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PATHOLOGICAL GAMBLING IN CHILDREN AND ADOLESCENTS

measuring instruments, prevalence and prevention

- summary -

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Key words: *problem gambling, pathological gambling, children, adolescents, prevalence, prevention, measuring instrument, screening, validation.*

INTRODUCTION

The present thesis is one of the first of its kind in our country which treats the subject of problem and pathological gambling, a very serious health problem.

Children and adolescents represent the target population with the highest risk for developing impulse control disorder. This disorder can have devastating consequences because of the rising availability of places for gambling, easy access and diversity of games on the market. Pathological gambling is nowadays one of the most dangerous problems children and adolescents are confronted with.

It is obvious that children and adolescents play more because of the availability and diversity of games of chance. Studies indicated that 10% of adolescents have problems regarding games of chance and their consequences: lying about gambling, damage of social relationships, excessive concern with the impossibility to stop gambling, repeated borrows and/or thefts of money for continuing playing, school absenteeism because of gambling (Gupta, Derevensky and Martin, 2006).

The present paper is structured into two parts: the first is the theoretical background (Chapters 1 and 2) and the second part of personal research (Chapters 3, 4, 5, and 6).

Chapter 1 includes a presentation of the key words in gambling in children and adolescence" the concept of gambling and pathological gambling, neurochemistry of gambling, psychosocial particularities of pathological gambling, problem and pathological gambling in children and adolescents (signs and symptoms preceding pathological gambling in children and adolescents, consequences of pathological gambling in children and adolescents, research regarding pathological gambling in children and adolescents, the role of cognitive factors in developing this pathology). In Chapter 2 there are exposed the researches' objectives and hypotheses. Chapter 3 contains personal investigations: the first validation study of screening and measurement instruments of problem and pathological gambling (SOGS-RA and 20 GA-RA) and Chapter 4 studies of prevalence of problem and pathological gambling in children and adolescents (11 to 19 years old) at a regional and national level. Chapter 5 presents the results of two experimental studies of primary prevention of pathological gambling in school children. Chapter 6 is dedicated to discussions and general conclusions. At the end there are the bibliography and annexes.

CHAPTER 1

CONCEPTS

Pathological gambling is characterized by an impulse associated with compulsivity leading to gambling which affects social, personal, and scholar life. The onset of this disorder is in childhood or adolescence. Some behavioural changes are signs of pathological gambling as the need of increasing the bet, resistance associated with irritability and anxiety, obsession of the game and avoiding solving problems because of the game (Petry, 2001; Hollander, Buchalter şi DeCaria, 2000).

Getting a pathological gambler is a process in four phases which usually starts in childhood or adolescence. Gamblers develop a perception of control which is an illusion and he/she overestimates the winning possibilities (Langer, 1975).

Gamblers are prone to make illusionary bounds between events that actually are independent. Another interesting phenomenon is that gamblers while gambling have totally different cognition than when they are not gambling.

Some factors considered to be more related to developing pathological gambling are:

- Individual factor (sex, age, genetics, biology, emotional and mental state, cognitions, other behaviours at risk).
- Family factors
- Social and community factors

Signs and symptoms of pathological gambling in children and adolescents

For early diagnosis of problems related to gambling parents and teachers can pay attention to some signs which might develop into pathological gambling.

1. Spending a lot of time gambling or thinking of games
2. Absenteeism and low school performances
3. Spending more money on games
4. Mood changes and stress when they are not able to gamble or when they are blocked from gambling
5. Promises of quitting or reducing gambling in frequency are not accomplished
6. Lies or secrets related to gambling
7. Losses of money or impossibility to cover expenses related to gambling
8. Borrowing or asking for money from family members and friends for continuing gambling

9. Continuing gambling to regain money lost and the belief that they can stop playing whenever they decide or when they regained all the money lost
10. Gambling is a way of forgetting own problems
11. Gamblers speak about big wins and about previous gambling experiences
12. Gamblers are anxious to gamble big amount of money
13. Variable disposition from happiness to profound depression

There are some social consequences of severe gambling:

- Expel
- Loss of family or friends and colleagues
- Financial difficulties

Studies showed that early exposure to gambling in childhood or adolescence represent a risk factor for developing pathological gambling in adulthood (Burge et al., 2006)

Children and adolescents believe that ability and luck have a very important role in winning in gambling. This category is two times more vulnerable because they have developed abilities in using technology which create access to machines and they have a psychological vulnerability because of their age. Taking into account these aspects and because prevalence studies show alarming growing of pathological gambling among teenagers some primary prevention is needed (Todirita and Lupu, 2011c). There is a very ingenious method developed by specialists from McGill University in Montreal (Canada) for the purpose of prevention. There are interactive activities on computer according to different ages – for children there is Amazing Chateau and for adolescents Hocked City.

Some cognitive factor can lead to pathological gambling:

1. Erroneous perception of ability and luck in games
2. Illusion of control (Langer, 1975, Langer and Roth 1975; Ladouceur et al., 1988, Delfabbro, 2004)
3. Superstitions and rituals – wrong relationship cause-effect between two events which occur by chance (Walker, 1992; Ladouceur and Walker, 1996, Toneatto et al., 1997; Joukhador et al., 2004)
4. Erroneous bounds between independent games.

CHAPTER 2

OBJECTIVES AND HYPOTHESIS

These researches are supposed to contribute to scientific knowledge in the field of impulse control disorder with studies of national and international impact.

For measuring any behaviour one needs valid instruments which may register the phenomenon in an exact and accurate mode. The present thesis had as the first objective to adapt and validate the screening and measuring instruments for problem and pathological gambling in children and adolescents in Romania. The instruments chosen are SOGS-RA (South Oaks Gambling Screen – Revised for Adolescents) and 20 GA-RA (Gamblers Anonymous Twenty Questions - Revised for Adolescents).

The second objective was to identify the gambling prevalence in children and adolescents (11-19 years) firstly in a regional study and then in a national prevalence study.

After collecting these data we decided to implement experimentally some primary prevention programs and to measure which program is more efficient. Primary prevention is needed because of the reduce costs of implementing it and because treatment is always more expensive than prevention.

The last two studies compared in two different experimental designs the efficacy of rational emotive and behavioural education (REE) with the specific prevention program using Amazing Chateau program in different combination. Our hypothesis was that Amazing Chateau is more efficient than REE in the fifth study and that Amazing Chateau combined with REE is more efficient that REE alone after intervention and in follow up in the sixth study.

CHAPTER 3

STUDY A – MEASURING INSTRUMENTS OF PROBLEM AND PATHOLOGICAL GAMBLING IN CHILDREN AND ADOLESCENTS

The first two studies had as objective to adapt and validate two scales for screening and measuring problem and pathological gambling in children and adolescents following the norms stated by Hambleton, 1994; Hambleton and Patsula, 1998; Geisinger, 1994 and consist of:

1. Translation and retroversion of the scales
    a. Translation into Romanian of the scales
    b. Retroversion of the scales
    c. Evaluation of discrepancies between the original version and those obtained after retroversion
2. Reliability analysis compared with the original version
3. Norms for general population
4. Validity analysis compared with the original version
5. Norms compared with those reported by other studies

South Oaks Gambling Scale – revised for Adolescents (SOGS-RA) validations - study 1

Problem and pathological gambling has to be addressed more frequently because, as the prevalence studies show (Lupu and Todirita, 2013) there is a growingly phenomenon. Some researchers and specialists are concerned with children and adolescents gambling as Derevensky and Gupta, 2006, Dickson and Derevensky, 2006, Dickson, Derevensky and Gupta, 2008; Magoon, Gupta and Derevensky, 2007. South Oaks Gambling Screen – SOGS - (Lesieur and Blume, 1987) is the scale which measures problem gambling in adults and it is largely applied. Winters, Stinchfield and Fulkerson, (1993) derived SOGS-RA from SOGS for offering a more accurate measurement tool in the case of problem and pathological gambling in children and adolescents.

SOGS-RA has 16 items (4 of them being omitted from interpretation) and has only one factor as literature shows (Winters, Stinchfield and Fulkerson, 1993). These scale measures gambling behaviour in the last 12 months. Items from SOGS were adapted for childhood and adolescence. The new instrument focuses on the frequency of gambling and on other behaviours that accompany gambling while SOGS focuses on the matter of money. Winters, Stinchfield and Fulkerson (1993) reported a good reliability (.80) and validity of the scale. Wiebe, Cox and

Mehmel, 2000 indicate that a total of 4 or more positive answers are an indicator of problem gambling.

Criteria for gambling in DSM-IV TR include 10 symptoms and in DSM V only 9, excluding a criteria that supposes the financing of gambling throughout thefts. These criteria were used to analyze the criterion validity of SOGS-RA in the Romanian version.

Methods

Participants

Respondents in this study (*N*=197) were recruited from schools and were aged 11 to 19 years. 63.95 were male and the mean age was 15.51 years. Mean age for male was 15.93 years with a standard deviation of 2.33 and for female 14.76 with a standard deviation of 2.24. Participants belonged to classes from sixth grade to thirteenth grade.

The participants came from all big regions of Romania: Nord-Vest, North-East, South-West, South, Centre and Bucharest. 98.5% of the sample approached participated at the study.

Procedure

We first obtained a written consent from the scale's principal author, Ken Winters, Ph.D. Professor, at the Department of Psychiatry at University of Minnesota Medical School. Then parents signed an informed consent for taking part of the present study. Children and adolescents were given 30 minutes to answer all the questions and they were explained that is no god or wrong answer. They were asked to be as sincere as they can as results are not made public in the presented form and the questionnaires were anonymous.

Instruments

The validated instrument, South Oaks Gambling Screen-Revised Adolescent scale (Winters, Stinchfield, and Fulkerson, 1993), establishes the gambling severity. Based on the adult version of the South Oaks Gambling Screen (SOGS), the content of the SOGS-RA was adapted to be more suitable for young people. Items like those addressing borrowing money were less emphasized in the English SOGS-RA version. From the fifth item there were "yes-no" answers. The first four items dealt with types of games played ever or during the last year, the amount of money gambled and issues of whether parents gambled and if they gambled a lot. The other twelve items referred to chasing losses, lack of control, causes of excessive playing, emotional impact of gambling, and ways of financing gambling, consequences of this behaviour. The items were related to the diagnostic criteria of DSM-IV TR. These items can be considered as related to DSM V too as only the last item refers to the criteria excluded from DSM V – illegal financing of gambling (borrowing or stealing money for continuing the game or for paying the debts).

This scale is the most frequently used to measure gambling behaviours in adolescents (Gupta and Derevensky 1998) and reported in prevalence studies (Lupu and Todirita, 2013). The sum of these twelve items was the total SOGS-RA score which served as the criterion for assessing the severity of gambling (Winters, Stinchfield, and Fulkerson, 1993). The reliability of the SOG-RA in terms of alpha coefficient was reported to be 0.8 (Winters, Stinchfield, and Fulkerson, 1993). Alpha Cronbach for English version of SOGS-RA was 0.81 for male and 0.76 for female (Poulin, 2002), and for the Lithuanian version 0.75 (Skokauskas et al., 2009).

Results

Reliability of a psychological test refers to the expected stability of the similar measurements. If an instrument is reliable then the results obtained in similar conditions it has a certain stability in time (Dempster and Brainerd, 1995). Internal consistency refers to what extent all items measure the same variable. Stability in time indicates to what extent in different time measurements a subject can obtain similar results at a scale.

- **Internal consistency**

For establishing the internal consistency of SOGS-RA we calculated the alpha Cronbach coefficient. Table 4 shows results of internal consistency of the Romanian version of SOG-RA.

