PLANT BASED ASSISTED THERAPY FOR THE TREATMENT OF SUBSTANCE USE DISORDERS - PART 1. THE CASE OF TAKIWASI CENTER AND OTHER SIMILAR EXPERIENCES

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ABSTRACT

Objective. This article aims to give an overview of the major American centers using traditional herbal medicine or their derivatives in the treatment of substance dependence. Methodology. For the purpose of this article we have considered a small number of plants hailing from South, Central and North America. The research has been based on scientific literature, information exchange with treatment centers, internet searches and the personal experience of the authors. Results and discussion. Results show the relevance of certain psychoactive plants well known also for inducing modified states of consciousness (MSCs) including Ayahuasca, Coca, Wachuma, Tobacco, Psilocybe mushrooms, *Salvia divinorum* and Peyote. Conclusions. Plant based assisted therapy for the treatment of substance use disorders appear to be a promising field of research, although validation of the clinical outcomes need to be improved for the majority of the analyzed cases.

Key words: plant-based assisted therapy, substance use disorders (SUDs), drug addiction, traditional and complementary medicines.

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TERAPIA ASISTIDA POR PLANTAS PARA EL TRATAMIENTO DE LOS TRASTORNOS POR USO DE SUSTANCIAS - PARTE 1. EL CASO DEL CENTRO TAKIWASI Y OTRAS EXPERIENCIAS SIMILARES

RESUMEN

Objetivo. Este artículo tiene como objetivo dar una visión de los centros en las Américas que utilizan plantas medicinales tradicionales o sus derivados en el tratamiento de la dependencia a sustancias. Metodología. A tal fin, hemos considerado un número reducido de plantas provenientes de América del Sur, América Central y América del Norte. La investigación se ha basado en la literatura científica, el intercambio de información con los centros de tratamiento, las búsquedas en internet y la experiencia personal de los autores. Resultados y discusión. Los resultados muestran la relevancia de ciertas plantas psicoactivas bien conocidas también por inducir estados modificados de conciencia (EMC) como ayahuasca, coca, wachuma, tabaco, hongos psilocibios, *Salvia divinorum* y peyote. Conclusiones. La terapia asistida por plantas para el tratamiento de trastornos por uso de sustancias parece ser un campo de investigación prometedor, aunque la validación de los resultados clínicos debe mejorarse para la mayoría de los casos analizados.

Palabras clave: terapia asistida por plantas, trastornos por uso de sustancias (TUS), drogadicción, medicinas tradicionales y complementarias.

INTRODUCTION

Today, the Diagnostic and Statistical Manual of Mental Disorders (DSM) identifies Substance Use Disorders (SUDs) as primary mental health disorders (Robinson & Adinoff, 2016). Mental and substance use disorders in 2010 were the leading cause of years lived with disability worldwide (Whiteford et al., 2013). The World Health Organization considers that about 11.8 million people are suffering from illicit drug dependence worldwide, while according to the United Nations Office on Drugs, there are an estimated minimum of 190,000 cases of premature deaths from drugs each year, the majority attributable to the use of opioids (UNODC, 2017). In 2016

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alone in the U.S. there were around 60,000 deaths due to opioid overdose (Katz, 2017). Thus, it becomes clear that the scale of the problem is that of a real public health emergency, as declared by U.S. government in October 2017 (Merica, 2017), indicating as well that the current biomedical approach does not provide effective answers.

Addiction care is currently focused on substitution treatments, such as methadone and buprenorphine (Subutex) in the case of heroin, which seem limited and ineffective. The inefficiency of methadone substitution treatment has been clearly demonstrated by a study performed by Scotland's leading drugs expert (Methadone fails 97% of drug addicts, 2006). The report, compiled by Neil McKeganey, Professor of Drug Misuse Research at the University of Glasgow, shows that three years after receiving methadone only 3% of addicts remained totally drug-free.

On the other hand, complementary and traditional medicine offer a huge variety of diverse treatments for SUDs (Jilek, 1994; Lu et al., 2009; Sarkar & Varshney, 2017), and since few decades there is an increasing interest particularly in the development of therapeutic protocols based on medicinal plants or their chemical derivatives from botanicals such as iboga, ayahuasca, peyote, psilocybin mushrooms, and coca leaves, among others (Winkelman, 2014; de Veen et al., 2017; Brown, 2013; Nunes et al., 2016; Hurtado-Gumucio, 2000). The promising effectiveness of plant-based treatments may be due not only to their pharmacological effects including the induction of modified states of consciousness (MSCs), but also to the ritual framework in which such plants are administered (including dance, music, rhythm, drums, isolation, fasting, etc.) (Lanaro et al., 2015; Talin & Sanabria, 2017; Winkelman, 2003).

Within the ritual context, the MSC provides access to realities of the invisible world (Mabit, 2010) and allows the discovery of active elements in the unconscious of the person that often lead to the identification of the cause that trigged the addictive behavior in the first place. MSCs facilitate rehabilitation by boosting the process of taking awareness of the inner problem and offer great support to the psychotherapeutic approach. The material that emerges during MSCs requires a symbolic interpretation in the style of dream interpretation and allows at the same time the patient to go beyond verbal expression and verbal limitations. Those patients with low capacity for symbolization, and for whom verbal therapies are less effective, benefit from

the visionary induction, as registered in the Takiwasi Center by Jacques Mabit (2007) and Anne Denys, who points out the importance of the "symbolic deaths" experienced during Ayahuasca rituals and their healing power in opposition to the "peak experiences" of drug consumption (Denys, 2005). In addition, studies show that the mystical dimensions of these experiences appear to be related to positive outcomes and persisting personality changes have been demonstrated as well (Bogenschutz & Pommy, 2012).

