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THE IMPACT OF EXERCISE ON DRUG ADDICTION TREATMENT: A QUALITATIVE STUDY

PANAGIOTIS CH. DIAMANTIS¹, YANNIS THEODORAKIS & MARIOS GOUDAS

A b s t r a c t

Aims: To explore perceptions of drug addicts regarding the exercise component of attending an abstinence-based residential rehabilitation program.

Methods: 12 adult male participants took part at the study. The rehabilitation program lasted six months and exercise was included at the treatment program. Exercise sessions run five days per week for at least one hour. In-depth individual interviews were conducted midway, and focus group interviews at completion of treatment. Additionally, observation was also used.

Findings: The results indicate that exercise has had a significant impact on the treatment as participants reported improved self-esteem, confidence and mood, increased self-awareness, and various behavioral changes. Exercise also facilitated communication and enhanced the bonding among participants. These outcomes contributed to retention to treatment and prevention of premature dropout, and in addition reduced the resistance to therapy and influenced positively the entire treatment process.

Conclusions: Exercise should be included in the philosophy of any rehabilitation program for drug addiction. Not only does it improve the physical condition and the mood of the patients but also has the potential to affect the whole physical, social and psychological process of change, resulting to better treatment outcomes.

Keywords: Addiction, exercise, substance use, therapy, qualitative research.

BACKGROUND

Substance use disorders (SUD), both abuse and dependence, are a key issue for public health. The misuse of psychoactive substances causes significant physical and mental health issues as well as social problems not only to the person who uses them, but also to society at large (UNODC, 2015). In 2015 about a quarter of a billion people used drugs. Of these, around 29.5 million people - or 0.6% of the global adult population - were engaged in problematic use and suffered from drug use disorders, including dependence. Opioids were the most harmful drug type and accounted for 70% of the negative health impact associated with drug use disorders worldwide (UNODC, 2017). In Greece, 4894 applications for treatment of drug addiction were submitted in 2014 (ΕΚΤΕΠΝ, 2015).

¹ Contact Details: diamadis702@hotmail.com

Drug addiction is defined as a cluster of cognitive, behavioral, and physiological symptoms that indicate a person has impaired control over substances use and continues to use such addictive substances despite the ensuing severe adverse consequences (American Psychiatric Association, 2013). From a neurobiological point of view, it is evident that addiction is caused when the excessive use of a drug affects the reward system of the brain (Gradner, 2011). Apart from this, however, before pharmacological and physiological addiction set in, drug abuse is induced by a number of environmental and psychological risk factors: lower economic status and social inequality (EMCDDA, 2010), dysfunctional family background (Velleman, Temleton & Copello, 2005), trauma in early childhood (Hamersley et al, 2016; Wills, Vaccaro & McNamara, 1992; Wurmser, 1985), deficits on psychological (ego/self) structures (Khantzian & Albanese, 2008) and disturbed emotional function (Krystal, 1978), are just a few of the multitude of theories explaining and factors causing drug dependence. Furthermore, it is estimated that almost 50% of the drug depended clinical population, is suffering from at least one personality disorder while emotional, anxiety and psychotic disorders are also very commonplace (Kessler, Chiu, Demler & Watters, 2005).

The heterogeneity of the causes leading to drug addiction is such that it has inescapably resulted in a variety of established therapies to be applied in clinical practice, either alone or in combination with one another, the most prevalent among which are substitutes maintenance therapy and several psychotherapeutic approaches, such as psycho-educational groups, cognitive behavioral therapy (CBT), motivational interviewing, psychodynamic therapy, the 12-steps etc. (Zschucke, Heinz & Strohle, 2012).

Despite the increasing effectiveness of psychopharmacological and psychotherapeutic strategies, relapse rates remain high (Ramo & Brown, 2008) resulting in a need for supplementary interventions in order to improve treatment outcomes. There are valid reasons to advocate exercise as a therapeutic intervention in drug addiction treatment. Physical exercise is an organized, voluntary, planned and repetitive physical activity, aiming to promote and maintain every aspect of fitness and health (Berger, Pargman & Weinberg, 2007). General population research literature has associated exercise with a wide range of positive physical (Haskell et al., 2007), psychological (Daley, 2008; Legrand, 2014; Stonerock, Hoffman, Smith & Blumenthal, 2015), and social health outcomes (Bailey, 2005; Gill et al., 2013).

In the field of drug addiction treatment, discussions about the advantages of physical activity as a relapse prevention strategy date as far back as 1985 (Marlatt & Gordon, 1985). Yet, the number of studies examining the effects of exercise, although growing, is still limited. Despite the small literature on the field findings of the existing studies suggest that physical activity could, in fact, constitute an effective supplement on drug addiction treatment, as it reduces anxiety and depressive symptoms (Wang et al., 2014; Li et al., 2002; Palmer et al., 1995; Unjem et al., 2016; Zscucke et al., 2012) improves self-confidence, self-esteem and body image (Roessler, 2010; Collinwood et al., 1991), enhances mood states (Williams, 2000), general well-being (Collingwood et al., 1991) and quality of life (Muller & Carlsten, 2012). Additionally, it offers participants the opportunity to attain a pleasant mental state without substance use (Lynch, Peterson, Sanchez, Abel & Smith, 2013) and adopt a positive lifestyle change that is incompatible with substance abuse (Brown, Abrantes & Read, 2010). All the above-mentioned psychological changes

have been closely linked to positive substance-related outcomes such as reduced drug intake, increased abstinence rate, reduced craving, higher completion rate of the rehabilitation program, altered behavior and relapse prevention.

