



NEUROPSYCHOLOGICAL AND SOCIAL PROFILE IN DRUG ADDICTION IN ECUADOR

Santiago Poveda-Ríos, Abrahan Mora Pérez, Tamara Naranjo Hidalgo and Eduardo Hong Hong

Faculty of Psychology, Pontifical Catholic University of Ecuador-Ambato Campus

ARTICLE INFO

Article History:

Received 10th December, 2018

Received in revised form 2nd

January, 2019

Accepted 26th February, 2019

Published online 28th March, 2019

Key words:

Profile, Social, Neuropsychological, Addiction, Drugs

ABSTRACT

Introduction: Drug addiction has several consequences that undermine the drug addict lifestyle, but there is still a lot more to study about this phenomenon. Objective: To establish the social and neuropsychological profile of drug addicts to serve as a guidance for prevention plans in Ecuador.

Methodology: The study design was cross-sectional, correlational, ethnographic and descriptive. Personalised interviews were conducted with 65 participants aged between 20 to 40 years old who have used cannabis, cocaine, and cocaine base drugs; amongst others during 1 to 12 years. The population are currently taking part in the drug addiction rehabilitation centres in different geographical zones of the country.

Findings: The neuropsychological profile shows 33.9% of attention problems are linked to phonological matters while 87.7% are linked to visuospatial and mnemonic imbalance during coding and evocation.

Conclusions: The neurological and social profile of an Ecuadorian drug addict is complex and there is still the need to deepen more regarding social factors, type of substances, frequency of use and the amount of drugs.

Copyright © 2019 Santiago Poveda-Ríos et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The use of illegal substances is a major concern worldwide since it causes social and economic issues. The Annual Drug Report (2016) released by the United Nations shows that 246 million people aged between 15 to 64 have used illegal drugs since 2013, a significant increase of three millions people compared to 2012. Drug-dependence involves genetic and neurobiological (Campollo Rivas, 2013), social, family and cognitive factors (Juárez González et al., 2013).

Drug abuse alters the activity of the neuroanatomical and functional system in certain brain regions where different cognitive functions such as taking decisions (Verdejo García, 2006), motivation, learning, attention span (Ardila et al., 2015), and memory are involved (Ruiz Sánchez de León and Pedrero Pérez, 2014). Such factors have been taken into consideration for the purpose of different international scientific researches but have not yet been investigated in Ecuador.

International studies about neuropsychological deficits related to cannabis use during the 80's until the present time have shown potential cognitive impairments in many important functions such as attention, memory (Portellano, 2005) and social functioning associated with drug consumption (Ardila and Rosselli, 2007). Subsequently, several researches have found potential neuropsychological impairments signs

caused by cocaine abuse in memory functions (Ahston, 2001; Ranganathan and D'Souza, 2006; Arbaiza del Río, 2014), learning and attention (Horner, 1999; cited from Madoz Gúrpide, Ochoa Mangado and Martínez Pelegrín, 2009).

Furthermore, the relation of social factors in drug use has been widely researched by different authors who state that the use of such substances causes "addiction" (Cunningham and Ramer, 2010). It affects the subject according to their social background (Steinglass y Bennett, 2009), such as family (Segalen, 1992; Font-Mayolas, Gras, Planes, 2006; Moffatt, 2006) and other social institutions including schools, clubs (Flandrin, 1979), and its activities (Lave and Wenger, 1991; Arevalo Varela et al., 2007). It is reported that the first stage of addictive behaviour is related to alcohol consumption in peer groups (Herrera et al., 2012) or having friends who consumed alcohol (Halley Grigsby et al., 2014), without neglecting social factors such as poverty or the lack of education. In addition, a list of intrapersonal, interpersonal and contextual risk factors were developed to provide an understanding about addiction (Hawkins et al., 1992), and the causes why it was socially addressed as "Drug Consumption Biopolitics", which involves ownership and exclusion factors (Reguillo Cruz, 2000). Social context is an important factor (Quijano Guesalaga and Asselborn, 2012) that affects public opinion and the addict argument (Santander, 2011), acting upon its worldview, and considering itself as a social problem from a social perspective (Santander, 2011), taking into consideration several contextual factors (Stone et al., 2012). This social phenomenon about addiction and its influence in cognitive

*Corresponding author: Santiago Poveda-Ríos

Faculty of Psychology, Pontifical Catholic University of Ecuador-Ambato Campus

functions has a great impact on social behaviour and daily activities (Madoz Gúrpide *et al.*, 2009). Therefore, the aim of this study is to establish the social and neuropsychological profile of drug addicts to serve as guidance for prevention plans in Ecuador.

METHODOLOGY

Design

The research was cross-sectional, descriptive, correlational and ethnographic.

