Age Differences in Overall Functioning, Gambling-Related Symptoms, and Comorbid Conditions Among Gamblers

Abstract

Objectives: Previous research has examined the role of age in health and functioning among gamblers. This study aims to provide greater understanding of this relationship by comparing younger, middle-aged, and older gamblers with respect to their mental and physical functioning, comorbid psychological disorders, and other gambling-related features.

Method: This study utilized data from the National Epidemiological Survey for Alcohol and Related Conditions (NESARC) with adults meeting one or more DSM-5 disordered gambling symptoms categorized into three age groups: 18 to 34 years old (N = 436), 35 to 54 years old (N = 453), and 55 to 98 years old (N = 321).

Results: Older adults were less likely to qualify for a DSM-5 disordered gambling diagnosis, had lower physical functioning, less help-seeking behavior, lower prevalence of comorbid psychiatric conditions, and were more likely to play a single game (versus multiple games) within a casino (versus outside of a casino) compared to other age groups. The three age groups also differed in terms of the DSM-5 gambling criteria endorsed. Age also moderated the influence of one indicator of quality of life and gambling severity: lower social functioning was associated with increased gambling severity to a greater extent in younger and middle-aged adults than in older adults.

Conclusion: Our findings suggest that older adults meeting at least one disordered gambling criterion experience less severe gambling symptomatology and better mental health, but poorer physical functioning that may be a product of aging. We propose that lower gambling prevalence and better mental health in older adult gamblers is consistent with socioemotional theories of successful aging.

Keywords

Gambling, Comorbidity, Addiction, Lifespan

Introduction

Similar to most addictions, disordered gambling impacts individuals across the adult lifespan [1-3]. However, research suggests that disordered gambling presents differently depending on age, including the types of games played and prevalence rates [1, 4]. The increasing accessibility of gambling both in and out
Age Differences in Overall Functioning, Gambling-Related Symptoms, and Comorbid Conditions Among Gamblers

Mackenzie et al.

also now classifies gambling as a behavioral disorder, with the World Health Organization's ICD-11 proposing that three pathways appear to exist in all adults [1]. The first 'grief pathway' involves problem gambling when feeling upset or needing personal space that results from a desire to avoid negative emotions related to unresolved losses. The second 'habit pathway' involves using gambling as a means of addressing a relatively minor unmet need, with initial positive experiences leading to habituation. The third 'dormant pathway' involves pre-existing vulnerabilities that manifest as a gambling addiction as an older adult. These three pathways appear to correspond to those proposed to exist in all adults [14], with behaviorally conditioned equivalent to habit, emotionally vulnerable similar to grief, and behaviorally vulnerable equivalent to dormant. However, in older adults, there is an extra emphasis placed on the role of isolation, unresolved losses, and mismanagement of life stressors [18].

Prior research therefore suggests that most younger and older adults who gamble do so in healthy, non-addictive manner while others develop symptoms of disordered gambling. When gambling in younger adults becomes problematic, it is associated with a variety of negative outcomes, including poor academic performance and comorbid psychological disorders [11, 12]. The pathways model of problem gambling [2, 13, 14, 15] proposes that three pathways exist in the development of disordered gambling: behaviorally conditioned, emotionally vulnerable, and behaviorally vulnerable. This model has mostly been tested with young adult and adult populations [2].

Like younger adults, older adults who gamble do so recreationally and non-pathologically. Engaging in gambling and gambling-related activities is generally seen as beneficial for older adults, providing the opportunity to socialize and obtain social support. Research suggests that the majority of older adults who engage in gambling are best classified as 'social gamblers' who visit the casino infrequently as a social activity, similar to any other planned social outing [16]. Those who endorse socialization as their main motivation for going to the casino and gambling are likely to visit the casino infrequently, as they more frequently partake in other social outings not centered on gambling, and do not experience any adverse or problematic outcomes due to their gambling behaviors [17].

For those older adults whose gambling is not social and healthy, however, many have experienced problem gambling episodes for prolonged periods through their lifetimes, while others will develop these problems starting in later life. Generally, the most significant predictors of problematic gambling in older adults are unresolved losses and ‘mismanagement of life stressors’ [18]. Three potential pathways have been identified to help explain both risk and protective factors in the development of disordered gambling behaviors in older adults, all of which are connected to isolation [18]. The first ‘grief pathway’ involves problem gambling when feeling upset or needing personal space that results from a desire to avoid negative emotions related to unresolved losses. The second ‘habit pathway’ involves using gambling as a means of addressing a relatively minor unmet need, with initial positive experiences leading to habituation. The third ‘dormant pathway’ involves pre-existing vulnerabilities or comorbidities that manifest as a gambling addiction as an older adult. These three pathways appear to correspond to those proposed to exist in all adults [14], with behaviorally conditioned equivalent to habit, emotionally vulnerable similar to grief, and behaviorally vulnerable equivalent to dormant. However, in older adults, there is an extra emphasis placed on the role of isolation, unresolved losses, and mismanagement of life stressors [18].

