Clinical insight level predicts successful quit or control attempts during the first three months of outpatient addiction treatment

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Highlights

- Lower baseline clinical insight level was associated with lower success to quit or reduce use 3 months later
- Lower clinical insight at treatment entry might predict lower response to addiction treatment
- Clinical insight might be a critical factor for addiction treatment efficiency

Abstract

Introduction: Low clinical insight in psychiatry is defined as poor recognition of one's mental illness, including disability to self-evaluate symptom severity. It has been reported as common in addiction and is associated with lower treatment compliance. Longitudinal studies suggest that low clinical insight could be linked to more relapse. However, association with successful quit attempts remains unknown.

Objective: Our objective was to examine the prospective link between baseline clinical insight level and self-reports of successful attempts to quit / control use during the first 3 months of outpatient addiction treatment.

Methods: Participants were recruited from the ADDICTAQUI cohort at outpatient treatment intake for substance or behavioral addictions. They completed a baseline evaluation using the Addiction Severity Index (ASI), the Mini International Neuropsychiatric Interview (MINI), and the modified Hanil Alcohol Insight Scale (m-HAIS) with a follow-up ASI 3 months later. Data were analyzed using multiple logistic regression and non-parametric tests.

Results: Lower clinical insight level at baseline was associated with less successful quit / control attempts during the first 3 months of outpatient treatment compared to a higher clinical insight level, controlling for sociodemographic factors, baseline addiction severity, and comorbidities (n = 54; exp(B) = 0.76; p (FDRcor) = 0.033).

Conclusion: Poor clinical insight may be a barrier to treatment success, and future studies should examine underlying mechanisms.

Key words

Addiction; Clinical Insight; Use control; Quit attempt; Longitudinal; Naturalistic Cohorts

1. Introduction

Addiction is a dynamic process characterized by an impaired control over use of reinforcing substances or behaviors, its persistence despite negative consequences and repeated relapses after attempts to reduce or stop (American Psychiatric Association, 2013; Auriacombe et al., 2018; Hasin et al., 2013; Maisto et al., 2016; Witkiewitz and Marlatt, 2007). Recent reviews and meta-analysis highlight that abstinence is not the only efficient approach in the treatment of addiction and "controlled" / "low risk" use is also a viable option with comparable improvement in social functioning and use reduction (Aubin and Daeppen, 2013; Henssler et al., 2021).

In the perspective that addiction is a chronic disease, its treatment is a process over several years (Auriacombe et al., 2016; Fatseas and Auriacombe, 2009; O'Brien, 2008). One of the most important predictive factors for good outcome is patient retention in treatment (Carruzzo et al., 2009). The onset of treatment is a critical period during which the risk of discontinuation is frequent. Relapse rate is very high over the first three months after quit attempts (e.g., (Nalpas and Boulze-Launay, 2018; Piñeiro et al., 2017; Snelleman et al., 2015)). Some factors at treatment initiation are known to increase relapse risk such as craving, addiction severity or psychiatric comorbidities (e.g., (Cavicchioli et al., 2020; Serre et al., 2015; Sinha et al., 2006; Sliedrecht et al., 2019; Tiet et al., 2007)). In addition, individual lack of perception of one's own addiction, that refers to an individual's insight level, may compromise treatment efficiency and increase relapse risk.

Insight is a multidimensional mental state defined as "*the capability of psychiatric patients to recognize and accept that they are suffering from a mental illness*" (Thirioux et al., 2020). Clinical insight, one sub-dimension of insight, is the capability to recognize one's mental illness, its symptoms and consequences, and to consent to related medical care (Amador et al., 1991; David, 1990; Jaafari and Marková, 2011; Marková and Berrios, 1995; Thirioux et al., 2020).

Individuals with low insight into addiction are known to overestimate their capacity to quit by themselves or control their use (Rinn et al., 2002). Several studies showed that people with lower insight self-reported less use severity and consequences (Kim et al., 2007; Lyu et al., 2017; Maremmani et al., 2012; Schuckit et al., 2020). Interestingly, impaired clinical insight may also contribute to a lack of willingness and/or attempt to quit, and the main barrier to seeking treatment (Probst et al., 2015).