Participants

The study involved 65 male and female addicts. The sample collected was based on a criterion of different of socio-economic status, drug addiction centres in several provinces and regions of the Republic of Ecuador. The sample ranged from 20 to 40 years old addicts with 3 to 16 years of literacy rate and 1 to 12 years of drug consumption, amongst other complex irregular variables to define such as consumption frequency, amount and the type of drug.

The eligible criteria took into account solid drugs (cocaine, cocaine base, cannabis, ecstasy) for subjects who claimed not to remember or know about the process of detoxification. The subjects who did not complete the process of detoxification were excluded, as well as legal or non-legal drugs, since the main concern is to get information about the neuropsychological and social profile of the drug addict on solid drugs. It is important to mention that the ones who suffer from psychiatric or medical illness were not taken into consideration.

Instruments

Several tests that are part of the Neuropsychological test battery "Neuropsi", developed by Ostrosky and Colswere conducted. The testis standardised for subjects aged between 6 to 85 years to assess memory, attention and executive functions. It comprises 27 tests and administered from 60 to 90 minutes since it contains standard answers and cognitive dimensions. The test and retest reliability is 0.88 for the overall rate and 0.84 to 1.0 for testing (Ostrosky *et al.*, 2012), enabling to achieve grouped scores in four ranges: highly normal (116 or more), normal (85-115), mild to moderate (70-84) and severe (69 or less).

Procedure

Given that drug addiction centres comply with regulation policies of the Ministry of Public Health in Ecuador, it was possible to work only with a few facilities in various areas of the country. Once the number of participants was defined, individual sessions were conducted after they were told about the objective of the study. Then, the individual's signature on the consent form was obtained according to the bioethics regulations of this research. At the beginning, 117 participants were pre-qualified according to the inclusion criteria; nevertheless, 24 of them were excluded in the first assessment once their information was misleading. Subsequently, 28 participants dropped out or left the rehabilitation centre. Individual sessions were non- consecutive and spaced out between 2 to 3 months, 60 minutes each. According to the Toxicology Report and the medical record conducted in each of the facilities, those who were being evaluated were grouped based on the use of common drugs (cannabis, cocaine, base of

cocaine) and less common drugs: heroine, sniffing glue, perica(referred in Spanish as a type of marihuana and crack), grouped into:

- ✓ Group 1: Base of cocaine and cannabis users (f=20).
- ✓ Group 2: Base of cocaine users (f=16).
- ✓ Group 3: Some common drug and one less common users (f=9).
- ✓ Group 4: Cocaine, base of cocaine and cannabis users (f=7).
- ✓ Group 5: Cocaine users (f=5).
- ✓ Group 6: Cannabis users (f=5).
- ✓ Group 7: Cocaine and cannabis users (f=2).
- ✓ Group 8: Cocaine, base of cocaine users (f=1).

The strategy identified a direct relationship of the type of drugs they used and the neuropsychological and social profile of the participants, as well for its discussion.

Statistical Analysis

Quantitative Analysis

For the global rate and the score of the subtests of the instruments that were applied, the (r Pearson) correlation coefficient and linear regression (R²), using the IBM SPSS Statistics 20.0 enabled to provide descriptive and inferential information of the findings.

Qualitative Analysis

Nondirective ethnographic interviews and observations were conducted to gather information. They were organised, coded, categorised, structured and theorized. Furthermore, the analysis software Zoom Tropes V7.2 was used in addition to a detailed analysis.

Findings

The sociodemographic variable involved 63 participants that were males, representing 96.92% of the group; and 32 female participants, representing 3.08% of the group. The average scores and standard deviation for age was M=26.14 years and SD=5.584; literacy rate: M=10.63 y SD=2.837; lifetime drug consumption M=47.15 y SD=30.653, measured in months.

Social Profile of Drug Usage

Social Discourse

Discourses are considered as social practices of people's imaginaries and influences socio-historical and cultural life (Haidar, 2000). Furthermore, discourses practices are set as historical configurations reflected in time, periods, social economic and geographical area (Foucault, 1983). Therefore, analysing the addict discourse reflects their reality, imaginary and worldview. Therefore, it is important to establish the influence of social factors on the addict when consuming drugs.

The friends criteria (Chart 1), shows a dominant discourse, with a subjective narrator in a dynamic and active interface supported by social links that highlight a direct relationship with substances and drugs; which were taken as reference points. The findings are similar to the institutional criteria, whilst in the family criteria, there is an argumentative - dominant style with an active interface with no definition of their narrative role nor the use of references or universes such as: health, illness, drugs and substances. These findings show a dominant- enunciative style when referring to friends or

institutions, which establishes a relationship of complicity when it is about the use of drugs and reveals a point of view of this reality. In contrast, the dominant-argumentative refers to family, which compares and criticise the use of drugs, since there is a greater influence in secondary socialization rather than primary ones.