The addiction phenomenon directly involves ethnic groups that traditionally used sacred plants to induce MSC and are now strongly affected by substances such as alcohol, which represents for them an imported product taken out of context (Mabit, 2001). The use of psychotropic plants for ceremonial purposes in Latin America has been documented for thousands of years with no report showing the presence of massive addiction disorders in traditional societies (EFE, 2012). Traditionally the consumption of psychoactive substances was the result of a long and careful process of observation and experimentation, which allowed to recognize those plants capable of producing the desired effects and to specify the most adequate procedures related to the way of introducing them into the organism, mainly with religious purposes (García Díaz, 2002). The emergence of a new economic and political order radically changed the situation, with psychoactive substances transformed into goods and products, sometimes designed to keep pace with the frantic rhythm of modern society, as in the case of cocaine, leaving completely aside the ceremonial, religious and ritual aspects (Mabit, 2018). Addiction in traditional societies, therefore, seems to be consequence of a failed meeting between indigenous cultures and the Western world.

In response to the problem, the same communities are trying different methods to reconnect with their ancestral roots and codes: the healers of the Peruvian coast treat their alcoholics through the ritual use of mescaline cactus, with a high success rate (Chiappe, 1976; Seguin, 1979), see for example the astonishing 68.44% recovery rate registered by Campos (1957); the re-introduction of traditional native culture and spirituality has a profound impact on the recovery of many communities devastated by alcohol consumption as in the famous Alkali Lake experience (Bopp & Bopp, 2011); the Natives of North America quickly and significantly reduce the incidence of alcoholism in their reserves by reviving their ancestral practices that include the ritual use of peyote and tobacco (Hodgson, 1997). As part of this

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movement, the Takiwasi Center organized in 2015 the "Intercontinental meeting of indigenous leaders on addiction and culture" (Mabit & Berlowitz, 2017), with the aim of discussing the issue of addiction and elaborating new solutions that must arise from the same indigenous societies since these are indicating to be more effective compared with conventional approaches. Such kind of events are typical contexts of medical pluralism and syncretism, were the circulation of plants, people, and ideas as an asymmetric creative process is conceived, and where savants from different nations negotiate power, interact, and reconfigure knowledge (Cueto & Palmer, 2014).

A key factor to understanding the benefit of a culturally-focused treatment (Rowan et al., 2014) is recognizing the meaning of indigenous wellness, from which the use of herbal therapy derived, which is understood as a harmonious relationship of all the parts of the person, including mind, body, emotion, and spirit. Traditional medicine interventions often address wellness in a holistic sense, taking into special account rituality, and considering that harmonious relationships are necessary not only between individuals and societies but also with the environment and the spiritual world (invisible world, spirits, non-human entities) (Chaumel, 1983; Regan, 2011), in contrast to Western biomedical approaches that focus on the absence of disease and imply mind-body separation in treating illnesses such as addiction.

- *Main Research Objectives*

This article aims to give an overview on the centers that use traditional herbal medicine or their derivatives in the treatment of substance dependence, mentioning the most promising initiatives for drug addiction treatment that include in their protocols certain well known psychoactive plants. In general, there are few proposals of centers formally constituted and with published scientific data that use therapeutic practices inspired by traditional medicines to cure drug addiction. This precisely opens the opportunity to point out that this empty space is filled with isolated personal initiatives, that receive poor or none government aid, despite encouraging results and growing scientific interest on the subject. Most of the initiatives rely on personal experiences and researches, which have nonetheless the potential to be replied at larger scale. On the other hand, some of the plants considered for this article are not yet used within a treatment center, but the promising results on a pharmacological level could lead to the conception of experiences oriented towards their application

in the context of a therapeutic community. The present article represents the first part of a much-extended overview work and will be followed by a second part in which will be given space to plants hailing from other continents like Iboga and less-known cases that nevertheless represent interesting proposals in the field of drug addiction treatment based on medicinal plant based assisted therapy.

MATERIALS AND METHODS

For the purpose of this article we have considered a small number of plants hailing from South, Central and North America. Medicinal practices are considered traditional when consumed in the country and culture of origin and become complementary and alternative when transferred to other contexts (Gureje et al., 2015). This is the case of most of the medicinal plants and practices, which, beyond the country of origin, are used in the treatment of addiction both in the original and in western contexts. This overview is centered on innovative initiatives, which can come from individuals or institutions, regarding the use of plants and herbal preparations in the treatment of addiction. The authors belong to the Takiwasi Center, a pioneer experience in the use of Ayahuasca for the treatment of substance use disorders and mental health problems (Mabit & González, 2013; Horák et al., 2014; Berlowitz et al., 2018). Just as Takiwasi is a pilot experimental project with a high component of innovation, in the same way other similar experiences were investigated, which are bearers of innovation, beyond the clinically relevant results that in some cases may not be available yet.

The present research has been carried out mostly by interviewing one the founder of Takiwasi Center and co-author JM, by recalling his knowledge, contacts and experiences on drug addiction treatment centers focused on the use of traditional plant medicine at a global scale. In some cases, such centers were contacted again (mainly by e-mail) to refine, amplify or confirm the overall acquired information. Data concerning Takiwasi Center were acquired mostly through unstructured interviews with different personnel from the therapeutic team including medical doctors, traditional healers, and psychotherapists. The internal library, which presents a huge amount of information and first-hand research data about Takiwasi organized mostly as final year master thesis or PhD thesis, was also consulted. Finally, scientific literature and internet searches were also used to complete the overall information acquired during the research.

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The information presented refers mainly to the use of medicinal plants in the treatment protocols of each center and to the general interaction of different therapeutic practices. This has been done to put in evidence the great value of a transcultural therapeutic approach and the inner evolutionary component of traditional and complementary medicines.

