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IJPR Volume 19, Number 1

Feature Articles ***Page***

Positive effects of spirituality in facilitating recovery for people with severe mental illness - Daniel Young ……... 5-12

Adult Step-up Step-down:
A sub-acute short-term residential mental health service
-Thomas, Rickwood & Bussenschutt…….. 13-21

Moving On as a Key Part of Recovery: What issues arise for Service Users when moving from mental health units into community care? – Daly & Opoku…… 22-33

Cross-Cultural Differences and Similarities in the Expression of Jealousy in a Couple: A Comparative Study Between Couples of Greek and Albanian Descent - Sikelianou, Georgakopoulou & Pandiri……. 34-56

Positive Emotions and Addiction - Flora & Stalikas…… 57-85

Peer Support as a Direct Benefit of Focus Group Research: Findings from a Secondary Analysis - Forchuk, Meier, Montgomery & Rudnick…… 86-98

Quality of life and need assessment changes in individuals with severe mental illness: a 5-year follow-up study - Freysteinsdóttir & Ólafsdóttir…….. 99-117

Rehabilitation for students diagnosed with depression and/or anxiety disorder – feasibility and perceived impact of OPI group rehabilitation program in Finland
Appelqvist-Schmidlechner, Wessman, Salmelainen, Tuulio-Henriksson & Luoma……119-126

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Positive Emotions and Addiction

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Abstract
Despite the clinical observations that indicate a possible connection between emotions, addictive behavior and treatment, there is not sufficient research on the role of positive emotions in addiction and addiction treatment. The present study aims at the examination of the role of positive emotions in the process of therapy, especially viewing it as an important factor influencing outcome. The sample consisted of 157 clients undergoing substance abuse therapy in a residential treatment program. The results indicate the significance of positive emotions and the differentiations of impact in various treatment stages. Taking into account the role of emotions in the development of addictive behavior, this study demonstrates the complex role of this factor in the addiction field, with various implications for research and clinical practice.

Introduction:

A relatively new parameter with regard to the study of addiction as an experience and phenomenon generally is the **study of emotions** (Elster, 2000; Panksepp, Knutson & Burgdorf, 2002). The majority of the studies that have researched aspects of emotions in substance users have focused on the study of the emotional reaction of craving, on its potential neurophysiological correlations (Adinoff *et al*., 2001; Garavan *et al*.; 2000; Sell *et al*., 2000; Wexler *et al*., 2001), on the changes in the physiological and neuroendocrinic responsiveness to the presence of emotional stimuli (Gerra *et al*., 2003; Navarro & Rodríguez de Fonseca, 2000) as well as on their involvement in the decision- making processes (Bechara *et al*., 2001; Bechara Dolan & Hindes, 2002; Bechara & Damasio, 2002). However, the number of studies conducted with regard to emotions in clinical populations

of substance users remains yet insufficient.

The complexity of the study of emotions implies that there are various theories and models, (Lane, Nadel & Kaszniak, 2000; Lang, 1980; Lang, 1995; Lang, Bradley & Cuthbert, 1997) according to which emotion has been defined as the predisposition for action and which support a dimensional structure based upon the three following motivational factors: valence (positive or negative), arousal level (high or low) and dominance (more or less control).

An example of a study of the emotion research in the field of physiological response is the application of Lang's model in the study of the emotional response in substance users by Gerra *et al.* (2003). A group of 12 heroin users, who restrained from use, showed less activation in the various physiological and neuroendocrinic response systems compared with the control group. Moreover, certain studies have indicated a lower activation of the emotion-related brain regions in substance users who were exposed to pleasant and unpleasant images and at the same time a higher activation of the same regions in response to images related to substance use (Garavan *et al*., 2000; Wexler *et al.*, 2001). The low activation of the physiological indicators and the emotion-related brain regions in the presence of pleasant and unpleasant images, usually causing a high activation, as well as the subjective perception of these images as less pleasant/ awakening indicate the existence of changes in the experience of emotions in substance users, probably due to long- term use. However, to this day there are still few clinical data about the experience of emotions in substance users. A recent study showed that the experience of emotions may be significantly altered in substance abusers, and that these alterations may play an important role in drug abuse treatment course and results (Aguilar de Arcos, Verdejo-García, Peralta-Ramírez, Sánchez-Barrera. & Pérez-García, 2005). The nature of these differences, which will contribute to a better understanding of the role of emotions in treatment, is required to be further researched.

It is generally accepted that substance abuse and withdrawal are associated with a wide range of positive and negative psychophysiological effects that contribute, partly, to the activation of pull and avoidance behaviours and to emotional states (Wise, 1988). In addition, substance abusers in general show a low tolerance to unpleasant physical symptoms and negative emotions, which result from continuous substance abuse and withdrawal periods (Araujo *et al*., 1996; Lacks & Leonard, 1986). Indeed, alcoholics who relapse, often recognise negative physical and emotional states as the causes of relapse (Carpenter & Hasin, 1999; O'Brien, Ehrman & Ternes, 1984; Tiffany & Drobes, 1990), a finding which has been confirmed in clinical studies (Cooney, Litt, Morse, Bauer & Gaupp, 1997; Litt, Cooney & & Morse, 2000). Other researchers have shown that the experience of dominant negative emotional events is associated with a higher risk of relapse after the completion of a detoxification program (Hull, Young & Jouriles, 1986). Similarly, the negative emotional reactions, the inability to resist temptations or impulses to drink, to test their personal control and face interpersonal conflicts are associated with relapse within the first year after treatment in a residential therapeutic community. In this research a more important role was played by the factors of interpersonal nature (Fernandez-Montalvo, Lopez-Goni, Illescas, Landa & Lorea, 2007).

Researches on the role of particular emotions supplement and enrich the positions and the findings mentioned. Thus, the increase of positive emotions, such as the sense of subjective power and freedom, greater self-esteem and the attribution of change to internal and not to uncontrollable factors, as well as the simultaneous decrease of negative emotions, such as the sense of loss and inability, were mentioned as the basic emotions after the successful participation in a residential therapeutic program. The authors go beyond the findings and refer to a subsequent increase of autonomy, a broader view of life and a more realistic approach of it (Ravenna *et al*., 2002). Moreover, the emotion of hostility was found to decrease dramatically within the first six months of treatment of addicts in a residential therapeutic community compared with the individuals of the control group (Small & Lewis, 2004). The role of emotional process in psychological disorders in addiction is suggested by a research assessing emotions before and after the treatment. Here, the lack in perceptual representation, emotion regulation and communication / expression of the emotion was confirmed. The awareness of physical internal

emotion indicators increased, whereas the changes after the treatment were important and substantial for the recognition and expression of the proper emotion (Reicherts, Casellini, Duc, & Genoud, 2006).

However, the exact nature of emotional motivational states in substance abusers has not yet been adequately understood. An empirical observation is the fact that the clinical presentation of addicts shows, among others, their blunted emotion and their inability to recognise and process basic emotions. In addition, abusers are characterised mainly as individuals with emotional immaturity, what renders the role of emotions in addiction rather significant. The function mechanism of negative emotions that press the individual to seek "temporary/ hallucinogenic relieving answers" is successfully described by Zapheiridis (2009): "when negative emotions are not recognised, not associated with their real causes, so that the individual does not take on his/her responsibility as part of his/her emotional self, then they are experienced as irrational and impose self-destructive and irrational isolating behaviours, which need to be justified/rationalised in retrospect". This rationalization takes place through the arbitrary attribution of these emotions to the "hostile" and "uncontrollable" environment via which "the bad emotional mood in present time and place is justified on the one hand and negative emotions are not perceived as irrational by the mental self on the other hand, since they are now associated with specific events and states of the present time" (pp. 65-66).

