

Measurement of early maladaptive schemas in heroin addicts treated with methadone in north of Morocco

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The Early Maladaptive Schema (EMS) are the cognitive structures and the set of processes guiding our behaviors by serving the filtering and the treatment of the information, these dysfunctional schemas have a close relationship with the addictive behaviors. The aim of this work measuring EMS in heroin addicts undergoing methadone treatment as well as making a comparison between the activation of the schemas before and after treatment. The present study was carried out on 101 Moroccan patients in a medico-psychological center in Tangier with 85 men and 16 women (mean age was 35), having been diagnosed with opioid dependence described in the DSM-V. EMS were measured using Young's questionnaire short version with 13 schemas. The results showed difference between the activation of schemas in the pre- and post-treatment (difference=21, CI=11.07-10.63, $p<0.001$) with an activation of the schema *Fear of losing control* ($M=166.86$ (65.3%). In addition *Unrelenting standards* schema that is significant in men ($t=1.97$, $p=0.048$), against *emotional deprivation* and *vulnerability* with women ($t=4.56$, $p\leq 0.001$), for the correlation between age and EMS was low, except for the schema of losing control which is highly correlated with age ($R=0.55$, $p\leq 0.001$). Thus, the substance abuse and personality disorders are often coexisting, confirming in part the hypothesis put forward by Ball and Young, which postulates that individuals displaying criteria of substance abuse have an activation of inappropriate schemas of insufficient *self-control* or *Entitlement/Grandiosity*.

Keywords: Early Maladaptive Schema, addiction, methadone, heroin, Morocco.

Medición de esquemas tempranos de mala adaptación en adictos a la heroína tratados con metadona en el norte de Marruecos. Los esquemas de mala adaptación tempranos (EMT) hacen referencia a las estructuras cognitivas y al conjunto de procesos que guían nuestros comportamientos, sirviendo al filtrado y al tratamiento de la información. Estos esquemas disfuncionales tienen una relación cercana con los comportamientos aditivos. El objetivo de este trabajo fue medir los EMT en adictos a la heroína en tratamiento con metadona, así como realizar una comparación entre la activación de los esquemas antes y después del tratamiento. El presente estudio fue llevado a cabo en 101 pacientes marroquíes en un centro médico-psicológico en Tánger, con 85 hombres y 16 mujeres (la edad media fue de 35). Los EMT se han medido utilizando la versión corta del cuestionario de Young, con 13 esquemas. Los resultados han mostrado diferencias entre la activación de esquemas en el tratamiento previo y posterior (diferencia=21, IC=11.07-10.63, $p<0.001$), marcada por la activación del esquema *Miedo a Perder el Control* ($M=166.86$ (65.3%). Además, el esquema de *Estándares implacables* fue significativo en los hombres ($t=1.97$, $p=0.048$), mientras que los esquemas de *Privación Emocional* y *Vulnerabilidad* lo fueron en las mujeres ($t=4.56$, $p\leq 0.001$). Por otro lado, la correlación entre la edad y el EMT fue baja, excepto para el esquema de *Pérdida de Control*, que mostró estar altamente correlacionado con la edad ($R=0.55$, $p\leq 0.001$). Por tanto, el abuso de sustancias y los trastornos de la personalidad a veces coexisten.

Palabras clave: Esquema de mala adaptación temprano, adicción, metadona, heroína, Marruecos.