Age Differences in Gambling

The prevalence of disordered gambling does not remain static over the course of the lifespan. Overall, a meta-analysis of pathological gambling found that between 0.2 and 2.1% of the population suffer from disordered gambling, with approximately 0.5 to 4.0% experiencing sub-threshold gambling problems [6]. Age-specific prevalence estimates vary between studies, although across studies a consistent general pattern is found with younger and middle-aged adults exhibiting higher prevalence of disordered gambling than older adults [3, 7, 8]. More specifically, rates of past-year gambling participation peaked for those 22 to 30 years old, while problem gambling behaviors peaked later for those 31 to 40 [3]. Regarding older adults, general prevalence estimates suggest that approximately 10 to 13 percent of individuals over the age of 60 gamble frequently [9].

Aside from prevalence, research suggests that the characteristics of pathological gamblers may also vary depending on the age of onset of the disorder. A study by Verduna Vizcaino and colleagues compared characteristics of early-onset (age 25 or less) and late-onset (age 26 or above) gamblers in a nationally-representative sample of Americans [10]. Early-onset gamblers were more likely to be male, single and never married, have an income below $70,000, and exhibit traits of cluster B personality disorders than were late-onset gamblers.

Many younger adults who gamble do so in a healthy, non-addictive manner while others develop symptoms of disordered gambling. When gambling in younger adults becomes problematic, it is associated with a variety of negative outcomes, including poor academic performance and comorbid psychological disorders [11, 12]. The pathways model of problem gambling [2, 13, 14, 15] proposes that three pathways exist in the development of disordered gambling: behaviorally conditioned, emotionally vulnerable, and behaviorally vulnerable. This model has mostly been tested with young adult and adult populations [2].

Like younger adults, older adults who gamble do so recreationally and non-pathologically. Engaging in gambling and gambling-related activities is generally seen as beneficial for older adults, providing the opportunity to socialize and obtain social support. Research suggests that the majority of older adults who engage in gambling are best classified as 'social gamblers' who visit the casino infrequently as a social activity, similar to any other planned social outing [16]. Those who endorse socialization as their main motivation for going to the casino and gambling are likely to visit the casino infrequently, as they more frequently partake in other social outings not centered on gambling, and do not experience any adverse or problematic outcomes due to their gambling behaviors [17].

For those older adults whose gambling is not social and healthy, however, many have experienced problem gambling episodes for prolonged periods through their lifetimes, while others will develop these problems starting in later life. Generally, the most significant predictors of problematic gambling in older adults are unresolved losses and 'mismanagement of life stressors' [18]. Three potential pathways have been identified to help explain both risk and protective factors in the development of disordered gambling behaviors in older adults, all of which are connected to isolation [18]. The first 'grief pathway' involves problem gambling when feeling upset or needing personal space that results from a desire to avoid negative emotions related to unresolved losses. The second 'habit pathway' involves using gambling as a means of addressing a relatively minor unmet need, with initial positive experiences leading to habituation. The third 'dormant pathway' involves pre-existing vulnerabilities or comorbidities that manifest as a gambling addiction as an older adult. These three pathways appear to correspond to those proposed to exist in all adults [14], with behaviorally conditioned equivalent to habit, emotionally vulnerable similar to grief, and behaviorally vulnerable equivalent to dormant. However, in older adults, there is an extra emphasis placed on the role of isolation, unresolved losses, and mismanagement of life stressors [18].

Prior research therefore suggests that most younger and older adults who gamble do so in healthy ways, with a subset engaging in disordered gambling through three pathways. There is theoretical reason to expect that problem gambling should become less common with increasing age. Strength and vulnerability integration (SAVI) theory [19] suggests that aging enhances older adults' ability to cope with problems and disengage from negative emotions. However, when stressors are chronic, significant, and unavoidable, age no longer provides these advantages. Instead, older adults must rely on the physiological ability to regulate stress, which generally decreases over the course of the lifespan. Theoretically, according to SAVI, older adults who begin to gamble late in life may do so as a means of coping with, or escaping from, other problems including reduced functionality or comorbid conditions.

