patient sample. Few studies have compared the QoL of patients with SUD with medical samples before.[6] We set out to examine differences in the respective subdomains (physical, mental, social, and existential) of QoL in order to increase knowledge about the QoL domains that are most affected in SUD patients. We expected that patients from the general hospital would report a decreased score on their perceived physical health but otherwise describe the quality of their relationships and their psychological health similar to that seen in a normative reference population. Thus, the rationale for the comparison was to contrast the QoL of a SUD sample with a sample closer to a general population sample. We also examined whether SUD patients would report an increase in QoL at a follow-up after the detoxification treatment. Finally, factors associated with QoL were examined. For this analysis, we included basic demographics and two of the strongest previously identified determinants of poor QoL, such as formal SUD diagnosis (ie, study population) and psychiatric comorbidity, measured as mental distress.

Methods

Participants and procedures. The respondents were the participants of the two studies at the Sørlandet Hospital.[17,18] Both studies included patients aged ≥18 years and excluded patients who were unable to understand the information provided due to language problems or cognitive impairment. The first study (SUD study) was a prospective study conducted between September 2008 and August 2010, which included patients in a controlled trial at a detoxification ward in the Addiction Unit. The central tenet of that study was to test whether patients could

be motivated to seek their own support in community-based, addiction-related, mutual help groups (MHGs) postdischarge and included a motivational condition versus a control group who got brief advice about attending MHGs. Of the 156 eligible patients, 16 patients declined to participate, leaving a final cohort of 140 patients (representing 89% of the eligible respondents). To avoid the influence of withdrawal symptoms on QoL baseline scores, patients were neither approached nor recruited to the study until they had passed the acute detoxification phase. Therefore, patients were first approached to participate in this study at a mean timepoint of 4.5 days after their admission. At a six-month follow-up, these respondents were contacted again and 80% ($N = 113$) provided outcome data on substance use and QoL. Those lost to follow-up were younger (35 versus 43 years; $t = 2.6$, $P < 0.01$) but otherwise had no defining characteristics. The mean QoL scores at baseline for those lost to follow-up were comparable with those who were engaged with the study. The results of the controlled trial in terms of MHG participation have been reported elsewhere.[18]

The second study (MED study) was a cross-sectional study among patients admitted to the general hospital ward in late 2013.[17] The objective of this study was first to assess alcohol use in patients admitted to the medical wards and to examine whether patients' alcohol use had been assessed by doctors during the interview at admission. Patients also reported their QoL. Data were collected from October 1, 2013, to December 20, 2013. In addition to the exclusion criteria mentioned earlier, we did not approach those who were deemed too ill to participate or complete the questionnaire. Research nurses collected the data, but the questionnaires were self-administered. Those who were incapable of completing the questionnaire themselves were offered an opportunity to complete it during an interview. Of the 998 successfully admitted patients, 670 patients were eligible for the study, 128 patients did not wish to participate, and 23 patients did not provide QoL data, yielding a final sample of 519 patients (77% of eligible respondents). The two studies are described separately in more detail elsewhere.[17,18]

After providing informed consent, data on patient demographics were collected, and the participants were assessed with the questionnaire described later. Both the studies were approved by the Regional Ethics Committee of the South-East Health Region. All procedures performed were in accordance with the ethical standards of the national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Measures. Essential demographics were collected, including gender, age, relationship status (living alone or living with another person), and education level, with a 5-point ordinal scale from obligatory school to university level. The Mini International Neuropsychiatric Interview, version 5.0, was used to confirm the SUD diagnosis in the SUD study.[19] In the MED study, diagnosis was obtained from the patient records.

Quality of life. QoL was measured at study inclusion using the QoL-5 test, a short, generic QoL instrument.[12,14]

QoL-5 consists of the following five subjective statements: two questions are about physical and mental health, two questions address the quality of significant relationships (partner and friends), and one question addresses the existential self, ie, the relationship with oneself. Responses were scored on a 5-step ordinal scale from 1 to 5. A score of 1 is very good, and a score of 5 is very poor. The raw scores were then transposed and inverted as a decimal scale ranging from 0.1 to 0.9: 0.9 was the best and 0.1 was the worst score.[14] Thus, a 0.2-point difference refers to one step on the raw score scale. Mean scores for health, relationships, and the existential self were calculated, and a total QoL score was derived.