The EMS developed by Beck and Young are defined as broad and invasive models or themes of memories, emotions, cognitions and bodily sensations about oneself and relationships to others that may be dysfunctional. Significantly, schemas are knowledge structures stored in long term memory, which are built by successive integration of experiences and contain all the intimate beliefs and convictions of the subject itself and the world (Mammad et al., 2017; Rusinek & Sgard, 2005; Young et al., 2005). These early schemas take their source in childhood and gradually integrate with the personality of the individual, it is a way for the child to understand and manage his environment during childhood. In adulthood, these schemas have limited utility and can cause disorders. An EMS is activated when the individual finds in his environment a situation that corresponds to this schema (Schmidt et al., 1955; Young & Klosko, 1995). These cognitive Beck and Young models, EMS have been widely applied in many mental and behavioral disorders, namely, that several studies have investigated the correlation between the activation of EMS and other disorders such as Anxiety disorders that refer to the issue between symptoms and structural characteristics of the personality (Cousineau, 2012; Delattre et al., 2004; Mammad et al., 2017; Rusinek, 2006), depressive disorders (Cormier et al., 2011; Waller et al., 2001), personality disorders (Grebot et al., 2014), memory and academic performance (Ahami et al., 2017), but specifically the correlation between SPI and the domain of the addictive behaviors, which was the subject of a first approach by Beck et al. (1993), so that the latter had validated them in the field of addictive behaviors (Ball & Young, 2000). In addictions, it was therefore established that schemas in adulthood, are determining in the maintenance and triggering of addictive behaviors (Grebot & Dardard, 2010). Regarding to substance use and abuse, several studies have shown that EMS are over-activated in subjects with alcohol dependence (Decouvelaere et al., 2002; Rusinek & Sgard, 2005), as well as in the context of drug addiction with heroin addicts (Tison & Hautekeete, 1998) and with cannabis users. (Chabrol et al., 2001; Grebot & Dardard 2010).

In doing so Hautekeete et al. (2006) made a comparison between the level of activation of patterns in two life periods of alcohol-dependent subjects: (between childhood and adulthood), as well as after application of cognitive-behavioral treatment (CBT) not specific to EMS but applied in the treatment of addictive disorders, this research has shown a very strong increase in the level of activation of EMS with age, whereas, even in childhood, therefore, their schemas are already activated compared to non-alcoholics. There is similar agreement on global activation of schemas and activation of specifically: "insufficient self-control" and "emotional deprivation" schemas; in the area of "entitlement/grandiosity" self-sacrifice, subjugation, approval seeking, (Ball & Young, 2000) or other schemas such as emotional inhibition and vulnerability in the misuse of alcohol and opiates (Brotchie et al., 2004).

Thus this cognitive model of SPI has been experimentally verified by (Tison & Hautekeete, 1998) in the context of drug addiction with heroin addicts and secondly by the same author in highlighting the relationship between ASP beliefs (anticipatory, relieving, permissive) and drug addiction as well as in the substitution treatment with Buprenorphine (Hautekeete et al., 2006).

As ball points out, substance abuse and personality disorders would often appear coexist. The hypothesis put forward by Ball and Young (Ball & Young, 1998) postulates that individuals displaying substance abuse criteria have a higher activation of Insufficient self-control or entitlement/grandiosity, considering activation of the insufficient self-control schema as a direct trigger factor of consumption (Grebot & Marchand, 2008).

Heroin is the most damaging illicit substance because it causes the highest morbidity and mortality. The management of opiate users is a public health problem (Gignard et al., 2009). Treatment experts believe that heroin addiction is a chronic disease and that drug users will have to fight for the rest of their lives (GAO, 1990). In 2010, the number of heroin experimenters in France was estimated at 500.000 among 18-64 year olds (Beck et al., 2010). The concept of opioid substitution came into being in France with the authorization to market Opioid Substitution Drugs (OSD) in the nineties as part of a risk reduction policy (Guignard et al., 2009) while in Morocco, this program was only launched in 2010 in three pilot sites, namely Tangier, Rabat and Casablanca. The number of patients treated in Tangier was higher than that at the other two sites (Salhi, 2011).

The general objectives of these treatments not only total abstinence from the substance but also the prevention of somatic and psychiatric and psychic complications secondary to opioid dependence, as well as the promotion of the general quality of life of patients (Idrissi et al., 2018).

The aim of this study is to measure the activation of early maladaptive schemas among methadone-treated drug users in two periods, before and after treatment, as well as by age and sex.

METHOD

It is a prospective study for evaluative purposes, conducted at the Hasnouna Medical and Psychological Center (HMPC) in Tangier (Morocco) during the period between March 2013 and August 2013.

Participants

A 101 patients participated in this study including 85 men and 16 women. Those patients included in this study are attending the substitution program by Methadone (SPM), diagnosed with opioid dependence as described in the DSM-V, 18 years old or

more, with or without poly-addiction and with or without psychiatric comorbidity. They were chosen in a randomly according to their availability and voluntarism, they are met in individual interviews. Exclusion criteria include patients with intellectual disability or organic disease that obstructs the conversation, those with instability: aggression, impulsivity/acute psychiatric comorbidity, and patients with difficulties in understanding the questionnaires.

