

## Research Article

# General Health and Health Self-Perception in Gambling Disorder from a Consultation-Liaison Perspective: A Systematic Review

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**Abstract**

Addictive disorders are a significant complaint for referral to consultation-liaison (C-L) psychiatry services, as the C-L psychiatrist is specialized in consulting patients with general health conditions, as well as with psychosomatic disorders. Among addictive disorders, gambling disorder is likely to become an emerging issue in C-L psychiatry. The present systematic review aimed to examine the correlation between gambling disorder and general health, particularly focusing on health self-perception.

A systematic review of English-language papers was performed. The articles included in the present study reported general health or health self-perception data, as well as a measure of problem gambling severity.

Nine studies were included in the present review. The main result we yielded is that disordered gamblers appear to show a somewhat worse somatic health self-perception than the non-gambling population and that they were more likely to utilize medical services. All studies concerning the relation between gambling and general health used self-report measures and were cross-sectional in their design.

The literature seems to show a certain correlation between gambling and a worse self-perception of general health, although the effect size was limited. We hypothesize that at least a part of that patients presenting disordered gambling might be relatively often referred to C-L psychiatry due to their comorbidities. The clinical implications of the present work would point out that the consultation-liaison psychiatrist might play a pivotal role in detection and treatment of gambling disorder.

**ABBREVIATIONS**

C-L: Consultation-Liaison

**INTRODUCTION**

Consultation-liaison (C-L) psychiatry is a psychiatric subspecialty that constitutes the interface between psychiatry and general medicine, and it is therefore one of the areas of psychiatry that is most often confronted with patients with somatic comorbidities, as well as psychiatric disorders that primarily manifest themselves with somatic symptoms, i.e., somatization and somatoform disorders. Besides consulting patients with general conditions, the C-L psychiatrist also focuses on raising awareness among general practitioners about psychiatric and psychological aspects, as well as factors

facilitating the relation between physicians and patients [1,2].

Addictions are one of the most common disorders C-L psychiatry is confronted to [3], since they often are a cause, or an aggravating factor, for many general health conditions leading to medical service utilization. While substance addictions have been studied and routinely treated for a relatively long period of time, there is a growing amount of literature describing an addictive pattern applied behaviors, rather than exogenous substances [4]. Behavioral addictions represent an emerging issue in addiction psychiatry, with a growing number of different addictive behaviors identified in the literature, sharing the same foundation concept, that is, the perception of short-term reward may lead to a persistent, maladaptive behavior pattern generating adverse consequences. The literature suggests that

behavioral and substance addictions share many similarities, including their natural history, comorbidity, genetic contribution, neurobiological mechanisms, and response to treatment [4,5]. Among behavioral addictions, gambling disorder - formerly known as pathological gambling - is the first behavioral addiction to have been recognized and categorized as such in the DSM-5. Gambling disorder is no longer classified as an impulse control disorder as it was in the previous versions of the DSM, due to multiple findings that show a high comorbidity between gambling disorder and substance addictions, and that all these different conditions appear to share common genetic vulnerabilities, biomarkers, and cognitive deficits [6].

Gambling disorder is defined in the DSM-5 as a “persistent and recurrent maladaptive gambling behavior that disrupts personal, family, and/or vocational pursuits”, and has a lifetime prevalence of 0.4%-1.0% of the general population [7]. Such a large prevalence reflects the fact that gambling is currently a diffuse and legitimized behavior in most European countries: a number of studies have in fact shown that, in Europe, 70-97% of individuals older than 18 have gambled at some point during their lifetime, and that 70-90% have done so within the past 12 months [8,9]. While most people gamble recreationally and do not develop any gambling-related problem, a minority of people can develop maladaptive and addictive behaviors within the spectrum of problem gambling, of which most severe manifestation is gambling disorder [10].