Lack of clinical insight was identified by clinical staff as an important risk factor for re-hospitalization of patients with substance use disorders (Kent and Yellowlees, 1994), probably due to higher rates of relapse. To our knowledge, only ~~three~~ four prospective studies have examined the role of clinical insight in relapse, abstinence or recovery, all concerning alcohol addiction. In one study, lower clinical insight (before and after hospitalization) predicted less probability to be “recovered" or "improved" at 2 years (Willems et al., 1973). In another study, patients with lower clinical insight (Hanil Alcohol Insight Scale (HAIS)) upon discharge remained abstinent for less time and had fewer cumulative months of abstinence over the first year than those with higher clinical insight (Kim et al., 2007). In the third study, subjects with low clinical insight (HAIS) and high-level of implicit association for alcohol were more likely to relapse within the first month after hospitalization compared to those with good insight (Dandaba et al., 2020b). In the last study, lower clinical insight (HAIS) at baseline was associated with relapse (Shen et al., 2021). These studies suggest that the level of clinical insight may be involved in relapse, abstinence and prognosis of individuals with alcohol addiction. More studies are needed to confirm these results and to know if they are generalizable to other addictions. Moreover, the mechanisms underlying this association remain to be explored. Potential hypothesis could be that subjects with lower clinical insight may have more difficulties to cope with craving, due to lower cognitive and metacognitive abilities, or more automatic behaviors, which may prevent them to successfully control their use (Ceceli et al., 2022; David et al., 2012; Flaudias et al., 2019).

The currently available literature has mainly focused on the association of insight with the ability to remain abstinent from alcohol among subjects that are already abstinent. According to the fact that lower clinical insight is a known barrier to initiate treatment, w~~W~~e may also question whether insight might play a role in the success of individuals to initiate abstinence or regain control in use.

We hypothesized that people with lower clinical insight had a lower probability to succeed in becoming abstinent during treatment. Our main objective was to examine, based on prospective analyses, the correlation between baseline clinical insight and successful attempts to quit during the first 3 months of outpatient addiction treatment.

2. Methods

2.1. Participants

2.1.1. Procedure of the ADDICTAQUI cohort

Data were extracted from the Addiction Aquitaine Cohort (ADDICTAQUI) (Auriacombe, 2019). ADDICTAQUI is a longitudinal naturalistic cohort which included participants in outpatient addiction treatment centers over the age of 18 that met the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition, (DSM-5) (American Psychiatric Association, 2013) criteria for at least one substance use disorder or behavioral addiction. Non-inclusion criteria were severe cognitive impairment or illiteracy. All participants received on the day of their treatment admission appointment, a standard baseline clinical interview with a trained interviewer using the Addiction Severity Index (ASI), the Mini International Neuropsychiatric Interview (MINI), a numerical rating scale to assess craving, and a modified Hanil Alcohol Insight Scale (HAIS-m) for clinical insight assessment. Follow-up interviews were conducted at 3-, 6- and every 6-months thereafter. Cohort protocol is approved by French biomedical research regulatory and ethical committees (CNIL, CPP, CEEI/IRB). All participants received standard comprehensive care, consisting of individual behavioral treatment focused on craving management, relapse prevention and psychosocial support combined, when available, with pharmacotherapy (Auriacombe et al., 2016; Fatseas and Auriacombe, 2009).

2.1.2. Participant selection among ADDICTAQUI cohort

To be included in the current analyses, participants had to be included in the ADDICTAQUI cohort after August 2019, completed the modified Hanil Alcohol Insight Scale (HAIS-m) at baseline (T0), began an outpatient addiction treatment, and received a follow-up interview 3 months after treatment initiation (T1).

Participants were assigned to one main addiction group based on their main problematic use reported by the ASI (Drug and Alcohol section, Question 14 (D14)). If none could be identified, or more than one, main problematic use was determined as the most severe according to standard thresholds of DSM-5 diagnosis (MINI) and Interviewer Severity Ratings (ISR) from the ASI.

2.2. Instruments and measures

2.2.1. Mini International Neuropsychiatric Interview (MINI)

We adapted the MINI structured interview (Sheehan et al., 1998) to explore current (over the past 12 months) DSM 5 substance use disorders and behavioral addictions (gambling and gaming disorders. (American Psychiatric Association, 2013; Hasin et al., 2013). Other

behavioral addictions (e.g., sex, food) were explored using an adapted version of the 11 SUD criteria.