Instrument

In the present study, the structure of the short version of the *Young Schema Questionnaire* (YSQ-SV; Schmidt et al., 1995). Consisting of 13 schemas translated by Rusinek & Hautekeete (2000), was investigated. Based on the Rusinek short version 13 EMS adapted to children (Rusinek et al., 2013) with 26 items we constructed our questionnaire of 13 Schemas with 26 items also to accelerate screening in the addictive population. We found for the coefficient of alpha Cronbach=0.797, these items are presented as “*I’m afraid that the people who love me will leave me*”, “*I’m afraid of being mean without wanting to*” with 2 items for each schema, where we asked to react by surrounding a number ranging from 1 to 6 (the higher the score, the more the subject considers that the statement corresponds to him). The questions when processing the results are grouped according to the schemas they belong to.

Procedure

The questionnaire of the schemas is focused on 2 periods simultaneously: addiction period and the treatment period. The 13 schemas studied are: Mistrust, Abandonment, Subjugation, Vulnerability, Dependence, Insufficient Self-Control, Defectiveness, Failure, Unrelenting Standards, Emotional Deprivation, Social Isolation, Entitlement, and Fear of Losing Control. The collection of data was anonymous to ensure their confidentiality. The questionnaire is strictly anonymous at the time of the survey, and anonymity is systematically respected in the data processing. After obtaining authorization from the officials of the regional health delegation as well as the HMPC and after a reminder on the purpose of the study, free and informed consent was obtained for all patients included in the study.

Statistical analysis

The data entry and the statistical study were carried out on the SPSS software.

Quantitative data are summarized by their mean value (+/-: standard deviation), (N: effective) and (%: frequency). In order to test the significance of the different predicted effects we carried out t-tests (mean comparisons) and Pearson correlation calculations (r), Fischer tests. We considered a result to be significant beyond $\alpha=0.05$.

RESULTS

101 patients participated in the interview including 85 men with a mean age of ($M=37\pm8$) and a mean weight of ($M=66.40\pm14.29$) and 16 women of mean age of ($M=27\pm6$) and a mean weight of ($M=65.70\pm10.89$). While the minimum age of patients is 22 years old and maximum is 65 years, with a mean of 35 years.

Table 1. Sociodemographic characteristics of patients

| | Effective (N) | Frecuence (%) | $M\pm SD$ | Min. | Max. |
|-------------------------------|------------------|------------------|-----------------|------|------|
| Sex | | | | | |
| Men | 85 | | | | |
| Women | 16 | | | | |
| Hometown | | | | | |
| Tangier | 89 | 88.11 | | | |
| Others | 12 | 11.88 | | | |
| Age | | | | | |
| M | | | 37 ± 6 | | |
| F | | | 27 ± 6 | | |
| Total | | | 35 | 22 | 65 |
| Level of studies | | | | | |
| Illiterate | 3 | 2.97 | | | |
| primary | 44 | 43.56 | | | |
| secondary | 29 | 28.71 | | | |
| High school | 19 | 18.81 | | | |
| superior | 6 | 5.94 | | | |
| Age of first use | | | | | |
| <20 years | 80 | 79.20 | | | |
| >20 years | 21 | 20.80 | | | |
| Total (Age) | | | 17.60 ± 4.20 | 11 | 32 |
| Duration of treatment (years) | | | | | |
| [0,1] | 29 | | | | |
| [1,2] | 48 | | | | |
| >2ans | 21 | | | | |
| Daily dose (mg) | | | 72.13 ± 22.84 | 15 | 170 |

Note. M =mean; \pm = SD/n effective

Based on the comparison of EMS between Addiction Period (AP) and Treatment Period (TP), we found that the (%) of EMS activated during the AP is a little high compared to the (%) of EMS activated during TP with 10% difference, as we observe that there is not a big difference between the total mean of the EMS between the two periods ($t_{100}=5.241$; $p<0.001$), except for the average between men and women, since it is noted during both periods that the overall average of the schema are higher for men than for women (table 2 and table 3).

