



## An 8-week stress management program in pathological gamblers: A pilot randomized controlled trial



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### ABSTRACT

Stress plays a major role at the onset and relapse of pathological gambling (PG), but at the same time it can also be the aftermath of gambling behavior, thus revealing a reciprocal relationship. Although the role of stress has been well-documented, there is a paucity of studies investigating the effect of an adjunctive stress management program on PG. In this 8-week parallel randomized waitlist controlled trial pathological gamblers, already in the gamblers anonymous (GA) group, were assigned randomly in two groups, with the intervention group ( $n = 22$ ) receiving an additional stress management program (consisting of education on diet and exercise, stress coping methods, relaxation breathing –RB- and progressive muscle relaxation –PMR). Self-reported measures were used in order to evaluate stress, depression, anxiety, sleep quality/disturbances, life-satisfaction and daily routine. The statistical analyses for the between group differences concerning the main psychosocial study outcomes revealed a statistically significant amelioration of stress, depression, anxiety symptoms and an increase of life-satisfaction and a better daily routine in participants of the intervention group. We hope that these will encourage researchers and clinicians to adopt stress management in their future work.

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### 1. Introduction

Most people (70–90%) have gambled at least once in their life span, but this behavior has remained in the realm of entertainment and did not become pathological (Morasco et al., 2006; Raylu and Oei, 2002). Pathological gambling (PG) is defined as the failure to control the urge of gambling despite of the serious adverse social, financial, interpersonal and vocational consequences which inflict upon a person's life, his/her family and upon society, in a larger scale (Chase and Clark, 2010; Sacco et al., 2008; Shek et al., 2012; Winslow et al., 2010). The prevalence of PG in the UK's general population ranges from 0.5 to 0.8% (Cunningham-Williams et al., 2005; Gooding and Tarrier, 2009). PG is associated with psychiatric disorders such as anxiety, mood disorders, substance abuse etc. (Giddens et al., 2011; Lloyd et al., 2010; Loo et al., 2008), as well as

with stress-related medical disorders such as hypertension and cardiovascular diseases (Cunningham-Williams et al., 2005; Fong, 2005; Giddens et al., 2011; Lloyd et al., 2010; Loo et al., 2008).

Factors that appear to influence the onset, duration, severity and relapse of PG are gender, age, psychosocial and socioeconomic characteristics (e.g. stressful events, family and workplace environment etc.) (Ledgerwood & Petry, 2006b) as well as biological factors (Cavedini et al., 2002; Lloyd et al., 2010). Regarding PG motivation, the main reasons are earning money, mood regulation, avoidance of unpleasant emotions, entertainment, boredom, coping with stressful events and socialization (Kim et al., 2006; Ledgerwood and Petry, 2006a; Lee et al., 2007; Lloyd et al., 2010; Loo et al., 2008). Most importantly, the existence of various incentives reflects the different perceptions that the individual holds about reward in order to mitigate negative emotions (Lee et al., 2007).

Stress is an integral part of our daily lives, resulting from the complex interaction of the individual with his/her environment (Lazarus & Folkman, 1984). Stressors induce diverse psychological and physical responses, the stress response, which is influenced by the individual's appraisal, called perceived stress (Chrousos and

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Gold, 1992; Dhabhar, 2009). Excessive or prolonged perceived stress leads to unhealthy and maladaptive behaviors (e.g. substance abuse, fatty diet etc.), even to stress-related medical and psychiatric disorders. PG is an example of these behaviors, since it serves as a mean to cope or escape from stressful situations.

It is well-established that PG has both neurobehavioral and social influences. For example, studies report the existence of prefrontal cortex (PFC) circuitry deviations from normal connectivity and furthermore a genetic predisposition as attested by the role of certain polymorphisms for the neurotransmitters' system molecules implicated in the function of the reward system-PFC interplay (Bagby et al., 2007; Cavendish et al., 2002; Comings and Blum, 2000; Loo et al., 2008; Nussbaum et al., 2010; Zack & Poulos, 2009). These yet not fully delineated mechanisms may account for the stress-PG relationship, since the maladjustive response to stress is heralded by the inability of PFC to down-regulate the stress system response, thus leading to a reward-dependent stress coping behavior (Van den Bos et al., 2013). Also, sociocultural factors (e.g. familiarity with gambling, social acceptance of gambling and/or gambling with friends and family) seem to be important, since one third of PGs report having a gambler in their family or tend to adopt the gambling behavior of their family (Loo et al., 2008; Raylu and Oei, 2002). The above mentioned socio-, neuro-behavioral pattern of PG favors the concept that gambling is a socially-learned behavior implemented by the individual in order to cope with stress and the ensuing dysphoric mood and/or emotions (Blaszczynski and Nower, 2002; Ledgerwood and Petry, 2010; Loo et al., 2008).