References and Relationships

Discourses references and relationships represent a social context, which are regrouped in equivalent classes to the main actors, objects and concepts. The findings of the references and relationships of the friend criteria (Chart 2) shows that there is a direct relationship when using references such as drug addiction, problems, happiness, consumption and disease. The use of factive verbs are shown in 55.5% of the total, and are predominantly associated with verbs conveying the idea of "being", "consuming" and "having". Furthermore, the pronoun "I" linked with such criteria was applied to 76.8% of the cases, depicting the level of awareness of their addiction. Meanwhile, the institution criteria show references that are directly linked to drugs, friends, consumption, disease, education and a better life; in which 54.3% of the addicts who used verbs conveying the idea of "being", and "having" and 88.5% of addicts who used the pronoun "I", reflect a level of empowerment concerning such criteria. The last criteria "Family", shows a close relationship amongst references such as relatives, inferiority, drug addiction and physical challenge; in which 60.6% of the cases who used such verbs and 68.3% use the pronoun "I", reflected a degree of awareness and relevance to the criteria.

In conclusion, secondary socialization is directly related to consumption, while primary socialization is linked to drug addiction. There is a greater percentage when using factive verbs in secondary socializations if compared to primary ones.

Neuropsychological Profile in Drug Use

The findings depicted from the neuropsychological profile for attention, memory and cognitive domains a regular trend for people who were affected severely in different visuospatial and hearing components. Nevertheless, three findings show a greater relevance on frequencies.

Attention

When testing Digit Detection, it shows a greater impact on 33.9%, between mild- moderate to severe changes in the attention and concentration component (Chart 3), identifying difficulties in recording phonological characteristics of the information. Meanwhile, there are severe and mild changes on 87.7% of the group under study during the Visual Search, showing significant deficits when recording visuospatial characteristics. Similarly, there were severe and mild findings in the Digits Forward Span, where 61.5% of the group shows changing when it was run, having poor attention.

Memory

The findings about the encoding section depict mild and severe deficiencies in several tests (Chart 3). Verbal paired associates (84,7%), Logical Memory (92,3%) and Rey-Osterreith Complex (100%) used for decoding, encrypting were derived to long term memory (LTM), which are severely affected at a phonological and visual level. Nevertheless, despite the poor implementation of Faces (58,4%), the findings of the iconic coding are less dramatic if compared to Rey-Osterreith

Complex, given to its own nature. The findings of the evocation component are flawed between severe and mild alterations. The results of Word list Free Recall, Logical Memory and Rey-Osterreith Complex were poor, while Word list Cued Recall, Word list Recognition, Verbal paired associates and Faces, shows evocation deficit linked to the misuse of strategies.

The statistical analysis for the memory and attention tests were conducted with a margin of error of 5% (significance level $p=0.05$), showing notable differences between the rates of neuropsychological effects correlated to addiction; thus: visual detection $r=.025$; $p<.05$; associated peers evocation $r=.032$; $p<.05$; and a high level of significance in: memory curve coding $r=.007$; $p<.01$; coding logical memory $r=.000$; $p<.01$; other shows significant deficits correlated positively when it affects cognitive domains (Chart 4), where the evocation results shows substantial statistical differences given the primary effect of coding.

Drug type and Neuropsychological Implications

The findings about the exposure level of the neuropsychological profile regarding to the drug-type use (Chart 1), are the ones who show severe alteration in cognitive domains when consuming cocaine base/ cannabis (G1) and cocaine base (G2), resulting into 16.92% in each of the cases; followed by the ones who use a common drug, including one less common (heroin, contact cement, ecstasy, peyote, acids) (G3) with 10.77%. The results were obtained after classifying the subjects according to the drugs they prefer, which in most cases are related. Nevertheless, the lack of severe or mild-significant alteration (G8) is due to a small number of subjects who are part of this group without affecting cognitive domains. The analysis depicted poor planning, programming, self-regulation, monitoring, inhibition and semantics related to base of cocaine over-consumption, while visuospatial, phonological and sequencing deficiencies are linked to the one who prefer using of cannabis. However, in a less restricted sense, there was a direct relationship between the neuropsychological profile and its consumption linked to two or more drugs.

DISCUSSION

From a social perspective view, it is undoubtedly that addiction is an apprenticeship, directly linked to a socialization process (Lave and Wenger, 1991), where the subject incorporate practices of a social context. Secondary socialization (Giddens, 2000) could have an impact on the frequency of use if compared to primary socialisation. Therefore, several studies have shown that its use within a family has an influence (Steinglass and Bennett, 2009), but it is not determining on the subject. (Halley Grigsby *et al.*, 2014). Nevertheless, other researches conclude that there is correspondence between relatives, couples, and friends who consume (Font-Mayolas *et al.*, 2006), a situation that this research analyses.

Discourse analysis is essential to understand how addiction works, thus, primary and secondary socialisation have a direct impact on addiction (Poveda-Ríos *et al.*, 2016). Their worldview examines three factors: a) their first stages associated to pleasure; b) to then link to addiction; c) and rehabilitation, who success is when they get the support from the people involved in primary socialisation.