Gambling and Comorbid Psychiatric Disorders

In the DSM-5, gambling was diagnostically reclassified as a substance-related disorder rather than its previous classification as an impulse control disorder [20]. The World Health Organization [21] also now classifies gambling as a behavioral addiction in the ICD-11. One of the main reasons for this reclassification is the close similarity that gambling exhibits in relation to others substance use disorders when it comes to motives for use [22, 23]. As individuals frequently employ substances as a means of coping with, or escaping from, negative affect, it stands to reason that this relationship may become excessive and develop into what would be best described as a mental health problem.
Much like other substance use disorders, disordered gambling is associated with a variety of comorbid psychiatric conditions and health difficulties across the lifespan [24, 25]. This includes, but is not limited to, major depression, bipolar disorder, post-traumatic stress disorder, generalized anxiety disorder, specific phobia, hypomania, and substance use disorders [25–32]. One study found as many as 96% of individuals with a lifetime gambling disorder diagnosis met criteria for at least one other lifetime psychiatric disorder [33].

A meta-analytic review found that DSM-IV pathological gambling was highly comorbid with mental health disorders such as any substance use disorder including alcohol and nicotine (57.5%), any mood disorder (37.9%), and any anxiety disorder (37.4%) [34]. Another meta-analysis reviewed the comorbidity of treatment seeking gamblers who may or may not have met the criteria for a clinical diagnosis with DSM-IV Axis I disorders (i.e., mood, anxiety, and substance) [35]. The findings suggest strong relationships between gambling and any current mood disorder (23.1%), any current alcohol or substance use disorder (22.2%), and any current anxiety disorder (17.6%). When compared to non-gamblers, problem gamblers are five to six times more likely to experience a substance use disorder and three times more likely to experience a mood and/or anxiety disorder over the course of their lifetimes [36], whereas in a recent longitudinal case-control study of 427 problem gamblers versus 1583 controls, the risk of lifetime mood, anxiety, and substance disorders was two to three times higher in the gambling group [37]. Psychiatric comorbidities are often more severe in individuals who have been diagnosed with pathological gambling compared to those who have not [34]. For example, among individuals diagnosed with major depressive disorder, pathological gambling was associated with increased likelihood of suicidal ideation and suicide attempts [38]. Problem gamblers also score higher on measures of bodily pain and lower on measures of physical functioning and general health than recreational or non-gamblers [30].

While gambling is associated with comorbid psychiatric disorders in both younger and older adults, a study of Spanish treatment-seeking gamblers suggests that age is associated with differing clinical outcomes and comorbid conditions [39]. This study observed that older disordered gamblers exhibited more comorbid health difficulties, which may be explained by the idea that long-term gambling in older adults has a negative effect on somatic symptoms and mental capacities [31, 40]. For example, engaging in casino gambling may lead to fewer opportunities to engage with others in a meaningful manner, a lack of exercise, spending many hours sitting, and being in an area with frequent nicotine and alcohol consumption, high stress, high anxiety, and poor nutrition, to name a few potentially harmful outcomes.

**Current Study**

Previous examinations of pathological gambling and comorbid disorders with age have been conducted on samples of treatment-seeking gamblers or strictly on groups of in-treatment pathological or disordered gamblers. Our goal was to extend this previous research by comparing gamblers (those who meet DSM-5 criteria, as well as sub-threshold gamblers) of differing age groups in a nationally representative sample. The current study compares physical and mental functioning, gambling-related symptoms, and the prevalence of comorbid mental health conditions in gamblers among three age groups: young adults (18 to 34 years old), middle adults (35 to 54 years old), and older adults (55 to 98 years old). Based on previous research, we expected that older adults would experience fewer comorbid psychiatric conditions and poorer overall physical and mental functioning. Further, we expected age to moderate the relationship between both physical and mental functioning domains and gambling severity. Based on SAVI theory, we hypothesized that age would strengthen associations between gambling and poor physical functioning, and weaken associations between gambling and negative mental health outcomes.

**Method**

**Participants**

Data were from the National Epidemiological Survey for Alcohol and Related Conditions (NESARC), a nationally representative, cross-sectional sample of American adult’s ages 18 years or older. The NESARC utilized a structured diagnostic survey. Wave 1 was collected between 2001 and 2002 through in-person interviews, with 43,093 total participants completing the survey for an 81.0% response rate. More recent versions of the NESARC, namely NESARC Wave 2, collected between 2004 and 2005, and the NESARC-III, collected between 2012 and 2013, did not assess gambling. The NESARC was chosen for analyses as it includes the largest number of individuals qualifying for a diagnosis of DSM-IV pathological gambling in any nationally representative sample in addition to assessing for individual psychological disorders [41]. Information regarding sampling procedures and quality control have been previously detailed by Grant and Dawson [42].

**Measures**

Within the NESARC, the Alcohol Use Disorder and Associated Disabilities Interview (AUDADIS-IV) assessed gambling, gambling-related measures, and other psychiatric disorders.