Furthermore, positive social outcomes such as finding dwelling and employment (Burling et al., 1992), and development of friendship networks (Neale, Nettelton & Pickering, 2012) have also been reported. Additionally, the social interaction among the participants during exercise interventions was also associated with positive drug-related outcomes (Palmer et al., 1995; Burling et al., 1992; Roessler, 2010; Neale et al., 2012).

Recent studies have stressed the importance of fitness in building recovery capital (Morton, O'Reilly & O'Brien, 2016), and that integrating exercise into SUD treatment “presents a unique opportunity for improved treatment outcomes” (Weinstock et al., 2017), while exercise is considered as a sufficient prevention strategy for adolescents (McElrath, O'Malley & Johnston, 2011).

All positive outcomes are related to changes in physical fitness. However, changes in strength and aerobic capacity also affect changes in the sense of the body, the way we feel our body. Roessler (2010) noticed this aspect, which she referred to as the “bodily awareness” factor. The factor of body sensation is considered of great importance as the relationship between body and psyche is well established (Aristotles, 2016). McDougall (1989) argued that substance abuse is a psychosomatic illness. The fact that drug abuse is primarily a somatic abuse is apparent on the body of any drug-addicted individual. Indeed, physical sensation and the social dimension are two aspects of SUD that have been particularly stressed in treatment projects on substance abuse (Donaghy & Ussher, 2005).

Even though these studies provide valuable information about the relation between exercise and SUD treatment, all researchers apart from Morton and colleagues (2016), Neale and colleagues (2012) and Roessler (2010) adopted traditional quantitative approaches that have inherent limitations in relation to this topic rendering it difficult to draw definite conclusions (Linke & Ussher, 2014; Zscucke et al., 2012).

Having an insufficient sample, both in terms of size and characteristics, was a limitation reported in almost every quantitative study. In some researches the sample size was too small to provide valid findings while in other studies researchers recruited participants from different stages of recovery, in order to obtain a sufficient sample size. Yet, it is imperative that the recovery stage and abstinence rate be taken into account (Linke & Ussher, 2014), since they affect both the physical and the mental condition of the participants.

Additionally, most studies recruited participants from different treatment approaches. We consider that there are differences between the substitute maintenance and abstinence-based treatment. First, both methadone and buprenorphine are opioids of high psychotropic potency, including the risk of addiction (Fisher, Rhem, Rgen, Kim & Kirst, 2004) and are associated with several health problems (Wang et al., 2014). Therefore, the physical and mental condition between participants who use substitutes and participants who are totally absent from any psychoactive substance may differ. Second, the ultimate objective of illicit drug treatment is a drug free state, where the individual will reintegrate into society having sufficient physical, psychological and social function. To that end, multidisciplinary approaches combining pharmacological, psychosocial and

psychotherapeutic interventions are suggested in order for the treatment to be more effective (WHO, 2009). However, according to the empirical evidence, in some cases, psychosocial or psychotherapeutic interventions are either sparsely used in substitutes maintenance treatment programs or not at all. On the other hand, in the abstinence-based rehabilitation programs, psychotherapy and psycho-educational interventions are used widespread, and focus is placed on physical, psychological and social aspects of addiction rather than the neurobiological ones, and in many cases substitutes are not administered. We consider that a patient who is attending a rehabilitation program of multidisciplinary approach, experience and perceive the exercise differently than a patient who merely replaces heroine with a substitute. It is also believed that integrating exercise into psychotherapy or psycho-educational groups, may positively affect treatment outcomes (Linke & Ussher, 2014).

Furthermore, the existing literature suggests that each individual experiences exercise differently (Fox, 1994), thus the benefits of exercise are likely to vary. In view of the heterogeneity of drug depended patients, participants may have a variety of responses regarding the gains of exercise. This was obvious in the qualitative study of Neale and colleagues (2012) where participants reported diverse benefits.

Another factor that should be taken into account when it comes to the mental health domain is the study environment. Studies which require patients to move to the study environment instead of being conducted in the natural treatment environment are liable to induce discomfort to the patients who then fail to obtain the most from exercise (Faulkner & Sparks, 1999), and as a result are more likely to drop out thus, all these elements that are introduced in the quantitative studies reduce the generalization of the findings.

The present study took place in the Drug Rehabilitation Center (DRC) “18 ANO” - Attica Psychiatric Hospital, in Greece. This is a human-centered abstinence-based rehabilitation center where a variety of treatment interventions are implemented in order to ascertain that all parameters of drug dependence are taken into account and physical exercise is included in the rehabilitation program. Exercise has been integrated in the treatment schedule for over 20 years. Although physical exercise has been applied for many years into DRC “18 ANO” –as well as in the majority of rehabilitation centers in Greece-, a review of the relative literature reveals that no previous studies have been conducted to explore its relative effects on the rehabilitation process. Furthermore, despite there being a plethora of empirical evidence in Greece, we believe that the record of the views and experiences of patients who use exercise as an adjunct to treatment, through a planned research context will help the possible emergence of themes and dimensions of treatment that might have previously escaped attention.

The present study was explorative. It aimed to explore the effects of physical exercise on a clinical population suffering from drug dependence, through their own views and experiences, within their natural treatment environment, and whether and how exercise influences the treatment outcomes.