Table 1 Discourse: style- universes-references

Criteria	Style / Setting	Universe reference 1	%	Universe reference 2	%	References used	%
Friends**	Dominant-enunciative; subjective narrator Setting: Dynamic-action	Social matters	100	Presence	100	Existence	100
		Health, illness	88	type of drug; drugs, vital functions, casualty, knowledge	100	Time	95
		Social matters	82			Alcohol and drug addiction, friends	86
		General matters	77	Identity and Family	82	Emotions	83
			100	Accidents	67	Friends	72
Institutions**	Dominant-enunciative: subjective narrator Setting: Dynamic-action	Communication, economy	93	Time, type of drug, presence, order, behaviour and finances	100	Family, problems	67
		General matters (education, body, objects, economy, art)	91	Drugs, identity-family, space	88	Curiosity	63
		Health and diseases	89	Positive behaviour (housing, parents, educational centres)	80	Drugs, time, friends, degree	88
		Social matters	80			Drug addiction	75
		Thoughts and behaviour	63			Relatives fellowship, university	75
Family*	Dominant-argumentative In the real: dynamic, action	Health-illness, economy, employment, food	100	Drugs, presence, businesses. Time, order	100	Concordance	67
		General matters (sociability, thoughts behavior employment, body)	83	Causality, knowledge	87	Nutrition	60
			83	Substances, relationship (feelings), principles	73	Drug addiction, user, deal with problems	90
						Exact time (siblings, method)	90
						Classification (problem, grouping, treatment)	80
				Person (business-work)	75		

Note: Primary Socialisation (*) ;Secondary Socialisation(**); data analysis gathered from Zoom Tropes V7.2 through ethnographic interviews.

Table 2 Discourse: relationships-references

Criteria	Relationship	Verbs-connectors	%	Modalities-adjectives	%	Pronouns-adjectives	%
Friends**	Drug addiction-alcohol; powder, alcohol, school, work, buddy, problems. Nutrition-alcohol; time, family. Problems-relatives, use-joy-illness	Verbs: factive	55,5	Modality: time	25	Pronouns: I	76,8
		Stative		Denial	35,3	Other Adjectives: good, friend, important	4,3
		To be, to use, to have, to try, to smoke, to feel	40,3	Adjectives: numeral	36,8		
Institutions**	Drugs-friends, use-joy-illness education-better life	Connectors: comparison	16,4				
		Verbs: factive	54,3				
		Stative	41,8	Modality: time	37,8		
		To be, to a have, to tell, like, to know.	8,9	Denial	15,9	Pronouns: I	88,5
		connectors: condition	25,3	Palace	51,6	Other Adjectives: good	12,4
Family*	Relatives-family politics. Inferiority-drug addiction. Nutrition-family. Time spend with sons (trips, friend, nutrition, economy, age).	Cause	3,8	Adjectives: subjective numeral	29		
		Place					
		Verbs: factive	60,6				
		Stative	30,3	Modality: time	25,5		
		To be, to tell, to have, to use, to do, to see, to live.		Denial	44,7	Pronouns: I	68,3
Family*	Nutrition-family. Time spend with sons (trips, friend, nutrition, economy, age).	Connectors:	36	Intensity	21,3	Other Adjectives: more, less, last	21
		Addiction	11,9	Adjectives:	35,9		
		Condition	11	Subjective numeral objective	35,9		
		Cause	11		28,1		
		Opposition	19,3				

Note: Primary Socialisation (*) ; Secondary Socialisation(**); data analysis gathered from Zoom Tropes V7.2 through ethnographic interviews.

Table 3 Attention and Memory Neuropsychological on drug addicts

Tests	Severe alteration		Mild to low alteration		Normal		Total
	f	%	f	%	f	%	
Attention and concentration							
Digit forward span	27	41,5	13	20,0	25	38,5	65
Mental control	24	36,9	14	21,5	27	41,5	65
Visual search	37	56,9	20	30,8	8	12,3	65
Digit detection	12	18,5	10	15,4	43	66,2	65
Spatial forward span	22	33,8	13	20,0	30	46,2	65
Immediate memory							
Word list	42	64,6	14	21,5	9	13,8	65
Paired associates	43	66,2	12	18,5	10	15,4	65
Logical memory	39	60,0	21	32,3	5	7,7	65
Rey-Osterreith Complex Figure	48	73,8	17	26,2	0	0,0	65
Faces	22	33,8	16	24,6	27	41,5	65
Delayed memory							
Word list (free recall)	44	67,7	14	21,5	7	10,8	65
Word list (cued recall)	52	80,0	13	20,0	0	0,0	65
Word list (recognition)	38	58,5	26	40,0	1	1,5	65
Paired associates	45	69,2	18	27,7	2	3,1	65
Logical memory	54	83,1	9	13,8	2	3,1	65
Rey-Osterreith Complex Figure	57	87,7	8	12,3	0	0,0	65
Faces	35	53,8	19	29,2	11	16,9	65
Totals	41	62,5	14	21,5	10	15,9	65