Table 4

Alpha Cronbach for SOGS-RA

	Alpha Cronbach	No of items
Male	.878	
Female	.859	
Total	.881	12

From these results - 0.88 for male and 0.86 - we can conclude that the scale is reliable. The alpha Cronbach coefficient is dependent on the number of items the scale is made of and in this case the alpha Cronbach is very high.

- **Test-retest correlation**

Stability indicates to what extent a participant can obtain similar results in different measurements in time. We tested a group of 140 persons and after a three month period we tested the same persons and then we calculated a correlation coefficient between these two administrations. The more the time passed between applications the lower the correlation was. This phenomenon is not only because the instruments is not stable in time but also because the behaviour can suffer changes in time.

The results are shown in Table 6 and they are between .77 and .98.

Table 6

Correlation between different applications

		N	Correlation	Sig.
Item 1	$5T_1$ and 5 T_2	140	.775	.000
Item 2	6 T_1 and 6 T_2	140	.926	.000
Item 3	7 T_1 and 7 T_2	140	.861	.000
Item 4	8 T_1 and 8 T_2	140	.954	.000
Item 5	9 T_1 and 9 T_2	140	.943	.000
Item 6	10 T_1 and 10 T_2	140	.984	.000
Item 7	11 T_1 and 11 T_2	140	.976	.000
Item 8	12 T_1 and 12 T_2	140	.982	.000
Item 9	13 T_1 and 13 T_2	140	.935	.000
Item 10	14 T_1 and 14 T_2	140	.964	.000
Item 11	15 T_1 and 15 T_2	140	.972	.000
Item 12	16 T_1 and 16 T_2	140	.966	.000

Validity

Any psychological instrument has to be valid. Validity refers to the relation between the score obtained to an instrument and a criterion or an external performance. This characteristic leads to the possibility to make some inferences based on the results to the test.

Criterion validity

The extent the result of a test can correlate with the already known performances or standards (named criteria) is the criteria validity. We can obtain criteria validity calculating the concurrent validity. We correlated the results obtained by the participants at DSM-IV TR with the results obtained at SOGS-RA, DSM-IV TR being the only valid instrument which measures the same pathology in Romanian.

We had two groups of children and adolescents: one without problems with gambling from schools and high-schools and one with diagnostic of pathological gambling according to a psychiatrist and based on the criteria of DSM-IV TR.

Correlation between the diagnostic according to DSM-IV TR as a criterion variable and scores obtained at SOGS-RA is r=.87, $p<0.01$, a strong correlation between the two instruments indicating a good concurrent validity, a significant relation between scores at SOGS-RA and the independent criterion (DSM-IV TR).

The predictive validity was investigated using the simple regression analysis. The unstandardized regression coefficient was .87 and R^2=0.76 which means that 76% of the SOGS-RA scores' variation is due to being in one category of diagnostic based on DSM-IV TR.

To observe if there are significant differences between the two categories – gamblers and non-gamblers – we used ANOVA. The scores' variances were significantly different ($F_{1,195}$=622.037, p=0.000) which means the scores obtained at SOGS-RA by the non-gamblers were different from the scores obtained by the gamblers.

For the Romanian version of SOGS-RA we analyzed the scale's capacity to discriminate based on a criterion (the psychiatric diagnostic based on DSM-IV TR) between subjects with problem gambling, subjects at risk for developing problem gambling and subjects with no gambling or social gambling. We used Receiver Operating Characteristics (ROC) which can prove the discriminative value of the SOGS-RA scale.

Area Under Curve (AUC) between .50 and .70 shows a minor accuracy, between .70 and .90 there is a mild accuracy and over .90 there is a strong accuracy. This accuracy refers to the capacity of the scale to classify subjects according to relevant clinical categories (Pintea and Moldovan, 2009).

Table 10

SOGS-RA's discrimination accuracy between gamblers and non-gamblers

SOGS-RA score	DSM-IV TR diagnostic		Total rows
	NO	YES	
< 4	163	0	163
+4	0	34	34
Total column	163	34	197

Accuracy of SOGS-RA's classifications – indices of sensibility: 34/34=1; specificity: 163/163=1; rate of false positive: 0/34=0; rate of false negative: 0/163=1

Construct validity

Factor analysis is frequently used for establishing a scale's construct validity. Table 11 presents the matrix of the extracted components of SOGS-RA's items

Table 11

Matrix of the extracted components of SOGS-RA's items

Item	F1	F2	F3	F3
13.	**.829**	.271	.069	.053
7.	**.789**	.179	.244	.076
15.	**.648**	.199	.451	.201
9.	**.511**	.334	.264	.243
10.	.240	**.869**	.119	.130
8.	.023	**.758**	.341	.080
12.	.433	**.689**	.100	.136
11.	.376	**.628**	.180	.100
14.	.174	.237	**.877**	.140
16.	.312	.229	**.866**	.061
6.	-.042	.188	.100	**.840**
5.	.339	.048	.085	**.733**

Extraction method: Main components analysis.

Rotation method: Varimax with Kaiser Normalization.

a. Convergent rotation in 5 iterations

There are four factors according to the matrix above. The quantitative analysis was doubled by the qualitative analysis of each item and after these two perspectives we made a decision.

The first factor includes items referring to the excessive game's consequences with impact on the subject's social life. Factor 1 is named *social consequences* and includes items 13, 7, 15 and 9. The second factor includes items 10, 8, 12 and 11 and refers to emotions and the incapacity to self-regulate emotions – *emotional regulation.* The third factor refers to *game financing* and includes items 14 and 16. The last factor – *saving appearances* – includes items 5 and 6. Wiebe, Cox and Mehmel (2000) considered that the scale has two factors – the control over the game and the game's consequences. Boudreau and Poulin (2007) consider only one factor motivating that 11 items have very good internal consistency – more than .94.

We reorganized the sample and included children of 11 years and adolescents of 18 and 19 years because the Romanian educational system include these ages in the classes targeted by the original scale (Winters, Stinchfield and Fulkerson, 1993). One more argument to extend the sample is given by studies which show that children start gambling.

For establishing the score one has to add one point for each positive answer. The scale contains 16 items and the first 4 refer to types of game played, the maximum amount of money gambled and the parents' gambling behavior. For the final score one had to consider only item from 5 to 16. The fifth item is considered positive if one of the following answers "each time" or "most of the time". The maximum score is 12 and it ranges from 0 to 12. The results obtained can be considered according to the Table below.

Table 15

Results interpretation

SOGS-RA score	0 – 1	2 – 3	≥ 4
Category	Recreational or no gambler	Gambling at risk	Problem or pathological gambling

Discussions and conclusions

We followed the well known steps for the validation of SOGS-RA: translation, retroversion, reliability and validity, comparing norms (Hambleton, 1994; Hambleton and Patsula, 1998; Geisinger, 1994). After collecting date we analyzed them – factor extraction and analysis – we obtained four factors: gambling consequences, game financing, emotional regulation, and saving appearances. The scale has a very good internal consistency (alpha Cronbach between .88 and .86). The concurrent validity (throughout correlation with DSM-IV TR diagnostic) is very good (Pearson correlation $r=0.87$, $p<0.01$) and show a significant relation between SOGS-RA scores and DSM-IV TR criteria.

The predictive validity was investigated using the simple linear regression and the results indicate that 76% from the SOGS-RA score variance can be explained by the variance of diagnostic criteria according to DSM-IV TR. The SOGS-RA score makes possible the establishing of the level of gambling according to norms.

Some limitations have to be mentioned and refer to the asymmetric structure of the sample. Even though the number of the subjects respect the condition related to the number of items the scale is made of the next sample has to consider the equilibrium between genders.

Some future perspectives occur – a new validation study taking into account the above limitations and some correlation data between SOGS-RA and another measuring instrument for the same behavior.

Gamblers anonymous twenty questions revisited for adolescents - 20 GA-RA - study 2

Method

Participants

Respondents in this study (N=165) were recruited from schools and were aged 11 to 19 years. 50.30 were female and the mean age was 15.35 years with a standard deviation of 2.18. Mean age for male was 15.61 years with a standard deviation of 2.30 and for female 15.08 with a standard deviation of 2.04. Participants belonged to classes from sixth grade to thirteenth grade. The participants came from all big regions of Romania: Nord-Vest, North-East, South-West, South, Centre and Bucharest.

Procedure

Parents signed an informed consent for taking part of the present study. Questionnaires were applied by students in psychology and medicine who were volunteers in Romanian Association for the Study of Gambling. Children and adolescents were given 30 minutes to answer all the questions and they were explained that there is no god or wrong answer. They were asked to be as sincere as possible.

Instruments

The twenty questions of Gamblers Anonymous frequently used for measuring the intensity of pathological gambling among adults were adapted for the specific activity of children and adolescents. The new developed instrument was names 20 GA-RA because it was adapted and revisited for adolescents.

The new instrument has also 20 questions with “yes or no” answers. The items were related to the diagnostic criteria of DSM-IV TR. This scale is used to measure gambling behaviours in adolescents (Derevensky and Gupta, 2000) and reported in prevalence studies (Lupu and Todirita, 2013). The sum of these twenty items was the total 20 GA score which served as the criterion for assessing the severity of gambling.

Data analysis

Reliability

Reliability of a psychological test refers to the expected stability of the similar measurements. If an instrument is reliable then the results obtained in similar conditions it has a certain stability in time (Dempster and Brainerd, 1995). Internal consistency refers to what extent all items measure the same variable. Stability in time indicates to what extent in different time measurements a subject can obtain similar results at a scale.

Internal consistency

For analyzing the internal consistency of 20 GA-RA we calculated the alpha Cronbach coefficient - .92 for male and .96 for female. The internal consistency coefficient for 20 GA-RA is high - .94 as in the original English version in adults which show a good reliability.

Table 19

Alpha Cronbach for 20 GA-RA

	Alfa Cronbach	No of items
Male	.924	
Female	.966	
Total	.938	20

Validity

Any psychological instrument has to be valid. Validity refers to the relation between the score obtained to an instrument and a criterion or an external performance. This characteristic leads to the possibility to make some inferences based on the results to the test.

Criterion validity

The extent the result of a test can correlate with the already known performances or standards (named criteria) is the criteria validity. We can obtain criteria validity calculating the concurrent validity. We correlated the results obtained by the participants at SOGS-RA with the results obtained at 20 GA-RA, SOGS-RA being the only valid instrument which measures the same pathology in Romanian.

We had two groups of children and adolescents: one without problems with gambling from schools and high-schools and one with diagnostic of pathological gambling according to a psychiatrist and based on the criteria of DSM-IV TR.

Correlation between the diagnostic according to DSM-IV TR as a criterion variable and scores obtained at 20 GA-RA is r=.89, $p<0.01$, a strong correlation between the two instruments indicating a good validity, a significant relation between scores at 20 GA-RA and the independent criterion (DSM-IV TR).

Correlation between SOGS-RA as a criterion variable and 20 GA-RA as a predictive variable was .97, a very strong correlation between the two instruments. Person correlation ($r=0.97$, $p<0.01$) indicates a good concurrent, a significant relation between scores at 20 GA-RA and the independent criterion (SOGS-RA).

We were interested in the capacity of the new scale to discriminate based on a criterion between the three categories of players: non gamblers, problem gamblers and pathological gamblers.

We used Receiver Operating Characteristics (ROC) which can prove the discriminative value of the SOGS-RA scale. Area Under Curve (AUC) between .50 and .70 shows a minor accuracy, between .70 and .90 there is a mild accuracy and over .90 there is a strong accuracy. This accuracy refers to the capacity of the scale to classify subjects according to relevant clinical categories (Pintea and Moldovan, 2009).