Gambling. Gambling was measured via the AUDADIS-IV according to DSM-IV criteria. In order to examine participants with current gambling problems, gambling measures were limited to past-year experiences. Participants were screened into the gambling module if they answered positively to an item asking if they had gambled five or more times within the past year with participants who responded ‘yes’ completing the remainder of the gambling items. Fifteen questions were asked in order to operationalize the ten pathological gambling criteria outlined in the DSM-IV. To examine gambling as outlined in the DSM-5 [43], we eliminated the illegal acts criterion, resulting in nine disordered gambling criteria. This study includes gamblers who endorse one or more of the DSM-5 disordered gambling criteria. Gambling research frequently
includes sub-threshold gamblers in order to increase statistical power. Previous research has also supported the inclusion of sub-threshold gamblers as they are more similar to pathological gamblers than recreational gamblers [44]. Further, others have suggested that endorsing even one gambling symptom may be a sign of difficulties related to disordered gambling behaviors [45–50]. In an effort to capture individuals experiencing any sort of difficulty with gambling behaviors, participants meeting at least one DSM-5 disordered gambling criterion were accepted for inclusion in this study. In the analyses examining gambling as a disorder, participants were required to endorse a minimum of four of the nine DSM-5 criteria to receive a disordered gambling diagnosis [41, 48, 50].

The NESARC assessed other gambling-related items as part of the AUDADIS gambling module, including: (1) type of game played, (2) age of pathological gambling onset, and (3) whether the individual had sought a form of professional help for gambling. For type of game played, participants were asked whether they had participated in any of 15 different forms of gambling. In-casino games included card games, dice games, roulette, slot/video machines, and other casino games. Assessed games outside of the casino included bingo/keno, dice games, dog races/fights, card games, games of skill, horse races, lottery, sports games, stock or commodities markets, and other gambling. For age of pathological gambling onset, we utilized the participant age in years at their first episode. To assess help seeking for gambling, participants were asked whether they had ever attended Gamblers Anonymous or gone to ‘any kind of counselor, therapist, doctor, psychologist, or any other professional’. Only participants who qualified for a DSM-IV pathological gambling diagnoses responded to these gambling-related items. Therefore, while most analyses include all participants meeting at least one DSM-5 gambling criterion, regressions examining gaming type, age of onset, and whether participants had sought help for gambling issues were limited to those meeting five or more of the ten DSM-IV gambling criteria.

Substance-use disorder. Past year substance-use disorders were examined in accordance with DSM-IV criteria [51]. We combined ‘abuse’ and ‘dependence’ into a single ‘abuse or dependence’ variable for each substance assessed, excluding nicotine. Reliability for substance use disorders was good [κ = 0.74] [52].

Psychiatric disorders and health measures. The AUDADIS-IV assessed anxiety disorders (i.e., panic disorder without agoraphobia, panic disorder with agoraphobia, social anxiety disorder, specific phobia, and generalized anxiety disorder) and mood disorders (i.e., major depressive episode, dysthymic disorder, and hypomanic episode) according to DSM-IV criteria. Reliability for the mood and anxiety disorder diagnoses was fair to good [κ = 0.40 – 0.65] [52]. Both past-year and lifetime disorders were examined. Past-year diagnoses were grouped into larger categories such as ‘any mood disorder’ or ‘any anxiety disorder’ to improve statistical power. Lifetime diagnoses were examined as individual disorders.

The AUDADIS-IV assessed for the following personality disorders according to DSM-IV criteria: antisocial, avoidant, dependent, obsessive-compulsive, paranoid, schizoid, and histrionic, as well as conduct disorder without antisocial personality disorder. Other personality disorders, including borderline, schizotypal, and narcissistic were only assessed in Wave 2 of the NESARC and, therefore, were unavailable for examination in the current study. Reliability for the personality disorder diagnoses was fair to good [κ = 0.40 – 0.67] [52].

Participants completed the Short-Form 12 Health Survey - Version 2 [53], which assessed overall physical and mental health quality of life. The 12 items form two subscales (mental and physical disability) and eight domains that measure areas of disability: social functioning, general health, vitality, physical functioning, physical role, mental health, emotional role, and body pain. The SF-12 subscales and domains were examined during regression analyses, while the eight domains were the focus of the moderation analysis described later. Scores for each domain range are norm-based, ranging from 0 to 100 with higher scores indicating lower levels of disability and better health.

Age. We categorized participants into three age groups: young adults (18 to 34 years old), middle-aged adults (35 to 54 years old), and older adults (55 to 98 years old). Our decision to classify those 55+ as older is consistent with previous aging and gambling research [9, 54, 55] and is similar to the age groups used by Granero and colleagues [39].

