suicides in those aged 14 or under increasing from 1 in the first five years (2005-2009) to 5 in the second five years (2010-2014).

When Indigenous suicides were stratified by month, there was a seasonal variation, with increased suicides during the "wet" tropical season. Only 30% of those who suicided had previously engaged with, or been referred to, the Kimberley Mental Health and Drug Service, suggesting that ICD-10 and DSM-5 diagnoses of mental disorders may not be a good predictor of Indigenous suicide. Instead, impulsivity (possibly due to alcohol and cannabis toxicity complicated by complex trauma) has been identified and correlated to increased rates of Indigenous suicide[7]. Hanging was the method of suicide in 88% of Indigenous cases.

Current responses to this problem, though well intentioned, are fragmented and funded by various government programs. A culturally informed, long-term, collaborative approach focusing on resilience in young people may hold the key to effective suicide prevention in the Kimberley region[7,8]. Cultural continuity factors identified in First Nations people in Canada have been associated with suicide prevention[8]. We recommend that further funding be focused on research and development of effective Indigenous youth resilience programs that bolster cultural identity.

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Pathological gambling: a behavioral addiction

Pathological gambling, also referred to as gambling disorder, has become the first recognized non-substance behavioral addiction in the DSM-5. In this classification, several disorders in the heterogeneous DSM-IV category of Impulse Control Disorders Not Elsewhere Classified were reclassified based on data gathered during the time of DSM-IV. However, the DSM-5 classification has generated controversy, with some academic opinion being in favor of leaving pathological gambling in the chapter of impulse control disorders (see, for example, Grant et al[1] in this journal).

Here we provide a summary of the arguments that support the classification of pathological gambling as an addictive disorder (the "pro" arguments) and address those arguments raised by colleagues who favor a different nosology (the "con" arguments). On the "pro" side, several commonalities between pathological gambling and substance use disorders can be highlighted. Among these commonalities are their similar neurobiological underpinnings of brain function and cognitive features[2]. They include similarities in aspects of reward processing between pathological gambling and substance use disorders which are distinct from impulse control disorders. While these latter disorders have rewarding aspects for the individual[1], this reward is based on negative reinforcement: people have a feeling of relief after the act. In sharp contrast, substance-induced addictions and gambling offer positive reinforcement, at least in the early stages of the disease process[2], when people report a "kick" or a state of "flow". Only at later stages, compulsive features and negative reinforcement predominate. Furthermore, an increased salience of stimuli linked to problematic behavior is a central feature shared by pathological gambling and substance use disorders. In both conditions, reward anticipation is dysfunctional irrespective of the type of reward. Evidence suggests that individuals with gambling or substance use disorders exhibit a hypo-responsive reward circuitry. These results support the view that dopaminergic dysfunction constitutes a common feature of both substance-related and behavioral addictions, although further research is warranted[2].

Moreover, pathological gambling and substance use disorders have similar diagnostic characteristics, and comorbidity rates are high[2]. There is overlap in pharmacological and behavioral treatments. Shared genetic vulnerabilities between pathological gambling and substance use disorders exist[3], and a co-aggregation of pathological gambling and substance use disorder in first-degree relatives of individuals with pathological gambling as compared to controls' relatives has been observed[4].

Arguments against a classification of pathological gambling as an addictive disorder, as for example outlined by Grant et al[1], can be refuted without the need of classifying pathological gambling as an impulse control disorder. One of the arguments put forward was that it is premature to consider pathological gambling as an addiction given the finding of shared genetic vulnerability factors between pathological gambling and major depression. We think that the existence of these shared factors can be explained otherwise, given that mood disorders are the second most common co-occurring disorders in pathological gambling, after substance use disorders. In addition, shared genetic liability also exists between substance dependence (e.g., nicotine[5], cocaine[6]) and depression.

Another argument put forward[1] is that no obvious clinical utility exists for categorizing pathological gambling as an addiction because treatment approaches other than those used in the

treatment of substance use disorders may be useful for that condition. Examples outlined are lithium and exposure therapies. However, lithium has the potential to reduce excessive gambling in all likelihood because of its effectiveness in treating comorbid bipolar symptoms rather than pathological gambling *per se*[7]. We agree that exposure therapies can help to reduce gambling urges in pathological gambling. However, this treatment approach has been also successfully used in substance use disorders and is effective in reducing drug- or drug cue-related urges[8].

Finally, when considering prevention, classification of pathological gambling can have a significant impact. While the onset and course of addictions can profoundly be influenced by preventive measures[9], this has not been shown for impulse control disorders.

In summary, the arguments put forward by Grant et al[1] are not sufficient to counter the classification of pathological gambling as an addictive disorder in DSM-5 and to justify a different classification in the upcoming ICD-11. Rather, the opposite holds true. Pathological gambling can best be understood as a "behavioral" addiction, in which the individual is not addicted to a rewarding chemical substance but to a behavior that is rewarding to him/her.

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