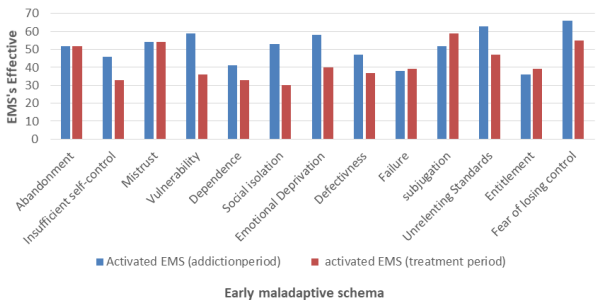
Table 2. Comparison of EMS between addiction period and treatment period

| | Addiction Period (AP) | Treatment Period (TP) | |
|-------------|-----------------------|-----------------------|---------------------------|
| Mean(Total) | 3.95±1.32 | 3.39±1.18 | $t_{100}=5.241; p<0.001$ |
| Women | 3.27 | 2.93 | $t_{100}=-2.971; p=0.004$ |
| Men | 4.63 | 3.8 | $t_{100}=5.124; p<0.001$ |

Table 3. Comparison between the number of activated and inactivated schemas between the two periods

| | Activated SPI Effective % | Inactivated SPI Effective Total |
|-------------------------|---------------------------|---------------------------------|
| Addiction periode (AP) | 665 50.64 % | 644 49.04 % |
| Traitement periode (TP) | 648 49.35 % | 669 50.59 % |

Figure 1. The number of activated EMS during the period of addiction and the period of treatment



In order to reveal the relationship between the activated patterns and the treatment effect on specific patterns, a comparison was made between only the activated patterns before and after the treatment and according to the comparison of the results presented in figure 1, we deduce that:

The most activated schemas during the addiction period are: Fear of losing control (66), Unrelenting standards (63), vulnerability (59), Emotional deprivation (58).

The most activated schemas during the treatment period: Subjugation (59), Fear of losing control (55), mistrust (54), Failure (52).

There is a decrease in the schema of fear of losing control, Unrelenting standards, Emotional deprivation and vulnerability between AP and TP, but there is an increase in schemas: subjugation, failure, Entitlement.

Table 3 presents the most activated schemas (the EMS that have the largest number and the highest % compared to other schemas) by sex and by the two periods (AP and TP). For men, we remark there is a predominance of schemas: Unrelenting standards, Fear of losing control over the two periods, for women there is a diversification of the dominance of the most activated schemas between AP and TP (Vulnerability, Emotional deprivation, and Social isolation) during AP and (Mistrust, Failure, Subjugation, Unrelenting standards) during TP.

Among the most activated schemas there are only the schemas: Unrelenting standards, Vulnerability, Emotional deprivation and social isolation that are significant between women and men according to the two periods (Table 4).

Table 4 presents the size of each type of activated schema in both periods before and after treatment by gender.

As far as men are concerned, there is a dominance of the schemes: "Unrelenting standards", "Fear of losing control" in AP and "Subjugation" "Fear of losing control" in TP, for women there has a diversification of the dominance of the most activated schemas because during the AP (Vulnerability, Emotional Deprivation and Social isolation, Failure). However there is (Mistrust, Social isolation, and failure,) during TP.

The comparisons made on each scheme in the two periods and according to the gender with the help of student shows first that the treatment effective is low on these schemas. Indeed, during the addiction period all comparisons turn out to be non-significant except for the schemas: Vulnerability, Unrelenting Standards, Entitlement, while during the treatment period there is a significant difference only for four schemas: Dependence, Emotional deprivation, Social isolation and Entitlement.