Other sociodemographic factors. Information regarding sociodemographic factors included sex, marital status, race/ethnicity, total past year household income, and highest level of education attained. Sex was categorized as ‘male’ or ‘female’. Marital status categories were ‘single or never married’, ‘married or cohabitating’, and ‘divorced, separated, or widowed’. Race/ethnicity was categorized into ‘White’, ‘Black’, ‘American Indian or Alaska Native’, ‘Asian, Hawaiian, or Pacific Islander’, and ‘Hispanic’. Total past year income was categorized into: ‘<$19,999’, ‘$20,000 to $34,999’, ‘$35,000–$69,999’, and ‘$70,000 and above’. Highest level of education was categorized into ‘less than high school’, ‘high school diploma or GED’, and ‘post-secondary education’.

Data Analyses

Weighted frequencies and cross-tabulations assessed differences among categorical sociodemographic factors across the three age groups (18–34 years old, 35–54 years old, and 55–98 years old) for individuals meeting at least one DSM-5 disordered gambling criterion.

To test our first hypothesis that age will vary with comorbid health conditions and overall measures of functioning, binary logistic (for categorical dependent variables) and linear (for continuous dependent variables) regression analyses compared gambling-related measures between the three age groups. Each of these analyses utilized a significance value of p < 0.01 to correct for Type I error.

To examine our second hypothesis that age would moderate the relationship between functioning and gambling severity, linear regression analyses examined the potential moderating effect of age on the severity of disordered gambling as
measured by the number of disordered gambling criteria endorsed. Specifically, we expected that age would moderate the effect of physical and mental health on gambling severity, with older adults showing a stronger relationship between physical and mental health on gambling severity. Age, the eight domains of the SF-12, and the eight 'age by SF-12' interaction terms were regressed onto a continuous variable for gambling severity, as measured by the number of DSM-5 disordered gambling criteria met. We created interaction terms by centering each variable before creating the interaction term to aid interpretation of the interactions. After conducting these regression analysis, any non-significant interaction terms were subsequently removed before running the final version of the regression model. Moderation analyses employed a significance value of p < 0.05 to determine whether interaction terms from the original models were retained in the final model.

We analyzed the data using the complex samples module of the SPSS statistical software (version 24) with the Taylor Series Linearization method used to account for the complex survey design of the NESARC, including clustering and stratification. All percentages were calculated using survey weights.

**Results**

Of the 43,093 participants completing Wave 1 of the NESARC, 11,153 endorsed having gambled at least five times in any previous year. Of these gamblers, 1,210 endorsed at least one of the nine DSM-5 disordered gambling criteria, including 436 in the young adult group, 453 in the middle age group, and 321 in the older adult age group. Sociodemographic comparisons between age groups for participants meeting at least one disordered gambling criteria are displayed in table 1. Across age groups, the majority of participants were White and male. Most participants had a post-secondary education and, in the oldest two age groups, were most likely to be married. We hypothesized that age would vary with overall measures of functioning and gambling features. The results of the logistic and linear regressions examining associations between age groups and both gambling features and quality of life (i.e., SF-12 scales) are shown in table 2. In these analyses, which were restricted to individuals who met criteria for a lifetime DSM-IV gambling disorder, age of gambling onset differed between all three age groups with the duration of their current problematic gambling behavior(s) being significantly longer in the middle and older age groups compared to the younger adult group. The oldest group was less likely than the other two groups to meet DSM-5 criteria for past-year disordered gambling. The oldest age group had a lower likelihood of seeking professional help for problem gambling behaviors.

In terms of SF-12 scores, physical functioning declined significantly (indicating worsening health) across age groups, whereas mental functioning among older adults was similar to the young group and better than the middle-aged group. All three age groups differed significantly from one another on the SF-12 domains of physical functioning, body pain, general health, and vitality, with worsening functionality in these domains with increased age. The youngest group was found to be in better health on the domains of physical role, emotional role, and social functioning than the other two groups. Older