Table 4 Neuropsychological componentson Attention and Memory on drug addicts

Pruebas	M	(D.T.)	r	R ²
Digit forward span	1,85	(1,079)	0,700	
	Mental control	(0,497)	0,059	
Visual search	6,14	(4,201)	0,025*	0,063*
Digit detection	1,92	(3,188)	0,979	
Spatial forward span	3,60	(5,049)	0,240	
Word list (coding)	2,94	(0,966)	0,007**	0,097**
Paired associates (coding)	1,29	(1,057)	0,003**	0,095**
Logical memory (coding)	3,68	(2,693)	0,000**	0,275**
Rey-Osterreith Complex Figure (coding)	7,66	(3,294)	0,490	
Faces (coding)	3,71	(1,027)	0,132	
Word list (free recall) (evocation)	5,88	(3,008)	0,000**	0,403**
Word list (cued recall) (evocation)	5,69	(3,283)	0,000**	0,332**
Word list (recognition) (evocation)	3,63	(5,049)	0,240	
Paired associates (evocation)	2,17	(1,039)	0,032*	0,056*
Logical memory (evocation)	3,15	(3,053)	0,000**	0,275**
Rey-Osterreith Complex Figure (evocation)	6,40	(3,263)	0,000**	0,195**
Faces (evocation)	5,88	(3,008)	0,000**	0,403**

Note: *There is significant correlation at a 0,05 level (bilateral); ** There is significant correlation at a 0,01 level (bilateral)

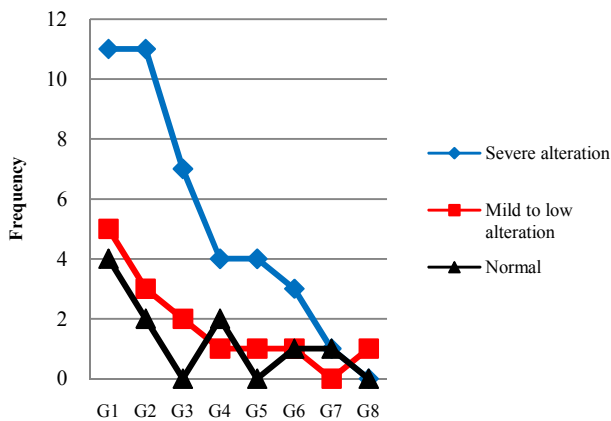


Chart 1 Neuropsychological profile in drug addicts based on drug consumption

From all the references that were analysed and employed by individuals towards addiction. It is important to point out that according to the phrase taken from NA “we lived to use drugs and we have them to live” (Narcóticos Anónimos, 2005). Therefore, the findings of this research shows the idea of “existence” of the people under study, is directly linked to a “friendly-use” and “schools” (secondary socialisation), but not to “family” (primary socialisation). The data is in line with a study conducted by Tenorio Ambrossi (2003), and others, who identified that behaviour starts with someone within a context of “addictive culture” (Cunningham and Ramer, 2010), thus; corroborating these results.

The neuropsychological profile, phonological, visuospatial and selectivity of attention deficits were found in different tests worldwide (Poveda-Ríos *et al.*, 2016), as well as studies about drugs impact on attention processes and other cognitive processes related to cannabis and cocaine base consumption (Torres and Fiestas, 2012). A Spanish study identifies the effects when consuming cannabis, cocaine, heroine and other types of drugs on auditory and visual attention (Verdejo García *et al.*, 2004) and a European study about the sole use of cannabis related to these results (Solowij *et al.*, 1995).

The findings about coding from memory control shown on echoic and iconic qualities are greatly affected due to drug consumption, which corresponds to studies that have shown that the use of cocaine, cannabis and heroine affects coding and determines the effect in LTM (Lundqvist, 2005).

The effects of multi-drug use on cognitive components (Robbins *et al.*, 2008), and other studies established that the anatomic basis of such deficits, show that cannabis affects the dorsal corpus striatum thus, its involvement on STM and LTM (Goodman and Packard, 2015). When the results on evocation were compared, they turned out to be non-conclusive. Therefore some studies associated it with consumption (Nestler, 2001), and other sexplains that despite the damage, there is noimportant differences to support its relationship (Noorafkan Roohiet. Al., 2010; Coullaut-Valera *et al.*, 2011).

At the end, the findings of the repercussion level on the type of drug about the neuropsychological profile, has its greatest impact related on cannabis/cocaine base (G1) and cocaine base (G2) which weresupported by other researches (Larrinaga Enbeita and Vergel Méndez, 2001; Fernández-Espejo, 2002; Crespo Fernández and Rodríguez, 2007; Bausela Herreras, 2008). Furthermore, the deficits associated to the ones who uses a more common drugs (heroine, cement contact, exctasis, peyote, acids, etc) reassure partially the use of heroine and exctasy (Capella *et al.*, 2015; Everitt and Robbins, 2016; Montgomery *et al.*, 2005), but not the ones such as peyote or cement contact.