RESULTS AND DISCUSSION

Ayahuasca-assisted treatment

- *Takiwasi Center*

The Takiwasi Center in Tarapoto, Peru, has been working for 25 years for the treatment of people confronting problems of drug addiction and mental health through the use of Traditional Amazonian Medicine (TAM), acting as a therapeutic community recognized by the national health authority to which must give account, as defined by the Peruvian Law Nº 29765. Takiwasi has been the first center to use TAM in the treatment of addiction. The Center was founded in 1992 after 6 years of preliminary research centered in the active observation of the work of Amazonian healers (shamans), especially regarding the ritualized use of medicinal plants for the treatment of coca paste, cannabis, cocaine and alcohol consumers. In the treatment protocol elaborated, ayahuasca[1] plays a fundamental role, associated with the ritual use of many other plants and inspired by the ancestral practices of the Peruvian Amazon such as purges, diets, plant baths, suctions, exhalations, etc. These resources are inserted in a dynamic that includes a psycho-therapeutic accompaniment and living together within a community of residents. This innovative approach is generating growing interest in scientific community (Brierley & Davidson, 2012) and is seeking validation through the implementation of an international research named Ayahuasca Treatment Outcome Project (ATOP); this is a multi-site research with sub-projects in South America (Mexico, Brazil, Peru), aimed at the evaluation of the effectiveness of ayahuasca-assisted treatment for alcohol and drug dependence. This approach firmly places the project in the broader context of efforts to integrate traditional medicine and complementary and alternative medicine with the Western approaches to health care.

[1] A psychoactive brew of ancestral origins used by the indigenous tribes of the Amazon and composed of the ayahuasca vine (*Banisteriopsis caapi*) and a complement plant (most often *Psychotria viridis*).

Apart from Ayahuasca, which is considered to be on the top of the plant hierarchy according to Amazonian cosmovision and which is gaining attention within the scientific community (Hamill et al., 2018; Nunes et al., 2016), several other herbal medicines are used in the therapeutic protocol of Takiwasi. The plants used at Takiwasi can be divided into different groups, according to their effects and purpose:

1. Emetic plants: used in ritual context they permit not only physical but also emotional and spiritual cleansing with each plant acting on a precise somatic zone having its symbolic correspondence. Besides their general purifying and detox effect, each plant centers its effect on certain organs, corporal regions or physiologic systems. Thus, we can find: Rosa Sisa (*Tagetes erecta*) used to clean up nerve and the mind from excessive rationalization; Azucena (*Lilium* spp.) useful for sexual cleanse and balance; Verbena (*Verbena* spp.) that works on the liver and the anger condensed in it; Sauco (*Sambucus peruviana*) used to clean up the respiratory system; and Yawar Panga (*Aristolochia didyma*) for a complete cleanup. Yawar Panga proves to be very useful particularly in the first detoxification phase of the treatment for drug addiction. Its emetic properties, and cathartic to a lesser degree, make it an excellent means of purification. It especially allows patients to disable the withdrawal syndrome, both in its physical and psychological aspects, especially anxiety (Mabit, 2014).

2. Adjuvants or containment plants: these plants are given to addict patients on a daily basis to gradually prepare them, physically and psychically, for the ayahuasca sessions and the diets. They work on the regulation of the nervous system and metabolism in general and have a gentle effect of detoxification. Among them the main ones are Camalonga (*Strychnus* spp.) and Mucura (*Petiveria alliacea*), which are excellent protectors and purifiers also on an energetic level. Some of the diet plants are also consumed in this context, although the mode of preparation and administration is different.

3. Master plants: used during specific ritual ceremonies, they can provide psychotropic experiences. Apart from ayahuasca, tobacco (*Nicotiana rustica*) and coca (*Erythroxylum coca*) are also used in extract form to allow the detoxification of individuals addicted to their modern, addictive derivatives. They are known as "master plants" due to their ability to activate certain

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psychical functions (concentration, stimulation of the memory, capacity to make decisions, etc.) that the patient perceives as revelations or "teachings".

4. Diet plants: the ingestion of these plants takes place in a ritualized context and is accompanied by a series of physical and psychical restrictions (dietary and behavioral rules, isolation, etc.). For drug addict patients, the therapeutic practice of the *"dieta"* (diet) with the consequent intake of diet plants can be very useful to integrate the experiences lived during the weekly session of ayahuasca and to gain awareness on the hidden causes that have originated their emotional, existential or spiritual problems that led them to drug consumption. According to the personal evaluation of the individual made by the therapeutic team, the patient can be given: Ushpawasha sanango (*Tabernaemontana undulate*), that works on the "memory of the heart", to metabolize memories of emotional importance and regain balance; Chiric Sanango (*Brunfelsia grandiflora*) that helps increase self-confidence and lose fears towards the outside world; Ajo Sacha (*Mansoa alliacea*) that strengthens will and decision-making; Chuchuwasha (*Maytenus macrocarpa*) that teaches righteousness and heal transgenerational wounds; Bobinzana (*Calliandra angustifolia*) that enhances rooting and emotional stability; Uchusanango (*Tabernaemontana sananho*) that teaches righteousness and humbleness.

5. Bath plants: these are aromatic and relaxing herbs and flowers used for energetic cleansing. This is a necessary step before the Ayahuasca session and a useful tool of the treatment protocol. This category includes Toé (*Brugmansia suaveolens*), Hierba Luisa (*Cymbopogon citratus*), Ruda (*Ruta graveolens*) and Wachuma (*Echinopsis pachanoi*).

6. Sauna plants like Ajo Sacha, Eucalipto (*Eucalyptus globulus labill*) and Ruda are essentially used for initial detoxification and to reduce withdrawal syndrome.

7. Refreshing plants, called *frescos* are used in response to an inflammation, especially after taking ayahuasca. These include Lancetilla (*Commelina diffusa*), Llantén (*Plantago major)*, Malva (*Malva sylvestris*) and Albahaca (*Ocimum basilicum*). These plants can be used in raw preparation, for example crushed in cold water, to be ingested or for head baths.