In view of the problems that were identified regarding previous quantitative research on drug depended population, we opted for a qualitative phenomenology approach. A phenomenological study, “describes the meaning for several individuals of their lived experiences of a concept or a phenomenon” (Creswell, 2007). Taking into consideration the

particularities of each participant's personal background and personality traits, we consider that their personal views on a common experience would help us to obtain an overall and in depth view of the impact of exercise on drug rehabilitation treatment, enriching the existing literature.

METHODOLOGY

In light of the acknowledgement of the role of "researcher as instrument" (Rubin & Rubin, 2005; Turato, 2005) and his inevitable involvement in the constructions of ideas (Janesick, 2001), we need to make explicit the background of the first author.

He has been employed as a physical trainer at the DRC "18 ANO" since 2002. Upon entering the SUD treatment field and being trained in the treatment environment by psychiatrists, he realized that the implementation of exercise on drug depended population is a complicated process, involving many dimensions that could affect not solely patients' mental health but the entire treatment process. Furthermore, he got familiar with the particular clinical population, understanding more and more each year their weaknesses, their ambiguous motivation for rehabilitation, their personal history, and possibilities of personal change. This accumulated empirical knowledge in association with the review of relative literature influenced the design of the study.

Participants and location

We consider it will be useful to give the reader an insight on the DRC "18 ANO", in purpose to obtain a better understanding of the particular site the study took place.

At the DRC "18 ANO", there are three recovery stages: initial, residential rehabilitation and reintegration into society. During the initial recovery stage the main goal is for individuals to free themselves from withdrawal symptoms -assisted by medication- and to stabilize their abstinence.

Once individuals have maintained abstinence for at least 20 days they enter the residential recovery stage. The treatment program includes individual and group psychotherapy, physical exercise, art-therapy, drama-therapy, occupational therapy and dance-therapy. The residential recovery stage lasts approximately six months. There is no need for substitutes (methadone etc.) to be administered as withdrawal symptoms have disappeared. Medications are provided in case of comorbidities (antidepressants, antipsychotics etc.). Random urine tests are used through this stage of recovery to ensure abstinence. Men and women go to separate residential rehabilitation centers because of their different characteristics.

Upon completion of the residential stage, patients move on to the reintegration stage, during which they dwell in their own homes or in the hospital's guesthouses if homeless, and they continue the treatment processes.

The study took place in the residential recovery stage. This choice was made for several reasons. Firstly, because the residential recovery stage is considered as the most important, since it is there that the major physical and psychological changes in patients will occur, in order for them to become sufficiently functional when reintegrating society (Matsa, 2002). Secondly, because exercise is included in the daily therapy schedule

and patients attend the sessions regularly. Additionally, the first author was an employee in the specific rehabilitation unit for over ten years, thus has an extensive knowledge of the treatment environment.

Finally, as the first author was not employed at the specific unit at the time of the study, the risk of a personal therapeutic relationship being developed between participants and their physical trainer influencing the narrations -with the participants relating what they suppose their therapist would like to hear and not what they really think- has been eliminated.

A purposeful sampling strategy was adopted based on the general recommendations by Creswell (2007). The participants recruited were 12 male adults who fulfilled two criteria: a) having a diagnosis by DSM-IV on drug dependence, b) attending regularly the exercise sessions, thus, experiencing the same phenomenon. There were no exclusion criteria. In case of relapse the treatment is discontinued and the patients returns to initial stage. We did not include women, because gender differences between men and women should be considered, as their preferences regarding the type, intensity and expectations from exercise may differ (Abrantes et al 2011). Two of the participants dropped out, resulting in a dropout rate of 16%. The average dropout rate at the residential rehabilitation unit the study took place is approximately 25%. The lower dropout rate was coincidental and not due to the study. The data from the interviews of the participants who quitted the rehabilitation program were excluded from the findings.

Participants reported heroine as the main substance in recent years. Together with heroine they reported use of cannabis, barbiturates, cocaine, MDMA, amphetamine, and several chemical home-made drugs. Their age was ranged between 23 and 52, with an average of 33 years old. Their history of abuse was on average 16 years. In the first round of interviews, they had already spent a period of two months in the residential recovery stage, with an abstinence rate (including alcohol) three months on average.

Five of the participants had previously attended other rehabilitation programs, two were starting anew in the "18 ANO" for the second time after relapse, three had made several attempts to beat addiction on their own, and for two of them this was their first attempt to quit drugs.

The exercise program

The daily fitness schedule included a 15' warm-up and a 45' soccer or/and basketball game under the supervision of a physical trainer and run every day except for weekends. In view of the comorbidities and the frequent physical injuries, the schedule is generally flexible and gives patients the autonomy to do alternative types of exercise such as jogging or walking if they want to. All clients had had medical check-ups and a doctor's permission to participate in the fitness program.

Apart from the scheduled exercise, clients had the opportunity to do strength training. The center had a well-equipped gym where they could work out on weight lifting in their leisure time. Six participants worked-out regularly five times per week for one hour on average, two participants occasionally, and two chose not to do any strength training.

Since their age and physical condition differed, the intensity of exercise was not imposed. On the contrary they were free to adapt it to their own needs. However, it has been observed that patients usually work out at a moderate-to-high intensity level both in strength training and team sports from the beginning –depending on their physical

condition, which increases gradually. Literature suggests that, if the intensity of exercise is self-selected, it appears to enhance tolerance on high intensity levels (Ekkekakis, Praffit & Petruzello, 2011).