"Diagnosis severity" was defined according to the standard cut-offs (mild: 2-3 criteria, moderate: 4-5 criteria, severe: ≥ 6 criteria) of DSM-5 SUD. "*Addiction criteria*" was defined according to the number of endorsed DSM-5 criteria. In order to take into account, the difference in the number of criteria for SUD (n=11) and gaming and gambling disorders (n=9) this variable was put on a comparable scale into the analyses (0-1). More than one disorder was qualified as "*poly-addiction*."

In addition, DSM-~~IV~~5 diagnostic criteria were also adapted for current and lifetime mood and anxiety disorders ~~were explored~~.

2.2.2. Addiction Severity Index (ASI)

The ASI is a semi-structured interview to assess substance users multidimensionally (McLellan et al., 1992). We used a modified and validated French version of the ASI (m-ASI), adapted to include tobacco and behavioral addictions (Denis et al., 2016). The m-ASI explores lifetime use and over the past 30 days, it was completed at baseline (T0), and follow-up (T1), i.e., 3 months after treatment enrollment independently of treatment status (still in / without treatment) (Figure 2).

The Interviewer Severity Ratings (ISR)~~)~~ estimated the severity of use for alcohol, drug, tobacco, eating disorders, gambling, gaming, and other addictive behaviors (range 0-9). A score greater than 4 indicated the need for addiction treatment.

From the ASI data, several variables were determined:

- "*Current use*" assessed the number of days of use in the past 30 days.
- *"Baseline regular use"* assessed whether subjects had regular use of the primary addiction (at least twice a week or 8 days) in the past 30 days prior inclusion.
- "*Lifetime duration of regular use*" (baseline ASI only) assessed the number of years of regular use, which was defined as at least 2 times per week for 6 months or more.
- *"Addiction medication*" (T0 at baseline and T1 at follow-up) assessed whether subjects took a medication for an addiction in the past 30 days.

- *"Regular use at follow-up"* (follow-up ASI only) assessed whether subjects had regular use (at least twice a week during two consecutive weeks) since the last ASI: no regular use (0), at least 2 weeks of regular use (1).
- "*Abstinence*" (follow-up ASI only) assessed whether subjects abstained from use since the last ASI: abstinence (0), at least 2 weeks without use (1), no abstinence period (2). Abstinence referred to a complete cessation of use during 2 consecutive weeks.

Participants were informed that all ASI interviews were completed by a urine collection for drug screening and breathalyzer for alcohol and CO detection to increase reliability of self-report. Within the ADDICTAQUI cohort, we have shown that substance use self-report was reliable (Denis et al., 2012).

2.2.3. Successful quit/control attempts

The variable "successful quit/control attempts" was modeled using the *"Regular use at follow-up"* and "*Abstinence*" ASI variables. Participants were assigned to the "No Success" group when they reported at least 2 weeks of regular use ("*Regular use at follow-up*" = 1) and no abstinence period ("*Abstinence status*" = 2) at follow-up ASI, *i.e.*, they had a continued regular use or did not try or successfully stop for at least two weeks since the baseline interview. All other subjects were assigned to the "Success" group, *i.e.*, they had either a sporadic, non-regular, controlled use or at least one successful abstinence period (2 weeks or more). Analyses compared the "No Success" and "Success" groups.

2.2.4. Craving evaluation

Baseline (T0) craving was evaluated during a face-to-face interview through a self-report assessment covering the past 30-days. "*Craving frequency*" was defined as the number of days with craving (0-30). "*Mean intensity*" and "*maximal intensity*" ever experienced were collected using a numerical rating scale from 0 (no craving) to 10 (extreme craving). Craving was defined as "an intense desire and/or the occurrence of obsessive thoughts centered on the [*main addiction*]". This single-item method is the most used in clinical and research practices and is effective in assessing craving (Enkema et al., 2020; Sayette et al., 2000; Tiffany and Wray, 2012).