It is worthy to note that the majority of these plants which come from the traditional Amazonian pharmacopoeia are still poorly studied using modern scientific approaches, especially within the context of drug addiction treatment. The innovative and pioneering use of medicinal plants has led Takiwasi to become an international reference and many government institutions from Latin America have been getting in contact with the center for years to try and set up similar proposals for the treatment of addiction in their countries. In this sense a joint proposal with Ecuador's CONSEP (National Council for the Control of Narcotic and Psychotropic Substances) reached an advanced stage. Other contacts were made with the National Council for Narcotics Control (CONACE) of Chile, the National Anti-Drug Office (ONA) of Venezuela and the National Council on Drug Policies (CONAD) of Brazil. This shows the interest in complementary and traditional medicine, although also the lack of political stability has prevented the proposals from transforming into more concrete actions.

The use of herbal medicines goes along with psychotherapeutic accompaniment, spiritual awakening and a marked ritual framework, being rituals a fundamental component of the overall activities during the treatment, other than necessary to unleash the healing power of the plants. The results of the treatment based on an internal evaluation (Giove, 2002) and on external researches (Denys, 2013) are promising: the study conducted by Rosa Giove on about 200 ex-patients showed a recovery rate of 54%, which reaches 67% considering only the patients who completed the whole treatment; while the interviews based on the Addiction Severity Index (ASI) conducted on 15 ex-patients by Anne Denys concluded that there had been a perception of major improvement in the overall status of 53% of the participants, minor improvement in 33% of the cases, and status unchanged in 14% of the ex-patients interviewed. Studies on Takiwasi's treatment protocol are constantly being undertaken (Berlowitz et al., 2018; O'Shaughnessy, 2017) and the ongoing ATOP research project aims at a more detailed evaluation of its efficacy.

- *El Emilio*

El Emilio Foundation (http://www.elemilio.org.ar/) is located in Cosquín, Argentina, and works since more than 20 years in the treatment of addictive behaviors associated with legal and illegal drugs consumption. Professor César Rabbat is the founder and director of the center which counts on the authorization from the local Ministry of

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Health. The protocol is inspired on the philosophy of native peoples of the region (Comechingones and Sanavirones) and the use of ayahuasca and medicinal plants from the Cordoba highlands, such as Suico (*Tagetes minuta*) and Palo amarillo (*Aloysia gratissima*), mixed together with a combination of spirituality, healthy diet, natural environment, physical activity, yoga, meditation, individual, group and family therapy (Rabbat, 2017). The main objective of the protocol is to promote the integration of the classic therapeutic community with natural and cultural alternatives for the prevention and approach of addiction. Similarly to Takiwasi, also in this case the treatment model consider the integration of traditional herbal medicine, Western psychotherapy and oriental practices oriented at mental wellbeing, thus creating a bridge between ancestral wisdom and modern world, in which the exchange of knowledge is mutual and productive.

- *Encamino*

Encamino (www.encamino1320.org) is a non-profit association located in Uruguay and directed by clinical psychologist Daniel Lapunov. The project is the result of several years of research and practical work in different organizations dedicated to the treatment of addictions in Uruguay. The therapeutic team is made up of professionals specialized in psychic health and addiction treatment. In the clinical approach of the association, modern psychology is combined with ancestral knowledge such as Chinese medicine and traditional Amazonian medicine of Peru, homeopathy and phytomedicine. Ambulatory care is provided through group therapy and individual psychotherapy. In group therapy, the work is focused on the three sorrows of addiction, as mentioned by Lapunov: the setting, the companions of consumption and the character that they have created (Lapunov, 2008). A weekly session of Chinese medicine (acupuncture) is also offered, while phytomedicine is used to face symptoms such as depression and anxiety. In this case the patients are administered medicinal plants from Uruguay in the form of extracts. Some of the plants used are Melisa (*Melissa officinalis*), Pasiflora (*Passiflora incarnata*) and Valeriana (*Valeriana officinalis*). The association also offers a temporary inpatient treatment protocol through retreats in the Peruvian Amazon made in coordination with the Situlli center, Tarapoto (www.centrositulli.com). In these retreats a work is carried out in conjunction with *vegetalista* doctors with the objective of achieving a physical and psychic detoxification through the intake of plants from the Peruvian Amazon. The work with plants that expand consciousness, such as Ayahuasca,

allows the reconstruction of the personality of the individuals and facilitates the meeting and reconnection with their own essence and their true identity.

- *Nierika A.C.*

Nierika (www.nierika.info) is a non-profit multidisciplinary association established in Mexico that aims to preserve the indigenous knowledge and traditions linked to the ceremonial use of sacred plants with therapeutic and spiritual purposes. The center receives residential and ambulatory patients and is run by Armando Loizaga Pazzi, psychologist and specialist in addictions, and Anja Loizaga-Velder, psychologist specialized in humanistic and transpersonal psychology and ethnopsychotherapy. Armando Loizaga has worked in the field of treatment and prevention of addictions in Mexico since 1991. He was director and coordinator of several clinical programs that considered the management of addictions from the cognitive-behavioral perspective. He has also collaborated with traditional medicine organizations in the study of cross-cultural treatments and worked as psychologist at Takiwasi in 1997-1998. Based on this experience, he has started to study the therapeutic potential of Ayahuasca in the treatment of addictions and founded Nierika. Anya Loizaga-Velder has studied and collaborated with traditional doctors for more than twenty years. She also wrote her master's thesis, PhD thesis and several articles on the use of Ayahuasca for the treatment of addictions (Loizaga-Velder, 2012). Nierika, is participating together with the Takiwasi Center in the project ATOP.