Since addictive disorders are of fundamental interest within the clinical activity of the C-L psychiatrist, and constitute a significant part of the complaints for psychiatric referral in the general hospital [3], it can be expected that behavioral addictions, and gambling disorder in particular, will have an increasing importance in C-L psychiatry, since it is a highly prevalent condition which is accompanied by multiple psychiatric comorbidities, and there is a raising awareness on the subject among healthcare professionals [11,12].

Psychiatric comorbidities of gambling disorder have been widely studied, with some psychiatric disorders having been shown to be most commonly associated to gambling disorder, namely alcohol and other substance use disorders [13,14], depressive disorders, bipolar disorder, anxiety disorders, and antisocial personality disorder [15]. It can also be found in the literature that pathological gamblers present an increased risk of suicidal behavior, which represents another important domain of intervention in C-L psychiatry [16]. Another finding that might be of interest from a C-L psychiatry perspective, in gambling disorder comorbidity, is the fact that several studies seem to indicate that pathological gamblers have an increased prevalence of somatoform disorders when compared to non-gamblers [17].

Despite numerous studies on the impact of gambling disorder on psychiatric health, the literature studying its impact on somatic health - in terms of general health diagnoses, parameters, self-perception, and quality of life from a physical health standpoint - is much less developed, and no reviews, to our knowledge, have tried to address the issue of somatic health in pathological gamblers.

We therefore decided to review the literature concerning gambling disorder and general health - in terms of objective

measurements of health parameters, general conditions, and medical services utilization, as well as general health self-perception - from a C-L psychiatry point of view, in order to help clarify the contribution that this psychiatric subspecialty might give in diagnosing and treating patients with gambling disorder.

The primary objective of the present systematic review is, therefore, to examine the relation between gambling disorder and general health, in terms of (1) physical health self-perception, in order to verify whether pathological gamblers and non-gamblers perceive their health differently and (2) in terms of objective (i.e. non self-report) data, such as health parameters (with a particular attention on body mass index and blood pressure) or medical services utilization, in order to examine whether the impact of gambling disorder on general health has been measured in the literature, as is the case for substance addictions. Finally, we added our reflections on the clinical significance of the findings of the present review, and discussed the role of the C-L psychiatrist in the detection and treatment of patients with gambling disorder.

## MATERIALS AND METHODS

### Search strategy and identification of relevant studies

The present study followed the PRISMA guidelines, one of the most widely used sets of items for conducting systematic reviews. However, the present review was not registered using a pre-specified protocol. We used a broad search strategy for potential articles, in order to include all relevant studies concerning general health, both as self-perceived and as objectively measured in terms of health parameters, non-self-reported diagnoses and medical services utilization. Electronic search was carried out in June 2016 on studies published from 1960 to June 2016 on the Pubmed, Web of Science, and PsycINFO databases using the following search keys: (gambling disorder OR pathological gambling OR problem gambling OR disordered gambling OR gambling OR gamblers) AND (health OR general health OR somatic health OR physical health OR health problems OR health perception OR health correlates OR self-rated health OR somatic symptoms OR medical conditions OR healthcare utilization OR medical utilization OR quality of life).

### Inclusion and exclusion criteria of the studies

Since we aimed to examine the relation between problem/pathological gambling and general health, the studies we included in the present review needed to meet the following criteria: (1) they were published in a peer-reviewed journal in the English language, (2) they included a standardized measure of gambling disorder, (3) they included either an objective measure of general health or a standardized self-report measure of general health self-perception as described earlier, and (4) the sample comprised participants aged 16 years and older. We excluded studies based on the following criteria: (1) the study did not include a standardized measure of gambling disorder and/or pathological gambling, (2) the study did not include an objective measure of general health or a standardized self-report measure. Due to the novelty of the subject, and the likely scarcity of studies, we decided to use a broad search strategy with relatively comprehensive inclusion and exclusion criteria.

## Identification of studies

Based on the inclusion and exclusion criteria, a first eligibility screening of titles and abstracts was carried out; full text was retrieved for relevant studies, as well as for studies for which relevance was in doubt. Study screening and data extraction was carried out by the first author. In order to minimize the risk of bias, selected studies were also screened by the second author, who also proceeded to independent data extraction, with no difference in agreement between reviewers.

