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What predicts outcome of an Internet-delivered therapy? The role of socio-economic status and gambling behavior

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SUMMARY

■ *This study analyzed the outcome predictors of an Internet-delivered cognitive behavior therapy (ICBT) for problem gambling, examining users' socio-economic profile and gambling behavior. Being males and employed, the fact of playing and to have gambling problems for less than a year, preference for non strategy-based games, and high frequency of playing were found to be predictors of therapy dropout. The findings from this study, though preliminary, suggest that certain patients' socio-economic characteristics and gambling behavior may have a bearing on the success or failure of an ICBT and that there is a need to adapt the therapy for those individuals at risk. In fact, detect at an early stage of the therapeutic relationship those patients with a greater propensity to dropout may allow the implementation of appropriate and customized approaches to reduce the difficulties to follow and complete a therapy. ■*

Keywords: Problem gambling, Gambling behavior, Socio-economic status (SES), Dropout, Internet-delivered cognitive behavior therapy (ICBT), Internet-based treatment.

Parole chiave: Gioco d'azzardo problematico, Comportamento di gioco, Status socio-economico, Dropout, Terapia cognitivo-comportamentale online, Trattamento online.

Introduction

In a comprehensive review of problem gambling, Neal, Delfabro and O'Neill (2005) define it as "characterised by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community". Problem gamblers do not always recognize the critical situation they face. It is often relatives, colleagues/employers and friends who induce them to seek help in order to solve gambling-related psychological, economic and legal problems (Pulford *et al.*, 2009; Gainsbury *et al.*, 2014). In many cases, shame and fear of stigma represent insurmountable barriers (Suurvali *et al.*, 2009; 2012; Hodgins *et al.*, 2012; Bellringer *et al.*, 2008) which prevent many problem gamblers from seeking help. In an

attempt to lower these barriers, new types of professional help have emerged (Carlbring *et al.*, 2008), based on use of telephone and information technology (eg. professional helplines, online counseling, websites). Indeed, several lines of evidence (Cunningham *et al.*, 2008) show that many problem gamblers prefer this type of approach when asking for help or beginning treatment (Wood & Griffiths, 2007) due to the degree of perceived privacy and anonymity offered. Furthermore, such interventions – compared to traditional face-to-face methods – permit greater flexibility in time management as well as overcoming geographical isolation (Griffiths & Cooper, 2003; Monaghan & Blaszczynski, 2009; Gainsbury & Blaszczynski, 2011; Rodda *et al.*, 2013; Hodgins *et al.*, 2013; Titov *et al.*, 2015).

In Italy epidemiological studies suggest that 4.3% of the general population is at moderate risk of problem gambling and 1.3% are actually problem gamblers (Colasante *et al.*, 2013). Thus, phone and online counselling and assistance services for gamblers have been introduced. Started in October 2009, *Giocare-sponsabile* (GR Responsible Gambling) is the first Italian national helpline dedicated to problem gambling. The service provides free and anonymous professional counselling and assistance via web (e-mail and chat) not only to gamblers, but also to those indirectly affected, such as relatives and friends. In its first six years of activity, the GR helpline provided roughly 45,000 con-

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sulting sessions (35,000 telephone conversations, 9,000 online chats); a comprehensive description of the service and its users may be found in quite recent works by Bastiani *et al.* (2015) and Lucchini & Griffiths (2015). Since August 2013, *Giocaresponsabile* has made an additional program of Internet-delivered cognitive behavior therapy (ICBT) (Butler *et al.*, 2006; Petry, 2005) available on its website *giocaresponsabile.it*.

ICBT's have proved to be valuable complements to traditional cognitive behavioral therapies for the treatment of psychiatric disorders and other clinical problems (Andersson & Carlbring, 2003; Hedman *et al.*, 2012; Titov *et al.*, 2015). Although there is still a paucity of published research trials on Internet-based intervention for gamblers (Gainsbury & Blaszczynski, 2011; Luquiens *et al.*, 2016), there is some evidence proving its effective results in reducing problem gambling, anxiety, and depression and improving patients' quality of life (Carlbring *et al.*, 2012; Karyotaki *et al.*, 2015). Moreover, research demonstrates that the effects of treatment are maintained following completion of treatment, and that the outcome of intervention may be partly predicted according to a number of pre-treatment characteristics, such as primary gambling activity, debts due to gambling, social support and personal yearly salary.