- *Centro Savia Terra*

Savia Terra (https://www.saviaterra.com/) is a therapeutic center located in Santiago, Chile, focused on detoxification, personal growth and human development. The center promotes a model which draws on the millennial wisdom and knowledge of indigenous ancestral traditions and on the scientific methods of medical and psychotherapeutic treatments. Ambulatory treatment for depression, stress and addictions is offered. The program includes: individual and group psychotherapy, therapeutic hypnosis, diets and purges of purification, detoxification and revitalization with Amazonian medicinal plants, including Ayahuasca, shamanic healing rituals and complementary therapies.

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- *Centro Boliviano de Solidaridad VIDA*

Centro Boliviano de Solidaridad VIDA has been dedicating for 25 years to the rehabilitation of people with addictive behaviors and is currently the only therapeutic community in Bolivia that uses medicinal plants. It has a team of psychiatrists, psychologists, addiction therapists, *amautas* (teachers) and shamans. Like most of the therapeutic communities of South America in its beginnings it was greatly influenced by the Italian therapeutic model "Progetto Uomo" (The Human Project), where shock therapy was central, and shouting was used to implement it. This model has changed very little in most of Bolivian rehabilitation institutions, with very low success rates (12% / 15%). In an effort to improve these frustrating statistics and with the desire of incorporating a broader perspective regarding the problem of addiction, VIDA begun to experiment with other types of approaches incorporating techniques such as Zen meditation, Thai Chi and ancestral Andean rituals. Finally, a couple of years ago the center incorporated ancestral medicinal plants such as ayahuasca, San Pedro, tobacco and since August 2017 also ibogaine. All of them are administered according to the Amazonian Andean rituals except ibogaine. The representatives of the center consider that the greatest contribution of the incorporation of the Andean philosophy is to give back to the patients a sense of pride and respect towards their ancestors. The most notorious difference observed by therapists since this holistic model began to be applied is the number of patients who complete the process and reintegrate themselves into society. There is no scientific literature or studies conducted so far that can support what has been reported by VIDA's staff.

- *IDEAA*

The Brazilian *Instituto de Etnopsicología Amazónica Aplicada* – IDEAA has been created by Spanish psychiatrist Josep Maria Fábregas (Labate et al., 2009). IDEAA combines therapeutic techniques derived from Amerindian shamanic traditions, *Santo Daime* religion, schools of Gestalt therapy and humanistic and transpersonal psychology. IDEAA treats mainly with dependency problems but can also receive patients with other disorders of a psychological and physical nature. The Institute's therapists and patients live together in a small community group. The therapeutic program includes manual work, ayahuasca sessions and experience integration group sessions. The main objective of IDEAA is to engage the individual in a process of introspection and self-knowledge. In this sense, the program also includes individual

sessions with ayahuasca, as well as oriental contemplative practices, such as Zen Meditation and Yoga.

- *Associação Beneficente Luz de Salomão*

The association ABLUSA, led by psychiatrist Wilson Gonzaga, has been using Ayahuasca since 1999 in rituals specifically aimed at street dwellers of the city of São Paulo, Brazil, in order to help them improve their life quality (Mercante, 2009). The participants in ABLUSA ayahuasca rituals are mainly alcoholics and crack addicts, and the visions experienced during the ceremonies help them identify their problems and consider making changes in their habits. The concept behind ABLUSA treatment proposal is to take care of the human being as a whole, in a holistic way, while seeking to put in evidence the deepest causes that lie behind the emergence of these addictive processes. Also, the proposal of spirituality, which is linked to the Ayahuasca rituals, is almost always very welcomed among these patients, thus resulting in positive outcomes in terms of recovery (Gonzaga, 2012). Another initiative has been put in place by Wilson Gonzaga since 2008 when he started providing psychiatric care in the public health network of three municipalities, as well as riverside communities, in the Manaus region. He later created a boat clinic to take patients to the Amazon to try a different treatment proposal: healing through immersion in the nature and traditional medicines, including ayahuasca.

- *The Recovery Center Caminho de Luz*

Caminho de Luz (http://casacaminhodeluz.org.br/) is a non-profit institution co-founded by José Muniz de Oliveira in 2001 in Rio Branco, Brazil. It aims to recover and reintroduce alcohol and other drug dependents in the society with the use of ayahuasca in spiritual sessions (Mercante, 2013). This work is carried out through participation in mutual aid meetings, individual attendance, practice of spirituality, educational, recreational, work, and activities, among others. It is constituted by two distinct institutions: the residential house itself, where the people are being treated, and the "community" that welcome people who couldn't return home after the end of their treatment, such as former homeless. The treatment is based entirely on the *Vegetal*, the local denomination of ayahuasca. As soon as they reach the center, the patients start taking three daily doses of the brew for detoxification: in the morning, after lunch and at dusk.

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- *The Spiritual Center Céu da Nova Vida*

Céu da Nova Vida (http://www.ceudanovavida.com.br/) is located in the State of Paraná, Brazil. It is directed by Father André Volpe Neto, a former patient of the center *Céu Sagrado* (Holy Heaven), another Brazilian center that treats drug addicts through Ayahuasca and is linked to the Santo Daime Church (Mercante, 2013). Santo Daime is a Brazilian ayahuasca religion founded by Raimundo Irineu Serrain in the early 1930s in the State of Acre. Members of Santo Daime, called "daimistas", consider ayahuasca a medicinal sacrament. It has been observed that in Santo Daime, especially in the line of Father Sebastião, the abusive consumption of illicit psychoactive substances and alcohol is not tolerated. In general, most "daimistas" do not drink and there is a kind of general perception that "Daime cures dependence on drugs and alcohol" (Labate et al., 2009).