20 GA-RA score variance were significantly different ($F_{1.163}$=672.629, p=0.000) that is the mean score for non gamblers at 20 GA-RA was significantly different from the mean scores of the gamblers. Results are similar with those for SOGS-RA.

The cut off point that the scale discriminates between pathological gamblers and the other type gamblers is 7 points. That is the cut off point the scale has a .8 sensibility (true positive/true positive+false negative, 24/30) and a specificity of 1 (true negative/true negative+false positive, 135/135).

Table 26

20 GA-RA's discrimination accuracy between gamblers and non-gamblers

20 GA-RA scores	Diagnostic DSM-IV TR		rows
	NO	YES	
< 7	135_{TN}	6_{FN}	141
+7	0_{FP}	24_{TP}	24
Total	135	30	165

sensilibitye: 24/30=0.8; specificity: 135/135=1;
false positive: 0/24=0; false negative: 6/135=0.04

Because the scores obtained by the participants were significantly different according to the category – non gamblers, problem and pathological gamblers – we can conclude that the scale can differentiate between pathological, problem and non gamblers.

Construct validity

Factor analysis is frequently used for establishing a scale's construct validity. This is a statistical procedure for finding out a small number of latent variables (or factors) using covariance of observed variables. The aim of factor analysis in this study was to reflect exploratory factor analysis of the twenty items of 20 GA-RA.

All items grouped in one factor. Only one item – 11 – was F=.36, but it was not excluded from the scale.

The score of the scale was obtained adding 1 point for each positive answer. The maximum score was 20 and the minimum 0. The two cut off points present in the literature too were 2 and 7. All scores under 2 were interpreted as non gamblers, between 2 and 6 problem gamblers and above 7 points were pathological gamblers.

Discussions and conclusions

In the adaptation and validation of the present scale we followed the steps of translation, retroversion, reliability and validity analysis, norms proposed by Hambleton, 1994; Hambleton and Patsula, 1998; Geisinger, 1994.

Following the steps above, we collected the data and analyzed them. After factor analyze there was only one factor; the internal consistency for school children aged from 11 to 19 years was r=.94. The concurrent validity for this scale was established with a correlation with the scores obtained at SOGS-RA (r=.9). Predictive validity was investigated calculating the correlation between the two variables. The variance analysis showed that 80% of the variance of the scores at 20 GA-RA can be explained by the variance of scores at SOGS-RA. All data revealed that 20 GA-RA is a reliable and valid instrument for evaluating the intensity of gambling – whether problem or pathological.

The aim of the present study was to adapt and validate the measuring instrument of problem and pathological gambling in children and adolescents. The present study had an equilibrated sample being symmetric regarding the gender. We tried to overcome a previous limit from the previous study.

The limits of the present study refer to the lack of a version in English for the same age range so there are no psychometric values to be compared with. This version adapted for children and adolescents - 11 to 19 years of age – was obtained by multiple adaptations of the original scale for adults. Validity studies are to be developed. Another limit of the study is that this instrument as the previous is self reported and interferes with the characteristic of the pathological gamblers who lie a lot.

Future direction should validate the new scale and could develop instruments that could be completed by the gamblers' families who usually bring the patient in the office.

CHAPTER 4

STUDY B – PROBLEM AND PATHOLOGICAL GAMBLING IN CHILDREN AND ADOLESCENTS PREVALENCE STUDIES

In 1996, Walker and Dickerson make a critical analyze of the problem and pathological gambling prevalence studies. It seems that until 1996 there was no study to be made according to the definition specified by the authors – the percentage of cases of pathological gambling that occur in a certain moment. A frequent error in all studies was the questions – these referred to the occurrence of gambling during life spam and not in the present of the respondents. This would lead to the overestimation of the prevalence of pathological gambling. The second mistake was made because of the need of studies to specify whether the respondent was a pathological gambler or not. In the 1996s the SOGS was not sufficiently validated. Anyhow as all studies applied the same instrument the results can be compared.

In 2012 Hayer made an analyse for the same prevalence studies which regarded European adolescents (Table 30)

Table 30

European studies on pathological gambling in children and adolescents with a sample ≥ 500 (Hayer, 2012)

Study/Country	Evaluation instrument	Sample characteristics (all scholars)	At risk gamblers prevalence	Problem gambling prevalence
Fisher (1999) Great Britain / Wales	DSM-IV-MR-J*	9774 12-15 years	-	5.6%
Ipsos Mori (2009) Great Britain / Wales / Scotland	DSM-IV-MR-J	8958 11-15 years	3.4%	2.0%
Johansson and Götestam (2003) Norway	DSM-IV**	3.237 12-18 years	3.5%	1.8%
Lupu and Todiriţă (2012) Romania	20 GA-RA***	1032 11-19 years	23.5%	3.5%
Moodie and Finnigan (2006) Scotland	DSM-IV-J	2043 11-16 years	15.1%	9.0%
Ólason et al., (2006) Island	SOGS-RA**** / DSM-IV-MR-J	3511 13-15 years	4.1/3.7%	2.8/1.9%
Skokauskas and Satkeviciute (2007) Lithuania	SOGS-RA/DSM-IV-MR-J	835 10-18 years	10.5/9.1%	5.2/4.1%
Villella et al., (2011) Italia	SOGS-RA	2853 13-20 years	-	7.0%

* DSM-IV-MR-J – Diagnostic and Statistical Manual for Mental Disorders – 4th edition – Mutiple Response – for Juvenile
**DSM-IV - 3-4 points – at risk gambler and ≥5 – pathological gambler;
***20 GA-RA - 20 Gamblers Anonymous Questions – Revised for Adolescents (Romanian version) - ≥7 – pathological gambler
****SOGS-RA- The South Oaks Gambling Screen-Revised for Adolescents (2-3- at risk gambler; >or =4 –problem or pathological gambler)

Regional prevalence study- study 3

Introduction

Romania is one of the European countries that have carried out research on gambling and/or problem gambling at a regional level rather than at a national level. European research has consistently shown that problem gambling can negatively affect significant areas of a person's life, including their health, employment, finances, and interpersonal relationships. In addition, there are significant co-morbidities with problem gambling, including depression, alcoholism, and obsessive-compulsive behaviours. These co-morbidities may exacerbate, or be exacerbated by, problem gambling. Availability of opportunities to gamble and the incidence of problem gambling within a community are known to be linked as Griffiths mentioned in 2009 Report. Results from studies in different European countries suggest that problem gambling among adolescents is considerably higher than among adults. Although problem gambling among adolescent samples tends to be higher than in adult samples, many of the participants used in these studies are either local survey and/or use opportunistic or non-representative samples. However, in countries where there have been large samples with good representation (e.g., Great Britain, Germany), the problem gambling prevalence rate among adolescents is at least four to five times higher than in the adult population (Griffiths, 2009).

Therefore it is very important to have prevalence studies even though they are preferentially designed, according to the possibilities of access to the studied group. Direction for further studies should follow the standardized procedure: having a representative sample for prevalence data for Romanian teenagers and adults, too.

In each country there are specific regulations that establish limits and control access to games. In Romania there is a legal limit of age and any teenager under 18 years old should not be given access to games.

New regulations regarding gambling in Romania were established according to no. 10 Article from the Romanian Government Emergency Ordinance 77/2009. The following are considered gambling:

1. Lotteries
2. Pari-mutuel betting and fixed-odds betting
3. Gambling specific to casinos
4. Slot-machines
5. Bingo in games rooms
6. Bingo games organized by TV stations

The following are not considered gambling and they are allowed without authorization:

1. Tombola organized in schools, kindergartens, and other communities that have an entertaining and non profit character for the organizer;
2. Amusing games with machines, vehicles, and other devices that do not suppose profit based on randomized elements, but having the aim of measuring force, intelligence and dexterity of the participants;
3. Actions organized by different economic operators, according to law, aiming at increasing selling and which do not imply participation fee or any other type of payment or contribution from the participants and neither raising the price previous to the advertising action

The old licence for gambling is replaced by the new licence for gambling's organization (given for 5 years) and the authorization to exploit gambling (given each year).

Lupu, 2009 recently reviewed the empirical evidence on gambling and problem gambling in Romania. As far as these data concern, there have not been carried out national gambling prevalence surveys although some regionalised researches have been done.

Although there has been little research in adult gambling in Romania, there has been some research on adolescents. Lupu et al., 2002 examined the prevalence of problem gambling using the GA-20 scale in three Romanian counties on 500 high-school students between the ages of 14 to 19 years (57% female and 43% male). They reported that 34 students (6.8%) were identified as problem gamblers (scoring 7 or more out of 20 on the gambling scale). Among these 34 individuals most were male (n=28). The games most frequently played by Romanian teenagers were: poker (35%), football pools (56%), bingo (32%), basketball betting (6%), blackjack (3%), and roulette (3%).

Two-thirds of the sample gambled very frequently (64%) with 18% gambling rarely or very rarely. Most of the gamblers played in groups (82%). The mean age the participants began gambling was of 14 years. Findings also showed that 18% of the problem gamblers had alcoholic fathers and 12% had fathers who were problem gamblers. No significant differences were found between problem and non-problem gamblers in what regards family income and social status. Among pathological gamblers there were students with high financial and social status, but also with low incomes and problems in family. This is a characteristic for those with dependencies.

In another study, Lupu, Boroş, Miu, et al., 2001 analysed the risk factors for problem gambling in 231 Romanian adolescents between the ages of 14 and 18 years. Using the GA-20 scale, Lupu et al., 2001 categorised the participants into three groups: non-gambling/ recreational gambling, occasional gambling (0-1 positive answers – Level 1); problem gambling (2-7 positive

answers – Level 2); pathological gambling (7-20 positive answers – Level 3). Results revealed that 34% were non-gamblers or gambled very occasionally (Level); 54% were problematic players (Level 2); and 12% were defined as pathological gamblers (Level 3). Risk factors for pathological gamblers included: parental divorce, serious physical illness in a family members, death of a family member, family break-up, psychological illness in a family member, sexual abuse, and being in a severe accident. Results also showed that 14% of problem gamblers used illegal drugs. Lupu et al., 2001 identified two distinct types of pathological gambler:

- Adolescents from an unfavourable family and social environment, who had to deal with stress and trauma (e.g.: neglect, physical, and/or sexual abuse). In this case gambling was a coping mechanism to deal with chronic stress.
- Adolescents from a favourable family and social environment with a medium to high income, where parents neglected the child because of hard working. In this case gambling was a way to spend time and/or to attract a parent's attention.

Lupu (2009) noted that the significant prevalence of pathological gambling among Romanian adolescents in the study by Lupu et al., 2002 has been confirmed by similar cases in Romanian child psychiatry clinics (Lupu et al., 2008, 2009).

Method

After 8 years from the last study designed in Romania by Lupu et al. in 2002 there was the need to find out the direction toward which this phenomenon was heading. Gambling is getting higher in rates of frequency, intensity and duration. Problems and consequences following gambling are more tragic. Suicide and crimes are very high among people and teenagers who gamble. We tried to have a bigger sample, which is from 500 to 1032 children and adolescents, and to extend the ages from 14 to 11 years old as the lowest limit. This was because the literature mentions cases of pathological gambling starting with this age of 11 years old and most of pathological gamblers betting for the first time at this same age. The sample was designed according to access criteria. Schools where the study was conducted were chosen on the criteria of accessibility but classes who participated were randomly selected, some of the schools or high-schools participating with 100% of the classes (that is the case of Harghita county's school enrolled). Out hypothesis was that when lowering the age limits the prevalence will diminish. It is expected that children between the ages of 11 and 14 years do not gamble as much as the adolescents between the ages of 15 and 19 years.