## RESULTS

Our search identified a total of 2,082 results. After removal of duplicates, a total of 1,095 studies were retained. Among the remaining papers, 19 relevant studies were then further screened, and all of these 19 studies were then obtained in full-text in order to assess their eligibility. Nine articles met our inclusion criteria, 6 of which examined the relation between gambling disorder and general health in the general population [18-23], 2 of which did so among patients over 65 years of age [24,25], and one of which did so for both adult and elderly patients [26]. Ten studies were

excluded after full-text assessment since they did not include either an objective and replicable measure of general health, or a standardized self-report questionnaire. Papers concerning the relationship between general health data and pathological gambling are resumed in Table (1). A flow diagram of the paper identification process is provided in Figure (1).

## General health correlates of gambling disorder

**Identified measures:** The articles included in the present review, with their respective sample sizes and methods, are reported in Table (1). All of the studies that met our inclusion criteria either used the Short Form (36) Health Survey (SF-36) scale or the Short Form (12) Health Survey (SF-12, SF-12v2) as a measure of general health self-perception. These two scales investigate the same four dimensions of general health self-perception and quality of life. Specifically, both the SF-36 and SF-12v2 questionnaires identify 8 subscales, 4 of which describe physical health, with the other 4 subscales describing mental health. The subscales describing physical health were, specifically, (1) self-perceived physical functioning, (2) bodily pain, (3) limitations in one's role due to general health problems,