CONCLUSIONS

The social profile of a drug addict in Ecuador is difficult to describe, especially between family (primary socialisation) and the most immediate context (experience and interaction): school, group of friends, communication channels, social networks; amongst others (secondary socialisation). It was found that during secondary socialisation, there is no relationship between first use and the presence of an addict within the family, given the case, this may be caused by underlying drivers that were not considered. Furthermore, secondary socialization strongly affects when not doing primary socialisation, thus, increasing the risk of consumption.

The addict world vision varies in relation to the first stage of drug use or rehabilitation. During the rehabilitation process there is also variations regarding to the length of time, when comparing between people who first arrive to a rehabilitation centre to those who are about to leave. Nevertheless, it has not been put into detail during this research.

Conversely, no direct relationship was found between the economic or social status of the participants. This depended more with their level of education, which could be conclusive such as the case of being unemployed or having unemployed parents. Nonetheless, there cannot be only one cause for drug consumption like the cause effect theory but a connection between numerous personal and social factors.

The consequences regarding phonological, visuospatial and attention control deficits could affect the prefrontal and posterior cortex as shown in language oral comprehension (semantic implications), complex learning processes (when using analogies, comparisons or metaphors). This is to say, deficits are clearly detected in daily activities such as paying bills, understanding semantic contents of a letter, writing a receipt; amongst others.

Several coding components depict a complex encrypted mechanism of information registered by sensorial dimension networks of the subject when performing a task or a certain activity. Since the coding component is affected, it is expected that information gathering to be deficient, limited or nulled. Therefore, this information should have previously been stored and retained in the short and long-term memory accordingly. During evocation, spontaneous recovery or recognition shall be considered. This could help to determine its impact on the memory. These findings do not just consider the evocation problem as a unitary component of the memory but also the additional shortcoming that could establish the differences between the problem of a memory as well as amnesia and dementia disorders. Consequently, taking them away from recovery greatly improve when recognition strategies are used, causing evocation deficit.

The drugs that had a potentially greater adverse impact on cognitive functions were G1 (cocaine / cannabis), G2 (cocaine base) and G3 (most common used drug with one less frequent drug such as: heroine, cement contact, ecstasy, peyote, acids, etc.) Nevertheless, there is the need to make deeper researches about the amount of drugs, frequency and the length of time they are used, as well as less common drugs like cement contact or peyote to get information on how these would affect the neuropsychological profile.

Acknowledgements

This study was funded by Pontificia Universidad Católica del Ecuador Sede Ambato and the contribution of several rehabilitation centres in the Republic of Ecuador that complied with the requirement of the Ministry of Public Health.

Conflict of Interest

None

References

Ahston, H. 2001. Pharmacology and effects of cannabis: a brief review. *British Journal of Psychiatry*, 178, 101-106. doi:10.1192/bjp.178.2.101