Rationale

The brief review of the recent, though few, studies shows, among others, the absence of research activity in important aspects of the phenomenon, such as an in-depth examination, beyond simple recognition, of the nature and quality of emotions, as well as the study of the role of positive emotions in issues of addiction and withdrawal as a factor we believe to promote treatment. Clinical and neuropsychological studies seem to focus on negative emotions, which are arguably assumed to relate to the causes and treatment of addiction. Thus, there is emerging evidence that suggests, among others, the multifaceted importance of a combined study of emotions in this field. Part of the so far limited research is the difficulty faced in the research approach of these concepts. The gathering of the basic research methods contributes to the acknowledgement of the advantages and restrictions of each method and constitutes the first step towards planning the conduct of further researches.

Research questions

In this research we set the following research hypotheses:

1. Positive emotions increase during treatment for those who continue treatment.
2. Positive emotions are among the factors affecting the transition from one phase of treatment to another.
3. Positive emotions are associated with other factors that are important for treatment

Method

Sample

Participants of the study were patients undergoing treatment in the Drug Addiction Treatment Unit (adult rehabilitation) of the public Psychiatric Hospital of Attica, Athens. In numbers, the total sample included 157 patients, who met the criteria of "Substance Use Disorder", according to DSM-IV. The diagnosis was conducted by the professional psychiatrists of the Attica Hospital and the results were presented to the researchers of the study along with the demographic data of each participant. No patient had a history of comorbid disorders. From the participants 80.3 percent were men (n=126) and 19.7 percent were women (n=31). Their average age was 30.03 years old (SD=5.1). 54.1 percent (n=85) of the participants were new

patients undergoing treatment for the first time, while 45.9 percent (n=72) included patients, who were undergoing this particular treatment for the second or even third time. Furthermore, 75.1 percent (n=118) of the sample had attempted to follow an addiction treatment before (in any type of therapeutic centre of community).

Research tools

The first part of this paper focuses on presenting the selection of the proper psychometric tests, which was based on their repeated use in different clinical researches, on their psychometric validity and on their compatibility with the needs of the current project.
The employed scales were the following:

1. Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), (Miller, 1994, Miller & Tonigan, 1996). Subscales: Problem Recognition, Taking Steps, Ambivalence.

2. For the assessment of readiness for change there was made use of the SOCRATES scale, originally constructed for the assessment of readiness for change of people with alcohol abuse problems. This scale was chosen because it is the only one that consists of questions related specifically to the use of alcohol or drugs. The scale gives three scores derived from factor analysis and corresponding to the following variables: Recognition (Re), Ambivalence (Am), Taking Steps towards change (Ts). Its rating is given by the sum of the questions that constitute each subscale. The present study uses version 8, which is a smaller scale consisting of 19 statements, and it is the result of the analysis of factors of previous versions of the scale. This short form of the scale includes those questions which have the largest correlation with each factor. The ratings of the 19 statements scale have a high correlation with the larger scale of 39 statements -Recognition (r = .96), Taking Steps (.94), and Ambivalence (.88). The psychometric properties given by the constructors of the 19 statements scale are:
Cronbach Test-retest Reliability
Alpha Intra-class Pearson
Ambivalence .60 -. 88 .82 .83
Recognition .85 - .95. .88 .94
Taking Steps .83 - .96 .91 .93

More specifically, this study uses the form 8D (Personal Drug Use Questionnaire) concerning the individual users of drug substances. The scale consists of 19 statements that encourage the person to answer questions relating to a) the recognition of the problem (7 statements) (e.g., "I really want to make changes regarding the use of drugs", "If I do not change my drug use soon enough, my problems will get worse", "I have a drug problem"), b) the doubt of the existence of the problem (4 statements) (e.g., "Sometimes I wonder if I am addicted", "Sometimes I wonder if my drug use is hurting other people"), and c) the steps taken in the direction toward change (8 statements) (e.g., "I've already started to make some changes in my drug use", "There was a time I used drugs a lot, but I've managed to change it," "I have already made changes in my drug use, and I'm looking for ways to avoid relapsing to my old habit").

The degree of agreement of the respondent with each statement is rated on a 5-point sliding scale of equal intervals, where 1 = strongly disagree, 2 = disagree, 3 = I cannot decide / I'm not sure, 4 = agree, 5 = totally agree. The total score of each subscale is calculated as the sum of the statements that constitute it. The constructors of the scale do not provide an overall cumulative score of the three subscales. The rating of the subscale for the recognition of the problem ranges from 7-35, that of the doubt subscale ranges from 4-20, and that of the taking steps subscale ranges from 8-40.

Internal reliability: The examination of the internal reliability was performed by calculating the Cronbach's

alpha reliability index. The analysis showed that the internal reliability of the subscale of the recognition of the problem is a = .86, that of the doubt subscale is α= .63, and that of the taking steps subscale is α=.88. The internal consistency of the Greek scale was in the value limits of reliability, as given by Miller & Tonigan, 1996.

Brief Situational Confidence Questionnaire (BSCQ) (Breslin, Sobell, Sobell & Agrawa, 2000).
The scale used for the assessment of self-efficacy was the Brief Situational Confidence Questionnaire (BSCQ). This particular scale was created as an alternative to the Situational Confidence Questionnaire (SCQ), as some therapeutic programs found that the original tool requires a lot of time to be completed in clinical practice (Sobell, 1996). The pilot part of the present study reached also the same conclusion, thus showing the impractical use of the Situational Confidence Questionnaire (SCQ). The 8 statements VSCQ correspond to eight subscales of the SCQ. The respondents are asked to rate the degree of certainty they have at the time of their answering the questionnaire that they would resist using substances in any state of being (e.g., "I would be able to resist the urge to use substances in situations where I would have unpleasant feelings, such as in the case of feeling pressured about things in general, or if everything was going wrong for me"). The scores range from 0 (not at all confident) to 100 (totally confident). A comparison of the short and long versions of the SCQ scale (Breslin et al., 1997) showed that the short version is reliable and responds well on the 8 subscales of the original version. The scores of the scale of the eight statements have a satisfactory correlation with the largest scale of the 100 statements, ranging from .56 to .80. The scale gives a score derived from the quotient of the sum of the responses to 8 statements. Thus, the score ranges from 0 to 100. The BSCQ was chosen because it has many advantages for studies in clinical contexts. It can be administered in a few minutes, it is easily interpretable, and for this reason it can also be used in other areas of health care provision, apart from field concerning addictions.

Internal reliability: The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the scale has an internal reliability of α=.82. The internal consistency of the Greek scale was in the value limits of reliability, as given by Berslin et al..,2000.
3a Client Satisfaction Questionnaire (CSQ) at Pre-treament (Expectations) (Dearing, Barrick, Dermen & Walitzer, 2005).
3b Client Satisfaction Questionnaire (CSQ-8) (Larsen, Attkinson, Hargreaves & Nguyen, 1979).

The scale that was used to estimate the expectation and satisfaction was the Client satisfaction Questionnaire (CSQ-8) (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) in its original form, as well as a version of it (Client Satisfaction Questionnaire -CSQ- at Pre treament (Expectations)) that was constructed later on and addresses the concept of satisfaction before treatment (expectation) (Dearing, Barrick, Dermen & Walitzer, 2005). This scale was created to assess the satisfaction with the treatment in the context of the provision of health services. The 8 in total statements of the scale were selected by health professionals on the basis of their correlation with data showing client satisfaction and after a subsequent factor analysis (e.g., "How would you rate the quality of service received?", "If a friend was in need of similar help, would you recommend the program to him or her?"). The CSQ-8 gives an estimate of overall satisfaction with the services provided. It does not give a precise assessment of the client's perceptions regarding the benefit of the treatment, but it does give the client's opinion for the value of the services he/she receives. The degree of the respondent's agreement with each statement is rated on a 4-point sliding scale of equal intervals. The score ranges from 4-32 and a higher score indicates greater satisfaction (Larsen, Attkisson, Hargreaves, & Nguyen, 1979). This scale was chosen because, as indicated by the constructors, it allows for satisfactory implementation in all cultural contexts, as well as due to the nature of this research that concerns the study of characteristics in the context of the provision of health services. Various studies have shown the high internal validity of the CSQ-8 (Wilkin, Hallam, & Doggett, 1992), with the coefficient alpha being consistently above .90 (Attkisson & Zwick, 1982).