Procedure

Every participant selected a pseudonym, to protect their anonymity when reporting findings. A consent form between the authors and the participants was signed and an oral approval was given from the director of the DHC “18 ANO”.

In-depth interviews were conducted for data collection. A semi-structured interview guide was used, based on the general recommendations by Creswell, 2007 and Kvale and Brinkmann, 2009. The outline of the semi-structured guide contained introductory questions aiming to obtain demographic information about the participants, as well as to break the ice between them and the interviewer. Then, five main open-ended questions were posed, followed by probes and follow-up questions that covered a broad range of topics related to drug abuse treatment: body sensation starting from drug the abuse period till the moment of the interviews, emotional responses to body sensation, experience of exercise, possible differences between strength training and team sports, patients' preferences, effects of exercise on their everyday living, impact of exercise on psychological and behavioral changes and influence of exercise on treatment outcomes.

The first round of interviews was conducted during the second month of residency at the rehabilitation center. This period was chosen mainly because, based on practical experience, at that point the participants' physical condition has already improved to some extent, therefore they can participate sufficiently to the sessions and are able to fully benefit from the fitness program. What's more the period of drug abuse and the withdrawal symptoms are still fresh in their mind, therefore the information about the changes they are going through is more solid. Focus group interviews followed at the end of the residential stage, in order to cover the influence of exercise through the entire period of residential treatment, and to explore possible differences on the impact of exercise between the beginning and the end of the treatment.

In addition to the interviews, observations and informal discussions with the staff of all disciplines performed by the first author were used in order to get additional information about the participants' behavior, their treatment progress, and the reliability of their narrations.

The interviews were audiotaped and transcribed verbatim, and then were read repeatedly in order to capture a sufficient general sense of each text (Kvale & Brinkmann, 2009). An inductive analysis was used to identify codes and organize themes. A thematic analysis was then used to cross-reference participants' narrations, observations and staff's information about the treatment progress.

RESULTS

The experience of exercise

Taking into account Fox's (1994) argument that exercise is a very personal experience, we were interested in finding out how this particular population experiences physical exercise in the particular circumstances it takes place.

Let it be mentioned that team sports were called “morning activity” because the daily treatment program starts with the exercise sessions. As a result, this term has been used in this paper on several occasions.

There were differences in how patients experienced the two types of exercise, with strengthening exercise being viewed more as a real workout than team sports.

“I only do weight lifting for exercise. Morning activity is just playing. I see it purely as playing and nothing but playing. It’s the weights that are the real workout”. Hristos.

On the other hand team sports were “games” that were “fun”, “entertaining” and helped patients to connect with each other.

“It’s not just the fact that I work out. It also helps me joke around, communicate with the guys; we go out, have some fun, get a little closer with each other. We’ll have a few laughs, enjoy it, you know what I mean. Isn’t that fun? You bet it’s fun” Asterix.

The experience of “play” and the social interaction involved in sports triggered an emotional process that constituted a decisive factor in showing a clear preference for team sports over weight lifting.

“I prefer team sports more because I like this whole relationship that is built with the others. Tension, joy, anger. (Pause) All these feelings that are stirred, you could never generate by yourself. To be excited, to compete, I like that. It makes me feel alive” Mike.

“Now, going to the gym, well, have tried to keep it up but I find it hard. I don’t know. (Pause) I think it is because we don’t ‘play’ there. What I mean to say is that when we play basketball there is all this action, joking around; besides exercising and having to follow a technique and all that. People’s personalities come out and so on. (Pause) The bottom line is that it seems to suit me more” Dimitris.

In many narratives participants reported that the experience of playing took them back to their childhood and adolescence, before they started to use substances, which enhanced the element of enjoyment.

“... It makes me feel young again, exercise does. As if I were 18 years old and played soccer with my friends, that’s how it makes me feel. That’s what I like about it” Kroif.

“I like it because it reminds me of my childhood” Marios

Additionally, team sports take place outside the “house”, and the opportunity to change scenery for a little while coupled with the need for motion enhanced their partiality for this preference.

“I like the fact that we don’t just sit around, doing nothing, you know. I like group therapy sessions too, mind. I get something different from each group. But there, you’re always behind a wall, in a room” Garifalakias.

“That’s the only time we get outside the “house”. What I’m saying is that if we stay in for 5-6 days, it is hard on us to say the least, and by going out to get some fresh air, to play a little, the routine changes” Mark.

All these factors contributed to making participants experience “morning activity” as a pleasant and important daily routine, to which they attributed a distinct trait, different from all

other therapeutic interventions, lighter and more pleasant, which could discharge stressful situations.

“In my case, it helps knowing that every morning I have something to expect, that I will spend an hour pleasantly. I lighten up and it makes me happy during the day. In other words, even if I have had a tough day, I know I’m getting out of the house and play, unwind and that I’ll be fine. So, it helps me very much” Mike.

“Exercising time is a bit more chill than treatment time. Letting off steam, you know, it’s not so much (pause). It may be a therapeutic process to some extent, but exercising also involves pleasure, it includes the element of playing” Asterix.