The study was performed on one thousand thirty two teenagers, between the ages of 11 to 19 years from Cluj and Harghita counties. Teenagers completed a structured questionnaire "The 20 questions of the Gamblers Anonymous American Association" and 20 more questions related to

age, sex, family, income, school, toxic drug use, favourite gambling games and frequency of gambling, the maximum amount gambled (Lupu&Todiriţă, 2010). Participants completed the questionnaire in 50 minutes. The design is descriptive one and we analyzed the descriptive parameters and the frequencies.

Data analysis

After collecting the data we were able to make some exploratory data analysis on these.

The study indicated that the subjects were divided into three groups according to their results after completing the questionnaire:

Level 1 - 0-1 - non-gambling/recreational gambling or occasional gambling

Level 2 - 2-6- problem gambling

Level 3 - ≥ 7 – pathological gambling

Table 32

Categories of Gamblers

	Male	Female	Total	Percentage
Level 1	437	316	753	72.96%
Level 2	200	43	243	23.54%
Level 3	33	3	36	3.48%
Total	670	362	1032	99.98%

In Table 32 you can see how many participants are falling in each category mentioned above. As you can observe there are 23.54% problem gamblers who should probably need counselling and to be informed about games of skill and games of chance.

The mean age of pathological gamblers is 16.52±1.82 years and the youngest gamblers are only 11 years old (in two cases).

The questionnaire reveals the most frequent games played by Romanian teenagers. In Table 2 you can see how often teenagers play each kind of games. You can see that there is a difference between the games played weekly and those played sometimes. SOGS-RA which is in process of being validated is an instrument that offers this kind of date, separating the information between games played during the last year and games played during lifetime. The most frequent games played are sport betting and slot machines, lotto and internet casino and pool bets, roulette and Black- jack, playing cards for money. In Table 33 you can observe the percentages and the number of those who declared practicing this kind of games.

Table 33

The Most Frequent Games Played

Weekly	Number of players/Percentage	Sometimes	Number of players/Percentage
1.Sport betting/Slot machines	13 36.11%	1.Playing cards for money	15 41.66%
2.Lotto/Internet Casino/Pool bets	9 25%	2.Sport betting/Scratch tickets/Lotto	13 36.11%
3.Roulette/Black- jack	8 22.22%	3.Pool bets	11 30.55%
4.Playing cards for money	6 16.66%	4.Internet Casino	10 27.77%
5.Stocks	5 13.88%	5.Slot Machines	9 25%
6.Horse betting/Playing dice on money	4 11.11%	6.Roulette/Black- jack	6 16.66
		7.Playing dice on money	5 13.88%
		8. Horse betting	2 5.55%
		9.Poker	2 5.55%

We were interested in the association between gambling and psychoactive substances abuse. In Table 34 you can see that the most frequent association between gambling and substance abuse is with alcohol in 24 cases from 36, and then with the so called legal drugs, cigarettes, and illegal drugs. Those who reported consuming legal drugs consumed illegal drugs too. We consider that a high rate of those who answered the questions were not accurately declared smoking as in other studied with the same sample the rates of smoking were significantly higher.

Table 34

Association between Gambling and Psychoactive Substances Abuse

Alcohol	Illegal drugs	Legal drugs	Smoking
24 (66.66%)	5 (13.88%)	7 (19.44%)	6 (16.66%)

Discussions and conclusions

Figure 2 presents the percentage of each category observing that pathological gamblers are 3.48% meaning that they are less than in the study from 2002.

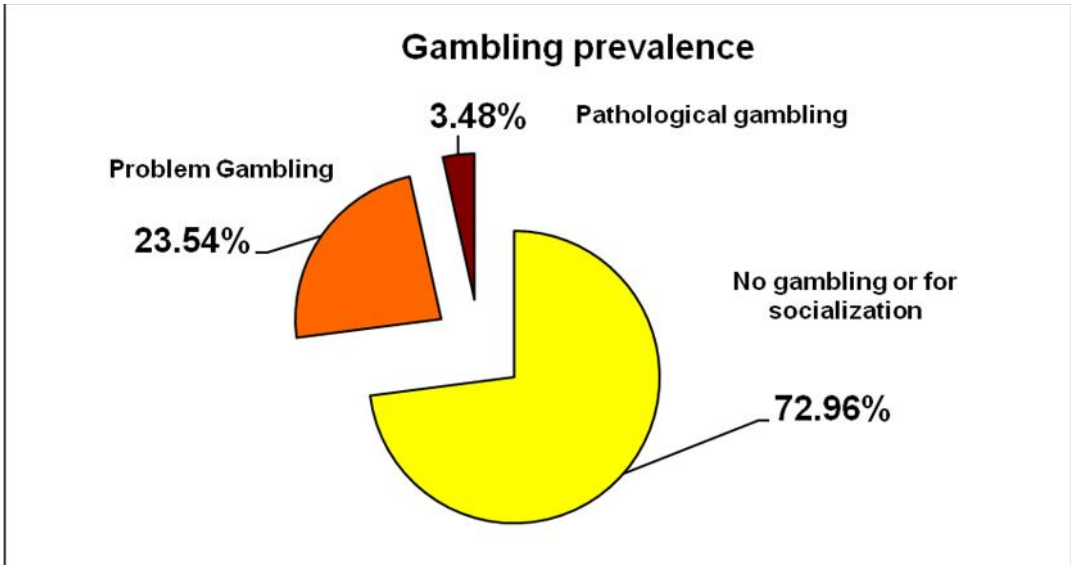

Figure 2. Gambling prevalence – regional study

As we mentioned in the hypothesis we expected the percentage to lower because of the changes in the sample's mean age. In the same figure you can see that a lot of children and adolescents 23.54% have problems with gambling this meaning the prevention programs are recommended as an educational politic. Further studies designed by the authors of the present article demonstrate the effectiveness of prevention programmes in children. Both pathological and problem gambling exceed percentages found in other countries. It is well known that gambling prevalence in adolescents is higher but in this case the output is alarming.

The association of psychoactive substance abuse with gambling is a well known phenomenon. We expected that the highest association to be with smoking as cigarettes are easy to provide among children and adolescents though selling them to children and adolescents is legally forbidden. We consider that a high rate of those who answered the questions were not accurately declared smoking as in other studied with the same sample the rates of smoking were significantly higher.

In Table 35 there is the comparison between 2002 and 2010 studies in Romanian teenagers regarding problem gambling diagnosed with 20-GA.

Table 35

Comparison between 2002 and 2010 Studies in Romanian Teenagers

Year	2002	2010
Sample	500 adolescents 14-19 years old Cluj, Sălaj, Bacău counties 43.40% male 56.60% female	1032 teenagers 11-19 years old Cluj, Harghita counties 65.57% male 34.43 % female
Pathological gamblers	34 6.8% 82.36% male and 17.64% female Sex ratio F:M 1:4.6	36 3.48% 91.66% male and 8.33 % female Sex ratio F:M 1:11
Preferred games for gambling	1.Pool-55.88% 2.Poker-35.29% 3.Bingo-32.25% 4.Basketball beting-5.88% 5.Roulette and creps-2.94%	1.Sport betting/Slot machines-36.11% 2.Lotto/Internet Casino/Pool bets-25% 3. Roulette/Black Jack-22.22% 4. Playing cards for money-16.66% 5. Stocks-13.88% 6. Horse betting/Playing dice for money-11.11%
Maximum amount gambled	0.5-5 Euro-32.35% 5-10 Euro -32.35% 10-100 Euro -20.58% 100-1000 Euro-14.70%	0.5-5 Euro-38.88% 5-10 Euro -13.88% 10-100 Euro -44.44% 100-1000 Euro-2.77%
Group gambling	Individual - 17.64% Group - 82.36%	Individual - 22.22% Group - 72.22% Individual as well as in group - 5.55%
Academic results	Acceptable - 47.06% Modest - 52.94%	Acceptable - 69.44% Modest - 30.55%
School attendance	Regular attendance - 35.30% Irregular attendance - 64.70%	Regular attendance - 61.11% Irregular attendance - 38.88%
Family incomes	Low incomes - 41.77% Moderate and high incomes - 58.83%	Moderate incomes - 52.77% Moderate and high incomes - 47.22%
Control perception in gambling	The belief that they can control the game - 76.47% The chance has no importance in gaining - 26.47%	The belief that they can control the game - 50% The chance has no importance in gaining -50%
Mean age in starting gambling	13.25±1.51 years	14.94±2.30 years

There is a clear difference in what regards the size of the sample. The 2002 study contained only 500 participants and the female were more representative in this sample which can lead to lower rates of gambling as females do not start gambling so often at this age as males do. Pathological gamblers are more males in both studies; it is as expected and according to the literature. Preferred games compared during these 8 years are changes because of the access to new types of games like slot machines and internet gaming. In 2002 games like bingo and pool on money, or playing cards on money were more frequent than nowadays. The trend is to move gambling from casinos and face to face games to the internet. In what regards the maximum amount of money gambled there are some differences between the two studies as the majority bets more money in the last study than they did in 2002. It seems that teenagers consider gambling a way of

making money and maybe a good solution to get rid of usual tasks, of boring and maybe forgetting daily problems. It is specific for this age to have a highly socialized life and make most of the activities in groups, gambling being one of them. Some of the teenagers tend to feel themselves more important while gambling and getting the attention of their peers. It is known that gambling leads to lowering academic results and increasing the number of absences which can be an alarming sign for teachers. Family incomes do not affect whether teenagers gamble or not. Being rich or poor is not a condition for being more predisposed to gambling. Both are affected by gambling in an equal way. Each pathological and problem gambler has cognitive distortions and they think they can control the outcome of a game of chance misleading the process with that specific to the games of skills. Irrational beliefs, magical thinking or superstitions are commune among gamblers and this is the case with adolescent gamblers too. The mean age in starting gambling is 13.25±1.51 years in 2002 and 14.94±2.30 years in 2010.

National prevalence study - Romania- study 4

Introduction

A growing number of researches indicate a rising in the prevalence of pathological gambling in the last period and most of the cases are diagnosed during adolescence especially in countries from the Western Europe (Lupu and Todiriţă, 2011b, Todiriţă and Lupu, 2011a, 2011b). Establishing the prevalence and comparative studies are difficult to conduct because of the differences referring to age, location, sample size and type of measurement.

The fourth study aims at measuring the national prevalence of problem and pathological gambling in children and adolescents (11-19 years).

Method

Participants

For a significant sample we asked for a randomization from a sociologist. He took into account the population size in 2010 of children and adolescents of 11 to 19 years old. That was 2 091 218. For establishing the minimum size we calculated it with http://www.surveysystem.com/sscalc.htm. For a level of confidence of 95% the sample has to be at least 1067. The pupils were chosen from schools in Romania based on a randomized sample made by Macro Media Transylvania and the County Scholar Inspectorate.

The number of the participants was 2006 aged 11 to 19 years old all from schools. The rate of answer was 89.15% from a total estimated of 2250. Mean age was 15.04 with a standard

deviation of 2.3. From the 2006 respondents 48.3% were males and 21.2% were from the rural zone.

According to the sample characteristics given by the experts we had to respect some rules:

1. Choose schools from the 7 big regions of Romania: North-West, North-East, South-East, South-West, South, Centre and Bucharest.