This scale was modified by Dearing, Barrick, Dermen & Walitzer in 2005, in order to evaluate the satisfaction

expectation of the treatment at the time of the client's introduction to the therapeutic context. It consists of the exact same questions with the original one, the only difference being that the verbs change from the past tense to the future (e.g., "Do you believe that you will receive the kind of services you want from the program?" "To what extent do you believe that the program will meet your needs?").
Internal reliability: The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the expectation scale has an internal reliability of a = .78, and the satisfaction scale has an internal reliability of a = .87. The internal consistency of the Greek scale was in the value limits of reliability, as stated by its constructors.

.Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlen, Zimet & Farley, 1988). Subscales: Family, Friends, Important others.

The scale used for the assessment of social support was the Multidimensional scale of Perceived Social Support (MSPSS), originally constructed for assessing the existence of social support in a large sample of university students and then successfully applied on a number of clinical and non-clinical samples (Kazarian & McCabe, 1991; Stanley, Beck, & Zebb, 1998; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). This scale was chosen because it estimates three sources of support: family, friends and significant others, and it also has a range of features that suit its application on the study population and on this particular study: a) it is short (12 statements), b) it is suitable for investigations that require the simultaneous measurement of several characteristics and c) it is suitable for populations that for one reason or another cannot "tolerate" a lengthy questionnaire. Furthermore, the questions are easily understood by people with a low or a moderate level of education (Canty-Mitchell & Zimet, 2000; Zimet et al., 1988).

The scale gives three scores derived from factor analysis and corresponding to the following subscales: Family (Fa), Friends (Fr), Significant Others (SO). The scale consists of 12 statements that encourage the person to answer questions about their perceived social support from their family (4 statements) (e.g., "My family really tries to help me", "I get the emotional help and support I need from my family"), from their friends (4 statements) (e.g., "My friends really try to help me," "I can count on my friends when things go wrong") and from their Significant Others (4 statements) (e.g., "There is a certain person around me when I need it" "I have a person that is truly a source of relief for me"). The degree of the respondent's agreement with each statement is rated on a seven-point sliding scale of equal intervals, where 1 = disagree very-very much, 2 = disagree very much, 3 = Disagree, 4 = I am neutral, 5 = Agree, 6 = Agree very much, 7 = agree very-very much. The rating of each subscale is given by the sum of the questions that constitute it. Similarly, the sum of the three subscales gives the total score of the assessment of social support. The score of each of the subscales ranges from 4 to 28, and that of the overall scale ranges from 7-84.

Internal reliability: The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the family subscale has an internal reliability of a = .83, the friends' subscale has an internal reliability of a = .89, the Significant Others' subscale has an internal reliability of a = .72, and the overall scale has an internal reliability of α=.84. The internal consistency of the Greek scale was in the value limits of reliability, as given by Zimet, Dahlen, Zimet & Farley, 1988.

5.Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995).Subscales: Depression, Anxiety and Stress.
To assess the clinical picture of the participants we used the Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995). The DASS, consisting of three self-report subscales, was constructed in order to measure the negative emotional states of depression, anxiety and stress. According to its constructors, the creation of DASS has not been the measurement of the typically defined emotional states, but a further process

of identifying, understanding, and measuring clinically significant emotional states usually described as depression, anxiety and stress. Thus, the DASS covers the needs of both researchers and scientists - professional clinicians.

In its original form, the scale has 42 statements, with each of the three subscales containing 14 questions. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic stimulation, musculoskeletal effects, the stress that is associated with real life conditions and the subjective experience of the effects of stress. The stress scale is sensitive to the levels of chronic nonspecific stimulation. It assesses difficulty to relax, nervous arousal, and the easiness of getting upset / agitated, irritable / over-excited and nervous. Respondents are asked to use the 4-point scales of severity / frequency for the purpose of assessing the extent to which they experienced each situation during the previous week, where 0 = does not apply to me at all, 1 = true for me to some extent, or for some time, 2 = applies to me to quite a large extent, 3 = applies to me very much, or for most of the time. The scores for Depression, Anxiety and Stress are calculated by adding the scores of the relevant questions, while, as suggested by its constructors, the sum of the three scales gives us an overall assessment of negative emotional states.

Regarding, now, the psychometric properties of the DASS, the gamma coefficients that represent the weight of each scale for the overall factor (total score) are: .71 for depression, .86 for anxiety and .88 for stress. (Lovibond & Lovibond, 1995). The reliability of the three scales is considered adequate and the test-retest reliability is also satisfactory with .71 for depression, .70 for anxiety and .81 for stress. (Brown et al., 1997). Exploratory and confirmatory factor analysis has supported the proposition of the three factors ($p < .05$; Brown et al., 1997). The DASS anxiety scale has a .81 correlation with the Beck Anxiety Inventory (BAI), and the depression scale DASS has a .74 correlation with the Beck Depression Scale (BDI).

This study uses the short form of the scale, the DASS21, consisting of seven questions/statements on each scale. In the depression sub-scale, examples of questions/statements are "I had difficulty in developing initiative to do things," "I felt that there was nothing to expect with joy". In the stress scale, examples of questions/statements are "I tended to overreact to situations," "I felt that I was very nervous". In the anxiety scale, examples of questions/statements are "I realized that my mouth was dry," "I felt scared for no reason." The criteria for the selection of the questions/statements of the DASS21 are their ability to cover the three factors and to allow the comparison of the score with that of the full scale. It is proposed to multiply the scales' scores in DASS21 by 2, so that they can be compared with the data of the original DASS and with other published data. The score of each sub-scale ranges from 0 to 42, and the total score of the scale from 0 to 126.

The reasons for the selection of this particular scale are its strong psychometric properties and its ability to combine the measurement of three variables. In addition, the DASS21 has also the advantage that its completion requires only half the time required for the original one. There are published studies which indicate that the DASS21 has the same factor structure with the original DASS and gives similar data (Antony et al., 1998; Henry & Crawford, 2005). Generally, the original DASS is preferred in clinical work, and the DASS21 is often better for research purposes.

Internal reliability. The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the internal reliability of the stress subscale is α=.84, the internal reliability of the anxiety subscale is a=.81, the internal reliability of the depression subscale is a=.88, and that of the overall scale is a=.93. The internal consistency of the Greek scale was in the value limits of reliability, as given by Lovibond & Lovibond, 1995.

Differential Emotions Scale-Modified (DES-MOD) (Fredrickson & Tugade, 2003). Subscales: Positive Emotions and Negative Emotions.

The scale used for the assessment of the positive and negative emotions was the Differential Emotions Scale-Modified (DES-MOD), which was originally constructed for the assessment of different emotions and then modified by Fredrickson & Tugade by adding 9 additional emotions. This scale was selected for its good psychometric properties, and because it allows for the assessment of positive and negative emotions. It is consisted of 20 statements (as, for example, "I felt to be having fun, to like having a good time, to be seeing things from the lighter side," "I felt angry, frustrated, annoyed") and one question regarding the selection of the most intense of the above sentiments. Respondents are asked to report the highest degree to which they felt this way in the past two weeks. The degree of the respondent's agreement with each statement is rated on a 5-point ratio scale of equal intervals, where 1 = not at all, 2 = slightly, 3 = sometimes, 4 = often, and 5 = very often.

The scale gives scores for the two subscales: a) of positive emotions consisting of nine emotions (amusement, contentment, gratitude, hope, love, pride, sexual desire, joy, interest), and b) of negative emotions consisting of seven emotions (anger, shame, contempt, repulsion, guilt, fear, sadness). The sum of the questions constituting each subscale gives its rating. In the first application of the scale, the subscale of positive emotions showed an internal reliability of a=.79 and the subscale of negative emotions showed an internal reliability of a=.69. Apart from the creation of the subscales, the authors state that the main purpose of the scale is the measurement of discrete emotions (Fredrickson & Tugade, 2003).