Their preference for team sports does not mean that strengthening exercise was not well-liked. On the contrary, it was a pleasant and creative way of managing their leisure time, which also worked as a replacement of the “morning activity” sessions when missed, and was more related to body shape improvement and body image than team sports.

“But on days when there is no morning activity, on rainy days, at weekends, etc., I need it, I miss working out. And I usually only go to the gym on days when I have missed morning activity”, Dimitris.

“I saw a big difference in my body. And I loved it. It helps me. When I do not feel well, I am bored, I do not have what to do, I go (pause) and just like that within the first 5 minutes. As soon as you go, you like what you do, you are happy. I’m happy when I see the changes in my body” Mike.

Beyond the experience of strengthening exercise per se, another particular aspect emerged: the experience of the gym as an area, a place that favors communication, the bonding of patients and the cultivation of relations among them.

“In my view, it’s not the weight lifting that makes a difference. I believe it’s the gym, the place. (Pause) I use it as a place that suits me around here, which helps me to talk and to also listen” Marios.

In some cases, being at the gym as an area seemed to outweigh the experience of doing strengthening exercise.

“I lift them (weights) every day, I do a few sets. (Pause) I stay at the gym for a couple of hours but I mostly talk to the other fellows of the center. I only really lift weights for fifteen to twenty minutes” Kyriakos.

The experience of the body

The two-way relationship between body and soul is widely accepted in psychology. What’s more, the idea that the body draws from the psyche and the psyche is expressed through the body is prevalent. The link between body and soul is reflected in Jordy’s words.

“I think my body expresses what I feel at all times” Jordy.

When dealing with an emotional or mental crisis, the body is called upon to alleviate the mental pain, and that is where the cause of the abuse that drug addicts usually inflict on their bodies is rooted (Matsa, 2002). We investigated the body-psyche relationship of the participants in every stage, from drug abuse to the moment of the interviews. Although

the questions referred to “body sensation”, many of the participants also talked about “body image”. By “body image” they didn’t mean exclusively having a well-shaped, fit body when looking in the mirror. The term was stretched and referred also to a mental picture they have in their mind about their body, and consequently encapsulated both concepts.

While using substances, their relationship with their bodies constantly fluctuated from absolute indifference to the awareness of the negative consequences of abuse.

“I didn’t care at all about my body. It just did whatever my mind wanted” Asterix.

“How did my body make me feel? It made me feel as if I was running out of time, that I did not have time. That is, I could feel myself vanishing” Paco.

Having withdrawal symptoms is a particularly unpleasant experience that primarily concerns the body. When the withdrawal syndrome subsided, throughout the early recovery stage, all participants experienced symptoms of anxiety and depression during which their poor physical condition either was one of the causes of these symptoms, or made symptoms worse.

“I had no strength, I would go from one sofa to the other. I had zero energy, smoked like a chimney. As expected, I didn’t like the way I looked. I was like ‘just look at yourself!’ As if my gloomy mental state didn’t make me feel bad enough already, the way my body looked was one more blow” Hristos.

“I thought I would never go back to the way I was before, my spirits were very low, I felt despondent, I thought everything was gone, that I had aged prematurely and that it would not change even though I had stopped doing drugs” Kroif.

As abstinence rate increased, and to some extent they managed to better deal with the symptoms of depression, the need for physical activity began to emerge.

“...The way I felt the things around me changed, my sense of smell, of taste. The colors. Like waking up from a dream. And my body was beginning to acquire mobility. I had to do something with it. So, I went cycling” Jordy.

On entering the residential recovery stage and beginning having regular exercise sessions they all witnessed an immediate change in their body image and sensation, which in turn triggered a number of positive emotions.

“My body feels good not only in general but also after workout; it feels alive and healthy (Pause). It’s a beautiful feeling as for many years, both when I used drugs and when I did not, I neglected my body. And now that I feel it recovering, I do not know, I’m pleased. I’m glad to see I’ve still got it, I haven’t lost the war, that though it may be late it’s not too late. I find that kind of reassuring” Hristos.

“Oh, I can feel my body is stronger (Pause). I feel like it is slowly changing. I feel very well, wonderful in fact. I like it. Because I’m doing something good for me and my body. Because before I was killing it, whereas now I’m building it up. I’m making it stronger, sounder, more like it should be” Paco.

The influence of exercise

Psychological

Khantzian (1997) claims that the use of substances is a kind of self-medication, which relieves the individual from painful affect states. On stopping the use of substances, psychological distress reemerges, burdening the mental health of the patients, a factor that often leads to relapse. Exercise seemed to positively influence the way participants handled the chaotic emotional states.

"I like it because I believe, I'm sure - although no one can be sure of nothing - but well, I think it's the only way for me to unwind. I often feel like I'm in a maze and that's how I'm going to get out of that maze. I love that very much, and I try to work out every day, to sweat. It helps me to put my mind at ease, to get rid of my remorse, my obsessions, of the past, my guilt" Kyriakos.

This kind of self-regulation improved participants' mood. In general, all participants stressed that exercise helped improve their mood. Exercise can enhance mood in several ways. In this study we distinguish three elements that were of particular importance for all participants. The first, as was previously mentioned, was the changes in body sensation and image. The second was the tension release, both physical and mental, which had various aspects.

"Exercise helps me decompress; from stress, anger, tension, sadness, all kinds of emotions. If I am in a state, I'll just run, cry, joke around and it will get better. I'm not saying there are no other ways to vent myself, but if it is immediate relief you're looking for that's physical, isn't it?" Asterix.