A recent review (Merkouris *et al.*, 2016) identified the available evidence regarding outcomes for gamblers following psychological treatment for disordered gambling. If being male, older age, and not having gambling debt predicted positive outcome of the treatment, education and income were not consistently associated with positive or negative outcomes. There were, however, several inconsistencies between Merkouris *et al.*'s findings and those identified by a previous systematic review of treatment outcomes from psychological treatment for disordered gambling (Melville *et al.*, 2007). For instance, Melville *et al.* identified older age, lower gambling debts and longer duration of gambling behavior as potential predictor of treatment dropout, while Merkouris *et al.* suggested that older age and no gambling debt were associated with positive treatment outcomes. Trying to summarize these evidences, longer duration of gambling behavior, lack of social support, younger age of gambling onset and lower gambling debt are associated with dropping out, while female gender, younger age, not having a significant other and not being in the action stage of change are all associated with a less positive response to these treatments (Carlbring *et al.*, 2012; Odlaug *et al.*, 2013).

Taking the above into consideration, by analyzing the socio-economic and gambling profile of users who entered the GR online therapy program but did not complete it, this study aims to further explore possible predictors of dropout from an ICBT. The underlying purpose is to contribute to effective strategies of retention in treatment, better outcome of treatment, and a clearer understanding of the characteristics of problem gamblers who would not be likely to benefit from an Internet-delivered therapy.

Methods

Sample

This is a non-randomized consecutive sample. Out of the 1039 gamblers (83% males) who accessed the GR online helpline services between August 2013 and August 2015, the study focuses on the 192 gamblers who began *Giocaresponsabile* Internet-delivered cognitive behavior therapy (GR ICBT): 40 of them (21%) completed the entire treatment, whilst 152 (79%) dropped out before completion.

Data collection and instruments

Users are required to register on the website *giocaresponsabile.it*, and anonymity and confidentiality are guaranteed throughout the entire treatment. Access to therapy is subject to clinical assessment of both the severity of the gambling disorder and the motivation for treatment.

Assessment of gambling disorder is based on the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001), a nine-item screening tool used to measure the severity of gambling problems in the general population. The PGSI has a range of 0 to 27, describing different levels of problem gambling. A score of 0 means the person does not have a problem (social gambling); a score of 1 and 2 highlights a low risk (low risk gambling); a score of 3 to 7 represents a risk, though limited, of developing an addiction (moderate risk gambling); a score between 8 and 27 indicates a problematic condition. Users with a score between 8 and 27 are automatically admitted to the therapy.

For the motivational assessment, a short test based on clinical experience (Miller & Rollnick, 2014) identify four different profiles: A. low motivation and low perceived self-efficacy (no user matched this profile); B. low motivation but high perceived self-efficacy (1% of the users); C. high motivation but low perceived self-efficacy (48% of the users); D. high motivation and high perceived self-efficacy (51% of the user). Users matching profile A are automatically excluded from the therapy.

Program modules are visible in a private session accessed by the patient using a personal user ID and password, and are managed by therapists in agreement with the patient. Furthermore, patients must attend a weekly 30-minute telephone conversation with the assigned therapist. Patients completing the therapy continued to receive treatment for nine months, with two follow-ups (in the third and sixth months after completion). The others dropped out after an average of four months.

The GR ICBT is structured in five phases associated with nine related goals:

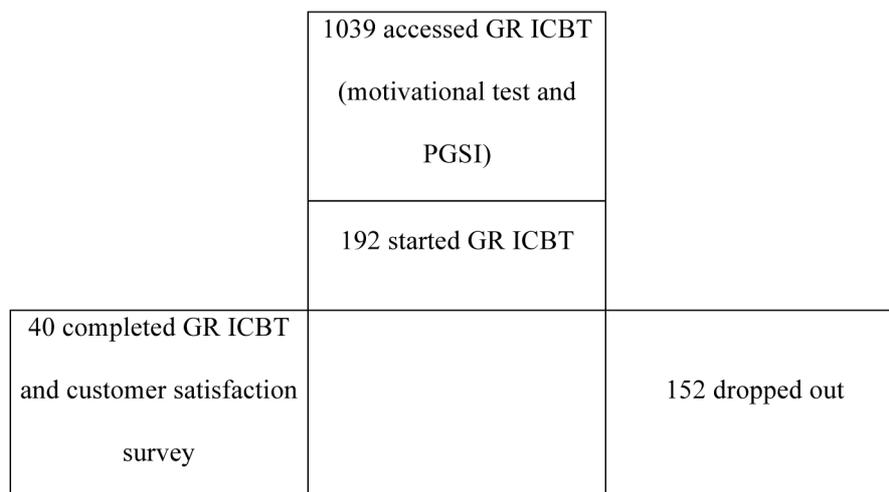
1. assessment;
2. functional analysis (1st goal – identify risky situations; 2nd goal – keep a weekly gambling diary; 3rd goal – identify gambling-related factors);
3. craving management (4th goal – manage craving intensity; 5th goal – reformulate craving-related dysfunctional thoughts; 6th goal – evaluate craving-related rational thoughts);
4. resource management (7th goal – get out of debt and/or manage personal resources independently);
5. relapse prevention (8th goal – react to slips in problem gambling; 9th goal – recognize high-risk situations).

Finally, patients were asked to fill out a customer satisfaction survey composed of 14 items (minimum score = 1; maximum score = 5) related to the structure (timing, working mode, contact with the therapist) and effectiveness of the treatment received and to the therapist-patient relationship (Fig. 1).

During the therapy, information on the following variables was collected:

- (a) socio-economic status: gender, age, marital status, educational level, employment status, housing situation;
- (b) gambling behaviour:
 - (i) history of gambling (duration of gambling activity): less than 1 year, less than 10 years, 10 years or more;
 - (ii) awareness of problem gambling (duration of self-perception of problems related to gambling activity): less than 1 year, less than 10 years, 10 years or more;

Fig. 1 - Giocaresponsabile Internet-delivered cognitive behavior therapy (structure)



- (iii) types of games played, as defined in in other studies (Odlaug, 2011): strategy-based games (poker, blackjack, horse racing, sports, and other betting), non-strategy-based games (lottery, video lotteries and new slot machines, pull tabs, scratch cards, bingo and keno), both strategy-based and non-strategy-based games;
- (iv) gambling setting: on-site, on-line;
- (v) frequency of gambling: occasional (less than once per week), moderate (1-2 times per week), regular (up to 6 times per week);
- (vi) monthly expenditure on gambling: amount of money spent monthly: < 1,000 euros; from 1,000 to 10,000 euros; > 10,000 euros;
- (vii) gambling debts: < 1,000 euros; from 1,000 to 10,000 euros; > 10,000 euros.

Statistical analysis

All analyses were performed using STATA 13.0 (STATA Corp., TX, USA) and SPSS v.21.0 (IBM Corp., Armonk, NY, USA). Categorical variables were expressed as percentages, and continuous variables were expressed as mean, standard deviation, median and interquartile ranges (IQR). An independent samples t-test was conducted to compare the mean of different variables between groups (treatment completed vs dropouts). The Chi-square test (or Fisher's exact test) was used to compare categorical variables between two groups. Cox proportional hazard models were tested for the unadjusted hazard ratios of treatment completed/dropout among each covariate (i.e. gender, marital status, educational level, employment status, housing situation, history of gambling, awareness of problem gambling, types of games, gambling setting, frequency of gambling, monthly expenditure on gambling, gambling debts). The multivariate Cox model with the backward stepwise procedure was performed to evaluate the relationship between treatment completed/dropouts (dependent variable) and the covariates assessed in this study (independent variables).

Results

Table 1 shows differences in terms of socio-economic status and gambling behavior between patients who completed the GR

Internet-based therapy (*completed*) and those who did not (*dropouts*). Significant differences were observed with respect to some variables. Among socio-economic characteristics, a significant difference was observed with respect to gender, with 74% of *dropouts* and 92.5% of *completed* being males. A significant difference was also observed in employment status: 13% of *dropout subjects* have no regular job, while none of those who completed the therapy is unemployed.

With reference to gambling behavior, dissimilarities emerge between *completed* and *dropouts* in the number of years spent on gambling (history of gambling), in the awareness of problem gambling, but also in the frequency of gambling. The majority of both *dropouts* and *completed* has been gambling for more than one year but less than ten. Among the *dropouts*, 40.3% have been playing for less than one year and 16.9% acknowledged that they are problem gamblers within the past year; among the *completed*, 20% have been gambling for ten years or more and 53.1% have known they are problem gamblers for ten years or more. This highlights a greater proportion of subjects in the group of dropouts who have been playing for less than a year being aware of their gambling problem. Lastly, it has been observed that *dropouts* have a greater propensity for non-strategy-based games than the *completed* group.