| Table 1: Sociodemographic comparison between age groups for participants endorsing at least one DSM-5 disordered gambling diagnostic symptom. |
|-----------------|-----------------|-----------------|
|                 | Age 18-34 Years (N = 436) | Age 35-54 Years (N = 453) | Age 55-98 Years (N = 321) |
| **Sex**         | **%**            | **%**            | **%**            |
| Male            | 281 70.8         | 251 63.1         | 158 54.3         |
| Female          | 155 29.2         | 202 36.9         | 163 45.7         |
| **Marital Status** |                |                |                |
| Single (never married) | 253 55.3 | 90 14.5 | 20 4.8 |
| Married / Cohabitating | 151 39.0 | 233 63.4 | 163 65.1 |
| Divorced/Separated/Widowed | 32 5.7 | 130 22.2 | 138 30.1 |
| **Total Household Income Before Taxes** | | | |
| < $19,999       | 114 21.8         | 98 16.6         | 110 26.2         |
| $20,000 - $34,999 | 100 20.7    | 76 15.9         | 74 21.2         |
| $35,000 - $69,999 | 147 36.8   | 157 32.3         | 89 31.8         |
| $70,000+        | 75 20.7         | 122 35.2         | 48 20.9         |
| **Ethnicity**   |                 |                 |                 |
| White           | 210 62.9         | 247 73.1         | 212 78.3         |
| Black           | 117 17.8         | 111 13.5         | 61 10.0         |
| American Indian/Alaska Native | 8 1.9 | 13 2.5 | 5 1.8 |
| Asian/Hawaiian/Pacific Islander | 21 7.0 | 16 3.4 | 9 4.6 |
| Hispanic        | 80 10.4         | 66 7.5           | 34 5.3           |
| **Highest Level of Education** | | | |
| Less than High School | 74 14.0 | 78 14.5 | 80 22.6 |
| High School Diploma or GED | 145 34.3 | 130 30.0 | 111 37.3 |
| Post Secondary Education | 217 51.7 | 245 55.4 | 130 40.1 |
Table 2: Linear and logistic regression analyses examining age group differences in gambling features and quality of life (SF-12) among gamblers meeting at least one DSM-5 disordered gambling diagnostic criterion.

| Gambling Features                                      | Age Groups            | P     |
|--------------------------------------------------------|-----------------------|-------|
| Age of PG onset (years)                                | 18-34 Years (N = 436) | 21.85 | <0.001 |
| Duration of PG                                         | 35-54 Years (N = 453) | 4.17  | 0.002  |
| Number of DSM gambling criteria                        | 55-98 Years (N = 321) | 1.98  | <0.001 |
| Past-year DSM-5 disordered gambling                    |                       | 38.5% | <0.001 |
| Lifetime helpseeking for gambling                      |                       | 41.4% | <0.001 |
| SF-12 Scales                                           |                       |       |        |
| Physical functioning                                   | 18-34 Years (N = 436) | 54.36 | <0.001 |
| Role physical                                          | 35-54 Years (N = 453) | 54.05 | <0.001 |
| Body pain                                              | 55-98 Years (N = 321) | 51.66 | <0.001 |
| General health                                         |                       | 52.79 | <0.001 |
| Vitality                                               |                       | 54.06 | <0.001 |
| Social functioning                                     |                       | 52.29 | <0.001 |
| Role emotional                                         |                       | 51.85 | <0.001 |
| Mental health                                          |                       | 50.53 | <0.001 |

N values are unweighted. %s are weighted. Similar superscript letters denote no statistically significant difference (p > 0.01) while dissimilar superscript letters indicate a significant difference (p < 0.01).

Adults showed better mental health compared to the middle age group but worse mental health than the youngest group.

Addressing the hypothesis that game type would differ with age, results found in table 3 show that older adults were particularly likely to play one game (84.2%), either slot machines or VLTs (62.9%), and did so nearly always in the confines of a casino (97.5%). On the other hand, the majority of those in the youngest age group played more than one game with 71.3% playing a game outside of the casino, compared to just 15.9% of older adults playing outside of the casino. It should be noted that the power of the game type analyses was limited by game type items of the NESARC only being asked of those meeting DSM-IV pathological gambling criteria (i.e., at least 5 of 10 DSM-IV criteria met).

Specific criteria were found to present differently between age groups, as per our hypothesis that age would vary with DSM-5 gambling criteria. Mean scores and test of age group differences shown in table 3 indicate that the youngest age group was more likely to endorse a need to gamble with increasing amounts, more likely to chase losses, and less likely to gamble as a means of escaping or relieving mood than middle and older age groups. Older adults were less for finances, and

Table 3: Logistic regression analyses examining age group differences in gambling-related variables.

| Gambling Participation (Only DSM-IV PG)  | Age Groups            | P     |
|------------------------------------------|-----------------------|-------|
| Played more than one game type           | 18-34 Years (N = 436) | 15 (62.9%) | 0.057 |
| Played game type in a casino             | 35-54 Years (N = 453) | 14 (56.6%) | 0.024 |
| Played game type outside of casino       | 55-98 Years (N = 321) | 19 (71.3%) | 0.063 |
| Played slot or video machine             |                       | 6 (26.2%)  | 0.039 |
| DSM-5 Criteria Met                       |                       | N = 436 | N = 436 |
| Preoccupation with gambling              | 18-34 Years (N = 436) | 260 (60.0%) | 0.494 |
| Need to gamble with increasing amounts   | 35-54 Years (N = 453) | 157 (36.1%) | <0.001 |
| Unsuccessful efforts to reduce gambling  | 55-98 Years (N = 321) | 51 (10.4%) | 0.456 |
| Restless or irritable when attempting to stop |             | 17 (4.2%)  | <0.001 |
| Gambles to escape or relieve mood        |                       | 100 (21.0%) | <0.001 |
| Chasing losses                           |                       | 181 (43.7%) | <0.001 |
| Lies to others to conceal extent of gambling |             | 66 (16.3%) | 0.015 |
| Risked/lost significant relationship/career |               | 12 (1.7%)  | 0.002 |
| Relies on others for finances            |                       | 21 (5.0%)  | <0.001 |