For patients without a partner, the relationship subscore was based on one question only. Normative data from a previous survey of the general population showed a mean QoL score of 0.69.[12] Because we were unable to obtain general population norms for subdomains, we considered the overall norm of the scale (~0.7) as a norm. This was used as the QoL in our reference population. The cutoff score for a markedly reduced QoL was suggested as ~0.15 below that of the general population (≤0.55). Scores reduced by a further 0.15 were considered to be severely low (ie, <0.40).[20] For the SUD cohort, QoL was also measured at a six-month follow-up, and the changes in QoL were computed by subtracting the QoL determined at admission from that obtained at follow-up, hereafter called the *QoL score change*. A QoL score increase from baseline to follow-up of 0.2 (1-point increase on the raw score scale; eg, from *good* to *very good*) or higher was denoted as substantial and indicated a clinically important improvement. Other QoL changes were considered moderate (≥0.1 score), small (≥0.05 score), or very small (<0.05).[12,14] The internal consistency of the scale was good; Cronbach's alpha coefficient was 0.79.[21]

Mental health. Mental health status was assessed with the symptom check list (SCL), a measure of mental distress that includes statements about symptoms of depression and anxiety (scale 1–4).[22] A mean score (global score index) was computed; the higher the score, the greater the distress. Two variations of this measure were used: SCL-10 in the SUD study and SCL-5 in the MED study. The two measures were scored on the same item scale and had similar cutoffs; ie, ≥1.85 is considered to be a pathological score.[22,23] Thus, we used the two SCL versions as a proxy for respondents' mental health status in the analyses.

Statistical analyses. Descriptive statistics were used to elaborate baseline characteristics. Student's *t*-test was used to explore between-group differences. The baseline score of the MED study sample served as a reference for both of the assessments in the SUD sample. Linear regression was used to examine variables influencing QoL. For this examination, we used the admission scores of both samples. The baseline regression model was controlled for gender and age. We then performed a sequential procedure and added factors associated with QoL (education level, relationships, and mental distress) in the analysis. The rationale for the sequential procedure was that when we continued to add variables that could be

influenced by the substance use, we would statistically control possible attributes of the SUD condition itself. At the end, we would then be left with the plain *biological* effect of the substance use'; ie, given that substance use would have no other consequences on education, relationships, or mental distress. Thus, it was considered important to examine QoL when variables with a high potential for being an integral part of the SUD condition were controlled for.

Results are presented as unstandardized coefficients (*B*) with 95% confidence intervals (CIs). The *R* square (R^2) value was used to assess the fit of the statistical model. Analyses of variables were considered to be statistically significant at a *P*-value of <0.05. All analyses were performed using IBM SPSS Statistics version 21.

Results

A total of 659 patients were included. The SUD sample was mixed, with patients who had alcohol and/or drug disorders (Table 1). Differences between the two samples were observed in demographic and clinical variables. Compared to the MED study, respondents in the SUD study were on average 24 years younger, fewer were women (33% versus 43%), a larger proportion were living without a partner (47% versus 34%), and

Table 1. Characteristics of study respondents (*N* = 659).

CHARACTERISTIC	SUD-STUDY *N* = 140 N (%) OR MEAN (SD)	MED-STUDY *N* = 519 N (%) OR MEAN (SD)	*P*-VALUE
Age, years	*41 (14)*	*65 (17)*	<0.001
Gender (ref: females)	46 (33)	227 (44)	0.021
Relationship, (ref: living without a partner, n = 643)	66 (47)	165 (33)	0.002
Education level (n = 658)			
Obligatory education (≤10 years)	89 (64)	109 (21)	
High school (10–13 years)	38 (27)	260 (50)	
Bachelor degree or similar (13–16 years)	9 (6)	91 (18)	<0.001
>3 years at University (>16 years)	4 (3)	58 (11)	
SUD diagnosis			
None	0 (0)	516 (99)	
Alcohol, harmful use	6 (4)	3 (1)[b]	
Alcohol dependence	74 (53)	0 (0)	<0.001
Drug dependence	60 (43)	0 (0)	
Quality of life[c]	0.46 (0.15)	0.68 (0.13)	<0.001
Mental distress (SCL[d])	*2.45 (0.71)*	*1.55 (0.67)*	<0.001

Notes: [a]The *P*-value was obtained from Chi-square. [b]The three patients with harmful alcohol use were excluded in the following analyses because they had a formal substance use disorder diagnosis.[c]QoL-5, scale 0.1–0.9; 0.9 is the best possible QoL, and 0.69 is the mean of the general population. [d]Symptom check list, global score index. SCL-10 was used for the SUD study, and SCL-5 was used for the MED study. The cutoff for a pathological score is similar for the two measures (≥1.85).

their education level was lower (64% versus 21% had primary education only; Table 1).