Furthermore, the results of the univariate Cox model analysis (Fig. 2) revealed that males had a significantly higher risk of giving up treatment than females (Hazard Ratio [HR], 1.73; confidence interval [CI], 1.04-2.88), as did employed subjects compared to unemployed ones (HR, 2.66; CI, 1.35-5.24). Many patients attending the GR ICBT reported difficulty maintaining the weekly telephone appointment with the therapist, which is always scheduled at the same time on the same day of the week. This rigidity in the organization may explain why – in contrast with the findings from other studies (Melville *et al.*, 2007) – employed patients, especially those working shifts, have a higher risk of dropping out of treatment than unemployed ones.

No statistically significant association was observed with respect to housing situation, educational level or marital status. Also, the fact of having gambling debts, of spending a little or a lot, and the setting of gambling do not seem to be associated with dropout. The characteristics associated with dropout from therapy, on the other hand, are the frequency of gambling and the

Tab. 1 - Descriptive statistics: socio-economic status and gambling behavior

		Completed		Dropouts		Sign.*
		n.	%	n.	%	
Gender	M	37	92.50	112	74.00	<0.05
	F	3	7.50	40	26.00	
Marital status	Married	16	40.00	42	27.60	ns
	Unmarried	15	37.50	64	42.10	
	Separated/divorced	9	22.50	46	30.30	
Educational level	Middle school	9	22.50	36	23.4	ns
	High school	24	60.00	97	63.60	
	University	7	17.50	19	13.00	
Employment status	Not employed	0	0,00	20	13.00	<0.05
	Employed	36	100.00	132	87.00	
Housing situation	Alone	9	22.50	35	23.30	ns
	With partner or children	25	62.50	79	52.00	
	With family of origin	6	15.00	38	24.70	
History of gambling	Less than 1 year	8	30.00	26	40.30	<0.05
	<10 years	16	50.00	35	54.50	
	10 or more years	8	20.00	3	5.20	
Awareness of problem gambling	less than 1 year	2	6.30	16	16.90	<0.05
	<10 years	13	40.70	58	58.40	
	10 or more years	17	53.10	24	24.70	
Type of game	Non-strategy-based games	23	57.50	88	60.60	<0.05
	Strategy-based games	5	12.50	23	15.80	
	Strategy & non-strategy-based games	12	30.00	34	23.60	
Frequency of gambling	Occasional (less than once a week)	4	10.00	10	10.40	ns
	Moderate (1-2 times a week)	13	32.50	18	19.50	
	Regular (up to 6 times a week)	23	57.50	65	70.10	
Gambling debts	<1,000 euros	3	17.70	13	21.00	ns
	From 1,000 to 10,000 euros	6	35.20	18	29.00	
	>10,000 euros	8	47.10	31	50.00	
Gambling setting	On-site	39	97.50	120	89.60	ns
	On-line	1	2.50	14	10.40	
Monthly expenditure on gambling	<1,000 euros	21	52.50	74	50.70	ns
	From 1,000 to 10,000 euros	18	45.00	72	49.30	
	>10,000 euros	1	2.50	0	0.00	

* Chi square or exact fisher test

types of game played. A higher rate of dropouts is found among regular players (up to 6 times a week) and among those who prefer non-strategy-based games, with an HR equal to 1.67 (95% CI, 1.02-2.78) and 1.83 (95% CI, 1.04-3.22) respectively. Having started playing less than 12 months ago (HR, 2.85; 95% CI, 1.40-5.80) and perceiving one's gambling behavior as problematic for less than a year (HR, 2.84; 95% CI, 1.10-8.03) were also associated with dropping out of treatment.

The Multivariate Cox model analysis (Fig. 3) showed that subjects preferring non-strategy-based games (HR, 1.26; 95% CI, 1.14-1.65), playing frequently (HR, 2.26; 95% CI, 1.30-3.93) and having started to play less than one year ago (HR, 2.33; 95% CI, 1.03-5.85) had a higher risk of abandoning treatment.