N values are unweighted. %s are weighted. Similar superscript letters denote no statistically significant difference (p > 0.01) while dissimilar superscript letters indicate a significant difference (p < 0.01).
were less likely to be irritable or restless when attempting to stop gambling than the middle aged group. The older adult group were also less likely to lie to conceal the extent of their gambling than the youngest age group.

To examine our hypothesis that age would vary with comorbid mental health conditions, table 4 shows the results of binary logistic regressions between age and comorbid mental health conditions. All assessed past-year mental health disorder groupings were associated with age. Specifically, the prevalence of any anxiety disorder, alcohol use disorder, any substance use disorder, and any mental health disorder were found to decrease with age.

Similarly, all assessed personality disorders were associated with age. The oldest age group was significantly less likely to meet criteria for conduct disorder without antisocial, dependent, paranoid, schizoid, and histrionic personality disorders compared to the other two age groups. Conversely, the oldest age group was more likely to meet avoidant PD criteria compared to the middle age group. The middle age group was more likely to meet obsessive-compulsive PD criteria than the other two groups. Antisocial PD was the only assessed personality disorder to consistently decline over the course of the lifespan.

To examine the hypothesis that age would moderate the relationship between quality of life indicators and gambling severity, we conducted regression analyses including interaction terms between age and all eight SF-12 domains (see Table 5). Only the final model is displayed in table 5. In the first version of the model, interaction terms between age and physical role as well as age and social functioning were significant contributors to the model. These were retained into the final model where age by physical role interaction term was no longer significant (p = 0.921) while age by social functioning (p = 0.001) interaction remained significant. An examination of the conditional effects of social functioning on gambling severity by age group suggests that lower social functioning was associated with increased gambling severity to a greater extent in younger and middle-aged adults, and this relationship was attenuated among the older adults.

### Table 5: Final model representing the extent to which age moderates the influence of quality of life indicators (SF-12) on gambling severity.

| # of DSM-5 PG Criteria Endorsed | p | B/B | 95% CI |
|----------------------------------|---|-----|-------|
| Age                              | ≤0.001 | -0.001 | -0.001 | -0.001 |
| SF-12 – Physical functioning     | 0.532 | 0.000 | 0.000 |
| SF-12 – Physical role            | 0.472 | 0.000 | 0.001 | 0.002 |
| SF-12 – Bodily pain              | 0.295 | 0.000 | 0.000 | 0.000 |
| SF-12 – General health           | ≤0.001 | -0.001 | -0.001 | -0.001 |
| SF-12 – Vitality                 | 0.343 | 0.000 | 0.000 | 0.001 |
| SF-12 – Social functioning       | 0.003 | -0.002 | -0.003 | -0.001 |
| SF-12 – Emotional role           | 0.663 | 0.000 | 0.000 | 0.001 |
| SF-12 – Mental health            | ≤0.001 | -0.001 | -0.002 | -0.001 |
| Age * SF-12 – Physical role      | 0.921 | 7.165E-7 | -1.368E-5 | 1.511E-5 |
| Age * SF-12 – Social functioning | 0.001 | 3.52E-5 | 1.426E-5 | 5.625E-5 |

### Table 4: Logistic regression analyses examining age group differences in comorbid mental health disorders among gamblers meeting at least one past-year disordered gambling criteria.