2.2.5. Hanil Alcohol Insight Scale modified version (HAIS-m)

The HAIS was developed to assess quantitatively and qualitatively the insight that patients have into their alcohol use disorder during inpatient detoxification (Kim et al., 1998). The HAIS has good to high psychometric quality (internal validity: Cronbach's $\alpha = 0.89$; sensitivity: 76.9 to 100% and specificity: 83.3 to 94.9%) (Kim et al., 1998). The French version of the HAIS was validated and showed comparable psychometric proprieties as the original scale (Dandaba et al., 2020a). The French HAIS consists of 19 items divided into three categories measuring the: (1) "Minimization of alcohol problems"; (2) "Recognition of loss of control"; (3) "Awareness of a problem with alcohol and the need for treatment" (Dandaba et al., 2020a). The total HAIS score ranges from -18 to 20. In this study, a modified version of the French HAIS was used, to evaluate the patient's insight of his "*main addiction*" regardless of the type of addiction (substance or behavior).

2.2.6. Treatment

Based on medical files and appointment dates with medical staff involved in treatment at the outpatient addiction centers, treatment was considered as "continuous treatment" if participant was still in treatment at 3-month follow-up (T1).

2.3. Statistical analysis

Univariate analyses examined the association between baseline (T0) *clinical insight* level (continuous, independent variable) and *Successful quit attempts* at follow-up (T1) (dichotomous, dependent variable), and with potential baseline confounding factors: age, sex, study level, polyaddiction, substance or behavioral addiction, current psychiatric comorbidities, past addiction treatment, current use (days), lifetime duration of regular use (years), addiction criteria, lifetime psychiatric comorbidities, addiction medication and baseline regular use. Additional analyses also examined the association between clinical insight level and sociodemographic variables and addiction-related factors (Supplemental Materials). Because of the non-normal distribution of variance, non-parametric tests were used for all univariate analyses according to variable types (Wilcoxon test (z), Kruskal-Wallis test ($\chi 2$), Spearman's correlation (ρ) or Pearson Khi-square test ($\chi 2$).

Multiple binomial logistic regression tested the association between "Successful quit/ control attempt" at T1 and clinical insight at T0. The model used a backward stepwise selection and controlled for clinically relevant variables (age, sex, study level, diagnosis severity, substance or behavioral addiction, craving, continuous treatment, past addiction

treatment, addiction medication, baseline regular use), and variables moderately associated with "Successful quit/control attempt" in univariate analysis (p(enter) = 0.25; p(exit) = 0.1).

Statistical analysis was performed using JMP Pro 15.0 (SAS Institute, Cary, North Carolina). The level of significance was set at $p < 0.05$. Multiple binomial logistic regression was FDR corrected.

3. Results:

3.1. Sample description

During the inclusion period, 115 subjects completed a baseline (T0) HAIS-m, of which 58 completed the follow-up T1 interview, 4 were excluded due to missing data at HAIS-m. This latter group of 54 subjects is our study sample and was included in the analyses. As described in Table 1, the participants were primarily male (57.4%), with an average age of 40.9 (*SD* = 13.4) years old. Average study level was 13.4 years (*SD* = 3.1). Large majority of participants (90.7%, *n* = 49) received treatment during the first 3 months of study. 75,9% (*n* = 41) of individuals had a substance addiction and 24.1% (*n* = 13) had a behavioral addiction, the most frequent main addiction was alcohol (37.0%).

Compared at baseline to those that did not complete the 3-month follow-up or had missing data at HAIS-m (n=61), the study sample did not differ in age, level of education, severity of addiction (duration, number of days, number of DSM-5 criteria), type of addiction (substance or behavior), psychiatric comorbidities (current or lifetime), number of previous treatments or level of clinical insight (data not shown). The study sample included slightly more women (*n* = 23) than the non-included sample (*n* =15) (Khi^2 of Pearson; $\chi 2 = 3.96$; $p = 0.05$).

From the study sample, 24 participants were in the "Success" group (44.4%) and 30 in the "No Success" group (55.6%). Among those in the "Success" group, 4 were abstinent the all three months, 4 were abstinent since at least 30 days before the follow-up, 12 individuals were not abstinent at the follow-up but reported a successful abstinence period of more than 2 weeks, 4 had a sporadic / non-regular use the all three months.