- Arbaiza del Río, M. I. 2014. Alteraciones cognitivas, conectividad funcional y personalidad en el drogodependiente. Madrid: Universidad Complutense de Madrid. Obtenido de <http://eprints.ucm.es/28339/>
- Ardila, A., Arocho Llantín, J., Lobos, E., y Rodríguez, W. 2015. Diccionario de Neuropsicología. 1, 1-53. Colombia: Universidad Católica de Colombia. doi:10.1001/Archneurpsyc.1948
- Ardila, A., y Rosselli, M. 2007. Neuropsicología Clínica. México: El Manual Moderno. Recuperado el 7 de Abril de 2016
- Arevalo Varela, M. T., Torres Salazar, C. I., Rodríguez Cáceres, E. D., y Cuevas Tobar, R. J. 2007. Consumo de sustancias psicoactivas ilegales en jóvenes: factores psicosociales asociados. *Pensamiento Psicológico*, 3(8), 31-45. Obtenido de <http://revistas.javerianacali.edu.co/index.php/pensamientopsicologico/article/view/70/208>
- Bausela Herreras, E. 2008. Neuropsicología y adicciones. *Revista Chilena de Neuropsicología*, 3, 1-3. Obtenido de <http://www.redalyc.org/articulo.oa?id=179317751001>
- Campollo Rivas, O. 2013. Epidemiología de las adicciones. En A. A. González Garrido, & E. Matute, *Cerebro y drogas* (págs. 1-7). Guadalajara, México: El Manual Moderno.
- Crespo Fernández, J., y Rodríguez, C. A. 2007. Bases neuroanatómicas, neurobiológicas y del aprendizaje de la conducta de adicción a la Cocaine. *Revista Latinoamericana de Psicología*, 39(1), 83-107. Obtenido de <http://www.scielo.org.co/pdf/rlps/v39n1/v39n1a07.pdf>
- Cunningham, D., & Ramer, A. 2010. Las Dimensiones Espirituales de sanación de Adicciones. Barcelona: Obelisco ediciones. Obtenido de https://taichiwuji.files.wordpress.com/2015/09/las-dimensiones-espirituales-de-la-sanacion-de-adicciones_01.pdf
- Fernández-Espejo, E. 2002. Bases neurobiológicas de la adicción. *Revista de Neurología*, 34(7), 659-664. Obtenido de <http://www.revneurol.com/sec/resumen.php?or=pubmed&id=2001437>
- Flandrin, J. L. 1979. Orígenes de la familia moderna. Barcelona: Grijalvo.
- Font-Mayolas, S., Gras, M. E., & Planes, M. 2006. Análisis del patrón de consumo de cannabis en estudiantes universitarios. *Adicciones*, 18(4), 337-344. Obtenido de <http://www.redalyc.org/articulo.oa?id=289122815004>
- Foucault, M. 1983. El orden del discurso. México: Representaciones Editoriales S.A. (Cuadernos marginales 36).
- Giddens, A. 2000. Sociología (Tercera ed.). Madrid: Alianza. Obtenido de http://www.perio.unlp.edu.ar/catedras/system/files/anthony_giddens_-_sociologia.pdf
- Goodman, J., & Packard, M. 2015. The influence of cannabinoids on learning and memory processes of the dorsal striatum. *Neurobiology of learning and memory*, 125(1), 1-14. doi:10.1016/j.nlm.2015.06.008
- Haidar, J. 2000. El poder y la magia de la palabra. El campo del análisis del discurso. La producción textual del discurso científico, 33-66. Obtenido de <http://www.uam.mx/cdi/pdf/publicaciones/produccion/poder.pdf>
- Halley Grigsby, T. J., Forster, M., Soto, D. W., Baezconde-Garbatí, L., & Unger, J. B. 2014. Problematic substance use among hispanic adolescents and young adults: implications for prevention efforts. *Substance Use and*