According to PG treatment literature, there is a wide range of multidiscipline practices including psychodynamic interventions, Gamblers Anonymous, behavioral interventions, cognitive interventions and combined cognitive-behavioral interventions (Dowling et al., 2008; Gooding and Tarrier, 2009; Loo et al., 2008; Petry and Armentano, 1999). Cognitive behavioral therapy (CBT) appears to be most effective in the treatment of PG, as in many cases led to complete abstinence from gambling even after 6- or 12-month follow-ups. Additionally, a large percentage of participants in CBT groups at the end of the intervention did not meet the diagnostic criteria for PG (Echeburua et al., 1996; Grant et al., 2011; Ladouceur et al., 2001, 2003; Morasco et al., 2007; Petry and Armentano, 1999; Sylvain et al., 1997). Relaxation techniques have been used mostly supplemental to other standardized treatment programs for PG in dealing with increased autonomic arousal, depression, and anxiety (Blaszczynski et al., 1991; Blaszczynski and Nower, 2002; Daughters et al., 2003; Dowling et al., 2008; Lopez Viets and Miller, 1997; McConaghy et al., 1983, 1988, 1991; McCormick, 1994; Nespors, 1994; Nespors et al., 2011). Results from clinical studies that employed relaxation techniques (e.g. imaginal relaxation) in PG treatment are very promising in matters of reduction (70%), control or cessation of gambling behavior (57%), anxiety and depressive symptomatology (Blaszczynski et al., 1991; Daughters et al., 2003; Dowling et al., 2008; Lopez Viets and Miller, 1997; McConaghy et al., 1988, 1991). In the study of McConaghy et al. (1991) a female gambler treated with progressive muscle relaxation and imaginal desensitization, in spite some relapses, remained abstinent 1 year after treatment (Lopez Viets and Miller, 1997). Thus, due to the therapeutic benefits of the relaxation training in gambling behavior, craving, depression and anxiety, it was recommended as a considerable therapeutic asset in the treatment of PG (Lopez Viets and Miller, 1997; Nespors, 1994; Nespors et al., 2011).

Gamblers Anonymous group (GA) is one of the most commonly utilized treatment for PG (Griffiths and McDonald, 1999; Petry, 2009; Sanju and Murali, 2005). Literature on PG treatment underscores the necessity of clinical studies assessing GA

effectiveness due to high levels of attrition and relapse (Griffiths and McDonald, 1999; Petry and Armentano, 1999; Sanju and Murali, 2005). A therapeutic schema including both stress management and GA group could lead to lower levels of relapse and longer period of abstinence (Petry and Armentano, 1999; Sanju and Murali, 2005).

Thus, it is evident that there is paucity of studies investigating the role of stress management in PG. The aim of this study is to investigate the additional psychosocial effect of a stress management program on pathological gamblers participating in a Gamblers Anonymous group. We hypothesize that stress management in PGs would improve their psychosocial wellbeing, as determined, in this study, by evaluating stress, anxiety, depression, daily routine, sleep quality and life-satisfaction. Thus, this combined intervention would bring beneficial effects on daily routine, levels of stress, depression and anxiety, life and self-satisfaction.

## 2. Materials and methods

### 2.1. Trial design

This was a two-armed, parallel group, randomized controlled study with a 1:1 allocation ratio of Pathological Gamblers to intervention and control group and an 8-week period of follow-up. After trial commencement, no change of the initial protocol took place.

### 2.2. Participants

Individuals experiencing gambling related problems (PG) were recruited from the GA group of KETHEA (Therapy Center for Dependent Individuals). Inclusion criteria were, a) over 18 years of age, b) primary diagnosis by KETHEA with PG according to the diagnostic criteria of DSM IV (American Psychiatric Association, 2000; Erbas and Buchner, 2012), c) currently participating in the GA group and d) literate in Greek. Exclusion criteria were, a) the practice of other relaxation technique (e.g. yoga, meditation, Pilates), b) the use of psychotropic drugs (e.g. antipsychotic, cannabis), c) the inability to read or write in Greek, d) the existence of mental disorders that may lead to drop out (e.g. major depression, suicidal ideation, psychosis, personality disorder).

45 individuals entered the study, 23 of which were randomly assigned in the intervention group (IG) and 22 in the control group (CG). 22 participants completed the stress management program (95.6%), whereas 1 dropped out (4.4%). Participants in the IG were 21 men (95.5%) and 1 woman (4.5%) (Mean age = 43.23 years, minimum 30 maximum 62). The CG group included 18 men (90%) and 2 women (10%) (Mean age = 41.95, minimum 28 maximum 66). No significant differences were found between the two groups regarding baseline characteristics.

The mean age of the sample was 42.62 (minimum 28 maximum 66) years, with the majority of the participants being male ( $n = 39$ , 92.8%). Regarding family status, 15 (35.7%) participants were single, 23 (54.8%) were married or cohabitating, 4 (9.5%) were divorced. As far as their education level, 18 were of high school education or less (42.9%), 21 of tertiary education (50%) and 3 of Postgraduate education (7.1%). Concerning past gambling behavior, the sample reported an average of 12.24 years. The majority of the participants gambled approximately between 100 and 1000 Euros (35.7%). Also, nearly 4 out of 10 (38.1%) reported a family history in gambling.

As far their preferred gambling activity, participants endorsed activities such as casino (54.7%), bets on sports (61.9%), cards (38%) and numbers (33.3%).

Also a 97.6% percent answered that gambling made them feel guilt, all participants reported problems in their family due to

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