Eight subjects (14.8%) at baseline (T0) and 24 (45.3%) at follow-up (T1) received addiction medication.

3.2. Univariate analyses

As described in Table 1 and Figure 3, participants from the "No Success" group were more likely to have a lower clinical insight level at baseline compared to those from the "Success" group (mean 9.0 (*SD* = 5.2) *vs*. 11.8 (*SD* = 3.6), Wilcoxon tests; $z = 1.98$; $p = 0.48$). They were also more likely to be female (Khi^2 of Pearson; $\chi 2 = 5.62$; $p = 0.02$), to be older (Wilcoxon tests; $z = -3.02$; $p < 0.01$), to have higher lifetime duration of regular use (Wilcoxon tests; $z = -2.97$; $p < 0.01$) and a higher number of days of current use over past month (Wilcoxon tests; $z = -3.99$; $p < 0.001$).

Clinical insight level at baseline was not associated with number of past month appointments with medical staff before follow-up interview (Spearman's correlation; $\rho = 0.10$; $p = 0.46$), ~~and~~ maintaining or discontinuing treatment (Wilcoxon test; $z = 0.38$; $p = 0.71$), addiction medication at follow-up (Wilcoxon test; $z = 1.23$; $p = 0.22$) but was associated with addiction medication at baseline (Wilcoxon test; $z = 2.03$; $p = 0.04$) (Table S1, supplemental materials).

3.3. Multivariate analysis

Multiple ordinal logistic regression model demonstrated that the "No Success" group was significantly associated with lower clinical insight level at baseline than was the "Success" group ($p = 0.033$), after adjustment for sociodemographic and addiction-related factors (Table 2). Subjects from the "No Success" group had a ~~0.75~~ 0.76 lower clinical insight than those from the "Success" group. ~~As described in Table 2, the "No Success" group participants were older ($p < 0.05$) and more frequently female ($p < 0.05$).~~

4. Discussion

Our main objective was to examine the correlation between baseline clinical insight level and successful attempts to quit or regain control in use during the first 3 months of outpatient addiction treatment. Adjusting for sociodemographic, addiction type and severity, our results show, for the first time, that lower clinical insight at treatment initiation was associated with a higher risk to not succeed in attempts to quit/control use in the first 3 months of outpatient addiction treatment.

The few studies that have examined clinical insight in addiction using HAIS suggested that, when abstinent, low insight could be associated with more difficulty to remain abstinent, and a worst outcome for individuals after inpatient detoxification (Dandaba et al., 2020b; Kim

et al., 2007; Shen et al., 2021; Willems et al., 1973). Our results are consistent with these previous studies, with important added value. In addition to alcohol, we have explored other substances and non-substance addictions, including food which contributes to generalize the results beyond alcohol addiction. Furthermore, we have explored how insight may influence the capacity to regain control though abstinence or reduced use whereases previous studies explored relapse once abstinent. Our results are also consistent with the hypothesis that patients with poorer insight could be less responsive to treatment. We do not have enough detail on the specific contents of therapy offered to each patient, so it is difficult to explore which components may have contributed to better compliance in our sample. Good level of compliance in our study could be partly explained by a fairly high level of insight, despite the inter-individual differences.

Among the factors known to impede response to addiction treatment and barriers to quit / control use are gender, income, severity of addiction or psychiatric comorbidities (for review (Chiappetta et al., 2014)). Noteworthy, some factors that increase attempts to quit or control use may also decrease the ability to do it, such as having a more severe addiction (Chiappetta et al., 2014). Our methods cannot separate these different factors. However, it is unlikely that our results could be explained by addiction severity (higher addiction severity associated with higher difficulty to quit / control use and lower insight). First our analyses controlled for addiction severity, and secondly, the majority of studies failed to find an association between clinical insight level and addiction severity, e.g., number of DSM-5 criteria, lifetime duration of regular use, quantity and frequency of use, comorbidities (Kim et al., 2007; Lambert et al., 2022; Poncin et al., 2015). Similar findings were reported for other psychiatric diseases (*e.g.*, (Eisen et al., 2001; Feyer et al., 2020; Vigne et al., 2014)). In our sample, none of the addiction severity factors neither psychiatric comorbidity or sociodemographic factors assessed were associated with the level of clinical insight (Table S1, supplemental materials). These results were not surprising, as there is no consensus in the literature on an association between clinical insight alteration and those variables (e.g., (Kim et al., 2007; Maremmani et al., 2012; Raftery et al., 2020)). This highlights the importance of exploring the mechanisms by which lack of insight impacts addictive processes, to understand how this could lead to poorer outcomes and/or relapse.