An important result of tension relief was anger management. Anger is a feeling very common to drug addicts because they are feeling trapped (Dodes, 2002).

"Me, for one, exercise helped me vent my anger, especially at the beginning. Yes, it calms me down. Because I too have selfishness issues and such. So, it often helps me when I can't deal with my anger. It helps to just go and work out and "leave" my anger there" Marios.

The third element was self-esteem enhancement. Many researchers argue that self-esteem is the link between exercise and better mental health. (Fox, 2000; Legrand, 2014; Sonstroem & Potts, 1996), which is also evident in this study.

"... I see that my muscles begin to show, my body is a little firmer, and I'm glad. I feel beautiful in and out and I think that this will show to other people too. (Pause) I feel better with myself. I feel more confident in me instead of being depressed or indifferent" Mike.

"Now, in other respects, it's like when I tried to quit smoking. It boosted my self-esteem and my self-confidence, that is, it definitely strengthened a more positive side of myself" Dimitris.

The improved mood, owing to exercise, influenced positively the entire treatment process. First, it favored the communication among participants. Communication is defined as the exchange of opinions, feelings, ideas and thoughts among people. In drug addiction treatment, communication is imperative but as a rule it is blocked.

“People with communication issues have changed. And they have changed in general; not just with regard to people whom they workout with, but also with people they don’t workout with. I can see that it is easier to approach them. The way I see it, he who takes care of his body opens up as a person” Jordy.

Second, it helped participants be more open, receptive and functional in the other treatment interventions.

“I feel secure, more confident. I feel more ready” Kyriakos.

“Exercise positively affects me so that I’m in a better mood regarding treatment. It helps me be more receptive to what they will give to me. To feel stronger so I can accept something I will probably not like. Exercise helps me deal with it” Paco.

“Yes, I join the therapy groups in a better mood and I am more open to giving more. Both to myself and to the rest of the group. That is, if I felt down in the dumps before a therapy session I might have thought «oh shit, I have to go to psychodrama now or ‘crap! It is psychotherapy time’ or ‘I feel pressured’”. (Pause) It’s not as if I don’t feel pressured when I’ve worked out beforehand; cause I do. And I realize a lot about myself. It just helps me to be more open and go with the flow” Mike.

Behavioral

Exercise seemed to have a positive effect on various behavioral changes, depending on the personality of each participant. Some participants described improved cooperation.

“To be honest, what exercise helped me the most with was getting me to cooperate with others whether I wanted to be with them or not. And that doesn’t have to do only with sports and exercise, it has to do with everything” Asterix.

In many narrations participants reported, without being asked, that they reduced smoking or had even been thinking about giving it up.

“... Working out helps me a lot. It has helped me cut down on smoking to an unbelievable degree. That is to say, I used to be a chain smoker and now I smoke 4-5 cigarettes a day. Cause when you work out you don’t feel like smoking as much, it kind of kills your urge to smoke” Kroif.

Furthermore, as a result of the improved body image and body sensation, healthier eating habits were adopted.

“As soon as I started exercise, I could quit eating bread just for the hell of it or not have dessert in more, and I also started minding what I eat.” Mike.

As smoking and eating habits were changing there was also a general tendency to better self-care as a result of engaging in exercise sessions.

“Loving, taking care of, and caring for yourself is part of the treatment... I now make sure I’m clean, my place is clean and that I live the way I think I deserve to. I want to be clean and have clean clothes and a clean space to live in” Marios.

Finally, improved mood caused higher energy levels, which in turn brought a vitality that made the participants creative throughout the day.

“...It generally helps me to do everything better, to sleep better, it animates me to do

things. Let's say that I'm in a better mood cause of the workout. I will sit down and start writing music, then I'll try to find things to do, to read books" Paco.

Social interaction

As Faulkner & Sparks (1999) argued, we cannot separate social factors from the exercise itself. Particularly for drug addicts the influence of social interaction on positive outcomes have been stressed extensively in literature. In this study we investigated the particular ways that social interaction manifested itself within this group.

We previously mentioned that gym was perceived as an area of therapy that helps the patients to connect with each other and become part of the social body. This impact it had particularly stressed by those participants who were more introverted. The "morning activity" was also thus described.

"...you can get closer to the other, (pause) I (pause) had already tried to do so in the past; I remember trying but I was all clammed up, I didn't talk, I was shy (pause). However, when I played soccer I would open up, I felt more free and that helped me get closer to the others..." Mike.

"... I notice the others talking to each other, making fun (pause) and I feel that I want to take part in it too, so (pause), I start to join in more" Mark.

Exercise promoted integration into group and the cultivation of relations among patients. What's more, another dimension of it came to light and the fact that it was mentioned by all participants without any prompt, indicates how strong its influence was. The "morning activity" was described as a process during which they could "let go" and be themselves.

"...we could get closer, much closer. (pause) It is harder to do so in a therapy group, what with your defenses and fears, what with your worries about what to say, there are lots different things that run through your head. During workout, in the game, you show who you really are, you play and that's it. It brings out the child in you, your spontaneity, it brings out everything. I think you're at your most innocent during the game. In other words it brings out your true self" Asterix.

The patients' true self was expressed through behaviors that reflected each other like a mirror through which they discovered one another but also their own self.