Discussion

This study aimed to analyze the outcome predictors of an Internet-delivered cognitive behavior therapy for problem gambling. Univariate analysis shows that males have a higher risk of leaving the GR ICBT, though the small number of females present in the sample limits the validity of gendered analysis. Employed subjects and those who have been perceiving their problematic behavior for less than a year have a higher risk of leaving the GR ICBT. Considering the multivariate Cox analysis, subjects preferring non-strategy-based games, playing frequently (up to 6 times a week), and having started playing less than one year ago have a higher risk of leaving the GR ICBT.

Fig. 2 - Univariate Cox model analysis

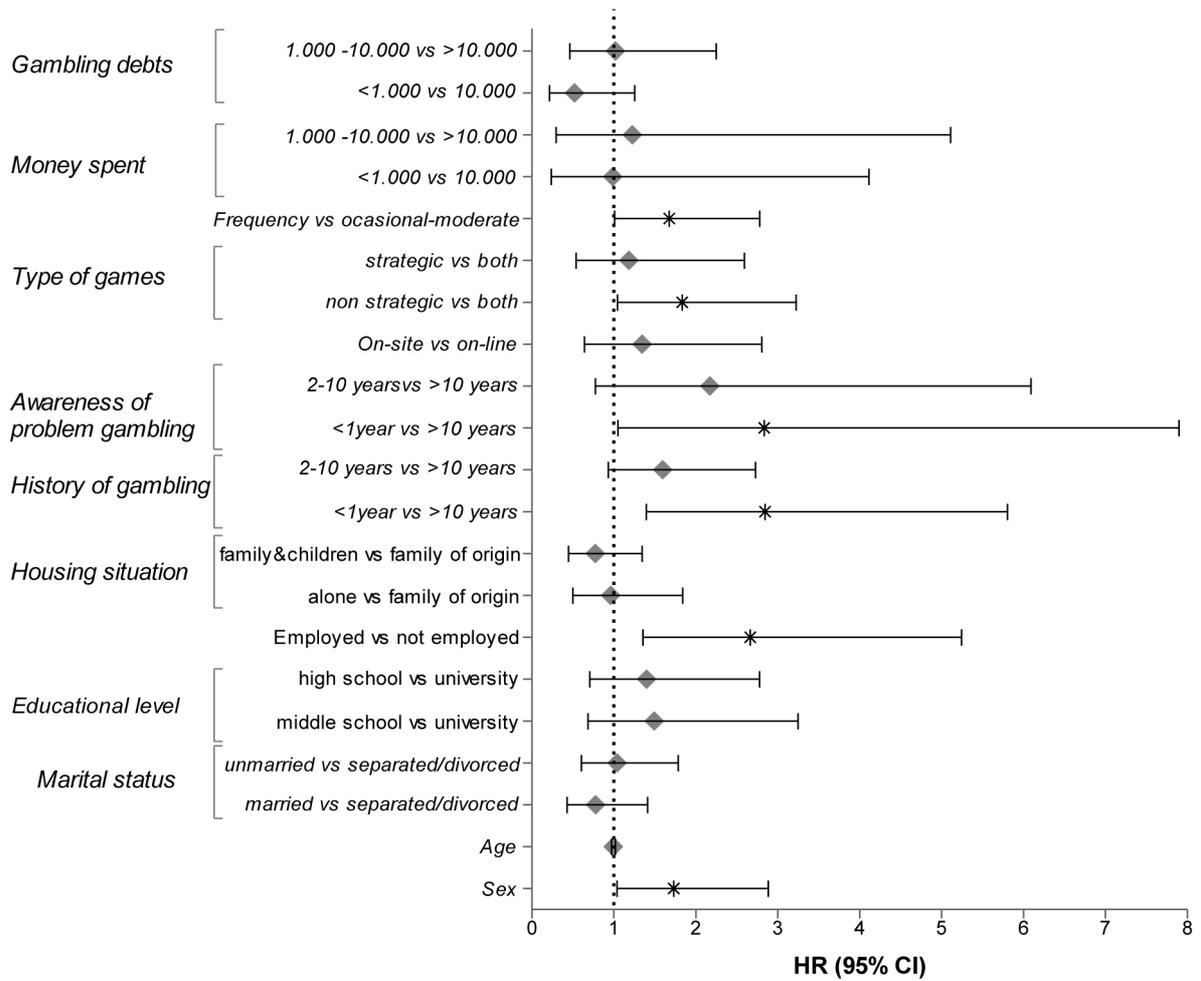
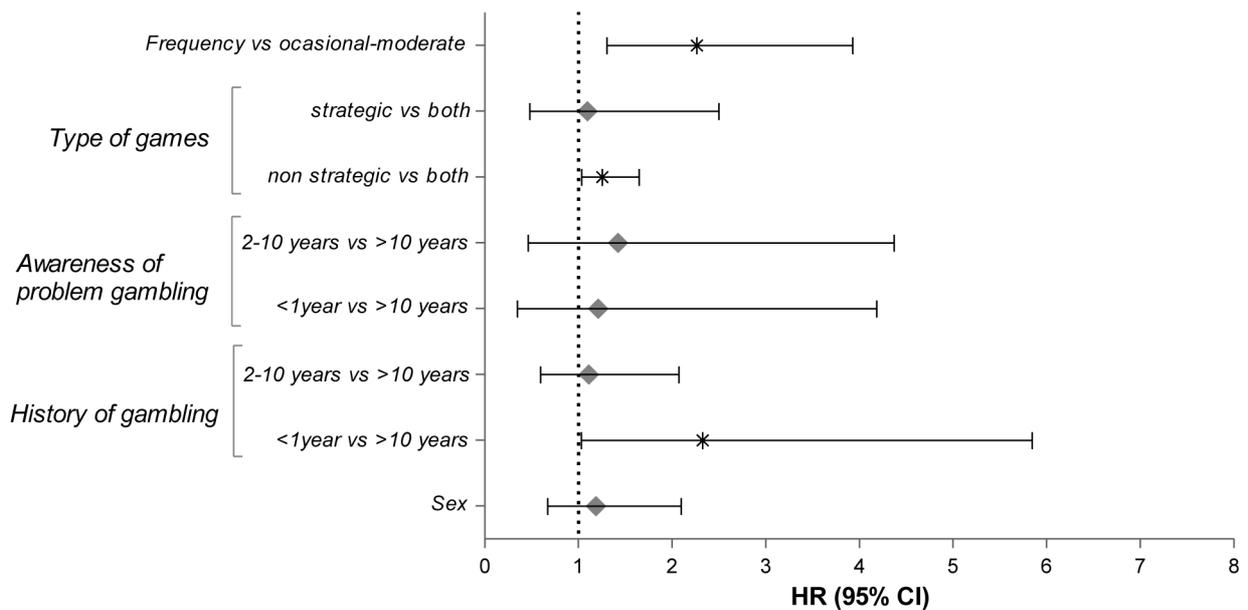