Internal reliability. The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the subscale of positive emotions has an internal reliability of a=.77 and the subscale of negative emotions has an internal reliability of a=.70. The internal consistency of the Greek scale was in the value limits of reliability, as given by Fredrickson & Tugade, 2003.

Meaning in Life Questionnaire (MLQ) (Steger, Frazier & Oishi, 2006). Subscales: Search for meaning and Presence of meaning.

The scale used for assessing the perception of the meaning in life was the Meaning in Life Questionnaire (MLQ), which was constructed to assess the existence and search of meaning. The scale was chosen for its strong psychometric properties and because it allows for its easy and concise administration.

The scale gives two scores deriving from factor analysis and corresponding to the following subscales: a) Presence of meaning and b) Search for meaning. The subscale of the presence of meaning shows an internal reliability of .81 to .86 and the subscale of the search of meaning shows an internal reliability .84 to .92. The MLQ consists of 10 statements that encourage a person to answer questions relating to the presence of meaning in their life (5 statements) (e.g., "I understand the meaning of my life", "I have a good awareness of what makes my life meaningful.") and to the search of meaning (5 statements) (e.g., "I'm looking for something that makes my life meaningful," "I'm looking for a purpose or mission in my life"). The degree of the respondent's agreement with each statement is rated on a 7-point proportional scale of equal intervals, where 1 = Completely untrue, 2 = Very untrue, 3 = Quite untrue, 4 = I cannot say True or false, 5 = Quite True, 6 = Very True, 7 = Absolutely true. The score of each subscale is the sum of the questions comprising it, and this ranges from 1 to 35.

Internal reliability The examination of the internal reliability was performed by calculating the Cronbach's alpha reliability index. The analysis showed that the internal reliability of the subscale for the presence of meaning is α=.81 and that of the subscale for the search of meaning is α= .81, respectively. The internal consistency of the Greek scale was in the value limits of reliability, as given by Steger, Frazier & Oishi, 2006.

The scales employed in this particular study are not yet officially translated into Greek. Therefore, their

credibility and validity were estimated upon a translation from English into Greek and a reverse translation from Greek into English conducted by 11 Greek mental health professionals who speak English fluently, after completing their postgraduate studies in the UK. Before the final analysis, the translated scales were examined and assessed by a group of 11 clinical psychiatrists (Msc), who verified the accuracy and validity of the terminology and its content. .

Preliminary Control
To assess and certify the psychometric tests' and their occurring results' reliability and internal consistency, a variable analysis, a Cronbach's α measurement and a normal distribution control were conducted.
Factor Analysis: Results have shown that this type of analysis reveals in most cases the number of factors relevant to the original analysis of the structure of the scales.
Cronbach's a measure: The internal consistency indicators of the subscales proved accurate, while the Greek scale models met the consistency requirements set by their producers.

Procedure
The research procedure was completed with respect to the American Psychiatric Association's ethics and rules (APA). Before proceeding with the basic measurements, the scales were distributed to people belonging to the same group of participants, i.e. substance abusers, who decided to undergo treatment.
The main part of the procedure is based on repeated measurements of the factors. In total, the research lasted for 21 months, from February 2008 to November 2009. The main research procedure included four measurements:

· The first measurement was completed during the first stages of treatment[1], described as Counseling Centre. In this stage all of the seven factors have been assessed.

· The second and the third measurement took place in the third and sixth month of the second phase of treatment (Residential Phase) respectively. All seven factors have been evaluated in this measurement apart from the factor of expectation, which was replaced by the factor of satisfaction.

· The fourth measurement was conducted during the third month of the Social Re-integration Phase, which follows the successful conclusion of the Residential Phase. The factors assessed were the same as in the second and third measurements.

Normal Distribution Control: According to the Kolmogorov-Smirnov Test, eight of the subscales followed a normal distribution, while nine did not. However, the latter subscales have been also considered to be congruent with the Kolmogorv-Smirnov test, given that they have included a sample of more than 30 participants (N>30 – The Law of Large Numbers: the average of the results obtained from a large number of trials should be close to the expected and will tend to become closer as more trials are performed).

In order to proceed with the evaluation of the four measurements and highlight the statistical differences among them, the Repeated Measurements Analysis with the Bonferroni correction has been employed. This particular type of analysis includes the answers of all participants of all four measurements (n=50). The analyses were separately conducted for each variable.

All patients admitted to the Therapeutic Program in the Counselling Center Phase were considered for the study (n=157) (1st Measure). This program admits a population-based sample of patients who meet the criteria of substance abuse disorder. In the consecutive series of 157 patients, 44 dropped out before the 2nd Measure (in the third month of the Residential Phase) (N=113), 22 dropped out before the 3rd Measure (in the sixth month of the Residential Phase) (N=22) and 26 dropped out before the 4rth Measure (in the third month of the

Social Re-integration Phase) (N=65). Moreover, some patients either refused to participate or were absent when the psychometric scales were handed out.

Table 1 shows the average scores in the measured variables of the patients who participated in each measure and of those who dropped out during the therapeutic time.

Results

Preliminary analyses

All patients admitted to the Therapeutic Program in the Counselling Center Phase were considered for the study (n=157) (1st Measure). This program admits a population-based sample of patients who meet the criteria of substance abuse disorder.

In the consecutive series of 157 patients, 44 dropped out before the 2nd Measure (in the third month of the Residential Phase) (N=113), 22 dropped out before the 3rd Measure (in the sixth month of the Residential Phase) (N=22) and 26 dropped out before the 4rth Measure (in the third month of the Social Re-integration Phase) (N=65)

Table 1 shows the average scores in the measured variables of the patients who participated in each measure and of those who dropped out during the therapeutic time.

With regard to the measurement of emotions in the course of treatment, we are referring the reader to Table 1, where we see the average values of the variables measured. This descriptive analysis shows that positive emotions are increased in those who continue treatment, compared to those who interrupt it, while negative emotions are increased in those who discontinue treatment, compared to those who continue.

Table 1:
Mean score of the studied variables in the 4 measurements of the participants that continued the treatment and of those that dropped out.

Variable	1st measurement (mean)	2nd measurement (mean)		3rd measurement (mean)		4th measurement (mean)	
	(N=157)	(N=113)	Drop outs (N=44)	(N=91)	Drop outs (N=22)	(N=65)	Drop outs (N=26)
Recognition	31.57	31.69	30.02	30.03	32.96	29.00	30.48
Ambivalence	13.05	12.67	12.65	12.26	11.58	11.42	12.90
Taking steps	35.66	34.77	34.42	36.24	36.25	36.74	35.86
Self-efficacy	61.44	54.22	63.43	69.42	56.25	76.07	68.45

Expectations/Satisfaction	27.12	26.10	27.42	27.30	27.25	25.92	24.14
Perceived Social Support	57.34	58.22	58.98	62.88	57.33	63.26	63.95
Anxiety	16.84	12.64	18.19	10.46	16.00	13.10	8.95
Stress	24.40	20.68	24.24	18.70	24.25	19.32	19.71
Depression	20.86	16.87	20.86	12.64	20.92	14.34	12.19
Positive Emotions	28.12	28.27	28.95	33.01	26.92	33.91	34.05
Negative Emotions	19.61	17.89	19.67	17.81	19.04	17.71	18.29
Presence of Meaning	22.23	23.42	22.84	23.68	24.25	23.02	23.32
Search of meaning	26.35	26.97	26.56	26.84	28.45	26.32	25.73

Research hypothesis 1: Positive emotions are increased during treatment for those who continue the treatment

In order for this question to be answered, the statistical analyses were performed with the use of the Repeated Measures Analysis with the Bonferroni correction for the purpose of the comparative assessment of all four measurements and the highlighting of statistically significant discrepancies among the measurements.