Table 4. The effectives of each schema activated during the two periods before and after treatment by gender

| EMS | Effective of AS (AP) | | | Effective of AS (TP) | | |
|---------------------------|----------------------|--------|-----------------------|----------------------|------|------------------------|
| | M | W | t, p | M | W | t, p |
| Abandonment | 42 | 11 | 1.26, 0.312 | 42 | 10 | 1.26, 0.457 |
| Insufficient self-control | 39 | 7 | 0.86, 0.625 | 43 | 8 | 0.23, 0.212 |
| Mistrust | 42 | 12 | 1.11, 0.214 | 39 | 14 | 1.09, 0.388 |
| Vulnerability | 45 *** | 14 *** | 6.41, ≤ 0.001 ** | 27 | 11 | 0.68, 0.305 |
| Dependence | 31 | 10 | 0.16, 0.811 | 37* | 10* | 2.48, 0.014** |
| Emotional Deprivation | 45 | 13 | 1.45, 0.396 | 32 | 11* | 1.96, 0.048** |
| Social isolation | 40 | 13 | 0.66, 0.121 | 32** | 13 | 2.61, ≤ 0.001 *** |
| Defectiveness | 35 | 12 | 1.24, 0.698 | 38 | 10** | 0.79, 0.434 |
| Failure | 25 | 13 | 0.84, 0.244 | 43 | 13 | 0.16, 0.741 |
| subjugation | 41 | 11 | 1.1, 0.413 | 47 | 12 | 1.12, 0.627 |
| Unrelenting Standards | 51** | 12*** | 3.04, 0.003*** | 42 | 9 | 0.83, 0.221 |
| Entitlement | 30** | 6 | 1.68, 0.0092* | 41*** | 7* | 4.30, ≤ 0.001 *** |
| Fear of losing control | 56 | 8 | 1.12, 0.256 | 44 | 9 | 1.05, 0.325 |

Note. ***very significant; **significant; *Little significant; M: Men; W: Women; AS: Activated schemas; AP: Addiction periode; TP: Treatment periode

The comparison between the activation of the EMS and the age according to the two periods AP and TP was made using the regression equation and multiple correlation coefficient R and coefficient of Fischer F , the results obtained showed that.

During AP: the correlation between age and EMS is usually low, with: the 26 variables account for 60.3% of the AGE variance ($R=0.78$; $F=3.01$; $p<0.05$) some terms in the equation have little influence, their ratio coefficient/ SD is less than 1.96.

In the TP the correlation between age and EMS is also low ($R=0.55$; $F=0.00$; $p<0.01$) and some terms in the equation have little influence, their ratio coefficient/ SD is

less than 1.96. Except for the schema Fear of losing control it is highly correlated with age ($R=0.85$; $p<0.05$) with the 26 variables account for 30.5% of the AGE variance.

So we deduce that there is an absence of a real effect of age on the higher activation of the schemes either in AP or TP.

DISCUSSION AND CONCLUSIONS

The follow-up of the impact of Substitution Treatment by Methadone STM was conducted in a subjective way, this is due to a difficulty of doing a longitudinal study since the subjects are in a state of strong dependence before treatment including psychic instability, strong agitation and social precariousness.

The activation of EMS in general remains high either before the treatment or after as shown in table 3 this is systematically linked to the STM itself which is not accompanied by a CBT (Cognitive-behavioral therapy), even if the latter does not focused on the treatment of EMS or with other specialized cognitive therapy like the schema therapy, because any detoxification treatment that includes a CBT intervention as an example may show a significant difference in disabling between the beginning and the end of a cure (Baert et al., 2003; Hautekeete et al., 2002). Thus, other studies have been able to show the effectiveness of a cognitive therapy which makes it possible to lower the level of activation of these schemas particularly in alcoholism (Hautekeete et al., 2006).

Table 3 regarding the general mean of EMS in the heroin population in this study remain less higher than a normal population studied in another study conducted on 212 students randomly selected in the country of Morocco (Mammad et al., 2017) and higher for a non-anxious population in France (Rusinek et al., 2004) table2.

The "subjugation" schema is the most pronounced less active during the period of addiction, that's mean there is an effect of isolation and anesthesia for life difficulties experienced (unemployment, poverty, school failure, precarious social ties) felt during the before the cure under the effect of heroin, in the same context another study showed that the emotional inhibition schemas is lower before the alcoholic detoxification treatment when the patients are still under the effect of the alcohol known for its effects on the inhibition (Hautekeete et al., 2006).