   Table 39

   Sample distribution according to region

	Frequency	Percent	Cumulative percent
North-East	858	42.8	42.8
South-East	558	27.8	70.6
South	254	12.7	83.3
South-West	26	1.3	84.5
North-West	87	4.3	88.9
Centre	24	1.2	90.1
Bucharest	199	9.9	100.0
Total	2006	100.0	

2. For each region we were indicated what type of school we should choose randomly. We had to choose from the following types: College, Secondary, School groups, High school or other type.
3. Pupils were chosen from the grade fifth to thirteenth respecting the age span.
4. For each class we had to respect another rule – the distribution of rural versus urban location.

   Table 40

   Classes' distribution according to environment

No. of classes	Urban	Rural	Total
5-8	22	22	44
9-13	41	4	45
Total	63	26	89

5. In each selected school we randomly chose a class

Procedure

We followed the steps:

1. Established the criteria for making a sample
2. Establish the working group and collecting the data

3. Introducing the data in data bases
4. Analyze of data

Instruments

Questionnaires applied consisted of:

1. Demographic data (school, class, city, county, age, gender, nationality)
2. Questions regarding predisposal factors for developing pathological gambling (family characteristics, socio-cultural and individual traits of gambling)
3. Questions regarding other risk behaviours (substance abuse)
4. Questions regarding types of games usually accessed
5. Questions regarding the way they perceive gambling and its control
6. SOGS-RA, described and validated in previous study
7. 20 GA-RA, described and validated in previous study

Data analysis

Prevalence of problem and pathological gambling according to SOGS-RA

From all 2006 respondents 32.6% declared they had gambled at least once in their life and 22.6% that they gambled in the last year. 653 participants gambled at least once in their life and were asked what their age at the first game was. They started at 11 years old (105 participants).

Scores at SOGS-RA ranged between 0 and 11 points. That means that they gamble at risk (2 to 3 points) and they are problem and pathological gamblers (above 4 points at SOGS-RA).

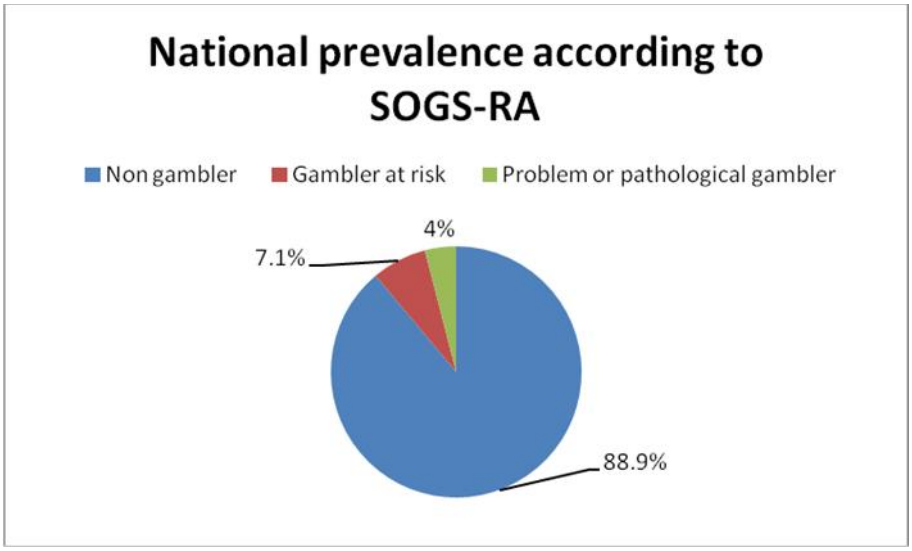

Figure 3. Problem and pathological gambling according to answers give at SOGS-RA

From the entire sample (*N*=2006) 52.69% were female and 16.9% declared they gambles at least once in their lives. From the male participants 49.3% gambled at least once.

11.3% from the female participants and 34.8% from males declared they participated in gambling activities in the last year. Mean age of the onset was 13.34±2.80 years in female and 13.64±2.45 years in male.

Implication in other risk behaviour

4% from the sample are problem or pathological gamblers and 7.1% are at risk to develop pathology, while 29.4% drink alcohol, 6.0% consume drugs and 17.3% smoke. Gambling in this age span is accompanied by alcohol and smoking. For an explanatory model there must be conducted studies of moderation and mediation.

Family and social influences

7.0% declare that at least one parent gambles. It is well known that parents of gamblers gamble more than those of the children who do not gamble at all. This behaviour is better manifested when learnt throughout vicariate learning.

Perception of control in gambling

79% from the problem and pathological gamblers considered they gambled more then they planned. 3.8% consider that they determine the game. This percentage is almost equal to the percent of problem and pathological gamblers. 55% of those who had more than 2 positive answers consider that they control the output of the game.

Gambling prevalence according to answers given at 20 GA-RA

Scores were distributed from 0 to 20. For a diagnostic of problem gambler one had to positively answer at 2 to 6 questions and for pathological gambling they had to give more than 7 answers.

2.6% were pathological gamblers and 10.1% were problem gamblers. That means that 12.7% from the school population aged 11 to 19 years should be referred to a special health service for prevention or intervention.

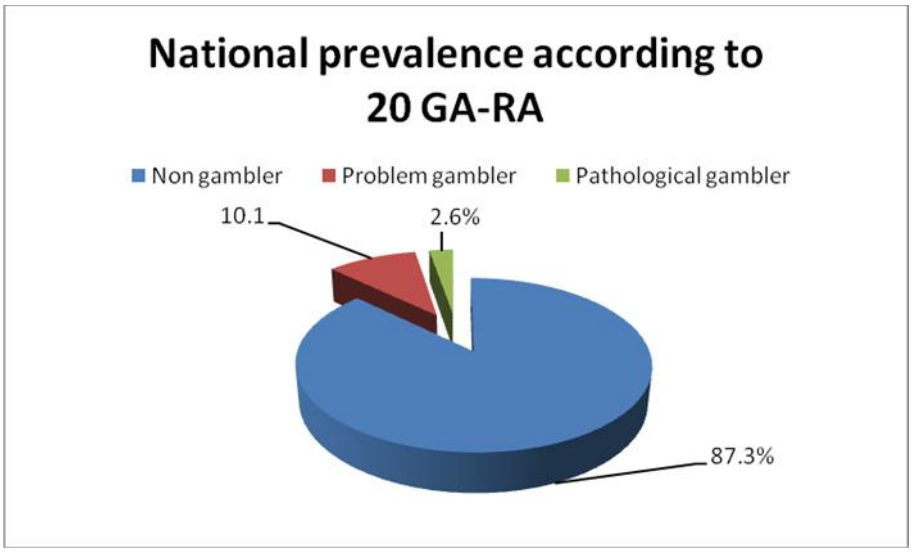

Figure 4. Prevalence of problem and pathological gambling according to answers at 20 GA-RA

Comparing data obtained with the two instruments it can be observed that the first instrument overestimated problem gambling. Data has to be very carefully analyzed because SOGS-RA gives information about gamblers at risk on one hand (7.1%) and problem and pathological gamblers on the other hand (4%). 20 GA-RA gives information about problem gamblers on one hand (10.1%) and pathological gamblers on the other hand (2.6%).

Mean age of problem gamblers was 16.32 years and of pathological gamblers 16.83.

Pathological gamblers characteristics

85.2% from pathological gamblers feel to go back to regain what they had lost and 20.4% thought of suicide because of problems caused by gambling. This percentage is found out in the literature too: one in 5 pathological gamblers try to suicide.

Their parents are in 67.9% of cases married while the non gamblers' parents are married in 72.5% of cases. 52.8% of pathological gamblers' families have good and very good incomes. Their grades for the previous semester are of a mean of 7.84±1.10.

Discussions and conclusions

The present study investigated children and adolescents 11-19 years old from schools all over Romania, a sample which permits the generalization of the data obtained. We followed all the rules to make a national prevalence study and we collected the date with a group of psychologists and doctors volunteers at Romanian Association for the Study of Gambling.

The following Table combine the results obtained in the national prevalence study comparing the answers at the two instruments validated.

Table 54

Results according to SOGS-RA and 20 GA-RA

Dimension analyzed	SOGS-RA	20 GA-RA
Sample	2006 children and adolescents 11-19 year, school population from all types of schools 7 geographical zones: NE, SE, NW, NE, S, Centre, Bucharest 48.3% male 51.7 % female	
Gamblers	- 4.0% (81) problem or pathological gamblers - 91.4% were male from the above category - 7.1% (142) at risk	- 2.6% (53) pathological gambling - 90.4% were male from the above category - 10.1% (203) problem gambling
Preferred games	1. Scratch cards – 23.2% 2. Loto – 22.9% 3. Tickets with prizes – 21.2% 4. Dices for money – 19.5%	
Way of gambling	Individual - 31.2% In group – 68.8%	
School results of pathological gamblers	From 6 to 10 7.48±1.10	
Absenteeism of pathological gamblers	32.1% declare that absenteeism will affect their evolution in academic preparation	
Incomes of pathological gamblers	Moderate and above medium incomes - 52.8%	
Perception of control of the gamblers	Can control the outcome of the game - 55%	
Mean age of onset	13.56±2.55 years	

In what regards the **limits** of the present study we can state that the questionnaire was self reported and data can be biased as gamblers usually lie about their gambling. Another limit is because the sample considered only the scholar population. The observation confirmed that children and adolescents who do not go to school game a lot. Pathological gamblers usually are expelled or they renounce to school. The sample distribution given by experts in sociology was pretty much unequal.

A **future perspective** should include explanatory models of gambling behaviour which could consider the moderator or mediator effect of other behaviours at risk or family and social influences.

Other future direction should consider primary prevention programs for all population above 11 years because the age of onset was this age.

CHAPTER 5

STUDY C – PRIMARY PREVENTION STUDIES FOR PATHOLOGICAL GAMBLING IN CHILDREN AND ADOLESCENTS IN SCHOOLS

Primary prevention of pathological gambling in children and adolescents – experimental study - design 1- study 5

Introduction

Problem gambling and pathological gambling are a growing phenomena all over the world. This pathology is better studied in adults, but there are some researchers and specialists who are concerned with children and/or adolescents (Derevensky & Gupta, 2006; Dickson & Derevensky, 2006; Dickson, Derevensky & Gupta, 2008; Magoon, Gupta & Derevensky, 2007). Prevalence studies demonstrate that there is an increasing rate of problem and pathological gambling among children and adolescents. Some of the countries made prevalence studies for this age range: Nordic countries (2.3% in Finland, Ilkas & Aho, 2006; 2.5% in Norway, 2.8% in Iceland; Olason, Skarphendinsson, Jonsdottir, Mikaelsson & Gretarsson, 2006 In Jaakkola, 2009); Germany (3% - Hurrelmann, Schmidt & Kähnert, 2003); Great Britain (5%-6%, see Griffiths, 2000; 2003); Lithuania (4% - Skokauskas et al., 2005; 2007); Romania (6.48% - Lupu & Todirita, 2010). Although problem gambling among adolescents tends to be higher than in adults, many of the participants used in these studies are either local surveys and/or use opportunistic or non-representative samples. However, in countries where there have been large samples with good representation (e.g., Great Britain), the problem gambling prevalence rate among adolescents is at least four to five times higher than in the adult population (Griffiths, 2009).

Taking into account these evidences, young people are clearly more vulnerable to the negative consequences of gambling than adults are. It is always better to prevent than to treat when there is the possibility to choose. That is why primary and secondary prevention programs should be integrated into school curriculums.