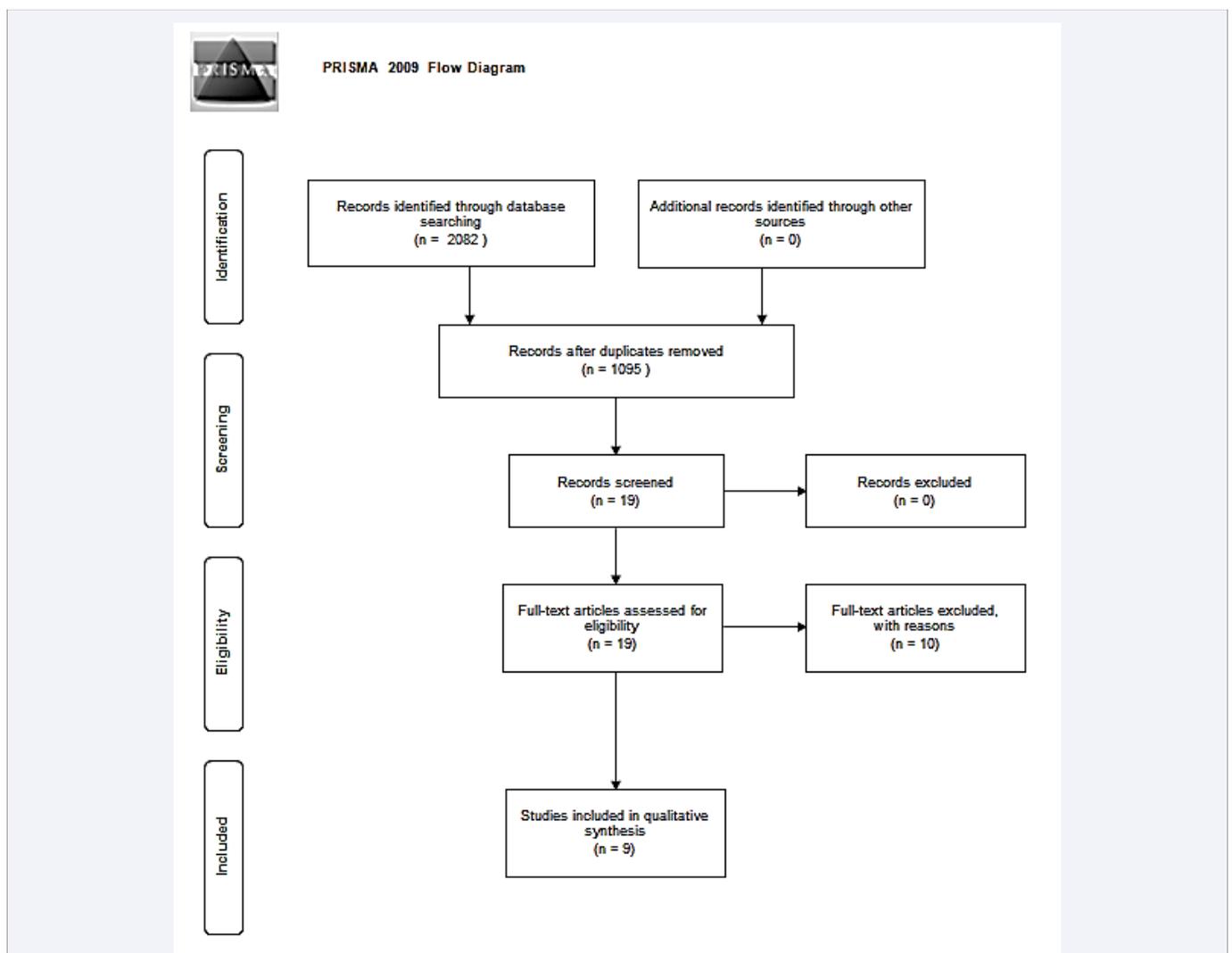


Figure 1 PRISMA 2009 Flow diagram.

and (4) self-perceived general health rating. In keeping with the objectives of the present review, we proceeded to classify studies according to the four physical health dimensions investigated by the aforementioned questionnaires, therefore discarding the four dimensions investigating mental health from further analysis. Since the SF-36 and SF-12v2 were the only standardized measures of general health self-perception we found across studies, we decided to use the four general health dimensions from these two scales for the purposes of the present review.

We could not identify studies that reported objective, i.e. non-self-reported, measures of general health, such as received diagnoses or directly measured parameters, although two studies among the papers we included reported BMI, and one [26] reported different health conditions, such as cardiovascular and gastro-intestinal conditions; we did not summarize these data since they were self-reported and were not gathered using a standardized questionnaire. The only exception was the study by Morasco et al. [22], which reported medical services utilization, defined as emergency room use in the year prior to assessment, which was deemed as a sufficiently reliable health-related measure and is summarized in (...and is summarized) below. Results on the adult and elderly population are (...and elderly population are) separately reported.

**Adult population:** Data concerning the SF-36 and SF-12v2 physical health dimensions on the adult population, namely physical functioning, physical role limitations, bodily pain, and general health rating, are resumed in Table (2).

**Medical services utilization:** Morasco et al. [22] analyzed data from the National Epidemiologic Survey on Alcohol and Related Diseases. The severity of gambling behavior was associated with higher rates of utilization of medical services among pathological gamblers, defined as a higher likelihood of emergency room treatment in the year before the assessment (OR = 1.98, 95% CI = 1.27-3.09).

**Older population:** Three studies reported self-perceived general data among the elderly. The study by Burge et al. [25] did not compare disordered gamblers to non-gamblers, but rather compared early onset to late onset problem (or pathological) gamblers, with the cutoff age for late onset gambling being 21 years of age. Findings from this study, which used the SF-36 scale, showed that late onset gamblers report a worse general health summary score (F = 4.61, df = 1, 49, p < .05), worse physical functioning and physical role functioning, as well as more intense bodily pain (F = 6.15, 4.96, 4.41, 4.85, 5.16, respectively; df = 1, 49, p < .05).

A study by Desai et al. [26] analyzed data on 8,205 individuals over 65 years of age; findings from this study show a statistically significant difference between elderly disordered gamblers and non-gamblers, with gamblers having worse physical health index scores (mean = 36.8, SE = 4.8) than their non-gambling counterparts (mean = 41.9, SE = 0.2). Since only summary physical health scores were considered, we could not differentiate which aspects of physical health specifically received a lower rating.