The analysis revealed a statistically significant difference between successive measurements (Table 2), and more specifically between the first and the third measurement, i.e., between the first treatment phase and the second phase (6th month of residential phase), between the 1st and 4th measurement, i.e. between the first and the last phase of the treatment, between the second and third measurement, i.e., between the two measurements of the residential treatment phase (3rd to 6th month), and between the second and fourth measurement, i.e., between the second phase of treatment (3rd month of residential stage) and the last phase (rehabilitation) (Table 3). Positive emotions appear to be significantly fewer in the 1st compared to the 3rd measurement, significantly fewer in the 1st compared to the 4th measurement, significantly fewer in the 2nd compared to the 3rd measurement, and significantly fewer in the second compared to the 4th measurement. The Mauchly's test shows homogeneity in the dependent variables ($p > 0.05$).

Table 2:

Test of within-subjects effects

	F	P
Positive emotions	11,038	**,000**

alpha = .05

Table 3:

Pair wise comparisons

Positive emotions	Positive emotions	Mean difference	Std Error	p. [α]
1	1			
	2	-,688	1,293	1,000
	3	**-4,250***	2,129	**,003**
	4	**-4,542***	1,086	**,001**
2	1	,688	1,293	1,000
	2			
	3	**-3,562***	,761	**,000**
	4	**-3,854***	,887	**,000**
3	1	**4,,250***	1,129	**,003**
	2	**-3,562***	,761	**,000**
	3			

	4	-,292	,748	1,000
4	1	**4,542***	1,086	**,001**
	2	**3,854***	,887	,000
	3	,292	,748	1,000
	4			

*The mean difference is significant at the ,05 level .
a Adjustment for multiple comparisons: Bonferroni.

In diagram 1 there are the factors shown, which recorded a statistically significant increase. To be more specific, the more the treatment progresses, the firmer becomes the belief that the substance abuser can cope with difficult conditions (self-efficacy), the more increase the positive emotions as well as the perceived social support. (Other factors: Satisfaction, Social Support –significant others and friends–, taking steps, presence of meaning).

Diagram 1

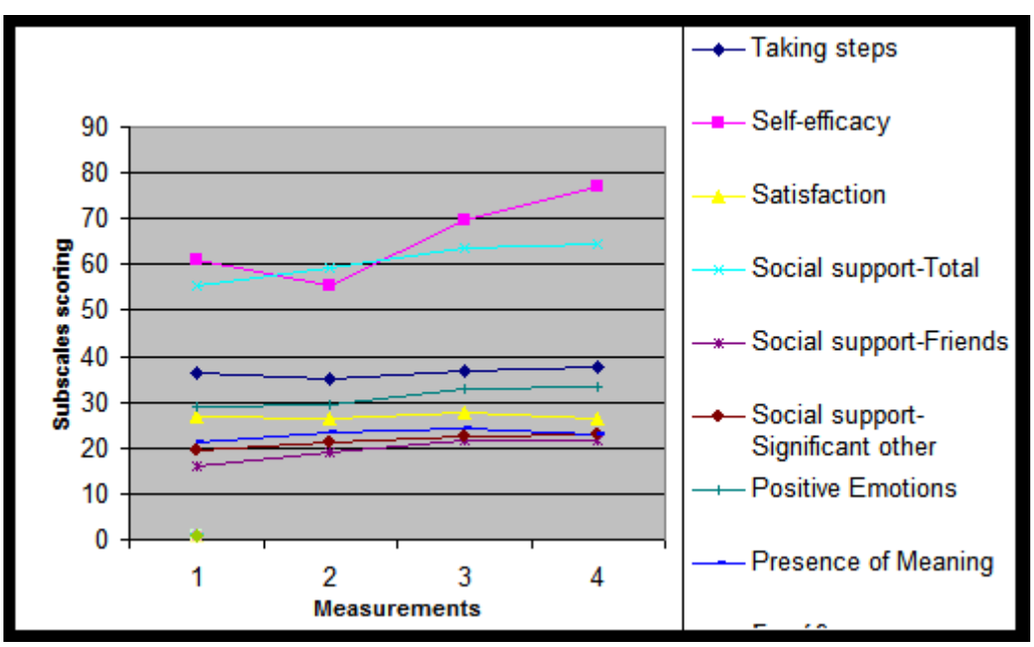
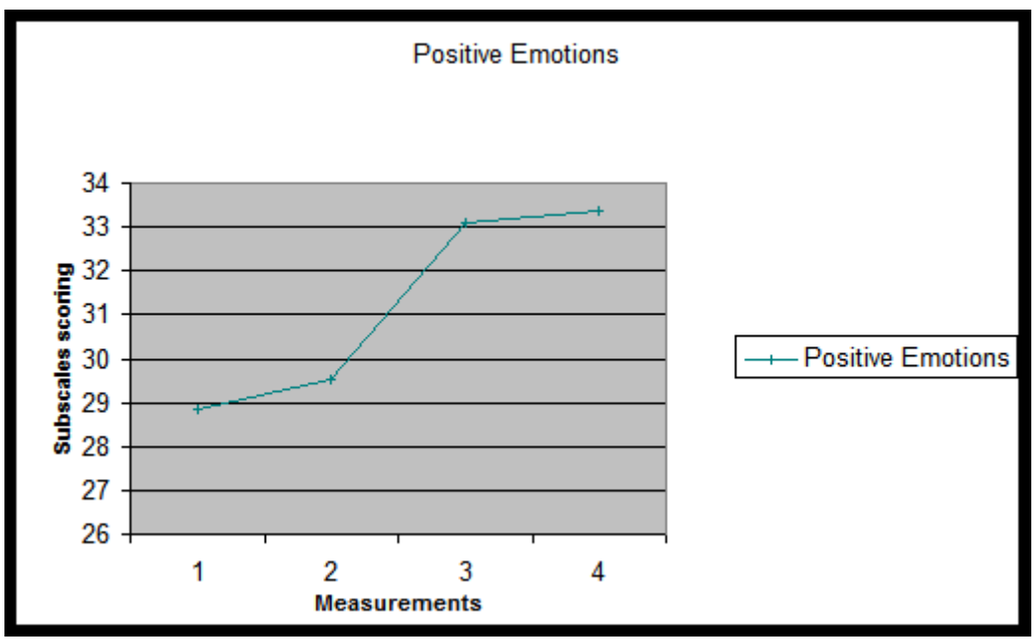


Diagram 2



Research hypothesis 2. Positive emotions are among the factors that influence the transition from one phase of treatment to another (counselling center, residential phase, social re-integration)

χ^2 control (Crosstabulation-Chi-Squareand t control (Independent Samples T-Test)
In order for this question to be answered, initially there was a χ^2 control (Crosstabulation-Chi-Square) conducted as well as a t control (Independent Samples T-Test) for the purpose of highlighting statistically significant discrepancies between the patients who dropped out of treatment and those who moved on from one phase of treatment to the next one and then, based on these controls, a Binary Logistic Regression was performed. In total, 5 regression analyses were performed, which correspond to transition from one phase of treatment to the next one.

The x ² test was carried out where the independent variable was categorical while the t-test in those analyses where the independent variable was quantitative. In both cases the dependent variable was the transition from one phase of treatment to another. The statistically significant results are presented below.
There were carried out a total of 5 x ² tests and 5 t tests corresponding to the passage from one phase of treatment to another, namely:

A) An x ² test and a t-test to find statistically significant differences between those who move from the counseling center to the residential treatment phase and those who stop at the counseling center stage.
B) An x ² test and a t-test to find statistically significant differences between those who stayed for the 3 months of the residential phase and those who entered the residential phase but discontinued treatment at a certain point before reaching the 3 months of stay.

C) An x ² test and a t-test to find statistically significant differences between those who stayed for the 6 months of the residential phase and those who stop treatment between the 3rd and the 6th month of the residential

phase.

D) An x ² test and a t-test to find statistically significant differences between those who managed to complete the residential phase and passed to the phase of rehabilitation and those who discontinued treatment at sometime during the residential phase.

