ABSTRACT

Pathological gambling (GAP) is considered a disorder in which the subject involved can not stop playing despite persistent and evident family, work and social problems. It is listed among the Impulse Control Disorders in the Diagnostic Manuals (DSM, ICD, PDM) because of the significant role that the impulsive trait has in the lives of the players’ personalities.

Impulsivity is a multidimensional construct denoted by the tendency to act a behavior or to make a choice without reflective mediation. An immediate act in reaction to a physical or psychic stimulus. Numerous researches testify how impulsivity is the structuring characteristic of the conduct of the gamblers.

Alexithymia, from the Greek a-lex-thymos, refers to the impossibility of recognizing and expressing one’s emotional states. Most often found in psychosomatic patients, the alexithymic construct also emphasizes imaginative poverty and the consequent concreteness of thought (operative thought) of subjects who are mainly directed towards the “material” aspects of their actions, having no reflexive space for the properly psychological aspects of their behavior.

The aim of this study is to evaluate the outcomes of the Orthos program over a period of 24
months in reference to specific constructs of the GAP such as: the characteristics of the game, the impulsivity, alexithymia, the dimensions of the attachment styles and the quality of the cures offered by both parents during childhood in Pathological Gamblers.

**Keywords:** pathological gambling; impulsivity; attachment styles; alexithymia; parental bonding

**INTRODUCTION**

Pathological gambling (GAP) is considered a disorder in which the subject involved can not stop playing despite persistent and evident family, work and social problems. It is listed among the Impulse Control Disorders in the Diagnostic Manuals (DSM, ICD, PDM) because of the significant role that the impulsive trait has in the lives of the players’ personalities.

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Alexithymia, from the Greek *a-lex-thymos*, refers to the impossibility of recognizing and expressing one’s emotional states. Most often found in psychosomatic patients, the alexithymic construct also emphasizes imaginative poverty and the consequent concreteness of thought (operative thought) of subjects who are mainly directed towards the “material” aspects of their actions, having no reflexive space for the properly psychological aspects of their behavior. Some studies highlight just how much the alexithymic trait is spread transversely to the psychopathological conditions, especially between pathological addictions.

In the GAP it was found that the alexithymic tract is significantly present compared to the general population.

Closely related to the concept of mentalization and symbolization of one’s emotional states, attachment studies show detached and/or preoccupied relationships in subjects with a deficit in the modulation of emotional states and in impulse control. Although they do not denote necessarily pathological characteristics, attachment styles underline the quality of relational experience within interpersonal relationships.

Some studies highlight the presence of attachment systems (regulation of proximity / affective distance from the other) insecure in subjects with pathological dependence on substances as well as pathological gambling.

The aim of this study is to evaluate the outcomes of the Orthos program over a period of 24 months in reference to specific constructs of the GAP such as: the characteristics of the game, the impulsivity, alexithymia, the dimensions of the attachment styles and the quality of the cures offered by both parents during childhood in Pathological Gamblers.

**MATERIAL AND METHODS**

ORTHOS is a three-week intensive residential intervention program with three follow-up meetings during the year following intensive residential interventions. ORTHOS’ philosophy envisages a non-moralistic and prejudicial approach to gambling (Zerbetto, 2002). The task of a therapeutic program is therefore to intervene in the use of dysfunctional and self-destructive forms associated with gambling and not the use of the same if within socially compatible modes.

**Questionnaires administered**

SOGS (South Oaks Gambling Screen: Lesieur and Blume, 1987, Italian adaptation by Guerreschi and Gander), a questionnaire composed of 16 items, for the screening of the presence and severity of the GAP.
**BIS-11** (Barratt Impulsiveness Scale-11, Patton et al., 1995; Italian adaptation of Fossati et al.), a questionnaire composed of 30 items on a four-point Likert scale, for the measurement of impulsivity. It is a tool that, by evaluating "acting without thinking", as impulsivity can be defined, can be considered as an indirect index of aggression, which is generally characterized by the reduction or loss of impulse control. It is a self-assessment scale, quick and easy to compile, widely used both to evaluate the role of impulsivity in the context of psychopathology, and for the study of impulsivity in non-psychiatric subjects. The psychometric instrument measures impulsivity in its motor components (acting without thinking), cognitive (decision rate-attention) and the absence of planning (anticipating and predicting the outcomes of actions, absence of self-control). Consisting of 30 items evaluated with a 4-point scale (rarely / never, occasionally, often, almost always / always), range 30-120.