The mental distress was significantly higher in the SUD sample; SCL global score index was 2.45 versus 1.56 (mean difference, 0.89; $P < 0,001$). The SUD samples' mean score was above the cutoff for a pathological score (1.85), while the MED sample had a mean score in the nonclinical range. There were three patients in the somatic sample who had a formal alcohol use-related diagnosis (alcohol–harmful use), these patients were excluded in the following analyses. As for the follow-up period of the SUD sample, those who were reached at follow-up had received a mean of 18 days (median 0, range 0–180) of inpatient treatment during the six-month follow-up period, although they were not intended to be directly transferred to further SUD treatment upon discharge. They had also attended a mean of 12 MHGs meetings (median 1, range 0–97). Almost half of the sample, 52 patients (46%), reported total abstinence from all substances for the 30 days preceding the follow-up interview.

Examining QoL, the mean score of the two groups was compared on each individual's QoL item. With the exception of physical health, all QoL items were significantly and substantially lower (0.22–0.26) in the SUD sample as well as the QoL-5 score (0.46 versus 0.68, mean difference −0.22, $P<0.001$; Fig. 1). Physical QoL was not significantly different between the two groups and was at a similar low level compared to a general population mean, ~0.2 below that of a general population mean expectation. For those who provided follow-up data in the SUD sample ($n = 113$), the overall QoL improved from 0.46 to 0.57, a mean improvement of 0.11 (95% CI: 0.08–0.15, $P < 0.001$) at the six-month follow-up. According to the interpretative guidelines, this is a moderate clinical improvement. The QoL-5 score was still significantly lower than the QoL of the MED sample (−0.11, 95% CI: −0.08/−0.13) and also significantly lower QoL ($P < 0.001$) on each individual's QoL item, with the exception of physical health (Fig. 1).

A sequential multiple linear regression based on baseline data where we adjusted for demographics, education level, and living arrangement (living with or without a partner) showed that the QoL difference between groups was still substantial (~0.2; Table 2). When mental distress was added to the analysis, the difference in QoL between groups was reduced to 0.10 (Table 2), but the difference was still significant.

Discussion

Patients with SUD admitted to detoxification experienced physical QoL as low as patients admitted to a general hospital and had significantly lower QoL on all other subdomains (psychological, social, and existential). The SUD patients reported a modest improvement in their QoL at a six-month follow-up, but still exhibited lower QoL compared to somatic patients. Regression analysis showed that having a SUD condition accounted for a substantial impairment in QoL even after controlling for age, gender, and education level. When

Table 2. Comparing baseline QoL between a MED study sample and the SUD study sample while controlling for demographic and mental distress in a sequential regression model ($N = 656^a$).

FACTORS	B (95% CI)[b]	P-VALUE	EXPLAINED VARIANCE (R^2)
First step			
Study population (SUD sample)	−0.22 (−0.25/−0.20)	<0.001	30%
Second step			
Study population (SUD sample)	−0.22 (−0.25/−0.19)	<0.001	
Gender (female)	0.00 (−0.03/0.02)	0.600	30%
Age, years	0.00 (0.00/0.00)	0.659	
Third step			
Study population (SUD sample)	−0.20 (−0.23/−0.17)	<0.001	
Gender (female)	0.00 (−0.02/0.02)	0.965	
Age, years	0.00 (0.00/0.00)	0.394	32%
Living without a partner	−0.04 (−0.06/−0.02)	0.001	
Education level	0.01 (0.00/0.03)	0.023	
Final step			
Study population (SUD sample)	−0.10 (−0.13/−0.07)	<0.001	
Gender (female)	0.02 (−0.00/0.04)	0.034	
Age, years	0.00 (0.00/0.00)	0.469	59%
Living without a partner	−0.04 (−0.06/−0.02)	0.001	
Education level	0.01 (−0.01/0.01)	0.307	
Mental distress[c]	−0.13 (−0.14/−0.12)	<0.001	

Notes: [a]Three patients in the somatic sample were excluded from the analysis because they had a formal diagnosis of substance use disorder. [b]Multiple linear regression; unstandardized coefficient (B) with 95% CIs. [c]Symptom check list, global score index. In the MED study, there were 23 patients who did not fill out the SCL form; these patients' data were excluded from this analysis.

mental distress was brought into the equation, it seemed to explain part of the variance in the QoL.