"What I have noticed, and in that I agree with the guys, is that in the court one cannot easily "hide", that is, a lot of behaviors come out and people's true colors appear. In other words, what they say about the court being a mirror is true" Mike.

"... I mean things that you may not take notice of during the day, and which do not come up in a conversation, you actually see them in the way someone plays, the way you play (pause) It is as if there are fewer filters in my behavior, fewer, (pause) fewer blocks in my mind" Dimitris.

DISCUSSION

Drug addiction treatment entails a change of the addicted person's lifestyle. This change presupposes an alteration in the relation of the drug addict with himself and the world, a

process involving his/her body, his/her psychological structures, and his/her social identity (Matsa, 2002). The present research explored the role of exercise in the therapeutic change process within that particular context.

As the study was conducted in the residential recovery stage of a particular treatment approach with exclusively adult male participants, it would be unwise to generalize the findings to the whole spectrum of drug addiction treatment or the entire drug addicted population. Additionally, given the exploratory nature of our study and the dearth of literature on the domain, any attempt to draw definitive conclusions would be inappropriate, so findings may be regarded as informative. However, notwithstanding these limitations, exercise has had a wide and significant impact on the treatment at the residential recovery stage. Each of its positive effects triggered another, setting in motion a chain reaction.

There are considerable internal and external pressures in effect when one decides to attend a drug rehabilitation program. Unsurprisingly, therefore, these individuals are faltering between relapse and recovery. During treatment the use of drugs as a solution for the psychological suffering does not exist, and patients fear of a life without substances. Feelings of powerlessness and frustration create anxiety, tension and rage (Fetting, 2012). Furthermore, a sense of inner emptiness, dissatisfaction, and boredom overshadows their life when sober. They go through various forms of denial (Wurmser, 1985); a refusal to accept their problem and a negative attitude towards everything, which blocks all thought and feeling. These are very common causes for dropouts, which usually lead to relapse.

From this perspective, an important effect result of exercise was its contribution to retention in treatment, resulting in the completion of the residential rehabilitation program. Exercise has been described, by this study's participants as a particularly enjoyable activity that removed accumulated tension, discharged the tense emotional state, reduced anger, reversed negative feelings, and enhanced mood. In all the narratives words such as "joy", "vitality", "satisfaction", "fun", "passion" and many similar ones appear. These pleasant emotions helped to release the blocked thinking and reverse the general negative attitude patients had assumed. So we can consider exercise as a positive element regarding the overall treatment. The patients who feel "happy during the day" can manage psychological distress more easily and persist in staying in the therapeutic setting, which lead to low dropout rate.

At the same time, apart from preventing premature dropout, exercise also affected the entire treatment process and consequently the treatment outcomes. The purpose of the treatment on this specific approach is patients to understand themselves, to pinpoint what led them to addiction, as the traumatic way in which they experience some situations prevents them having a full and creative life. This process requires clients' active engage to treatment, to express willingly their inner world in order to be treatment effective. However, putting all that in words is difficult for them at the beginning of treatment where substance abuse is recent, denial prevails, and have yet to develop a trusting relationship with their therapists and peers. Naturally, they cannot be forced to speak. The fear of exposure makes patients develop defenses against treatment because they are confronted with aspects of themselves and memories that may be difficult to deal with. Furthermore, they have small emotional vocabulary (Khantzian, 1999). Consequently, communication is limited or if anything is expressed it is void of essential meaning.

Therefore, during the first period of treatment when words are still weak the body is important. Withdrawal syndrome is a physical process. The relief one feels when this unpleasant experience is over is purely physical and the harm they have caused their bodies is the first thing they become aware of. All participants reported that a big part of the negative mood is rooted to the physical harm and the bad physical condition. Thus, physical rehabilitation is of priority at that point. One of the reasons we assume that clients worked out on moderate to high intensity level is that they sought the quickest possible physical rehabilitation which entailed a better mood. Wang and colleagues (2014) also noticed that high and moderate intensity exercise is more effective than low intensity.

Another interpretation is that they may also have been seeking a way to retrieve the image of the body they had before their dependence began. Exercise contributed to a quicker physical recovery and subsequently to a better body image and body sensation. A drug addict will continue to desire psychoactive substances emotionally, but he is physically removed from the world of substances and he experiences his body “as it should be”. After a long period of time on drug abuse, now they have a new body and exercise helps to gain physical self-awareness, to acknowledge their physical abilities and weaknesses and cultivate a new relationship with their body. It is the first step for self-awareness, signaling the beginning of the recovery. We could say that exercise helps the addicts to redefine the relationship with their body and concerns the physical part of the treatment process.

Furthermore, the physical recovery and changes on body image and sensation were significant factors for enhancing participants’ self-esteem and self-confidence. A healthy and strong body, and physical abilities improved in time, created feelings of worth and value for the self. What’s more, the positive feelings for the self, developed skills of self-care and self-protection. Their behavior started to change, adopting healthier habits and a more structured and creative lifestyle, which enhanced motivation for recovery.

Kohut (cited in Fetting, 2012, pp. 103-105) argued that the work of recovery is to develop patients’ capacities on the areas of tension-regulation, self-soothing and self-esteem. In this study we observed that exercise influenced positively these areas –especially tension regulation and self-esteem-. What we notice in particular is that the release of accumulated tension through the body, anger management, and a better self-esteem, favored communication and relationships among participants. Substance abuse is called to fill in the absence of essential relationship experiences (Matsa, 2002). Both team sports sessions and the gym area helped participants to connect to each other, to feel a sense of sameness, and a sense of belonging into a group. Furthermore, being accepted as part of the group, having a strong and healthy body, and a better mood, made them feel more confident and secure to express their story, thoughts, feelings and fears in psychotherapy and other interventions.