According to the findings of Pietrzak and colleagues [24],

**Table 1:** Sample sizes and methods of the articles included in the present review.

Article	Controls*	Pathological gamblers or problem/pathological gamblers (p/p)**	Methods***	Notes
<b>Adults</b>				
Black, Moyer & Schlosser, 2003	3474	30	SF-36	
Morasco & Petry, 2006	94	35	SF-12v2	Comparison between disordered gamblers and non-gamblers receiving disability
Weinstock et al., 2006a	72	78	SF-12v2	
Weinstock et al., 2006b	268	39	SF-12v2	
Morasco et al., 2006	31940	195	SF-12v2 Emergency room treatment in the previous year	Controls : "low-risks individuals"
Desai et al., 2007	11720	103 (p/p)	SF-12 BMI	
Black et al., 2013	91	95	SF-36 BMI	
<b>Elderly</b>				
Desai et al., 2007	5835	14 (p/p)	SF-12 BMI	
Pietrzak et al., 2005	48	48	SF-36	
Burge et al., 2004	-	52 (p/p)	SF-36	

\*Controls: low-risks individuals or non-gamblers.  
 \*\*Problem gamblers refers to gamblers whose problematic gambling behaviors is assessed by standardized measures, whereas pathological or disordered gamblers refers to subjects with a diagnosis of pathological gambling as assessed according to the DSM-IV criteria.  
 \*\*\*SF-36: Short Form (36) Health Survey; SF-12v2: Short Form (12) Health Survey version 2; BMI: Body Mass Index; SF-12: Short Form (12) Health Survey.

disordered gamblers reported significantly lower physical functioning ( $p < 0.01$ ), role physical ( $p < 0.05$ ), as well as general health rating ( $p < 0.01$ ). The only dimension that was not affected by disordered gambling, in this study, was bodily pain.

## DISCUSSION

The present review aimed to examine the relation between gambling disorder and somatic health correlates, both self-reported and objectively measured data. The main result we yielded is that disordered gamblers appeared to show a somewhat lower degree of self-reported general health perception and presented a complex set of somatic health complaints. Pathological gamblers reported worse general health in all of the self-report subscales of the SF-12 or SF-36 health survey, with varying degrees of consistency between different studies. However, it must be noted that (1) none of the subscales showed consistent differences across all studies, and that (2) the size of the effect was very limited for all of the dimensions we

analyzed. This having been said, we found that, at a sub-scale level, the dimensions of “bodily pain” and “overall health self-perception” were most consistently shown to be worse among pathological gamblers.

Our data seemed to point in the direction of a generally lower somatic health among gamblers as compared to non-gamblers. However, we must underline that multiple studies in the literature pointed out that somatoform disorders are more prevalent among pathological gamblers than in the general population [17,27-30]. Although this could not be directly derived from the available studies, we hypothesize that the low effect size and the low between-studies consistency might be at least partly due to the influence of such higher prevalence of psychosomatic disorders among problem gamblers. Moreover, we might argue that, if self-perception of one’s general health is not a reliable substitute for objective health data, this is even more the case in a population that shows a certain tendency to somatize, such as disordered gamblers. This highlights the need for further studies