E) An x ² test and a t-test to find statistically significant differences between those who stayed for all the 3 months of rehabilitation and those who although they had reached the level of rehabilitation they interrupted before completing the 3 months of this phase.

X ² tests and t-tests to find the statistically significant differences between those who interrupted their treatment and those who moved from one phase of treatment to the other.

The analyses gave the following results:

A) ***Transition from the Counselling Center to the Residential phase of treatment***

There is a statistically significant difference (p <0. 05) in the recognition of the problem, the self-efficacy and the search for meaning among those who go through the residential phase of treatment and those who interrupt their treatment at the initial stage of the Counselling Center. More specifically, those who go through the residential phase exhibit significantly greater recognition of the problem, significantly less self-efficacy and significantly less search for meaning compared to those who interrupt their treatment at its initial stage (Table 4).

Table 4:
Independent samples test
Statistically important differences between the participants that entered the residential phase and those that interrupted in the Counselling Center phase

Variables	Mean difference	t	df	Sig 2-tailed (p)
Recognition	-2,19	-2,027	131	*0,045
Self-efficacy	10,21	2,600	130	*0,015
Searching of the meaning	6,01	2,186	130	*0,032

**P*<0,05, ***P*<0,01, ****P*<0,001

B**)** ***Staying for the of the residential phase***

There is a statistically significant difference (p <0.05) in the recognition of the problem and the steps to change among those who stay for the 3 months of the residential phase and those who had entered the residential phase of treatment but discontinued it at some point before completing the 3 months of stay. More specifically, those under treatment who stayed for the 3 months of the residential phase had significantly greater recognition of the problem and had made more significant steps towards change compared to those who discontinued the treatment at some point during the residential phase, before reaching the third month (Table 5).

Table 5:
Independent samples test
Statistically significant differences between the participants that stayed in the 3-month residential phase and those who interrupted the treatment before the 3-month residential phase

Variables	Mean	T	df	Sig (2 tailed) (p)

	difference			
Recognition	-1,90	-2,377	117	*0,019
Taking steps	-2,21	-2,467	117	*0,015

**P*<0,05, ***P*<0,01, ****P*<0,001

C) *Stay for the 6 months of the residential phase*
The x^2 test showed that the stay for the 6 months of the residential phase depends on gender (c ² (1, N = 115) = 20.46, p =. 00). More specifically, men are significantly more likely to remain for the 6 months of the residential phase than women (Table 6).

The t-test revealed a statistically significant difference (p <0.05) regarding positive emotions (1st measurement), problem recognition, depression, and the overall clinical picture (anxiety, depression, stress) (2nd measurement) among those staying for the 6 months of the residential phase and those who discontinue treatment between the 3rd and the 6th month of the residential phase. More specifically, those who stay for the 6 months of the residential phase have significantly more positive emotions, significantly less depression, and significantly less anxiety, depression and stress (better clinical picture) compared to those discontinue treatment between the 3rd and the 6th month of the residential phase (Table 7).

Table 6:
Chi-Square test
Statistically significant differences between the participants that stayed in the 6-month residential phase and those that interrupted the treatment between the 3- and 6- month residential phase

Stay in the 6-month residential phase	Sex Man	Woman	χ^2	d	P
No	12 (-4,5)	12 (4,5)	20,46	1	,00**
Yes	82 (4,5)	9 (-4,5)			

**P*<0,05, ***P*<0,01, ****P*<0,001 (The adjusted standardized residual is in the parenthesis, below the group frequencies (εμφανίζεται στην παρένθεση κάτω από τις συχνότητες των ομάδων)

Table 7:
Independent samples test
Statistically significant differences between the participants that stayed in the 6- month residential phase and those that interrupted between the 3- and the 6-month residential phase

Variables	Mean difference	t	Df	Sig (2-tailed) (p)

Positive emotions	-3,65	-2,254	89	*0,027
Depression	5,14	2,135	110	*0,035
Clinical profile (anxiety, stress, depression)	13,96	2,191	110	*0,031

**P*<0,05, ***P*<0,01, ****P*<0,001

D) *Completion of the residential phase-transition to the re-integration phase*
The x^2 test showed that the completion of the residential phase and the transition to the phase of re-integration depends on the gender ($c^2(1, N=140) =8.84$, p=.03). More specifically, men are significantly more likely to complete the residential phase than women (Table 9).

The t-test revealed a statistically significant difference in the recognition of the problem and the steps toward change (1st measurement) among those who completed the residential phase and moved to the phase of re-integration and those who discontinued treatment during the residential phase. More specifically, those who completed the residential phase had significantly greater recognition of the problem and had taken significantly more steps toward change than those who interrupted their treatment during the residential phase (Table 9).

Table 8:
Statistically significant differences between the participants who completed the residential phase successfully and moved to the social integration phase and those who interrupted the treatment during the residential phase

Completion of the close phase	Sex Man	 Woman	χ^2	d	P
No	37 (-3,0)	16 (4,5)	8,84	1	,03*
Yes	78 (3,0)	9 (-4,5)			

**P*<0,05, ***P*<0,01, ****P*<0,001 (The adjusted standardized residual is in the parenthesis, below the group frequencies (εμφανίζεται στην παρένθεση κάτω από τις συχνότητες των ομάδων)

Table 9:
Statistically significant differences between the participants who completed the residential phase successfully and moved to the social integration phase and those who interrupted treatment during the residential phase

Variables	Mean difference	T	df	Sig (2-tailed) (p)
Recognition	-1,57	-2,052	79	*0,043
Taking steps	-1,96	-2,473	77	*0,016

**P*<0,05, ***P*<0,01, ****P*<0,001

E) *Stay for the 3 months of the re-integration phase*
The analysis showed no statistically significant differences between those who stayed for the 3 months of re-

integration and those who reached the re-integration phase but interrupted their treatment before completing 3 months of this phase.

Binary Logistic Regression

Then, based on the results of the x^2 and t-tests there was conducted a statistical analysis of logistic regression for binary dependent variables. There were a total of five regression analyses, corresponding to the passage from one phase of treatment to another, and more specifically:

A) A regression analysis for the purpose of finding the characteristics that influence the transition from the counseling center to the residential phase of treatment.
B) A regression analysis for the purpose of finding the characteristics that influence the 3-month stay in the residential phase of treatment.
C) A regression analysis for the purpose of finding the characteristics that influence the 6-month stay in the residential phase of treatment.
D) A regression analysis for the purpose of finding the characteristics that influence the transition from the residential phase of treatment to the social re-integration phase, and
E) A regression analysis for the purpose of finding the characteristics that influence the 3-month stay in the social re-integration phase.

The analyses gave the following results:

A) *Transition from the counseling Center to the Residential Phase of treatment.*
From the measured characteristics there was found that the search for meaning (1st measurement) has a statistically significant effect *($p < 0.05$)* on the transition from the initial phase of treatment, the counseling center, to the next phase of the residential program. According to the B coefficient (-0.282), if the search of meaning is increased, there is a reduction of someone's the probability to move from the initial phase of treatment to the residential phase (Table 10). The model explains 24.1% of the total dispersion of the dependent variable (Negelkerke R Square = 0.241).

Table 10:
Variables that affect the transition from the counseling center to the residential phase

Variables in Equation			
	B	Wald	p.
Recognition	,128	1,495	,221
Self-efficacy	,002	,010	,919
Search of meaning	**-,282**	4,569	**,033**

Constant	6,897	1,995	,158

Variables entered: Recognition. Self-efficacy, Search of meaning.

B) *Stay for the 3 months of the residential phase*
From the measured characteristics it was found that gender exerts a statistically significant effect ($p < 0.05$) on the 3-month stay of someone in the residential phase of treatment. According to the B coefficient (-0.282), men are more likely than women to reach the 3rd month of the residential phase of treatment (Table 11). The model explains 37.4% of the total dispersion of the dependent variable (Negelkerke R Square=0.374).