Fig. 3 - Multivariate Cox model analysis



These results are consistent with research associating both non-strategic gambling and high gambling frequency with severe gambling problems, which are more difficult to interrupt. In fact, non-strategic games are indeed more addictive than those involving competence and skill: the structural characteristics of non-strategy-based games, and slot machines in particular, seem to stimulate cognitive biases such as illusion of control, flexible attributions, representativeness, availability bias, illusory correlations and fixation on absolute frequency (Griffiths, 1994; Meyer *et al.*, 2011; Scalese *et al.*, 2015). Also, problem gamblers, treatment services, and gambling researchers consistently link high frequency of gambling activity with dysfunctional behaviors (Meyer *et al.*, 2009; Williams *et al.*, 2012) – for instance, scratch cards are categorized as a form of continuous gambling strongly predictive of behavioral disorders (Williams *et al.*, 2015).

As noted above, a systematic review (Merkouris *et al.*, 2016) revealed that likely predictors of successful treatment outcome include male gender, older age, being employed, lower severity of gambling symptoms and lower levels of gambling behavior, while preferred gambling activity and problem gambling duration do not appear to be significantly associated with the outcome of treatment. The results of this review are not fully in line with the findings of the present study. These inconsistencies could be partially explained by several methodological issues that limit the relevance of behavioral therapy trials in problem gamblers (Hodgins *et al.*, 2009): it may be difficult, for instance, to generalize the findings obtained from patients recruited via advertisements to patients seeking treatment in real-life settings (Fink *et al.*, 2012), as in the case of the GR ICBT.

Moreover, individuals with a recent onset of gambling and an equally recent development of problem gambling (less than one year) may have not yet consolidated enough motivation for change. Motivation, in fact, is often triggered by gambling-related financial difficulties worsened over time (Ledgerwood *et al.*, 2013). Some patients may therefore not be sufficiently motivated when approaching a treatment that – while freely available online – requires an on-going commitment.