Among the factors to explain the link between lower insight and more difficulty in quitting / controlling use successfully, is compliance with treatment. Indeed, lack of clinical

insight, due in part, to a lack of perception of treatment need, is known to be a major barrier for treatment initiation (Degenhardt et al., 2017), but also compliance (Goldstein et al., 2009; Yen et al., 2008). Even if our sample was composed of treatment seeking individuals, patients with a lower clinical insight could have more difficulties to perceive symptom severity, such as craving, and report them to their physician, that in turn could lead to reduced treatment efficiency (Lambert et al., 2022). Moreover, this lack of consciousness of addiction severity and symptoms could lead to an overestimation of the patient's capacity to control substance use by himself, which may in turn increase the lack of treatment compliance and result in a worst outcome. Interestingly, in our study, clinical insight level was not associated with maintaining or discontinuing treatment (a large majority of people were still in treatment at the 3-month follow-up), nor with number of past month appointments with medical staff. This suggests that despite treatment maintenance, those with less insight may be less responsive to treatment, regardless of compliance. To identify the factors that contribute to reduced treatment efficiency for these individuals remains needed.

The current study has several limitations that need to be acknowledged. Firstly, concerning the No Success group, the ASI did not differentiate subjects with continuous regular use from those who alternated with periods of regular and non-regular use. Thus, it is possible that some individuals could have regained control of their use over several weeks and therefore be less "severe" than those who remained in regular/compulsive use over the entire period. They would then have been put "wrongly" in the No Success group. Future studies could address this issue by assessing the successful quit / control attempts with a continuous measure of severity from abstinence to regular use. In addition, we could not establish if a participant had tried to control his or her use without success (*e.g.*, less than 2 weeks of abstinence) or had simply not tried (or wanted to try) to quit / control. Thus, both failure and absence of will are merged. Although our groups were created to study factors associated with success in quit / control use attempts (i.e., no success was modeled as a continued regular use or did not try or successfully stop for at least two weeks since the baseline interview), we cannot exclude that, subjects who try to quit / control but fail to do so during at least 2 weeks could be different from those who do not wish to quit / control. However, the probability of being in treatment without wanting change use is low. Moreover, we decided to pool patients that succeed in quitting with those who reported use, but not regular (less than twice a week) in the same "Success" category. Indeed, more and more addiction treatments aim at use reduction and not a complete abstinence (European Medecines Agency, 2010; Witkiewitz et

al., 2021; World Health Organization (WHO), 2000). Future studies will be needed to separate these different sub-categories from the "No Success" group to confirm our results. Secondly, sample size prevents us to control analyses on type of addiction (e.g., alcohol, tobacco), the multivariate analysis only controlled for the distinction between substances and behavioral addictions. Future studies should replicate and confirm our results for each addiction type. Thirdly, current study assessed early stage of addiction treatment, whereas addiction treatment may need a continuum over several years for efficiency. Maybe the factors that explain the difficulty in quit / control attempts in the first three months of treatment are different from those that explain the difficulty in quit / control attempts in the first year or later years. Further studies may explore successful quit / control attempts at later stages of treatment process. Finally, Successful quit / control attempt status was retrospectively evaluated in the laboratory by self-reports of participants, which could be distorted by memory bias. Future studies could use ambulatory tools to collect individuals' daily use prospectively.

5. Conclusion:

This study explored the prospective association between baseline clinical insight at treatment initiation and self-report of success in quit /control attempts after three months of treatment in a sample of individuals with various addictions. Interestingly, individuals with lower clinical insight were less likely to self-report a success, even after adjustment for addiction severity, sociodemographic and comorbidities. This was not the case in individuals with a similar baseline severity but a higher clinical insight level. These results have important clinical implications as clinical insight evaluation is not systematic in addiction treatment procedure. Future studies are needed to further investigate and better understand how clinical insight impact quit / control attempt success, relapse, and treatment adherence.