- Misuse, 49(8), 1025-1038. doi:10.3109/10826084.2013.852585
- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. 1992. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance-abuse prevention. *Psychological Bulletin*, 112(1), 64-105. doi:10.1037//0033-2909.112.1.64
- Herrera, A., Simich, L., Strike, C., Brands, B., Giesbrecht, N., & Khenti, A. 2012. Policonsumo simultáneo de drogas en estudiantes de pregrado del área de la salud en una universidad, León-Nicaragua. *Texto y Contexto Enfermagem*, 21, 79-86. doi:10.1590/S010407072012000500011.
- Juárez González, J., Barrios de Tomasi, E., Muñoz Villegas, P., y Buenrostro Jáuregui, M. H. 2013. Adicción farmacológica y conductual. En A. González Garrido, & E. Matute, *Cerebro y drogas* (págs. 8-30). Guadalajara, México: Manual Moderno.
- Larrinaga Enbeita, G., y Vergel Méndez, S. 2001. Neurobiología de la adicción: Cannabis. *Osasunaz*, 4, 177-196. Obtenido de <http://www.euskomedia.org/PDFAnlt/osasunaz/04/04177196.pdf>
- Lave, J., & Wenger, E. 1991. *Situated learning: Legitimate peripheral participation (Learning in Doing: Social, Cognitive and Computational Perspectives)* (Décima ed.). New York: Cambridge University Press. Obtenido de [https://books.google.com.ec/books?hl=es&lr=&id=CAVIO rW3vYAC&oi=fnd&pg=PA11&dq=Situated+learning:+L+egitimate+peripheral+participation+\(Learning+in+Doing:+Social,+Cognitive+and+Computational+Perspectives\)&ots=OBsFpu2LFm&sig=IDTvNT_pcbWQoZm7fjY0h_IH9D4#v=one](https://books.google.com.ec/books?hl=es&lr=&id=CAVIO rW3vYAC&oi=fnd&pg=PA11&dq=Situated+learning:+L+egitimate+peripheral+participation+(Learning+in+Doing:+Social,+Cognitive+and+Computational+Perspectives)&ots=OBsFpu2LFm&sig=IDTvNT_pcbWQoZm7fjY0h_IH9D4#v=one)
- Moffatt, A. 2006. *Terapia de crisis*. Buenos Aires: Puntosur.
- Montgomery, C., Fisk, J. E., Newcombe, R., & Murphy, P. N. 2005. The differential effects of ecstasy/polydrug use on executive. *Psychopharmacology*, 182, 262-276. doi:10.1007/s00213-005-0065-9.
- Narcóticos Anónimos. 2005. *Libro Blanco*. Canada: World Service Office.
- Nestler, E. J. 2001. Total Recall--the Memory of Addiction. *Science*, 292(5525), 2266-2267. doi:10.1126/science.1063024.
- Noorafkan Roohi, N., Hamidi, F., & Shirinabadi Farahani, K. 2010. Cognitive consequences of drug abuser: comparison with abuse of stimulants and opioid with regard to attention and working memory. *Procedia Social and Behavioral Sciences*, 5, 1698-1701. doi: <http://dx.doi.org/10.1016/j.sbspro.2010.07.349>.
- ONU. 2016. *Informe mundial sobre las drogas*. Viena: Oficina de las Naciones Unidas contra la Droga y el Delito. Obtenido de https://www.unodc.org/doc/wdr2016/WDR_2016_ExSum_spanish.pdf
- Ostrosky, F., Gómez, M. E., Matute, E., Rosselli, M., Ardila, A., y Pineda, D. 2012. *Neuropsi Atención y Memoria* (Segunda ed.). México D.F., México: Manual Moderno.
- Portellano, J. A. 2005. *Introducción a la neuropsicología*. Madrid: McGraw Hill Interamericana de España S.A.U.
- Poveda-Ríos, S., Mora Pérez, A., Lara Machado, R., y Naranjo Hidalgo, T. 2016. Predictores Clínicos de Demencia en Drogodependientes. *Revista Neuropsicología, Neuropsiquiatría y Neurociencias*, 16(3), 75-101.
- Quijano Guesalaga, H., y Asselborn, E. 2012. *Introducción a la Filosofía y Antropología Filosófica*. Buenos Aires: [en línea] Documento de cátedra del Departamento de Derecho de la Facultad Teresa de Ávila de la Universidad Católica Argentina. Obtenido de <http://bibliotecadigital.uca.edu.ar/repositorio/contribuciones/abogacia-filosofia-antropologiafilosofica.pdf>
- Ranganathan, M., & D'Souza, D. C. 2006. The acute effects of cannabinoids on. *Psychopharmacology*, 188(4), 425-437. doi: 10.1007/s00213-006-0508-y.
- Reguillo Cruz, R. 2000. *Emergencia de culturas juveniles* (Primera ed.). Bogotá: Grupo Editorial Norma.
- Robbins, T., Ersche, K., & Everitt, B. 2008. Drug Addiction and the Memory Systems of the Brain. *Addiction Reviews*, 1141, 1-21. doi:10.1196/annals.1441.020.
- Ruiz Sánchez de León, J. M., & Pedrero Pérez, E. J. 2014. *Neuropsicología de la Adicción*. Madrid: Editorial Medica panamericana.
- Santander, P. 2011. Por qué y cómo hacer análisis de discurso. *Cinta moebio*, 41, 207-224. Obtenido de <http://www.scielo.cl/pdf/cmoebio/n41/art06.pdf>
- Segalen, M. 1992. *Antropología histórica de la familia*. Madrid: Taurus Ediciones .
- Solowij, N., Michie, P. T., & Fox, A. M. 1995. Differential impairments of selective attention due to frequency and duration of cannabis use. *Biological Psychiatry*, 37(10), 731-739. doi: [http://dx.doi.org/10.1016/0006-3223\(94\)00178-6](http://dx.doi.org/10.1016/0006-3223(94)00178-6).
- Steinglass, P., & Bennett, L. 2009. *La familia alcohólica*. Barcelona: Gedisa.
- Stone, A. L., Becker, L. G., Huber, A. M., & Catalano, R. 2012. Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addictive Behaviors*, 37 (7), 747-775. doi:10.1016/j.addbeh.2012.02.014
- Tenorio Ambrossi, R. 2003. *Drogas: usos, lenguajes, metáforas*. Quito: El Conejo y Abya Yala.
- Torres, G., y Fiestas, F. 2012. Efectos de la marihuana en la cognición: Una revisión desde la perspectiva neurobiológica. *Revista Peruana de Medicina Experimental y Salud Pública*, 29(1), 127-134. Obtenido de <http://www.scielo.org.pe/pdf/rins/v29n1/a19v29n1.pdf>
- Ustariz Castillo, R. 2005. *El alcoholismo, Una visión comunitaria*. Maestría en Desarrollo Social. La Habana, Cuba: FLACSO.
- Verdejo García, A. 2006. *Funciones ejecutivas y toma de decisiones en drogodependientes: rendimiento neuropsicológico y funcionamiento cerebral*. Granada: Editorial Universidad de Granada. Obtenido de <http://docplayer.es/8746807-Tesis-doctoral-funciones-ejecutivas-y-toma-de-decisiones-en-drogodependientes-rendimiento-neuropsicologico-y-funcionamiento-cerebral.html>
- Verdejo García, A., Orozco-Giménez, C., Meersmans Sánchez-Jofré, M., Aguilar de Arcos, F., y Pérez-García, M. 2004. Impacto de la gravedad del consumo de drogas sobre distintos componentes de la función ejecutiva. *Revista de Neurología*, 38(12), 1109-1116. Obtenido de <http://www.neurologia.com/articulo/2003592>