All this suggests that there is a particular need for research exploring the several variables associated with dropping out of treatment, such as: stressful life events and the presence or absence of supportive social relationships; psychological variables, such as impulsivity, sensation-seeking and self-control; differences in these variables between genders (González-Ortega *et al.*, 2014); availability of reliable internet access and of a quiet environment to for computer use; treatment-related variables such as patients' expectations and motivation, therapeutic alliance, treatment duration. In particular, treatment credibility and a good working alliance (Postel *et al.*, 2011) are important factors in Internet-based psychotherapy (Alfonsson *et al.*, 2016). In GR ICBT case, 40 subjects completed a customer satisfaction survey (minimum score = 1; maximum score = 5), which yielded 4 as the average response score.

We should also consider the reasons why many individuals registered for the GR ICBT and then did not ask for an initial appointment with a therapist – the first concrete step in treatment – or dropped out in the early stages. One possible explanation for this might be the easy access to GR service: registration is often driven by impulsivity and curiosity rather than by real motivation for change. Considering a general high risk of dropout in internet-based treatment for psychological disorders – an average rate of thirty-five percent (Melville *et al.*, 2010) – additional research is needed in order to understand and prevent it (Casey *et al.*, 2017).

Limitations

One of the limitations of this study is certainly the nature of the sample, which is not representative of the general population of problem gamblers in Italy. There are, for example, considerable socio-economic differences even between GR helpline users and GR ICBT users. Compared to the helpline users, online therapy patients are younger (39 years vs 42), with a higher level of education (high school diploma or degree in 63% of cases), and have stable employment (60% are employees while 20% are self-employed). Comparison with the population samples of outpatients (Bellio & Fiorin, 2009; Lovaste *et al.*, 2015) assisted by local Italian addiction/problem gambling services facilities (SERD) outlines a similar inclination for non-strategic gambling but significant differences in average age (higher), educational and employment level (lower).

Other limitations on the data should be taken into consideration when interpreting the findings of the study. Firstly, the relatively small size of the sample, which is almost exclusively restricted to men and composed of treatment seekers. Secondly, the lack of control and comparison groups preclude a definitive conclusion (Chebli *et al.*, 2016). In general, as there are only a small number of research examining the association between socio-economic status/gambling behavior and outcome of the treatment of disordered gambling (Melville, 2007; Merkouris, 2016), caution is required in the interpretation of the evidence of the present study.

Conclusion and future research

The findings of this study, the first in Italy to follow patients engaged in online therapy over time, provide useful, though preliminary, information on the socio-economic and gambling behavior characteristic of patients at risk of dropout. Being male and employed, the fact of playing and to have gambling problems for less than a year, a preference for non-strategic gambling, and high frequency of playing were found to be predictors of therapy dropout. This suggests that certain patients' socio-economic characteristics and gambling behavior may play a role in the success or failure of an ICBT. Thus, there is a need to adapt the therapy for patients at risk, placing greater emphasis on motivating them (Jiménez-Murcia *et al.*, 2015). In fact, detecting patients with a greater propensity to dropout at an early stage in the therapeutic relationship might enable the implementation of appropriate and effective customized approaches.

In summary, considering that the goal of this study is to identify factors associated with dropping out of an ICBT, it is important to further investigate the impact of these factors in order to tailor treatment to specific patients' needs (Echeburúa *et al.*, 2017). This would help clinicians to identify participants who are likely to dropout and select who are most likely to benefit in situations where resources are limited. In the months to come, these and other findings will be considered in the evaluation of patients in order to maximize their retention in care. In particular, to enhance treatment retention, an effective ICBT should include intrinsic motivational components aimed at increasing patient engagement. Approaches focusing on motivational factors may result in better treatment engagement for some problem gamblers (Ledgerwood *et al.*, 2013). Thus, GR professionals have recently included a motivational module in the therapy to support patients in the early stages of treatment and to reduce their

risk of dropout. Another aspect is related to the development – in progress – of tools for evaluating the effectiveness of therapy. Assessment of the effectiveness of the GR ICBT based on objective parameters would help enhance strategies aimed at reducing the treatment dropout rate. It would also corroborate the results of the present study, which will be expanded with further data collection and analysis.

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