Two of the pathological gamblers in the sample analyzed by Lupu & Todirita, 2010 were 11 years old. The age at which young people start playing games for money is decreasing and prevention should start as early as possible, maybe during the age chosen in our study - 12 to 13 years. Most of the researchers agree that there is no prevention strategy which could exclude others. Baer, McLean & Marlatt (1998) argue that no single prevention approach to adolescent drug and

alcohol abuse has found to be uniformly successful; researchers agree that this is likely to be the case for gambling prevention.

Prevention programs should be tailored to the developmental level of youth they target, to their intelligence level and to their background (cultural and socio-economical). Abstinence might be a solution when trying to delay the first betting session in children's life but offering realistic and sustainable information about games and their outcomes seem to be more efficient.

Rational emotive education (REE) is a prevention program which can be used in classes; it aims at teaching teenagers problem-solving techniques and at enhancing their emotional strength by making them aware of the irrational beliefs causing emotional distress and replacing them with rational, adaptive beliefs (Bernard, 2004; Popa, 2004). Lupu & Iftene (2009) conducted a study demonstrating that REE is useful in reducing anxiety; emotional distress is known to correlate with a number of disruptive behaviour (among them gambling, too). According to the cognitive behavioural model, irrational cognitions lead to disruptive behaviour. The disruptive behaviour (gambling) can be modified either by changing irrational cognition (general intervention) or changing knowledge and attitudes towards gambling (specific intervention).

Providing specific information about gambling may be an effective way to help prevent gambling problems among children. This could reduce their illusion of control; change their knowledge and their attitude towards games of chance and games of skills. There are few studies regarding prevention (Ladouceur et al., 2004), though in 2002, Ferland, Ladouceur & Vitaro conducted a study to evaluate the prevention of gambling problems in youth. They used 424 students from grades 7 and 8 to evaluate the effectiveness of a video on reducing gambling, on increasing gambling knowledge, and on decreasing erroneous perceptions about gambling. Their findings indicate that the video significantly improved subjects' knowledge about gambling and corrected their misconceptions about the notions of chance and randomness.

The goal of the present study is to compare the effectiveness of software ("Amazing Chateau" - International Centre for Youth Gambling Problems and High-Risk Behaviors, 2004) whose aim is to modify erroneous beliefs and attitudes toward gambling among children from elementary school (Information) with rational emotive education (REE). The software targets several misconceptions, the illusion of control, attitudes and cognitive errors underlying this activity. This type of intervention was chosen because it is an interactive mean which capture attention, implies children and it does not imply further costs. An agreement of using the software was obtained from its designers.

Method

Participants

Participants (N=81) were grade 6 Romanian speaking children from a school in Cluj-Napoca; these children speak fluently English. Parents signed a consent form before the study began. Males constituted 45.7% (N=37) of the participants and the age was ranged between 12 and 13 years. Participants belonged to three different classes which were randomly assigned into one of the three conditions. 100% of the sample approached participated at the study.

Three experimental conditions were used. All completed the pre- and post-intervention 38 items questionnaires. One psychologist and a student in psychology administered the experimental and control conditions.

1. Control (N=24) - this group was neither shown the software, nor presented the principles for rational emotive education. However, to thank the children for their participation and for ethical considerations, they are to be shown the software during the next school year.
2. Information (N=29) – this group had 10 weekly meetings with a specialist in gambling. They received information about gambling and gaming throughout the software designed for elementary school children named “Amazing Chateau” (International Centre for Youth Gambling Problems and High-Risk Behaviours, 2004). Children had the opportunity to experience two different types of activities: gambling activities and skill activities. During these activities children learnt that gambling makes you lose a lot of money and that you can not predict the outcome of the game; it gives them the possibility to replace misconceptions (e.g. What are the chance when flipping a coin to land on head after five flips landed on head?), the illusion of control (e.g. Praying will help me win more), attitudes (e.g. Betting a lot of money makes me look “very cool”) and cognitive errors (e.g. Betting on the same numbers will increase my chances to win) with adaptive ones.
3. Rational Emotive Education (N=28) – this group had 10 weekly meetings with a psychologist who is specialist in gambling, too. REE offered the possibility to children to find out about the classification of emotions into: positive, negative functional and negative dysfunctional; they learnt about cognitive and behavioural ABC models (David, 2007); they were explained that emotions and behaviours are triggered by cognitions and by changing irrational cognitions they can change their emotions and behaviours. In this respect they were asked to read each evening “The 10 Commandments of Rationality” (David, 2007).

Procedure

The pre-test questionnaire was first completed by all experimental and control groups. In the first condition they were not presented anything after completing the questionnaire. In the second

and the third conditions the intervention protocols took part after completing the questionnaire. The post-test questionnaire was administered to all participants after the 10 weeks of intervention.

Instruments

The questionnaire includes 38 items each having three answering options, children choosing only one correct answer (see Appendix A for examples of questions). Items included questions referring to misconceptions, illusion of control, attitudes and cognitive errors. Items of this questionnaire were taken from Teacher's Manual: Youth Gambling Awareness and Prevention Program, Level II, „Hooked City" (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2004), translated and adapted in Romanian language. The scores of correct answers could vary from 38 (100% correct answers) to 0 (no correct answer). Correct, omitted and wrong answers were accounted for each participant at the beginning and at the end of the intervention.

Data analysis

Data were analyzed using the SPSS 17.0 software. Intergroup comparisons (i.e., control vs. Information vs. REE) were computed using One-Way ANOVA.

The means and standard deviations of correct answers at pre- and post-intervention are shown in Table 55.

Table 55

Means and standard deviations of correct answers at pre- and post-intervention

Sample	*Pre- intervention*		*Post-intervention*	
	M	*SD*	*M*	*SD*
1. Control *(N=24)*	20,54	2,02	19.00	6.20
2. Information *(N=29)*	19,27	2,75	28.44	4.74
3. REE *(N=28)*	20,14	2,08	23.00	4.74
TOTAL *(N=81)*	19,95	2,36	23,76	6,44

Means and standard deviations of correct answers at pre- and post-intervention

An analysis of covariance using the pre-test scores as a covariate was performed to test the equality of post-test scores. This was done in order to control for possible differences between groups at pre-test. The ANCOVA revealed significant group effects for post-test scores ($F(2, 77) = 23.33$, $p < 0.00$). The covariate variable – scores at pre-intervention – did not have a significant effect on the scores at correct answers after the intervention.

Table 56

Summary table ANCOVA of effects of intervention on knowledge about gambling before intervention

Source	Sum of Squares	df	Mean Square	F	Sig.
Correct answers before intervention	56.35	1	56.35	2.10	.152
Group	1253.63	2	626.81	**23.33**	.000
Residual error	2068.81	77	26.868		

Summary table ANCOVA of effects of intervention on knowledge about gambling before intervention

Table 58 presents the results of the two intervention groups and the control group at the two moments of assessment for correct answers by ANOVA.

Table 58

Results by ANOVA

Moment of assessment		Sum of Squares	df	Mean Square	F	Sig.
Correct answers before intervention	Between Groups	22,62	2	11,31	2,08	,131
	Within Groups	423,18	78	5,425		
	Total	445,80	80			
Correct answers after intervention	Between Groups	1197,37	2	598,68	21,97	,000
	Within Groups	2125,17	78	27,246		
	Total	3322,54	80			

The one-way ANOVA, $F(2, 78) = 21.97$, $p = .000$ demonstrated statistically significant differences between the two groups, as theory would dictate.

As hypothesized, the analysis revealed that the experimental condition significantly improved participants' knowledge about gambling as compared to the control group.

The Information condition obtained therefore significantly more correct answers than the control condition at number of correct answers given by children on questions about gambling. Also, the Information condition obtained significantly more correct answers than the REE condition.

Table 59

Post Hoc Tests (Scheffe)

Moment of assessment	*Sample*	*Mean Difference*	*Standard Error*	*Sig.*
Pre- intervention	1 vs. 2	1.265	.64276	.151
	1 vs. 3	0.398	.64794	.828
	2 vs. 3	-0.867	.61713	.151
Post-intervention	1 vs. 2	-9.448*	1.44040	.000
	1 vs. 3	-4.000*	1.45200	.027
	2 vs. 3	5.448*	1.38296	.001

Table 4 presents the Post Hoc Tests for the results of the intervention groups and the control group at the two moments of assessment (Scheffe). Using Scheffe's method for interval analyze it was found out that group 1 (control) was different from group 2 (specific intervention about gambling) and from group 3 (rational emotive education) (p=.027), and group 2 differed from group 3 (p=.001). The three groups' results differed significantly from each other.

Table 61 presents homogeneous subsets at the two moments of the assessment (Scheffe).

Table 61

Homogeneous Subsets

Correct answers before intervention

	Condition	N	Subset for alpha = 0.05
Scheffe[a,,b]	2	29	19.27
	3	28	20.14
	1	24	20.54
	Sig.		.145

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 26.82.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Correct answers after intervention

	Condition	N	Subset for alpha = 0.05		
			1	2	3
Scheffe[a,,b]	1	24	19.00		
	3	28		23.00	
	2	29			28.45
	Sig.		1.00	1.000	1.00

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 26.82.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

A one-way analysis of variance for uncorrelated scores demonstrated a generally significant effect depending on the intervention type ($F_{2.78}$=21.97, p=0.000). Throughout Scheffe's method of interval analysis it was found out that group 1 was different from group 2 (p=.000) and from group 3 (p=.027), and group 2 differed from group 3 (p=.001), but there were no other differences. The three groups' results differed significantly from each other.

Discussions and conclusions

This research aimed at verifying the hypothesis according to which prevention methods are effective in modifying the number of correct answers of children at questionnaires regarding their knowledge about gambling. This hypothesis was confirmed. Both methods used (Information throughout "Amazing Chateau" software and REE) influenced the answers given by children at post-intervention. Although REE is very useful for modifying thoughts, in what regards Gambling, specific information is to be chosen. The research revealed that specific information has a greater impact on the children's knowledge, illusion of control, attitudes, and erroneous cognitions about gambling.

Our results are consistent with those obtained by Ladouceur et al., 2004. They hypothesized that erroneous perceptions about hazard is the essential factor for the onset and maintenance of gambling behaviour. They designed two studies on students which demonstrated the efficacy of evidence-based prevention activities created and leaded by specialists in gambling.

Any organization capable of delivering the message about the signs of problem gambling and the benefits of prevention should be targeted to take on a more active role. There are good examples of projects educating youth about gambling and preventing problem gambling (e.g. YMCA Youth Gambling Project from Canada).

This study is the first of its kind in Romania but there should be designed other studies, too. Prevention programs should be adopted at National level and should include gambling and gaming as important issues along with smoking, drugs and alcohol consumption prevention programs. Each country should consider this issue throughout the Ministry of Education.

Primary prevention of pathological gambling in children and adolescents – experimental study - design 2- study 6

Introduction

During the past years gambling has become a subject of interest for researchers and clinicians (Griffiths, 2003). The most important prevalence studies were conducted in highly developed countries as USA, Canada, UK etc., but some at regional and others at national levels (Griffiths, 2009). Eastern countries started later to make research in the field, but very much used the experience of the former mentioned countries. The majority of the research presented prevalence rates even though there is still a need for well constructed and validated instruments of screening and diagnosis in the case of teenagers (Blinn-Pike et al., 2010). The most important implication mentioned by most of the studies is the need of data about the effect of prevention programs. Evidence-based proofs about a huge need for prevention of problem and pathological gambling in adolescents and adults are to be mentioned in further studies. Though, authors agree that it is important to inform teenagers about the consequences of excessive gambling (Dickson et al., 2002).