Declarations of interest

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Credit authorship contribution statement

Lambert L.: Conceptualization, Data collection, Analyses, Writing - original draft, Manuscript reviewing. **Serre F.:** Conceptualization, Data collection, Funding acquisition, Supervision, Manuscript reviewing. **Auriacombe M.:** Conceptualization, Funding acquisition, Manuscript reviewing, Supervision. **Thirioux B.:** Manuscript reviewing, Funding acquisition. **Jaafari N.:** Manuscript reviewing, Funding acquisition.

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Figure 1

Diagram distribution of subjects according to Successful quit / control attempt categories and clinical insight level (n = 54).

The density diagram shows how the data are distributed: the wider the diagram, the more subjects have that clinical insight value (violin type, equal area size). The whisker boxes show the distributions of the data according to quartiles, range and median.

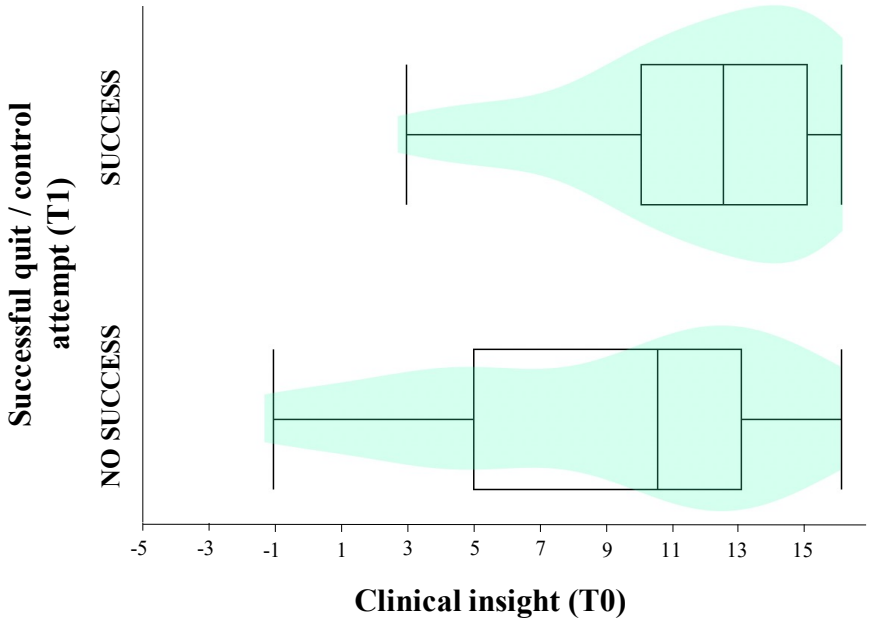

Table 1

Demographic, substance-related and psychiatric characteristics according to "Successful quit / control attempts" status at follow-up (T1) (*n* = 54).

	Mean (*SD*) or percentage (*n*)		**Coef.**	***p*-value**
Successful quit / control attempt (T1)	**No Success (*n* = 30)**	**Success (*n* = 24)**		
Baseline assessment (T0)				
Socio-demographic variables				
Age [a]	45.4 (13.8)	35.3 (10.9)	-3.02	**< .01**
Sex (male) [b]	43.3 (13)	75.0 (18)	5.62	**0.02**
Education level [a]	13.1 (3.2)	13.8 (3.1)	0.82	0.41
Addiction related factors for main addiction				
Clinical Insight level (total score) [a]	9.0 (5.2)	11.8 (3.6)	1.98	**.048**
Addiction criteria [c]	7 (3-11)	8 (4-10)	0.53	0.60
Current use (days) [a]	26.0 (7.4)	12.7 (12.3)	-3.99	**< .001**
Baseline regular use (yes) [b]	96.7% (29)	54.2% (13)	13.93	**< .001**
Past regular use (years; *n*=53) [a]	22.8 (13.4)	12.0 (10.7)	-2.97	**< .01**
Craving (days; *n*=53) [a]	18.3 (13.2)	16.0 (11.2)	-0.58	0.56
Craving mean intensity (0-10; *n*=53) [a]	5.9 (3.1)	5.8 (2.3)	-0.79	0.43
Craving maximal intensity (0-10; *n*=53) [a]	7.4 (3.4)	8.0 (2.5)	0.39	0.70
Past addiction treatment (yes) [b]	53.3% (16)	54.2% (13)	<.01	0.95
Addiction medication at T0 (yes) [d]	6.7% (2)	25.0% (6)	3.55	0.06
Other addiction related factors				
Current poly-addiction (yes) [b]	80.0% (24)	54.2% (13)	4.15	**0.04**
Main addiction			/	/
Alcohol	43.3% (13)	29.2% (7)		
Cannabis	10.0% (3)	8.3% (2)		
Stimulants	6.7% (2)	12.5% (3)		
Food	10.0% (3)	8.3% (2)		
Other behaviors	3.3% (1)	12.5% (3)		