According to the hypothesis put forward by Ball and Young (Ball & Young, 1998) postulates that individuals displaying substance abuse criteria have a higher activation of insufficient self-control or entitlement/grandiosity, considering activation of the insufficient self-control schema as a direct trigger factor of consumption. Otherwise in our study the schema "fear of losing control" appeared more activated, which show that our expected results are in line with the work of Ball and Young.

In our study, we found that four dominant schemas during the consumption period were more activated: "fear of losing control", "Unrelenting Standards",

"vulnerability", "Emotional deprivation" with regard to heroin use with or without poly-consumption, other results have shown that cannabis addiction is linked to the activation of three EMS (Insufficient self-control, Dependence and Fear of losing control) (Grebot & Dardard, 2010). On the other hand also in the case of the alcohol addict there is a group of schemas specific to the consumption of alcohol that are the schemas "Insufficient self-control", "Mistrust", "Self-Sacrifice", "Abandonment" and "Fear of losing control", at the same time these maladaptive schemas differentiate at the level of schematic patterns compared to subjects without specific (non-dependent) disorders (Decouvelaere et al., 2002; Rusnek & Sgard, 2005).

In addition this comparison above shows and confirm the schema attributed to dependence and substance abuse called "Fear of losing control". In the context of drug addiction with heroin addicts, these would be predisposing to the creation of specific addiction-related schemas that fall into two categories: one is related to relationships with others (to believe to be rejected or accepted) and the other one about autonomy, freedom and personal success (Tison and Hautekeete, 1998). Therefore in the first category we found for all patients: "Emotional deprivation"/"Abandonment"/"Mistrust"/"Subjection" which are the most dominant compared to other schemas either before or after treatment, this is due to the distortion and loss of social benchmarks that is considered a risk factor in drug-addicted patients (Idrissi et al., 2018) and which is based on the instability of the family relations, because the set of schemas quoted before considers that the family which is of typical origin is detached, cold, rejecting, fleeting etc. This belief implies that close people will not be able to provide emotional support, proximity, strength, or concrete protection for patients during their childhood period, this was implicitly declared during their interview time and when completing the questionnaires.

In the second category, which concerns autonomy, freedom and personal success, the following results were found: "vulnerability", "Unrelenting Standards" during the treatment period for both patients men and women distinctly, however, the "vulnerability" schema was higher among women significantly, and the "failure" schema was also higher among women in a non-significant way, while "Unrelenting Standards" is more activated in men in a significant way: figure 1, table 4.

According to a previous study of cannabis users, they resulted in three activated schemas: Emotional deprivation, Abandonment/Instability and Failure (Grebot & Marchand, 2008) this shows that there is a kind of similarity of activated patterns among other psychoactive substance users and heroin users noting that most of the patients in this study are poly users with a high rate of cannabis use (Salhi, 2011).

With regard to the schema of fear of losing the control that has been declared the most active in the present study, it has been considered as an avoidance response for other schemas and not a schema proper directly causing the addiction, according to the same study of Grebot and merchant.

The conclusion that can be drawn from the set of results obtained is that the substitution treatment with methadone has a beneficial effect on all axes of the patient's life as a medical than psychosocial, what affects the psyche and the well-being of the patients this effect was observed during the interviews where the totality of the patients affirmed to feel better and to be less handicapped by their daily psychic troubles as well as their health and quality of life (Idrissi et al., 2018) which is reflected directly in their expressions with respect to inappropriate schemas that seemed to be activated even slightly in the treatment period.

The present study focused on the measurement of EMS as a psychological factor that is considered to be an important factor in the success of methadone substitution therapy. We can note that this study has shown the over-activation of all EMS in heroin-addicted patients compared to the healthy population, especially the activation of insufficient self-control schemas, which is considered as a direct factor of the trigger of consumption in the majority of additive disorders.

On the other hand, there is not a great difference between the activation of EMS in the period of addiction and the period of treatment due to the absence of a psychotherapeutic treatment which must be imperatively associated with the STM, whether focusing on EMS such as schema therapy or non EMS centred as "CBT" "emotional therapy", "evolutionary cognitive therapy" as a therapeutic action on EMS in patients with associated personality disorders additive consumption of substances reduces the activation of EMS and consequently decreases the severity of consumption and abuse.

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