A substantial difference between the Brazilian centers observed and other mentioned experiences like Takiwasi or *El Emilio* lies on the fact that the latter use a variety of plant medicines in the treatment protocol, while Brazilian centers mostly only focus on ayahuasca. This seems due to the fact that these centers emanate from the main Brazilian ayahuasca churches: Santo Daime, União do Vegetal and Barquinha. These therapeutic communities were created after one of the first studies performed (Callaway et al.,1994) showed how many practitioners had abandoned the use of alcohol and other drugs, such as cocaine, as a consequence of their participation in Ayahuasca rituals (Grob et al., 1996). These findings have been confirmed by later studies (Halpern et al., 2008). Also, a study conducted on adolescents belonging to a Brazilian Ayahuasca church concluded that ayahuasca was a factor of protection against the consumption of alcohol (Doering-Silveira et al., 2005a).

In Brazil we could observe the original experience as well represented by the alternative project of rehabilitation of inmates promoted by the NGO Acuda (Associação Cultural e de Desenvolvimento do Apenado e Egresso) that includes the intake of ayahuasca (Duarte Bomfim, 2016; Romero, 2015). The president of Acuda, Luiz Marques, being a disciple of the Chilean psychiatrist Claudio Naranjo, had the idea to incorporate the use of this sacred brew into the therapeutic process of resocialization of inmates. This project is developed with the authorization of the local justice authorities. Many of the inmates are or have been addicted to substances and from this experience a Center called "Chácara Divina Luz" has also been created.

Among its activities the center includes treatment addressed to ex-inmates suffering from chemical dependency, but cares are available also to the whole community in general.

The potential of Wachuma

The plant named by Catholics as San Pedro was originally known among indigenous populations as Wachuma or Huachuma (*Echinopsis pachanoi*). This cactus, that belongs to the same family of peyote, grows in the Andes, in Southern Ecuador, Peru, Bolivia and in some areas of Argentina and Chile. Its main psychoactive component is mescaline. For centuries, throughout the coast and highlands of northern Peru, healers have been holding night sessions, called *Mesas con San Pedro* (Tables with San Pedro), in which both the healer and the patients ingest wachuma (Dobkin de Rios, 1979). A recent study was dedicated to verifying the therapeutic properties of this traditional Peruvian medicine procedure as performed by the healer Marcos Carbajal (Reyna Pinedo et al., 2010). The use of wachuma in the treatment of drug-addiction is confined to few experiences and initiatives that employ it in combination with other therapeutic techniques.

- *Runa Wasi*

An interdisciplinary group of professionals led by psychologist Sacha Domenech founded in 2001 the civil association Runa Wasi (http://runawasi.blogspot.pe/), in Buenos Aires, Argentina. The initiative follows the experience of the community Ayllu Tinkuy created in the 90s by Domenech (1996), who has been trained as socio-therapeutic operator in therapeutic communities by the "Progetto Uomo", and as practitioner of traditional Peruvian medicine.

In Runa Wasi, outpatient addiction and HIV treatment are offered, based on three main axes:

1) Verbal and academic psychotherapy that prefers an existential, gestalt and transpersonal approach rather than psychoanalytic. This is developed in weekly therapeutic sessions;
2) Individual and group corporal psychotherapy workshops;
3) Individual and group ceremonies with purgative plants (Tobacco);

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Apart from this, ayahuasca and wachuma ceremonies are also offered. in the case of wachuma, a Temazcal ceremony is also carried out, prior to the intake. According to Domenech, both ayahuasca and wachuma are plants that catalyze and enhance the patients' therapeutic process, giving a more dynamic sense to the latter. Wachuma particularly is a plant that works in the very deep affective level of the patient's relationship frame. Runa Wasi currently counts with a team of eight therapists, therapeutic companions and one psychiatrist for emergency cases. Approximately between 80 to 100 patients per week are attended, 30% of which are addicts consisting mainly of adults, aged between 30 and 35 years old, with polydrug use, including alcohol, cocaine, designer drugs and marijuana. Usually these patients have tried before a conventional treatment in their search for cure and well-being, before resorting to Runa Wasi.

- *Agustin Guzmán*

A personal initiative that doesn't receive formal support by the authorities is that of Agustín Guzmán in Peru. 25 years ago, Guzmán began researching and experimenting with the medicinal properties of Wachuma, thus discovering its anti-depressive properties (Guzmán, 2012). Being an alcoholic himself, Guzmán was treated of his illness after taking wachuma and later he was formed as healer and started to treat alcoholics. He uses wachuma combined with hot springs to treat depression, HIV, addictions to alcohol, cocaine and other drugs. Guzmán administers wachuma in two different modalities. The first one is the most common and consists of an intake of approx. 250 ml of wachuma that places the person in a state of trance that lasts approximately 12 hours. During this phase to combat the chills that the person often feels, they are immersed in a pool with thermo-medicinal water, at a temperature of 35 degrees. Guzmán's treatment is normally carried out at an altitude of 3,000 meters or more. After several intakes of Wachuma, the Temazcal ceremony is also incorporated in the process to continue the detoxification. The whole therapy normally lasts one month. The other way to administer wachuma as suggested by Guzmán is to ingest a spoonful of the extract of the plant diluted with water every night before going to sleep. This process is slower and can be done by the patient at home. After a week some changes starts to be noticed, especially during the oneiric state in which unsolved negative experiences from the past begin to emerge to be unraveled.