Tobacco	26.7% (8)	12.5% (3)		
Substance or Behavior [b]			4.29	**0.04**
Substance	86.7% (26)	62.5% (15)		
Behavior	13.3% (4)	37.5% (9)		
Psychiatric comorbidities				
Anxiety disorder lifetime (yes) [b]	46.7% (14)	33.3% (8)	0.99	0.32
Depression lifetime (yes; *n* = 52) [b]	75.9% (22)	73.9% (17)	0.03	0.87
Obsessive-compulsive disorder lifetime (yes) [b]	13.3% (4)	12.5% (3)	0.01	0.93
Mania or hypomania lifetime (yes) [b]	23.3% (7)	25.0% (6)	0.02	0.89
Psychosis lifetime (yes) [b]	10.0% (3)	20.8% (5)	1.24	0.27
Any psychiatric comorbidities current (yes) [b]	73.3% (22)	58.3% (14)	1.35	0.25
Follow-up assessment (T1)				
Continuous treatment between T0 – T1 (yes) [b]	93.3% (28)	87.5% (21)	0.54	0.46
Addiction medication at T1 (yes) [b]	46.7% (14)	41.7% (10)	0.14	0.71

Notes: Number of subjects (*n*) is mentioned when data are missing ($n < 54$). Legends: a. mean (*SD*) Wilcoxon test (*z*); b. % (*n*) Khi^2 of Pearson ($\chi 2$); c. median (range) Wilcoxon test (*z*); d. Khi^2 of Pearson ($\chi 2$) with more than 1/3 of expected frequencies of less than 5 (to be interpreted with caution). Addiction related factors are described only for the main addiction. Significant associations ($p < 0.05$) are in bold.

Table 2

Predictors of Successful quit / control attempts self-reported at 3-month follow-up (T1).

No Success (*vs.* Success)							
	B	***SE***	***χ2* of Wald**	***p*-value (FDRcor)**	**Exp (*B*)**	**Exp (*B*) 95% confidence interval**	
						Lower	**Upper**
Clinical insight	-0.28	0.11	6.37	**0.033**	0.756	-0.50	-0.06
Baseline regular user (no vs yes)	-1.40	0.82	2.93	0.087	0.247	-3.00	0.20
Age	0.06	0.03	2.76	0.137	1.062	-0.01	0.13
Sex (male vs. female)	-0.92	0.47	3.77	0.087	0.399	-1.84	-0.01
Study level	-0.12	0.14	0.71	0.590	0.887	-0.40	0.16
Addiction (substance vs. behavior)	-0.35	0.68	0.27	0.590	0.705	-1.68	0.97
Addiction criteria	-1.89	2.67	0.50	0.590	0.151	-7.13	3.35
Polyaddiction (no vs. yes)	-1.11	0.59	3.49	0.087	0.330	-2.27	0.05
Past addiction treatment (no vs. yes)	-0.23	0.41	0.31	0.590	0.795	-1.03	0.58

Backward binomial logistic regression models, fixed factors: age, sex, study level, addiction criteria, substance or behavior addiction, past addiction treatment.

Legend: FDRcor: False Discovery Rate correction, SE: Standard Error, B: estimate association parameter.

Statistics: $n = 54$; R2 (U) = 0.456; $\chi2 = 33.82$; df. = 9; $p < 0.0001$.

Significant associations ($p < 0.05$) are in bold.