In the present study, the physical QoL of SUD patients was as low as that of patients admitted to somatic wards. This was a surprising finding, but the physical problems of patients with SUD are increasingly recognized clinically and in the literature.[24,25] Such findings warrant that the physical problems of these patients should be assessed and recognized in all types of SUD treatment.[26] Although the physical condition of the SUD patients was modestly improved at the follow-up, their physical QoL was still substantially lower than the norm of a general population (0.56 versus ~0.7), indicating additional potential for improvement if addressed appropriately.

On all other areas, the SUD group reported QoL significantly lower than that seen among somatic patients, with the lowest score and the largest difference in the psychological health domain. Mental distress is a common experience for
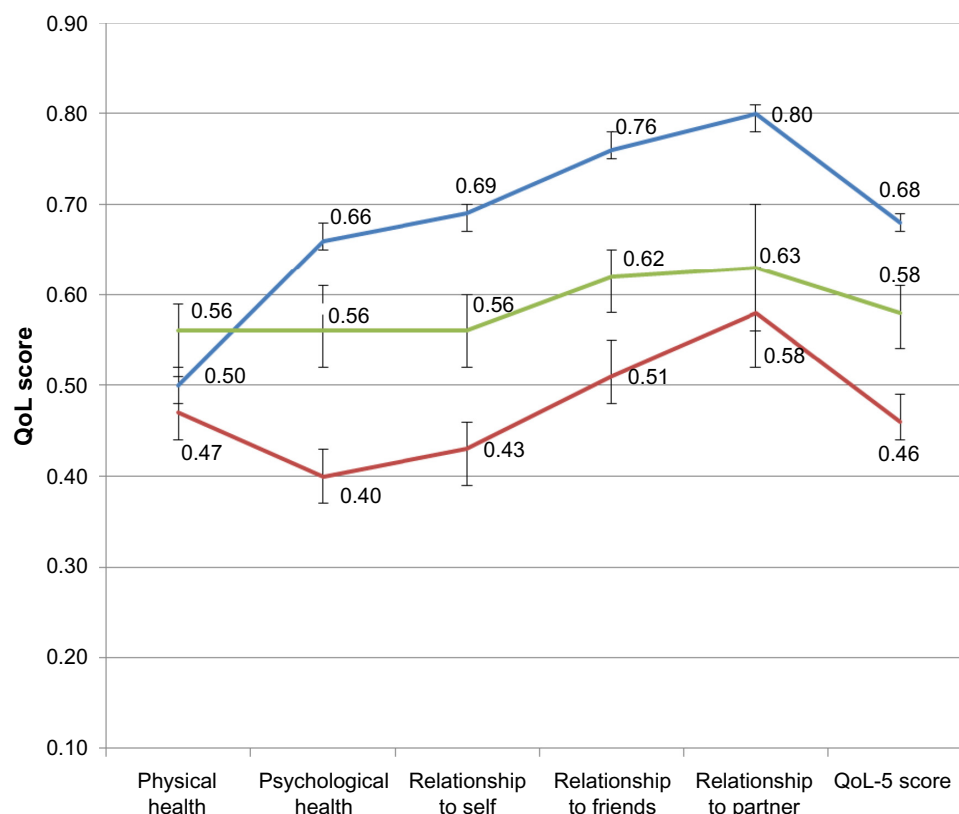
Figure 1. Comparison of quality of life scores[a] of patients admitted to detoxification units and patients admitted to general hospital wards. Red line mean patients in the SUD study ($N = 140$), green line mean patient in the SUD study at follow-up ($N = 113$) and blue line mean patients in the MED study ($N = 516$)[c].

Notes: [a]QoL-5, scale 0.1–0.9; 0.9 is the best possible QoL. [b]With the exception of physical health, the QoL of the SUD sample at both timepoints was significantly lower ($P < 0.001$) than the baseline QoL of the MED sample (Student's *t*-test). [c]Three patients in the somatic sample were excluded from the analysis because they had a formal diagnosis of substance use disorder.

patients with a SUD, partly due to the substance use and its consequences, and partly because psychiatric disorders often coexist with SUDs, resulting in a double burden of symptoms and problems.[27] Thus, it is not unexpected that the patients reported significantly lower psychological health and emotional well-being compared to somatic patients.[2] Even in samples with chronic somatic disorder, psychiatric comorbidity and alcohol abuse have been found to be the strongest determinants of poor QoL.[11] The causal path between substance use and psychopathological symptoms, such as depression and anxiety, should always be considered. Substance use may be a potent agent for deteriorating mental health.[28] Impaired mental health may also have preexisted before the substance use, and the substance use may deteriorate it further.[29] In any case, whichever came first, the psychopathology or the SUD, one should still focus on substance use because an improvement in psychological health could be expected if the consumption of substances is reduced or stopped.[28] Nevertheless, patients in treatment for SUD should also be provided with appropriate interventions toward existing psychopathology.