Until 2012 there have been few published evaluations of gambling prevention programs for children and adolescents. The first three studies were conducted in Canada and the fourth in USA. Gaboury and Ladouceur (1993) tested a gambling prevention program that involved randomly selected high school students and assigned into intervention and control groups. They presented three 75-minute informational sessions conducted over a 3-week period and followed-up 6 month later. The results showed that the students in the experimental group improved their knowledge about gambling compared with the control group. The improvement was maintained at the 6 month follow-up (Gaboury et al., 1993). Ferland et al in 2002 tested a 20-minute video to determine if it changed Canadian children's illusion of control over the output of the game. They randomly assigned children to four conditions (video only, lecture only, video and lecture, and control group). They found that the three experimental conditions were more effective in changing misconceptions about personal control over gambling compared with the control group. No follow-up data were collected (Ferland et al., 2002). In 2004 Lavoie et al involved 273 French-speaking students in grades 5 and 6 to test a video designed to (a) increase knowledge about gambling and (b) correct inaccurate knowledge. The effectiveness of the video was evaluated using two experimental conditions and one control condition. Analysis indicated that the video significantly increased gambling knowledge and decreased errors in attitudes toward gambling (Lavoie et al., 2004). Taylor

and Hillyard in 2009 tested a 45-minute program that consisted of lecture, discussion, and activities, with more than 8,000 students in Midwestern schools in the United States. The program was successful in increasing knowledge of the negative effects of gambling over the short term (Taylor et al., 2009).

In 2013 Todirita & Lupu in Romania randomly assigned 81 6th grade children into three conditions – control, specific gambling prevention program for elementary school children "Amazing Chateau" (AC) (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2004) and rational emotive education (REE). AC targets several misconceptions, the illusion of control, attitudes and cognitive errors in gambling. This intervention is an interactive mean of learning, it captures attention, and it doesn't imply further costs. An agreement of using the software was obtained from its designers from International Centre for Youth Gambling Problems and High-Risk Behaviors (Todirita & Lupu, 2013). The results of the study confirmed that using specific primary prevention tools for changing erroneous conceptions about games is more efficient than using only rational emotive education.

Rationale for the present study

Given the limited number of studies evaluating different prevention programs regarding gambling it is necessary to replicate studies. More evidence-based researches could sustain better earlier and specific gambling prevention activities implemented at national educational levels.

Scientific literature in the field of gambling states that the age of onset significantly influences the gravity of the pathology. That is why the delay of onset is considered to be a measure of prevention which could function (Derevensky et al., 2005). Considering the findings prevention should be started from the age of 11-12 years.

The purpose of the present study was to compare rational emotive education plus specific primary prevention program developed for restructuring erroneous information about gambling with specific content regarding gambling with rational emotive education.

Study 5 has as an objective to compare the efficacy of rational emotive and cognitive behavioural education (REE) and a primary prevention program designed especially for pathological gambling (INFORMARE) with impact on the pupils' knowledge about gambling (illusion of control, attitudes and erroneous cognitions about gambling). The hypothesis is that the INFORMARE will have more efficacy then REE in modifying knowledge about gambling in pupils.

Method

Participants

We selected three 6th grade classes from a Romanian school from Cluj-Napoca. Criteria of eligibility referred to be part of the class from the beginning of the school year, to have 13 years of age at maximum and not to be ever diagnosed with a mental health problem. Both boys and girls were eligible for participating in the study. Teenagers as well as parents signed an informed consent for taking part to this study. The teenagers' participation to this study was accounted for tutoring classes which are compulsory in Romanian school schedule. One psychologist and a psychiatrist administered the three conditions. Three students in psychology assisted the activity together with the tutor of the class. Teenagers were aged 12 to 13 years, they spoke fluently English as the software was designed and used in its original English version. All completed a pre-, post-intervention, at 3, 6 and 12 month 38 items questionnaire. No drop out was registered. 36 (48%) were male. The three classes (*N=75*) were randomly assigned to one condition. Each tutor of the class drew a ticket with one of the conditions from the urn having even chances to get into one of the three conditions.

Materials

A questionnaire measuring knowledge about gambling was used. It included 38 items each having three answering options, teenagers choosing only one correct answer. Items included questions referring to misconceptions, illusion of control, and cognitive errors. Items of this questionnaire were taken from *Teacher's Manual: Youth Gambling Awareness and Prevention Program, Level II, „Hooked City"* (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2004), translated and adapted in Romanian (Todirita & Lupu, 2013). We had the agreement of the authors of the Program for using all the information. The scores of correct answers could vary from 38 (100% correct answers) to 0 (no correct answer). Correct, omitted and wrong answers were accounted for each participant at the beginning, at the end of the intervention, at 3, 6 and 12 month after intervention.

Design

There were three experimental conditions.

1. Control (*N*=23) - this group was neither shown the software, nor presented the principles for rational emotive education. Discussions were led so that no topic on gambling to be reached. There were free discussions about subjects of interest for teenagers their age unrelated to social and emotional development or gambling. There were 10 weekly meetings of 50 minutes each.

2. AC + REE (*N*=24) – this group had 10 weekly meetings of 50 minutes each with two specialists in gambling – a psychologist and a psychiatrist. They received information about gambling and gaming throughout the software designed for elementary school children - "Amazing Chateau". This intervention is an interactive mean of learning, it captures attention, and it doesn't imply further costs – it is a software and PCs with audio output for each student or means for projecting the software for all the class are needed. Teenagers had the opportunity to experience two different types of activities: games of chance and games of skill. During these activities they learnt that gambling can make you lose a lot of money and that you cannot predict the outcome of the game; this experience gave them the possibility to replace misconceptions (after big loses there has to be a big winning jack pot), the illusion of control (if I have the amulet with me I will be lucky, if not, that is the reason I lose), attitudes (in order to be accepted by a group I have to play poker as they do, otherwise they will exclude me) and cognitive errors (children are not at risk for developing gambling problems, gambling is legal for all ages) with rational and correct knowledge. During the same 10 weekly meetings this group was explained the cognitive and behavioural ABC model (Ellis, 1979); this was illustrated with examples having as content gambling activities. Teenagers were given examples as it follows.

For example, when having a fight with parents for not giving you money (A – the situation) you may think "I must have my own money. I must find a way to make money easy and quickly. Gambling is a good way for making money" (B – thoughts, erroneous cognitions) then you may spend your savings and a lot of time gambling and avoid stress given by fights with your parents (C – behaviour – gambling, avoidance of negative emotions – anger - which becomes a reinforcement for doing so in the case of future fights and in the case you need money). ABC model sustains that a situation activates a certain pattern of thoughts which lead to behaviours. So behaviours are driven by thoughts, cognitions and not by the situation itself.

3. REE (*N*=28) – this group had 10 weekly meetings of 50 minutes each with the same psychologist and psychiatrist both specialists in gambling. REE offered the possibility to learn about cognitive and behavioural ABC models (Ellis, 1979); they were explained that emotions and behaviors are triggered by cognitions; examples having the content of gambling were discussed; they learnt that by changing irrational cognitions ("I must…", "I can't stand it…", "It is awful…", "I am a bad person") they can change their emotions (anxiety, anger) and behaviors (gambling, cursing, fighting). See the previous example.

Procedure

The 38 items questionnaire was first completed by all participants. The control group participated at discussions where no discussions about gambling were allowed. The second group participated at AC activities completed with REE activities. The third group participated in REE activities only. Each activity took place separately with each group. After the 10 weeks of intervention all participants completed the same questionnaire with 38 items. Follow ups were at 3, 6 and 12 month.

Data analysis

Data base was stored using SPSS 17.0 software. Intergroup comparisons (i.e., control vs. AC+REE vs. REE) were computed using One-Way ANOVA.

The means and standard deviations of correct answers at pre-, post-intervention, 3, 6 and 12 month follow-up are shown in Table 62. No significant differences were obtained between groups before interventions (M=23, M=22 and M=23 respectively); results are showing group differences after the intervention (M=21, M=30, and M=24 respectively).

Table 62
Number of correct answers at pre-intervention, post-intervention, 3, 6 and 12 month follow-ups

Sample		Pre-intervention	Post-intervention	Follow-up at 3, 6 and 12 month		
				3	6	12
	n	M *(SD)*	M *(SD)*	M *(SD)*	M *(SD)*	M *(SD)*
Control	23	22.56 (1.95)	20.61 (2.78)	19.31 (2.03)	18.17 (2.15)	16.78 (1.70)
AC+REE	24	22.17 (2.10)	30.42 (5.76)	30.58 (5.22)	29.75 (4.84)	29.17 (5.03)
REE	28	22.96 (2.55)	23.79 (3.57)	22.93 (3.50)	21.54 (3.39)	20.57 (3.28)
TOTAL	75	22.59 (2.23)	24.93 (5.77)	24.27 (5.95)	23.13 (5.97)	22.16 (6.21)

Note. Control = without specific intervention; AC = Amazing Chateau specific prevention program, REE = Rational Emotive Education.

Table 63
Results by ANOVA of correct answers

Moment of assessment		Sum of Squares	df	F	Sig.
Before intervention	Between Groups	8.24	2	.83	.443
	Within Groups	359.95	72		
	Total	368.19	74		
After intervention	Between Groups	1188.64	2	33.54	.000***
	Within Groups	1276.03	72		
	Total	2464.67	74		

Note. *** $p<0.001$

The one-way ANOVA, $F(2, 72) = 33.54$, $p = .000$ demonstrated statistically significant differences between groups after the intervention.

The analysis revealed that the experimental conditions significantly corrected participants' erroneous knowledge about gambling as compared to control group immediately after the intervention.

Subjects from the AC+REE condition revealed significantly more correct answers than the control condition. Also, subjects from AC+REE condition obtained significantly more correct answers than the REE condition only.

Table 64

Post Hoc Tests (Scheffe)

Moment of assessment	Sample	Mean Difference	Standard Error	Sig.
Pre- intervention	Control vs. AC+REE	.40	.65	.830
	Control vs. REE	-.40	.63	.818
	AC+REE vs. REE	-.80	.62	.444
Post-intervention	Control vs. AC+REE	-9.81	1.23	.000**
	Control vs. REE	-3.18	1.18	.032*
	AC+REE vs. REE	6.63	1.17	.000***
3 month follow-up	Control vs. AC+REE	-11.28	1.11	.000***
	Control vs. REE	-3.62	1.07	.005**
	2 vs. 3	7.65	1.06	.000***
6 month follow-up	Control vs. AC+REE	-11.58	1.06	.000***
	Control vs. REE	-3.36	1.02	.007**
	AC+REE vs. REE	8.21	1.01	.000***
12 month follow-up	Control vs. AC+REE	-12.38	1.05	.000***
	Control vs. REE	-3.79	1.01	.002**
	AC+REE vs. REE	8.60	1.00	.000***

*p< .05, **p< .01, ***p< .001.

*The mean difference is significant at the 0.05 level

Table 64 presents the Post Hoc Tests for the results of the three groups by the five moments of assessment. The three groups' results differed statistically significant from each other. Scheffe's method of interval analysis demonstrated that the control group differed from AC+REE group (p=.000) and from REE group (p=.032), and AC+REE group differed from REE group (p=.000) at post-intervention. Control group differed from AC+REE group (p=.000) and from REE group (p=.005), and AC+REE group differed from REE group (p=.000) at the 3 month follow-up. Control group differed from AC+REE group (p=.000) and from REE group (p=.007), and group AC+REE differed from REE group (p=.000) at 6 month follow-up. Control group differed from AC+REE group (p=.000) and from REE group (p=.002), and AC+REE group differed from REE group (p=.000) at 12 month follow-up, but there were no other differences. Analyzing the data obtained at

different moments of measurement one can observe that even thought after the intervention both intervention groups give more correct answers that the control group the only group maintaining correct answers is AC+REE. REE group gives even more wrong answers than before the intervention meaning that participants in the study got contact with incorrect information about gambling and they adopted it.