Table 11:
Variables that affect the 3-month stay in the residential phase of the treatment

Variables in Equation	B	Wald	p.
Sex	**-2,038**	3,536	**,050**
Age	-,191	1,853	,173
Recognition	,177	1,791	,181
Ambivalence	,148	1,652	,199
Taking steps	,021	,026	,871
Self-efficacy	,001	,007	,932
Expectation	-,042	,093	,760
Social Support	-,054	,326	,568
Stress	,033	,291	,590
Anxiety	-,077	1,488	,222
Depression	,001	,000	,984
Positive Emotions	-,025	,167	,683
Negative emotions	,023	,065	,798
Presence of meaning	-,015	,035	,852
Search of meaning	,060	,686	,408
Constant	3,237	,259	,611

Variables entered: Sex, Age, Recognition, Ambivalence. Taking steps, Self-efficacy, Expectation, Social Support, Anxiety, Stress, Depression, Positive emotions, Negative emotions, Presence of meaning, Search of meaning.

Variables entered: Sex, Age, Recognition, Ambivalence. Taking steps, Self-efficacy, Expectation, Social Support, Anxiety, Stress, Depression, Positive emotions, Negative emotions, Presence of meaning, Search of meaning.

At the same stage treatment, it was found that the recognition of the problem during the initial phase (1st measurement) exerts a statistically significant effect (p <0.05) on someone's 3-month stay in the residential phase of treatment. According to the B coefficient (0,108), if there is an increase in the recognition of the problem, there is also an increase of someone's possibility to stay in the residential phase of treatment for up to 3 months (Table 12). The model explains 9.9% of the variability of the dependent variable (Negelkerke R Square = 0.099).

Table 12:
Variables the affect the 3-month stay in the residential phase of the treatment

Variables in equation			
	B	Wald	p.
Recognition	**,108**	3,682	**,050**
Taking Steps	,049	,835	,361
Constant	-4,337	1,755	,013

Variables entered: Recognition, Taking steps

C) *Stay for the 6 months of the residential phase*
From the measured characteristics there was found that there is no characteristic with a statistically significant effect (p <0.05) on the 6-month stay in the residential phase of treatment.

D) *Completion of the residential phase - transition to the re-integration phase*
From the measured characteristics it was found that the expectation for the effectiveness of the treatment (1st measurement), the stress (1st measurement), and the satisfaction from the treatment provided during the residential phase (2nd measurement) exert a statistically significant effect (p <0.05) on the transition from the residential phase of treatment to the phase of re-integration. According to the B coefficient 0,554), an expectation increase at the beginning (1st measurement) increases the probability to complete a residential treatment phase and to pass to the phase of social re-integration. According to the B coefficient (-0.224), if there is an increase in the stress at the beginning of the treatment (1st measurement), the probability of someone to complete the residential phase of treatment and to pass to the phase of social re-integration is reduced. According to the B coefficient (-0.302), if there is an increase in the satisfaction from the treatment provided during the 3 months of residential phase (2nd measurement), there is a decrease in someone's probability to complete the residential phase of treatment and to pass the phase of social re-integration (Table

13). The model explains 44.7% of the variability of the dependent variable (Negelkerke R Square=0.447).

Table 13:
Variables that affect the completion of the residential phase and the transition to the social integration phase
Variables in Equation

	B	Wald	p.

			,254
Recognition	,266	1,299	
Ambivalence	,202	1,410	,235
Taking steps	-,187	,933	,334
Self-efficacy	,028	1,402	,236
Expectation	**,554**	4,129	**,042**
Social Support (important others)	-,035	,088	,767
Social Support (family)	-,085	,896	,344
Social Support (friends)	-,092	1,307	,253
Stress	**-,224**	4,414	**,036**
Anxiety	,088	1,060	,303
Depression	,160	3,329	,068
Positive emotions	,164	2,833	,092
Negative emotions	-,135	1,030	,310
Presence of meaning	-,101	1,141	,285
Search of meaning	,036	,172	,678
Satisfaction	**-,302**	4,145	**,042**
Constant	7,447	1,276	,259

Variables entered: Recognition, Ambivalence, Taking steps, Self-efficacy, Expectation, Social Support (important others) Social Support (family). Social Support (friends), Anxiety, Stress, Depression, Positive emotions, Negative emotions, Presence of meaning, Search of meaning Satisfaction

E) *Stay of up to 3 months in the re-integration phase*
Of the characteristics measured, it was found that those exercising a statistically significant effect ($p < 0,05$) on someone's stay for the 3 months of the social re-integration are the steps toward change, the treatment satisfaction, the social support from significant others and the symptoms of depression during the residential phase of treatment (2nd measurement). According to the B coefficient (0,596), if there is an increase in the steps toward change, there is also an increase in the probability of someone to stay for 3 months in the social re-integration phase. According to the B coefficient (0,788) if there is an increase in the satisfaction from the provided treatment, there is also an increase in the probability of someone to stay for 3 months in the social re-integration phase. According to the B coefficient (-1,086), if there is an increase in the perceived social support by significant others, there is a reduction to someone's probability to stay for the 3 months of the social re-integration phase. According to the B coefficient (0,419), if there is an increase in depression there is also an increase in someone's likelihood to stay for the 3 months of the social re-integration phase. (Table 14). The model explains 47.7% of the variability of the dependent variable (Negelkerke R Square=0,477).

Table 14:
Variables that affect the 3-month stay in the social integration phase
Variables in equation

	B	Wald	p.
Sex	11,035	,045	,832
Age	,233	,444	,505
Total Duration of drug use	-,106	,116	,734
Recognition		1,780	,182
Ambivalence	-,411	,982	,322
Taking steps		4,841	**,028**
	-,231		
	,596		
Self-efficacy	-,003	,008	,927
Satisfaction	**,788**	4,371	**,037**
Social support (important others)	**-1,086**	6,991	**,008**
Social support (family)			
Social Support (friends)	-,348	3,670	,055
	,146	,842	,359
Stress	-,255	2,813	,094
Anxiety	-,212	1,254	,263
Depression	**,419**	5,242	**,022**
Positive emotions	,139	,846	,358
Negative emotions	,267	1,537	,215
Presence of meaning	,094	,187	,665
Search of meaning	-,092	,232	,630
Constant	-19,927	,134	,714

Variables entered: Sex, Age, Total duration of drug use, Recognition, Ambivalence, Taking steps, Self-efficacy, Satisfaction, Social Support (important others) Social Support (family). Social Support (friends),

As shown by the results, positive emotions were not found to constitute a factor that affects transition from one phase of treatment to the next one.

Research hypothesis 3. Positive emotions are associated with other factors that are important for treatment.

In order for this question to be answered, a series of Multiple Stepwise Regression analyses were performed in each variable highlighted as statistically significant in the first three research questions. It should be mentioned here that all statistically significant variables were obtained from the 1st and 2nd measurement and not from the next ones. Apart from the variables highlighted in the previous questions, in the analyses of this question there was also self-efficacy included in the 4th measurement (last phase of treatment) as a variable highlighted by literature as playing an important role at the end of the treatment. (In the analyses there were used the variables of the same phase of treatment as well as the variables of the previous phases, which could possibly affect the dependent variables, as independent variables).

The findings showed that in the **first phase** of treatment, taking steps towards change and negative emotions have a statistically significant positive effect on **problem recognition** (1st measurement), search for meaning and problem recognition on **taking steps,** social support from significant others and positive emotions on **self-efficacy,** taking steps and presence of meaning on **expectation** for the outcome of the provided treatment, anxiety, depression and social support from significant others on **stress,** presence of meaning, negative emotions and self-efficacy on **positive emotions,** and finally taking steps and presence of meaning on **search for meaning.**

In the **second phase** of treatment, taking steps, satisfaction and stress were found to have a statistically significant positive effect on **problem recognition** (Residential phase – three months), whereas self-efficacy was found to have a negative effect.