Coca leaf to treat cocaine addiction

Another sacred plant of the native people of South America could be used to treat modern drug addiction. An empirical observation gives account of the Coca leaf chewing as therapy for cocaine addiction treatment, as suggested by Jorge Hurtado (2000). Hurtado is a Bolivian psychiatrist that has conducted several studied between the 80's and 90's and later from 1995 until 2005 by giving to cocaine paste addict patients, candies prepared with coca leaves. These special candies were supposed to facilitate the task of ingesting coca in its natural form, since chewing coca leaves requires a technique and patience that not everyone has. According to Hurtado thanks to the coca leaves 30% of the patients showed improvement in their mental state and their social adaptation after only 12 months of treatment and he presented these results at the International Forum on Coca Leaf, held in Popayán, Colombia, in August 2016. A similar approach has been proposed by the controversial Peruvian psychiatrist Teobaldo Llosa, who recommends the use of coca leaves for the treatment of cocaine addicts. Its treatment is known as "substitution of consumption" or "cocalization therapy" (Llosa & Chang-Fung, 2007; Llosa, 2010) and consists in the ingestion of capsules of coca flour (or variations), with or without the addition of alkaline substances, accompanied by a cup of coca tea, prepared with one or two bags in boiled water. In the Takiwasi Center, coca is used as well, this time in its medicinal extract form as a diet plant given to drug addicts during the *dieta*, as it reduces the withdrawal syndrome, restores normal sleep and increases dream activity.

Native American Church and the incorporation of Peyote

Native Americans have been struggling with alcohol abuse disorders and other dependencies for centuries, since their encounter with the western world (Prue, 2013). To respond to this defining problem five overlapping movements have provided a framework for alcoholism recovery within and across Native American tribal cultures from the 18th and 19th centuries. The leaders of these movements like the Delaware Prophets, the Shawnee Prophet and the Kickapoo Prophet, having experienced their own recovery path from alcoholism, were inspired on a return to ancestral traditions to face this problem. As consequence, new abstinence-based Native religions were formed in the 19th century, including the Native American Church (White, 2000). These religions constitute the most enduring frameworks for alcoholism recovery within Native communities. Native American Church members currently use peyote in their church services.

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The peyote religion possesses several attributes that make it particularly suitable as a treatment for the multiple social and psychological problems of the Indian alcoholic (Albaugh & Anderson, 1974). Although Indians in central and northern Mexico have ingested it for different purposes for thousands of years, only in the last century the use of peyote spread to tribes throughout North America in the form of rituals of the Native American Church. The avowed purpose of participation in the Peyote Cult is to allay physical and mental distress and to combat alcoholism by enhancing health and strength through communication with the spiritual level made accessible by the ritual context. The success of the Native American Church in rehabilitating Amerindians from alcohol and opiate dependence and the safety of ritual peyote use have been attested by experienced clinicians (Jilek, 1994).

John Halpern (Webb, 2011) is another researcher on the subject that has been able to verify that peyote is beneficial in the treatment of alcoholism and drug abuse among American Indians, adding that setting is also crucial to the effective use of peyote. An experience that comfort Halpern's research is that of the Na'nizhoozhi Center, a substance-abuse clinic located in Gallup, New Mexico, whose patients are almost entirely Native Americans. The center offers conventional therapies and programs such as Alcoholics Anonymous, as well as different traditional Indian healing ceremonies. Peyote is not given to patients during on-site church sessions, but staff members encourage clients to participate in regular peyote ceremonies once they leave the clinic. Interestingly, the clinic's internal records indicate that those who participate in Indian healing ceremonies have better treatment outcomes than those who have participated in Alcoholics Anonymous (Horgan & Tzar, 2003), although there's still no official publication on the subject.

Research on *Salvia divinorum* and SUD

Salvia divinorum is another Latin American sacred plant with potential to be used in the treatment of addiction. An expert on the subject is Ana Maqueda, research assistant and PhD candidate, Sant Pau Institute of Biomedical Research, Department of Pharmacology, Therapeutic and Toxicology. She is also founder and director of Xka Pastora, in Mexico. Xka Pastora (http://xkapastora.org/) is a non-profit organization dedicated to promoting the further study and research of *S. divinorum*, whilst also striving to integrate its traditional therapeutic uses into western medicine. This plant is endemic to the Sierra Madre Oriental of Oaxaca, Mexico, and member of the

Lamiaceae family. The first scientific report about the existence of the plant appeared in 1939, though the native inhabitants of the area, the Mazatec people, have been using the leaves of *S. divinorum* for its medicinal and psychoactive properties for centuries (Maqueda, 2017). In the indigenous Mazatecs language the plant is known as Xka Pastora. Mazatec traditional doctors use *S. divinorum* for the treatment of arthritis, inflammations, headaches, gastrointestinal problems, bacterial infections, addictions, and as a general revitalizing tonic. They consume the fresh leaves of the plant by chewing them and apply them as a cataplasm. Mazatec healers also do ceremonies with the leaves for its psychoactive properties, as a mean of modify their state of consciousness and thus be able to diagnose and treat mental and spiritual problems.

Currently, it is possible to find in the scientific literature pre-clinical evidences suggesting anti-addictive effects of *S. divinorum* at pharmacological level (dos Santos et al., 2014). Salvinorin A, opioid receptor agonist extracted from *S. divinorum*, has been identified as a potential therapy for drug abuse and addiction, having demonstrated anti-addiction effects by attenuating dopamine release and dopaminergic activation, sensitization, and other neurochemical and behavioral alterations associated with acute and prolonged self-administration of addictive drugs (Kivell et al., 2014). In some ways we can say that *S. divinorum* could function as a punisher of drug self-administration, although, as far as we know, there are no studies yet regarding the therapeutic usage of Salvinorin A on humans.