**RQ (Relational Questionnaire)** by Bartholomew and Horowitz (1991) validated in Italian by Picardi et al. (2000; 2002). The RQ is a self-report questionnaire that allows to evaluate the general orientation of the individual towards intimate relationships through a quadripartite classification.

Bartholomew and Horowitz (1991) validated the RQ on two different samples of university students, the first formed by 77 subjects (40 females, 37 males, age 18-22 years), the second formed by 69 subjects (36 females, 33 males, aged 17-24).

These studies confirmed the existence of the four types of adult attachment provided by the prototypical model (Bartholomew 1990). The distribution of the subjects in the attachment categories was similar for the two samples examined by Bartholomew and Horowitz (1991): in both cases, the category most represented was by far the one of the Safeties (47% in the first sample and 57% in the second), while the least represented was that of the Concerned (14% in the first sample, 10% in the second).

**TAS-20** (Toronto Alexithymia Scale - 20 items: Bagby, Taylor, Parker, 1994, Italian adaptation by Bressi et al.) 20-item questionnaire for the measurement of alexithymia and affective dysregulation.

This 20 item questionnaire has 3 factor scales:

- **DIF** (Difficulty Identify Feelings): difficulty in identifying feelings and distinguishing between feelings and physical sensations.
- **DDF** (Difficulty Describing Feelings): difficulty in describing one’s feelings to others.
- **EOT** (Externally-Oriented Thinking): cognitive style oriented towards external reality.

The TAS-20 does not include the evaluation factor of the reduced ability to fantasize that, according to many, seems integrated into the EOT factor.

The TAS-20 showed adequate values of internal reliability, test-retest and factorial, convergent and discriminating validity.

The TAS-20 score ranges from 20 to 100 with confirmed evaluation of alexithymia for values from 60 (cut-off) or higher, while for values from 51 or below no alexithymic picture is found.

The TAS-20 has also found fact reliability and validity in many different cultures, allowing the research to make significant progress thanks to the only useful evaluation tool.

**PARENTAL BONDING INSTRUMENT** (Parker et al., 1979). The Parental Bonding Instrument represents a “Scale for the evaluation of the relation with the parents”, it is a self-administering questionnaire to assess the quality of care offered by both parents in childhood up to 16 years of age. The Italian validation was performed by Scriminalli and Grimaldi in 1996 (Marzocchi, Neri, Euticchio 2002). The questionnaire consists of 50 items that form two scales referring to each parent and consisting of 25 equivalent items: 12 items refer to the “Care” dimension, 13 items to the “Overprotection” dimension. The questionnaire aims to answer the questions according to the memory that the subject has of his parents during the first 16 years of his life.
SAMPLE

The study involved 40 subjects who had participated in the ORTHOS treatment program at t0. The same subjects were retested at t1 at a distance from the end of the program defined as follows:
- post 6 months (7 subjects)
- post 9 months (6 subjects)
- post 12 months (7 subjects)
- post 21 months (12 subjects)
- post 24 months (8 subjects)

Subjects have average age at the time of t0 (start of treatment) of 43 years (DS = 13.25); they are predominantly men (90.1%), they are mainly married (43.2%), with an average education (47.7%). They do not present a clinical co-morbidity in 38.6% of cases. The subjects have a debt between €10,000 and 50,000 for 31.8%; only 4.5% exceed €100,000 in debt.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>43.00±13.25</td>
</tr>
<tr>
<td>Gender</td>
<td>Male 40 (90.1%) Female 4 (9.1%)</td>
</tr>
<tr>
<td>Education level</td>
<td>Elementary 0 (0.0%) Middle school 21 (47.7%) High-school 20 (45.5%) University 3 (6.8%)</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single 14 (31.8%) Married 19 (43.2%) Divorced 11 (25.0%)</td>
</tr>
<tr>
<td>Occupation</td>
<td>Unemployed 4 (9.1%) Employee 20 (45.5%) Manager 12 (27.3%)</td>
</tr>
</tbody>
</table>
POSICIONAMIENTOS PSILOCÓGICO Y MUNDO ACTUAL