Psychopathology is also very much intertwined with the areas that define QoL: psychological well-being and social functioning. Thus, psychopathological comorbidity would be a

confounder to the patient's QoL; ie, there would likely be bidirectional interactions between psychopathology and SUD, and both SUD and psychopathology would have a directionally negative effect on QoL.[30,31] Previous research did not find that having a SUD was associated with poorer QoL when controlling for psychiatric comorbidity.[27,32] This finding was supported in the present study to some degree; when mental distress was included in the regression model, the explanation of the variation in QoL increased substantively from 32% to 59% and the influence of the SUD *alone* was reduced. However, the effect of having a SUD condition was still at a significant level and had a stand-alone negative influence on QoL ($B = -0.10$) similar to what was found for mental distress alone ($B = -0.13$), indicating that both factors independently contributed to lower QoL.

The SUD patients improved their QoL in all subdomains, but the quality of the relationship to a partner improved the least (0.05) and displayed the largest difference with the somatic sample (0.17) at follow-up. Living without a partner was also a significant factor associated with a reduced QoL. It is striking that only half of the SUD sample lived in a relationship versus two-thirds of the MED study sample. Patients with a SUD often experience broken relationships or the family and/or social network may be worn out by trying

to help or mitigate the consequences of the condition.[33,34] As a consequence, positive familial restraining influences may no longer be present, and there may also be a lack of motivational support to promote self-help in the patient. Our data corroborated earlier findings among alcoholics undergoing rehabilitation, where perception of being lonely and feelings of loneliness were robust predictors of poor QoL and prognosis.[35]

Methodological considerations. The presented results must be interpreted in light of some methodological limitations. The study includes two distinct clinical samples: one (MED study) was a cross-sectional study and the other was a prospective cohort study (SUD study). Thus, we did not assess changes in QoL in the MED study. There was no formal sample size calculation for the current combined population. The MED study was undertaken years after the SUD study. We are not aware of any relevant large-scale changes in the economy or a policy that may have contributed to historical or cohort effects during this period. As might have been expected, the samples were quite different on all measured demographics, but these differences were controlled in the regression analysis.

In the SUD sample, all underwent an inpatient detoxification treatment at the time of the baseline data collection, a clinical intervention typically of 10 days duration, and there were observed improvements in QoL and in substance use at follow-up (almost half of the sample abstained from substance use in the month preceding the follow-up interview). The detox intervention might have accounted for the positive changes at follow-up in addition to the treatment and/or the mutual help the SUD sample had received during follow-up. On the other hand, given that a person's QoL might have been at its lowest point at the time of admission to a detoxification unit, it might be natural that the follow-up scores in the SUD sample would more closely align with the scores of the medical sample. Although the SUD sample improved their QoL at follow-up, it was still significantly lower than the QoL of the medical sample.

In the present study, we did not put a main focus on the changes within the SUD sample, a more detailed analysis of these changes has been published elsewhere.[36] Instead we compared the QoL of the two groups and controlled for the variables the two studies had in common in order to identify potential modifiable factors and increase the understanding of underlying *mechanisms* influencing QoL. The interventions in the SUD study (motivational intervention or brief advice about using MHGs after discharge) did not affect the patients' QoL.

Implications. Patients admitted to detoxification have severely reduced QoL across all domains, including perception of physical health. Clinicians in the SUD field need to address factors influencing patients' reduced QoL in order to achieve improvement, and this includes physical health and mental distress as well as social networks and domains.

Conclusions

The poor QoL of patients with a SUD admitted to detoxification treatment highlights the need to address the affected domains of patients' lives during treatment in addition to a focus on their substance use. In order to support patients during their recovery process, clinicians need to be interested in and oriented toward the QoL of patients and view improvements in QoL as paramount to achieving long-term clinical improvements and recovery.

Author Contributions
Conceived and designed the study: J-KV, TC. Analyzed the data: J-KV, AHP. Wrote the first draft of the article: J-KV. Jointly developed the structure and arguments for the article, agreed with article results and conclusions, and contributed to revising the article: J-KV, AHP, TC. All the authors reviewed and approved the final article.

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