**Table 2:** Subscales of the SF-36 and SF-12v2 items among the adult population across studies.

Study	Mean (SD) in control subjects*	Mean (SD) in pathological/disordered gamblers*	p-value
<b>Physical functioning</b>			
Black, Moyer & Schlosser, 2003	84.2 (23.3)	73.6 (29.1)	0.12
Morasco & Petry, 2006	57.3 (47.8)	47.9 (71.0)	0.21
Weinstock et al., 2006a	77.0 (30.5)	57.9 (32.7)	<0.01**
Weinstock et al., 2006b	83.1 (45.6)	70.6 (23.8)	0.08
Morasco et al., 2006	51.33 (20.7)	51.09 (12.6)	<0.01**
Black et al., 2013	84.3 (22.0)	73.5 (27.0)	<0.01**
<b>Role physical</b>			
Morasco & Petry, 2006	64.8 (42.5)	53.3 (63.2)	0.09
Weinstock et al., 2006a	80.2 (26.3)	60.9 (28.3)	<0.01**
Weinstock et al., 2006b	87.4 (34.4)	79.9 (19.7)	0.19
Morasco et al., 2006	51.0 (20.7)	50.95 (12.6)	<0.01**
Black et al., 2013	77.0 (35.6)	69.9 (38.7)	0.27
<b>Bodily pain</b>			
Black, Moyer & Schlosser, 2003	75.2 (23.7)	65.9 (29.7)	0.19
Morasco & Petry, 2006	68.4 (43.5)	43.9 (64.7)	<0.01**
Weinstock et al., 2006a	79.2 (31.4)	54.6 (32.7)	<0.01**
Weinstock et al., 2006b	86.7 (43.8)	72.4 (22.9)	0.04**
Morasco et al., 2006	50.00 (20.7)	49.45 (16.8)	<0.01**
Black et al., 2013	75.3 (23.8)	66.1 (28.3)	0.016**
<b>General health</b>			
Black, Moyer & Schlosser, 2003	72.0 (20.3)	65.3 (25.2)	0.26
Morasco & Petry, 2006	47.3 (40.5)	44.3 (60.2)	0.64
Weinstock et al., 2006a	55.1 (30.5)	49.6 (32.7)	0.28
Weinstock et al., 2006b	73.1 (54.3)	74.4 (28.9)	0.88
Morasco et al., 2006	50.54 (20.7)	48.96 (15.4)	0.18
Black et al., 2013	73.0 (19.3)	56.5 (21.4)	<0.01**
<b>Physical health summary</b>			
Weinstock et al., 2006a	50.1 (12.4)	43.1 (13.1)	<0.01**
Weinstock et al., 2006b	52.4 (18.0)	47.2 (13.7)	0.04**
Morasco et al., 2006	50.54 (16.6)	50.30 (13.4)	<0.01**
Desai et al., 2007	42.3 (21.7)	40.7 (40.6)	0.46
Black et al., 2013	78.0 (21.2)	67.2 (23.8)	0.002**

\*Standard error (SE) is converted into standard deviation (SD). For each dimension, higher scores indicate better functioning.  
 \*\*Statistically significant results.

using reliable and objective health measures in order to establish whether gambling disorder has a direct influence on somatic health.

Only two of the included studies investigated the prevalence of overweight and obesity among adult patients, comparing disordered gamblers and non-gamblers. The study by Black et al. [23] showed that pathological gamblers had a significantly higher BMI compared to non-gamblers, although the sample size was relatively modest, and the study by Desai et al. [26] showed higher rates of obese individuals (i.e., individuals with a BMI higher than 30) among pathological gamblers.

Another type of measure that was found to differ between disordered gamblers and non-gamblers was medical services utilization, which was shown to be consistently higher among pathological gamblers. It is to be noted, however, that the self-perception of one's health might have a strong influence on the frequency with which one might seek medical attention.

Although individual diagnoses were self-reported and gathered in a non-systematic way among the studies we included, Morasco et al. [22] identified a higher prevalence of medical diagnoses of tachycardia, angina, cirrhosis and other liver diseases, which is in part consistent with another study by Cowlshaw and Kessler [31], which found a relatively mild relation between at-risk gambling and the total number of somatic complaints, as well as having frequent headaches; due to the risk of recall biases, the non-systematic nature of data gathering, and the concomitant possible presence of psychosomatic disorders, we could not include these potentially very interesting data in the present review, and further studies are required on the subject.