The results showed that problem recognition, search for meaning, positive emotions and satisfaction have a statistically significant effect on **taking steps** during the three months of the residential phase of treatment (2nd measurement). The findings showed that positive emotions and problem recognition have a statistically significant effect on **satisfaction** from the provided treatment during the Residential phase of treatment (three months – 2nd measurement).

The results showed that presence of meaning and positive emotions have a statistically significant effect on perceived **social support** from significant others during the three months of the Residential phase of treatment (2nd measurement).

The results showed that negative emotions have a statistically significant positive effect on **stress** during the three months of the Residential phase of treatment (2nd measurement), whereas presence of meaning and self-efficacy have a negative effect.

The results showed that negative emotions, social support from significant others and self-efficacy have a statistically significant positive effect on **depression** during the three months of the Residential phase of treatment (2nd measurement), whereas presence of meaning and positive emotions have a negative effect.
The analysis showed that negative emotions have a statistically significant positive effect on the **general clinical presentation** (stress, anxiety, depression) during the three months of the Residential phase of treatment (2nd measurement), whereas presence of meaning, social support from significant others and self-efficacy have a significant negative effect.

Discussion

It is observed that positive emotions increase in the course of treatment for those who remain under treatment, while, as shown by the descriptive data (Table 1), those who interrupt their treatment seem to have less positive emotions and more negative ones. The statistically significant increase of positive emotions in the course of treatment for those continuing treatment is also supported in recent research (Flora & Stalikas, 2012). As shown by the analyses, compared with the two first measurements in the first phase and at the beginning of the residential phase, positive emotions appear much more at the end of the Residential phase and during the social re-integration phase as. It seems that the continuation of treatment is associated with an increase in the experience of positive emotions like gratitude, love, sympathy, pride, serenity, hope and sexual desire, all of which are emotions included in the scale that was administered. The coexistence in the group, the development of communication and the ability to express oneself contribute to the experience of emotions that are new for the patients due to the long experience of substance abuse. The management of the emotions that come to the surface is not easy to achieve, as it seems that emotions may play an important role not only at the beginning of substance abuse and in its duration, but also during the treatment of the addiction.

Respectively, there is a decrease of negative emotions in the course of treatment, always for those of the participants who continued their treatment, with the most significant difference observed between the last and first phase. Negative emotions, such as guilt and fear, seem to subside as treatment progresses. At this point it should be noted that initially guilt about what substance abuse brings with it is quite intense, as well as the emotion of fear about what is going to happen next. The psychological therapy process and the stay in the therapeutic community favor the relief of these unpleasant emotions, which often constitute a serious obstacle

to the addiction treatment attempt, as shown by the relevant findings about the emotion of hostility (Small & Lewis, 2004). The emotion of anger seems to be associated not only with the experience of substance use, but also with the changes resulting from treatment, which are related to the deeper causes and the emotional and social deficits that led to substance use and addiction in the first place. On the other hand, it is easy to assume that those who were under treatment and finally discontinued it had fewer positive emotions than those who continued. Combined with other factors, a negative emotion may lead to the interruption of the treatment process, as it is probably connected with pessimism and negative thoughts about the course of treatment and the future. Clinical observation has also shown that relapses are often associated with dealing with a difficult situation or a difficult emotion that the person was not able to manage successfully and was thus led to the use of substances as a means to self-healing.

In the second research question, positive emotions proved not to be included in the factors that predict transition from one phase of treatment to the next one. According to the analyses, the majority of positive emotions are connected only with the stay until the end of the residential treatment (Table 7). The fact that in most of the analyses positive emotions did not emerge as an important factor for the passage from one phase to the other should be assessed in combination with other results, as, for example, with the fact that the recognition of the problem, the satisfaction with the treatment, and the steps toward change appear as those factors that exert a positive influence for the continuation of the treatment. With regard to this, a second observation is related to the role of *negative emotional* and *clinical states,* such as stress, anxiety and depression. To be more precise, anxiety, depression, stress and the other negative emotions at the beginning of treatment (first phase and beginning of residential phase) seem to affect the continuation of treatment in the later phases, such as the end of the residential phase, the completion of the residential phase and the transition to the social re-integration phase as well as the stay in this phase. Most results support, as expected, the fact that the existence of negative emotions is negatively associated with the continuation of the treatment. In other words, the less negative emotions a patient experiences at the beginning of the treatment, the more possibilities he/she has to continue the treatment, a finding that confirms previous findings (D'Andrea & D'Andrea, 1996; Goeders, 2004; McKay, 2005).

With regard to the third research question, two sub-groups of correlated variables are observed. The first subgroup is made up of the variables of *change readiness* and more specifically, *problem recognition and taking steps towards change, expectation about the outcome of the treatment, search for and presence of meaning.* The second sub-group of variables includes *self-efficacy, positive emotions, social support and presence of meaning,* with the variables being positively correlated. The positive correlation between self-efficacy and social support is supported by a past research (Forcehimes & Tonigan, 2008). If the extent to what a patient believes to be able to adopt a certain behaviour – in this case to restrain from substance use under certain circumstances – increases at the beginning of treatment, there is an increase in positive emotions, in perceived social support and in presence of meaning too. The certainty that the patient can successfully adopt the desired behaviour is arguably associated with the positive emotions he/she develops about himself/ herself and others, the supportive presence of others and the importance he/she attributes to his/her life and actions. The interaction of these factors, which, compared with the previous ones, relate mostly to the presence of the patient in the external environment and its consequences on himself/ herself and reversely, creates a correlation among the concepts of self-esteem, emotions and relationships with others. It is observed that presence of meaning is a common predictive factor of both sub-groups of variables, possibly indicative of the great importance of meaning of life at the beginning of the treatment. The concept of meaning of life is contained, as it is difficult to be restricted to a scale of self-reference, in the contact with addicted people, since when referred to substance abuse and treatment, they either directly or indirectly refer to the lack of something or the search for it, a vague pleasure that used to be provided by substance use and then to the search for sufficient reasons to invest in the attempt that will lead to the change. The responsible for the therapeutic program psychiatrist reports that the main request of drug addicts, whether they are able to express it verbally or not, upon their entrance into the Drug Addiction Treatment Program and after the acceptance of the withdrawal environment, is the recovery of the meaning of life (Matsa, 2001).

Conclusions

The results corroborate the important role of variables such as change readiness, and social support in the transition from one phase of treatment to the next one, and underline the role of new variables in this field, such as positive emotions and the perception of the meaning of life. The positive predictive relation of self-efficacy to change readiness, positive emotions and meaning of life especially at the end of the treatment highlights the importance of this variable (which comes from the field of the cognitive school) as a predictive factor with regard to treatment. The establishment of a model able to explain the gradual therapeutic change in the course of addiction treatment through the utilization of the so far available data could be the next research step. This research has contributed, through the assessment of the combination of a series of factors at repeatable time points, to the understanding of the change process as a dynamic process, through the factors that foster it, the ones that inhibit it and others with a twofold and quite complex role. For the requirements of the research, it was assumed that both the continuation of treatment and the completion of its phases are identified with change process. It should be noted, however, that change in a state like addiction is a broader concept and may be achieved even by the "therapeutic failures" of an addicted person.

The importance of studies in addiction treatment lies in the improvement of the understanding of the recovery mechanism and the treatment methods applied, as it happens in the studies researching the treatment effectiveness of other mental illnesses, such as psychosis or anxiety disorders. In our opinion, studies like this one could make a more effective contribution to the field if they focused on the understanding of the deeper causes of addictive behaviours, of the need that drives mostly young people to seek such a way out of their problems and attempted to distinguish between addiction and simple substance experimentation. Such an attempt could, in our opinion, through suitable prevention strategies, contribute to dealing with the prime factors of the multifaceted nature of addiction.

[1] Stages of Addiction Treatment: 1st) Counseling Centre (from 4 to 6 months), 2nd) Residential Phase (from 6 to 8 months), 3rd) Social Re-integration (12 months.

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