<table>
<thead>
<tr>
<th>Game play</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retired</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>Student</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Casino game</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Slot machines</td>
<td>27 (61.4%)</td>
</tr>
<tr>
<td>Betting (i.e., horse betting)</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>Scratch cards</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>Lottery</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Playing cards</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>Online gambling</td>
<td>6 (13.6%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Debt</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100€</td>
<td>16 (36.4%)</td>
</tr>
<tr>
<td>100-1,000€</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>1,000-10,000€</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>10,000-50,000€</td>
<td>14 (31.8%)</td>
</tr>
<tr>
<td>50,000-100,000€</td>
<td>4 (9.1%)</td>
</tr>
<tr>
<td>&gt;100,000€</td>
<td>2 (4.5%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creditors</td>
<td></td>
</tr>
<tr>
<td>No creditors</td>
<td>16 (36.4%)</td>
</tr>
<tr>
<td>Banks</td>
<td>12 (27.3%)</td>
</tr>
<tr>
<td>Holding companies</td>
<td>11 (25.0%)</td>
</tr>
<tr>
<td>Friends</td>
<td>4 (9.1%)</td>
</tr>
<tr>
<td>Parents/relatives</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>Usurers</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td></td>
</tr>
</tbody>
</table>

STATISTIC ANALYSIS

The continuous variables have been reported as mean ± standard deviation, instead the categorical variables as percentages. An ANOVA analysis was performed on repeated measures with correction according to Bonferroni. The commercial software MedCalc Statistical Software v16.4.3 (MedCalc Software bvba, Ostend, Belgium) was used.

RESULTS

First of all, remember that all the continuous variables were checked for normal distribution with the Shapiro-Wilk test used for the groups less than 50. We proceed with a multivariate regression on the SOGS data at t0 and t1 and remember that the regression analysis it is a technique used to analyze a series of data consisting of a dependent variable and one or more independent variables.

In the case of the study, the variables are defined as follows:
STATISTICAL ANALYSIS

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In the case of the study, the variables are defined as follows:

- Employee variable: test scores (sogs, tas, bis, pbi, rq)
- Independent variable: sociodemographic variables / drugs / types of games etc. Through stepwise regression we can automatically know which predictors are the best of those that have been studied (gender, age, debt situation, etc.).

For SOGS, the best predictor to t0 is represented by the debt situation.

For the analysis of the BIS test that analyzes the impulsivity we proceed with the analysis of:
- Attentional impulsivity (IA)
- Motor impulsivity (IM)
- Impulsivity from non-planning (P)

With reference to the BIS scoring, as shown in the table below, we identify: A: attention

IM: motor impulsivity Ac: self-control
Cc: cognitive complexity P: perseverance
lc: cognitive instability

Compared to the BIS IA attentive impulse (deriving from the sum of BIS A and BIS Ic) we can say that it is associated with the type of game.

On the contrary, motor impulsivity is not associated with any predictor nor the impulsivity not planned, but the level of education and the type of play affect the BIS Ic.

Finally the type of game affects the BIS IA and the marital status on the BIS P.

The TAS; BIS; RBI PBI correlate with each other there is no correlation between the previous ones and the SOGS.

We summarize the data analysis at t0 below.