Research on psilocybin and SUD

Psilocybin (4-phosphoryloxy-N, N-dimethyltryptamine) is the major psychoactive alkaloid of some species of mushrooms traditionally used by the indigenous populations of Mexico in religious ceremonies to bring about visions and noesis, or divine knowledge (Letcher, 2007). Though we have no knowledge about registered care centers that use it as alternative therapy for drug addiction, it may provide a new treatment option for substance use disorder patients, given the beneficial results observed in recent clinical and pharmacological studies. Nichols et al. (2016) conducted studies to quantify acute effects of psilocybin in alcohol-dependent participants and to provide preliminary outcome and safety data, while other teams of researchers (Thomas, Malcolm, & Lastra, 2017; de Veen et al., 2017; Bogenschutz et al., 2015) have analyzed the pharmacological structure and clinical adaptability,

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getting to the conclusion that psilocybin has a low risk of toxicity and dependence and can be used safely under controlled clinical conditions. Large effects related to depression and anxiety symptoms resistant to conventional therapies were also observed. Psilocybin is considered to have the potential to reduce alcohol or tobacco use and increase abstinence rates in addiction. Psilocybin-assisted therapy appears promising, so that there are valid reasons to further investigate the therapeutic efficacy and safety of psilocybin as a potential SUD treatment.

CONCLUSION

Traditional medicinal practices that involve the use of herbal therapy indicate to be an interesting field of research if we consider all the studies that are being carried out and the promising anecdotal results in terms of effectiveness in the treatment of drug abuse disorders observed in some centers. Still, we observe the need for more scientific research on the data recorded by each center/experience and consequent validation through publication, taking into consideration the difficulties that may arise in bridging together traditional and modern concepts of efficacy (Gone, 2012). In this aspect, Takiwasi thanks to its more developed organizational structure, is one of the fewest centers that can show concrete results, although preliminary, as mentioned above. The positive outcomes claimed by these initiatives stands in opposition to the poor results of conventional treatments in the face of this serious issue that is now affecting people worldwide. The use of these resources could contribute enormously to the elaboration of new approaches to the problem. Pioneer and intercultural experiences come from every corner of the world and are carriers of hope for a great number of people that are looking for a new and effective answer to their cry for help.

By going beyond their country of origin and being transferred and adapted to other contexts these traditional herbal medicines have converted into complementary practices, and the main characteristic of their application is to be performed in articulation with other therapeutic practices, such as Yoga, Zen meditation and Western psychotherapy, for instance. This reminds us that when a traditional medicine is alive, it can progressively evolve including elements from other cultures, as it happened for example with the Amazonian rituals which over the centuries have incorporated habits from the Catholic tradition such as prayers, saints and hymns (Mabit, 2018). The experiences of different centers such as, El Emilio, Runa Wasi,

Encamino, VIDA and Takiwasi indicate that the interactions of multiple therapies within the concept of medical pluralism can greatly benefit the patients' treatment outcome and we consider they are showing a path to follow as new reference models in the global search for mental wellness and good living.

All herbal therapies used or with potential to treat drug addiction come from an ancestral knowledge linked to the ritual use of psychoactive plants, rituality often considered as a mandatory aspect to be taken into account for the therapy to be effective. The induction of modified states of consciousness within a ritual framework (with the use of tools such as plants, chants, drums, isolation, fasting, etc.) is then crucial to understand the effectiveness of a treatment, as in the case of the Ayahuasca ritual that plays a key therapeutic role, being a space in which somatic, symbolic and collective dimensions are blended (Talin & Sanabria, 2017).

The popular use of traditional medicine, including sacred plants, to treat addiction problems is widespread in the Americas and most of the centers mentioned have been created as a consequence of the observation of this use and its efficacy, which has also been confirmed by several academic studies, as in the case of Ayahuasca. According to Takiwasi's experience, one of the key aspects that pushes people to undertake a treatment is taking awareness of their underlying problem, process that often starts after an experience with psychoactive plants in a ritual context. This massive resorting to traditional healing methods stands in opposition to the general rejection of conventional treatments which seems to be unsatisfactory, both in terms of quality, number of people reached and outcome results.

We can also observe cases in which the personal experience of an individual going through issues of drug abuse or alcoholism and getting cured by a natural element such as a plant, has led the very same person to set out on important discoveries or initiatives. Unfortunately, the lack of official support from the authorities considerably limits the significance, the extent of the research and the dissemination of the results of these encouraging experiences. It is striking to observe that most of these psychoactive plants or their derivatives are generally considered illicit drugs in developed countries and, in some cases, they can even become drugs of abuse once decontextualized from the original ways of use. This clearly indicates that the problem does not lie in the plants themselves, but has to do with the people, i.e. culture, and their way of approaching them.

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On one side, we have observed several centers and experiences that use herbal medicines in their treatment protocol while following at the same time the guidelines transmitted by the traditional knowledge where this use has originated, especially focusing on ritual and spiritual aspects. This is mainly the case of ayahuasca that is used in religious or therapeutic environments. On the other side we have observed as well that a huge number of scientific studies on plants such as *S. divinorum* and psilocybin mushrooms, instead of leading to the creation of treatment centers inspired by their traditional uses, seems to point at extracting the primary alkaloids or molecules of interest for the pharmaceutical industry to produce conventional medicines. In doing so, they leave completely aside the ancestral norms of use and ritual context, despite the fact that this seems a necessary aspect to be taken into account for the medicine and the treatment to be effective and safe. Another example in this sense is that of Iboga, which, together with its alkaloid ibogaine, is the plant that has been studied for the longest time for its anti-addiction properties reported by many researchers, including Roman Paskulin (Goutarel, 1992; Paskulin et al., 2006; Brown, 2018). A chapter on this plant and its use in the treatment of addictions will be dedicated in the second part of the present article. There are still new fields that need to be explored in deep, as in the case of Chinese herbal medicines (Lu et al., 2009), the 100 hundred herbs detoxifying complex formula of the Buddhist Monastery Tham Krabok which remains unknown (Mabit, 1993), or the "Diet plants" used by the Takiwasi Center, for instance. Although the latter are supported by a thousand-years-old traditional use they are still largely unstudied by the scientific community, that seems to prefer, for example, focusing on trying to produce a prescription drug from ibogaine still 50 years after its discovery.

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