Indeed, it might be argued that the activity of gambling is largely sedentary, and as such, it might be one of the few thrilling activities available to people who either are in poor health conditions, or who have impairing psychosomatic symptoms. Psychiatric comorbidities associated to pathological gambling might also be mediating factors in the development of a number of behaviors that might lead to poorer general health. As an example, problem and pathological gamblers have been shown to have an important comorbidity in harmful substance use [14,32], as well as risky health and sexual behaviors [33]. However, it is impossible to draw any definitive conclusions based on the current literature.

While there might be some general health differences between gamblers and non-gamblers, that cannot be only explained by self-perception, such as BMI, cardiovascular and liver disease, what we can derive from the literature is that there is a lack of systematically gathered general health data among pathological gamblers to this day.

This underlines one of the most important limitations to our study that is, having examined almost exclusively self-reported general health data, which might be subject to a series of biases linked to self-report. A second limitation is that none of the studies we examined had taken psychosomatic diagnoses into account, that is, the available psychiatric literature does not allow us to draw a definitive conclusion on the impact of psychosomatic symptoms on gamblers' general health perception and medical services utilization. Data indicating a worse perception of general

health caused by general medical conditions have been shown to overlap with data from patients with a similar perception caused by psychosomatic conditions. As an example, in the psychosomatic literature, SF-36 questionnaire scores have been shown to be significantly lower in multiple types of patients with somatoform disorders [34]. Moreover, due to the exclusively cross-sectional nature of the studies available in the literature, it is currently impossible to determine whether gambling disorder contributes to poor health and/or somatization, or if, on the contrary, the latter conditions contribute to the insurgence of pathological gambling, or if common risk factors connect somatoform disorders, somatic conditions and disordered gambling. Finally, due to the scarcity of studies available on the subject, we had to aggregate studies on different populations in terms of age and psychosocial background, with varying degrees of rigor in data gathering, which might have impacted our results in terms of statistical significance and size of effect.

In general, further research on this subject might include the collection of objective health data among pathological gamblers, as well as longitudinal studies on general health and on psychosomatic disorders among pathological gamblers. This might help identify and quantify the impact of pathological gambling on general health, and the correlation with individual, specific conditions.

To summarize, we hypothesize that the relation between general health, psychosomatics, and gambling disorder is complex and multifactorial, reflecting the relation between general health, general psychiatric conditions, and substance use disorders. Individual aspects that might mediate the relation between general health and gambling disorder might involve, as an example, higher impulsivity [35], lower reward sensitivity [36], and higher discounting of rewards that are delayed in time [37], leading to poorer choices in multiple fields, including decisions concerning one's health.

The clinical implications we suggest in the present work are twofold. Firstly, actors involved in primary and hospital care, such as general practitioners and hospital physicians, need to be able to recognize signs of possibly disordered gambling behavior and be prepared to organize a referral to appropriate treatment, if this is available, in order to limit gambling-derived harm. Rapid and effective screening tools are already available to help the clinician investigate gambling problems, including the Lie/Bet questionnaire, which enables clinicians to carry out accurate gambling disorder screening with as little as two questions [38], although the DSM-5 criteria remain the gold-standard for diagnosis [7]. Secondly, it might be hypothesized that the C-L psychiatrist could play a pivotal role in identifying gambling disorder, as well as other behavioral addictions: we suggest that, due to worse health, or self-perception thereof, pathological gamblers might be over-represented in the clinical population that is most often referred to C-L psychiatry. Moreover, psychosomatic comorbidities might induce other clinicians to request a psychiatric consultation. Given the emerging importance of behavioral addictions, and gambling disorder in particular, we suggest that the C-L psychiatrist should be informed on the subject of gambling disorder and its potential impact on psychiatric, somatic, and psychosomatic health; that

he or she should be primed to sensitize somatic clinicians to problem gambling, help them in the diagnostic process, then inform and orient patients about treatment possibilities.

## CONCLUSION

The analysis of available studies on the subject of general health and health self-perception showed that problem and pathological gamblers perceive their general health as being worse with respect to non-gamblers, and concretely seem to be in worse general condition. However, this subject needs further research, since there are few available studies with different populations and varying degrees of rigor.

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