Table 66

Comparison between effect sizes in experimental conditions reported to pre-intervention.

	AC+REE	REE
Pre-post intervention	ES .66	ES .20
Pre-3 month follow-up	ES .71	ES .06
Pre-6 month follow-up	ES .69	ES -.18
Pre-12 month follow-up	ES .65	ES -.34

The mean effect size reported for AC+REE condition was between d= .65 and d=.71 while for REE condition was between d=-.34 and d=.20 (see Table 66).

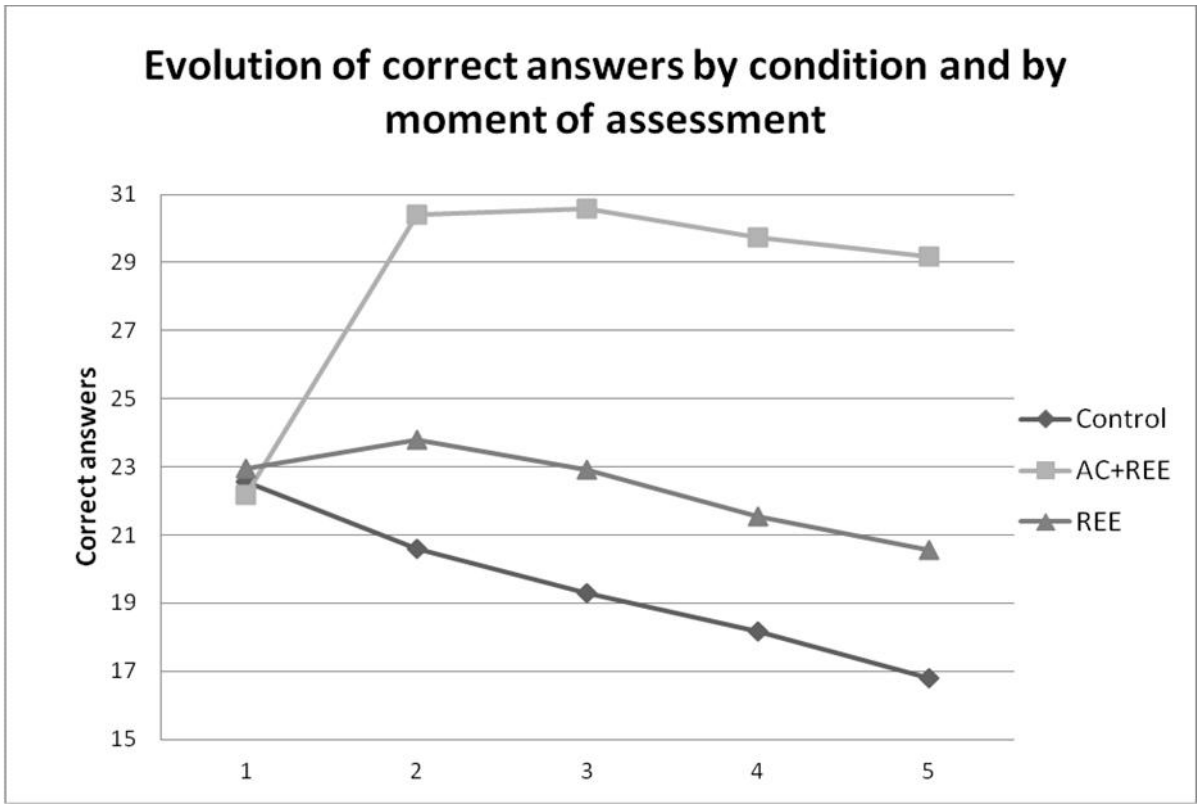

Figure 7. Longitudinal plot of correct answers for the three conditions at pre-, post-intervention and 3, 6 and 12 month follow-up.

As Figure 7 shows there is an obvious difference between the longitudinal evolutions of correct answers in the second condition compared with the evolution of the control and REE conditions. AC+REE group maintains results above the mean of 29 correct answers in all moments of assessment after intervention. REE has a good evolution immediately after the intervention, but a regression in three month from the intervention as the group might got incorrect information about gambling. This group was supposed to have better results in giving correct answers about gambling after learning that erroneous cognitions about gambling can lead to gambling.

Discussions and conclusions

This study answered some of the latest questions published in reviews – do prevention program work, do they modify cognitions about gambling? If so, which prevention program has better results in correcting erroneous cognitions and for how long do these results maintain?

Prevention has less costs then intervention. That is why the present study focused on prevention programs.

The present study's aim was to compare a prevention program and a combination of two prevention programs which revealed that the combination of rational emotive education with specifically for gambling designed prevention program gives better results in changing of erroneous cognitions and maintaining the changes for at least 12 month.

An important aspect revealed is that prevention programs do work in changing erroneous cognitions if specific prevention program is combined with rational emotive education.

In some schools prevention programs were already introduced as optional programs. They focused on social and emotional development and teach teenagers how to deal with strong negative and positive emotions.

These programs should include specific prevention programs designed for different addictions, for example gambling, as the case of the present study. Social and emotional development can contribute together with specific information about gambling addiction to a natural and non-problematic evolution from childhood to adulthood.

Prevention programs should be applied at National level and should include gambling and gaming as important issues along with smoking, drugs and alcohol consumption prevention programs. Associations and organizations having interest in gambling should finance studies of prevalence, prevention and intervention.

A limit of the present study is that it randomized three classes from the same school. For a future study randomization should be made from a better represented list of schools and classes.

Also longer follow-ups should be considered. Effects on gambling behaviour should be measured and presented in further studies; the number of participants in a condition should increase also.

This is the second pilot study which considers prevention programs on teenagers.

The research demonstrates the superiority of the association of specifically designed prevention programs for gambling with programs for social and emotional development compared to general programs for social and emotional development in modifying knowledge about gambling.

CHAPTER 6
GENERAL CONCLUSIONS AND DISCUSSIONS

The present research gives theoretical and empirical arguments for taking into account the issue of problem and pathological gambling in our country for children and adolescents. Gambling becomes a preoccupation during crisis and nowadays there is a growing interest from gamblers but from researchers too. It is important to find out what is that develops the pathology in children and adolescents, and what can help not to develop it. The majority of the researches focus on the already developed pathology in adults, but throughout this thesis we tried to emphasize the importance of prevention to keep health in children and adolescents and to stop develop pathological gambling in adulthood. Prevention helps for a better protection on long term in children and adolescents for all illnesses which might have developed when no prevention applied. Apart from individual benefits there are a lot of positive benefits for the family, local community and national health system.

The first part (**Chapter 1 and 2**) of the thesis gives a structured presentation of the concepts of game, gaming, problem and pathological gambling offering the theoretical background for the upcoming studies. We presented the definitions of the concepts found out in literature as central concepts of the thesis with a focus on the explanation of problem and pathological gambling in children and adolescents; explaining the impulse control disorder from a cognitive behavioral perspective which continues to be the paradigm of the researches; constructing the general background of the six studies.

Chapter 3 contains the first two studies which aim at adaptation and validation of two scales for screening and measuring problem and pathological gambling. These two studies present the results of validation of SOGS-RA and adaptation and validation of 20 GA-RA according to norms proposed by Hambleton, 1994; Hambleton and Patsula, 1998; Geisinger, 1994:

1. Translation and retroversion of the scales
    a. Translation into Romanian of the scales
    b. Retroversion of the scales
    c. Evaluation of discrepancies between the original version and those obtained after retroversion
2. Reliability analysis compared with the original version
3. Norms for general population
4. Validity analysis compared with the original version
5. Norms compared with those reported by other studies

Chapter 4 presents the results of two studies of prevalence, the first one at a regional level and the second one a national prevalence study in children and adolescents from all Romanian schools. The present two studies were necessary because there was a lack in relevant information about problem and pathological gambling in children and adolescents (11-19 years).

The regional prevalence study offered the following information:

- Percentage of problem and pathological gambling
- Other behaviours at risk which usually are associated with problem gambling
- Family characteristics of problem gamblers
- Games frequently played by participants at the present study
- Consequences of excessive gambling mostly in academic filed.

The national prevalence study presents results according to SOGS-RA and to 20 GA-RA which can be generalized for the entire population aged 11 to 19 years old.

- Percentage of problem and pathological gambling according to the two measuring instruments; results presented according to age, gender and class
- Percentage of behaviours at risk associated or not with gambling
- Types of games played
- Age of onset
- Perception of gambling and control of games
- Ways of financing games while it becomes excessive
- The effect of gambling on school results, absenteeism, failure or even school abandonment
- Characteristics of families of gamblers compared with the families of non gamblers
- Procentul jucătorilor problemă şi patologici de noroc pe vârstă, sex, clasă

Chapter 5 compares two primary prevention programs.

1. The comparison of the efficacy of rational emotive and behavioural therapy (REE) with Amazing Chateau, a specially designed program for prevention of pathological and problem gambling in children in modifying cognitions about gambling (information, cognitions, attitudes and illusion of control).
2. The comparison of the efficacy of rational emotive and behavioural therapy (REE) combined with Amazing Chateau with rational emotive and behavioural therapy alone in modifying cognitions about gambling (information, cognitions, attitudes and illusion of control).

We analyzed the extent to which the knowledge about gambling is modified immediately after intervention in the first study and after intervention plus three moments of follow up.

Once cognitions, illusion of control and inappropriate attitudes are modified we can suppose that the behaviour would suffer changes, even if this supposition has to be empirically tested. Following studies should prove with results the modifications in behaviour even if the two prevention studies proved the modification of cognitions.

Studies in this thesis complete the research in the field at national and international level. The results obtained in the six studies constitute a strong motivation for continuing the research in the field as mentioned above. There must be done some modifications in the prevention programs as well and be developed other programs for the same purpose and compare their efficacy.

Another future direction of the studies might be the development of a primary prevention program which might include the principles of rational emotive education in order to sustain for a longer time the cognitive modifications. Other longitudinal studies should be developed, but with random samples. Primary prevention program should be implemented to all secondary schools in order to stop the development of severe pathological gambling.

At the **theoretical level** the concept of pathological gambling was adapted and defined in Romanian social, economical and cultural context throughout the information offered by respondents regarding the way they perceive gambling. The prevalence studies realized for the first time in our cultural background gave important epidemiological data which justify the initiation and implementation of primary prevention programs of this destructive behaviour. The diffrerence between gamblers at risk and pathological gamblers is made and the so called problem gamblers are the target for primary and secondary prevention programs. The instrument that differentiates among problem and pathological gamblers is 20 GA-RA. The screening of problem and pathological gamblers or of gamblers at risk developing a disorder is made by applying SOGS-RA.

At the **methodological leve**l the present thesis has a very important contribution because of the validation of the first instruments measuring and screening for gambling in Romanian – that is 20 GA-RA and SOGS-RA. Choosing these two instruments was based on the fact that they were used largely on international research and because of their very good psychometric characteristics.

On **empirical level** the major contribution of the present thesis was given by the comparison of the two primary prevention programs in two different experimental designs. That is rational emotive education and Amazing Chateau which aims at changing the knowledge about games of chance and games of skills (erroneous cognitions, attitudes and illusion of control). On international level there is the first attempt to do such research of primary prevention programs which gives empirical data which sustain the usefulness of specially designed prevention programs for gambling.

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