With reference to t0, the following situation is highlighted: SOGS:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No co-morbidities</td>
<td>17 (38.6%)</td>
</tr>
<tr>
<td>Psychosis</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Hypertension/ischemia</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>Borderline syndrome</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>Under pharmacological treatment</td>
<td>14 (31.8%)</td>
</tr>
</tbody>
</table>
At T0 only 1 subject has SOGS between 0 and 2
At T0 43 subjects are pathological> SOGS 5 BIS
Considering the scoring on the impulsivity that foresee:
30-50: low
51-80: discrete
81-120 high
The situation shows that no subject is under the value 50, 5 subjects (11.4%) have a score higher than 80, then a high impulsivity, the remaining 39 have a discrete impulsivity (88.6%)
Regarding the TAS which measures alexithymia we remember:
Proceeding with the TAS analysis, we recall that the TAS presents 3 subscales: the stability and replicability of this three-factor structure have been demonstrated on both clinical and non-clinical populations using a confirmatory factor analysis (Bagby et al., 1994a; Parker et al., 1993).
The 3 subscales are defined as follows:
- difficulty in identifying feelings (F1) (item: 1, 3, 6, 7, 9, 13, 14)
- difficulty in communicating feelings to others (F2) (item: 2, 4, 11, 12, 17)
- external oriented thinking (operative thought) (F3) (item: 5, 8, 10, 15, 16, 18, 19, 20). The scoring of the TAS
  - non-alexithymic subjects who obtain scores below 51
  - borderline subjects who obtain scores between 51 and 60
  - alexithymic subjects who obtain scores greater than or equal to 61
A t0 21 subjects are alexithymic, 12 subjects are NOT alexithymic and 6 are border PBI
Starting from the CARE and CONTROL scales, it is possible to obtain a classification of the relative maternal or paternal parenting style, based on four categories:
- OPTIMAL PARENTING (High Care - Low Control)
- AFFECTIONATE CONSTRAINT (High Care - High Control)
- AFFECTIONLESS CONTROL (Low Care - High Control)
- NEGLECTFUL PARENTING (Low Care - Low Control)
The cut-offs on which to discriminate the two levels of CARE and CONTROL are the following:
  - Mothers: Care = 27.0; Control = 13.5.
  - Fathers: Care = 24.0; Control = 12.5
A t0 8 subjects present a picture referred to the mother of “low cure and low control”; 6 subjects “high care and high control”; 13 subjects “high care and low control” and 17 subjects “low care and high control”
A t0 11 subjects present a picture referring to the father of “low cure and low control”; 4 subjects “high care and high control”; 12 subjects “high care and low control” and 17 subjects “low care and high control”
In reference to the Relational Questionnaire (RQ): 16 subjects present a style of secure attachment, 16 subjects a preoccupied style, 14 subjects a fearful style and 8 subjects a detached style.
We proceed with the analysis of t1 with relative description of the data: SOGS
At t0 they were all pathological
At t1 24 subjects have SOGS between 0 and 2 At t1 16, they are pathological> 5
At t1 there are no subjects at risk
Regarding BIS at t1: 3 subjects have a high impulsivity pattern, 33 subjects of low impulsivity, 4 subjects impulsivity medium and 4 (drop out).
With reference to TAS at t1: 8 subjects are alexithymic, 25 are not alexithymic and 7 are border lines. Regarding the PBI at t1:
Maternal:
OUTCOMES EVALUATION OF ORTHOS FOR GAMBLERS: IMPULSIVITY, ATTACHMENT STYLES, ALEXITHYMIA, AND PARENTAL BONDING

Low care and low control: 6 subjects
High care and high control: 7
High care and low control: 14
Low care and high control: 13
Paternal:
Low care and low control: 8
High care and high control: 5
High care and low control: 10
Low care and high control: 17

For the Relational Questionnaire:
Safe: 12 subjects
Concerned: 10 subjects
Fearful: 12 subjects
Detached: 6 subjects

Once the descriptive analysis is finished, we proceed with an inferential analysis between t0 and t1 divided by subgroups.

As already highlighted in the study n. 1, also in this case, the results confirm the efficacy of the ORTHOS treatment compared to the reduction of the game symptoms (scores lower than 5 in SOGS).

With reference to the other constructs analyzed referred to the GAP we can say that:
as regards alexithymia, assessed through the TAS scale, the improvement of the two subscales is statistically significant:
DIF (Difficulty Identify Feelings): difficulty in identifying feelings and distinguishing between feelings and physical sensations.
DDF (Difficulty Describing Feelings): difficulty in describing one’s feelings to others.
The improvement of the subscale is not significant:
EOT (Externally-Oriented Thinking): cognitive style oriented towards external reality.

As far as impulsivity is concerned, improvement is statistically significant in its motor components (acting without thinking) and cognitive (decision rate-inattention) while improvement in the absence of planning is not statistically significant (anticipating and predicting the outcomes of actions, absence self-control).

Referring to both the parenting attachment styles of origin and the adult relational style assessed with the PBI and RQ tests respectively, they do not show any statistically significant variation between t0 and t1.

TABLES

SOGS

![Graph showing SOGS data over time]
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