An important aspect of exercise is that participants experienced the sessions less as a therapeutic activity and more as “fun”. However, the purpose of exercise is not to entertain the patients but to be a therapeutic tool. Winnicott (1971) places “play” in a potential space where children -but also adults- can be free from the limitations of reality and manifest a series of emotions that would be dangerous to express in real situations. This potential is manifested on this study, since team sports facilitated free emotional expression, authentic actions and reactions, and consequently the appearance of sides of the participants’ true self.

Regarding the denial and resistance to treatment, patients try to protect a fragile self. Furthermore, drug addicts lack of self-awareness due to the prolonged periods of substance abuse (Goldstein et al, 2009). Thus, either they are confused about who they really are either they are hiding from emotionally hazardous situations. Anyway, patients hesitate to express their real self, and they behave in a conformist and false manner at the beginning of recovery. Into the game, however, participants felt alive and free, the denial in treatment is reduced, and behaviors that expressed freely, helped participants to distinguish the real nature of their peers and, at the same time, their own attitude towards the others and themselves. It is a case of mirroring; the “multi-faceted mirror of the team,” as Wallon (1954) calls it.

These insights were not just mere observations of behaviors that helped participants to better understand their peers. They were raw material for further elaboration to psychotherapy, other interventions and the whole spectrum of everyday life. They start to obtain a real knowledge about who they really are and which are their real needs. Even the acting-out and the extreme behaviors that surfaced - due to the intense physical stimulation - were treated as psychotherapeutic material, as participants were given the opportunity to discuss what caused them, how influence the group, and what their consequences are.

There are of course other interventions that involve play. What made participants to distinguish exercise from the other interventions as less treatment and more “play”, is that in exercise sessions there is the element of motion and there is no need to express their thoughts and feelings in words. Additionally, the high interaction involved in team sports, the action and reaction, and bodily contact greatly enhanced this process.

At this point let us stress, that the influence of exercise on revealing sides of the true self has been highlighted because physical activity and psychotherapy are strongly correlated. In therapeutic approaches that do not use psychotherapy we will probably not find similar outcomes.

Since participants reported different experiences between strength exercise and team sports we discuss the particular effects of each type of exercise. In general both types of exercise shared common results and affected the therapeutic process as whole. In more particular, team sports affected more the retention in treatment due to the element of enjoyment involved in play. What's more, the revealing of the true self was solely due to team sports. We consider that team sports are more interrelated with the other treatment interventions. However, strength training contributed more in physical rehabilitation and seemed to be more effective in changes in body sensation and body image. Furthermore, strengthening exercises also expedite the recovery of the muscular system, helping with injuries, which are very common. In this light we believe that both types of exercise should be applied as they complement each other, encompassing a wide range of benefits.

CONCLUSION

This study's finding, show the necessity of exercise as an intervention at drug dependence treatment. It is impossible to dissociate the body from the soul in human, more so in the case of drug addicts whose body is of particular value, both while they use drugs

and during rehabilitation. From this perspective, it is hard to perceive an effective clinical practice that will not take into account the physical changes of the patients and their impact on the patients' mental state. Not only did physical exercise improve the physical condition and the mood of the participants in the study but it affected the whole physical, social and psychological process of change as well. That is why should be included in the philosophy of any rehabilitation center. This, however, does not mean that it can be considered a treatment per se. As Hristos puts it "it's not just the exercise that's helps, it's other things too...". Exercise is just part of a group of therapeutic interventions which together comprise the treatment as a whole.

For the initial and reintegration stages are required researches that are tailored to the specific therapeutic environments, as clients have differed needs and the treatment implementation may partly differ. This will allow us to complete the puzzle for the entire treatment. Separate research is also needed with regard to the female population and adolescents as they may experience and perceive exercise differently and have other expectations.

The result of manifestation of true self is proposed for further investigation. Since we did not meet any relevant bibliography, a more detailed study is needed to clarify the dynamics of the interaction between physical exercise and psychotherapy. The fact that this is an influence of the exercise that was stressed by everyone in both rounds of the interviews, seem to be of particular importance. We also propose further research on the contribution of exercise to strengthening self-esteem and self-confidence because they are of great importance in the work of recovery, and as other therapeutic interventions affect those psychological parameters as well. Finally, studies are needed on motivation, on how we can apply exercise in order to release all its potential.

The main benefits for the participants were twofold. Firstly, dropout prevention and retention in treatment, which is vital, as we need to ensure patients' stay in the rehabilitation center in order to apply treatment. And secondly, exercise contributed to a wide range of psychological changes, enhancing the overall treatment process. These benefits were induced by the relief of physical and emotional tension, the change in the participants' body sense and image, social interaction and the enjoyment of the sessions.

Physical exercise is of particular value in the first months of treatment, when the patients' defenses are up, to express in words is difficult, and resistance to treatment is still high. As time goes by the patient gradually relaxes and self-regulate, drops his "shield" and begins to engage actively in the therapy. The role of exercise in this is key. This does not mean that patients do not benefit from exercise anymore but oral communication is now easier and all other treatment procedures have been activated.

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