| Past Year Mental Health Disorder Groupings | Age Groups | p     |
|-------------------------------------------|------------|-------|
|                                           |            |       |
| Any mood or anxiety disorder              |            |       |
| (N = 436)                                  | 18-34      | 0.001 |
| Any mood disorder                         | 152 (32.5%)| 0.001 |
| Any mood disorder                         | 96 (19.0%) | 0.001 |
| Any anxiety disorder                      | 94 (21.3%) | 0.001 |
| Alcohol use disorder                      | 153 (36.8%)| 0.001 |
| Drug including marijuana disorder         | 49 (12.9%) | 0.001 |
| Any substance use disorder                | 167 (40.1%)| 0.001 |
| Any mood, anxiety, alcohol, drug disorder | 250 (56.3%)| 0.001 |
| Lifetime Personality Disorder            |            |       |
| Conduct disorder (w/o antisocial)         | 14 (2.7%)  | 0.001 |
| Antisocial PD                             | 74 (16.7%) | 0.001 |
| Avoidant PD                               | 23 (6.0%)  | 0.001 |
| Dependent PD                              | 7 (1.5%)   | 0.001 |
| Obsessive-compulsive PD                   | 75 (15.2%) | 0.001 |
| Paranoid PD                               | 71 (14.1%) | 0.001 |
| Schizoid PD                               | 42 (9.5%)  | 0.001 |
| Histrionic PD                             | 47 (10.3%) | 0.001 |

N values are unweighted. %s are weighted. Similar superscript letters denote no statistically significant difference (p > 0.01) while dissimilar superscript letters indicate a significant difference (p < 0.01).
Discussion

The current study examined the way gambling-related features, including prevalence of comorbid psychiatric disorders and both mental and physical functioning, vary across the lifespan. The findings of the study indicate that the ways in which gambling behaviors and comorbid disorders present in individuals meeting at least one disordered gambling criteria vary over the course of the lifespan. Older adults are more likely than other age groups to have decreased general functionality and health, more likely to play a single casino game, and less likely to present with a past-year comorbid mental health condition. The three age groups also differed in the DSM-5 gambling symptoms observed. These results generally supported our hypothesis that age would attenuate the relationship between gambling, well-being, and comorbid mental health conditions. Finally, age moderated the relationship between social functioning and gambling severity but did not moderate the same proposed relationship with any other domains of functioning. The relationship between lower social functioning and greater gambling severity was stronger in young and middle age adults than in older adults.

Younger adults had better health and functioning than at least one other age group (i.e., younger or middle-aged adults) on both SF-12 summary scales and all eight SF-12 domains of emotional and physical functioning. On four of the domains (i.e., physical functioning, body pain, general health, and vitality), the scores differed between all three groups with younger age group having the best functioning in these domains and the oldest age group having the worst functioning, partially supporting our hypothesis based on natural age-related declines in physical function, as measured by SF-12 or related measures [56, 57, 58]. The youngest group had better health/functioning in the remainder of the domains (i.e., role physical, social functioning, role emotional, and mental health) than at least one of the other two age groups, with minimal differences observed between the middle and oldest age groups. SAVI theory would suggest that physical health naturally declines while mental health should generally improve unless there are vulnerabilities that nullify age-related emotional advantages [19]. This is supported by our findings that older age was associated with worse scores on domains of physical functioning (i.e., physical functioning, body pain, general health, and vitality) while minimal differences between older adults and middle age adults were observed in domains of mental functioning (i.e., role physical, social functioning, role emotional, and mental health). Previous studies have also found that younger adults in general are less likely to present with difficulties in physical or emotional functioning while older adults in general have poorer overall health [39, 59]. Furthermore, past research has shown gamblers to be more likely to experience poorer overall mental and physical health compared to their non-gambling counterparts [34, 60, 61]. Though this may be a simple product of aging in some cases, others may experience gambling as the primary disorder, as Granero and colleagues [39] indicate. For these individuals, the largely sedentary act of gambling coupled with either the isolation frequently involved with online gaming or the common substance use observed within casinos may result in worsening physical and mental functioning over time [31, 39].

Significant age group differences were observed in the endorsement of DSM-5 gambling criteria. The youngest age group was more likely to chase losses and need to gamble with increasing amounts to achieve the same level of excitement than other age groups. Chasing losses has been noted as a criterion that tends to set problem or pathological gamblers apart from more recreational gamblers in young adults and may serve as an indicator of increasing severity in the future [46, 48, 62]. Older adults, on the other hand, presented with the number of total symptoms endorsed and differed most from the youngest group in terms of symptoms endorsed. While the youngest group endorsed the need for increased stimulation to reach a desired excitement level, the motivation for older adults appeared to be more driven by a desire to escape or relieve mood. The introduction of late-onset gamblers in the older age groups likely explains the desire for older adults to escape or relieve mood as late-life gambling largely serves to act as an escape from late-life emotional distress [18].

The results of this study found lower prevalence rates of mood, anxiety, and substance use disorders in older adults compared to other age groups. This lower prevalence of comorbid mental health conditions in older adults is consistent with the finding that gambling in older adults is less severe in terms of total symptoms endorsed, and similar to other studies that found earlier age of onset to be associated with greater comorbid disorder severity [39, 54, 63]. SAVI theory suggests that the relatively lower presence of comorbid mental disorders in older adult gamblers may be due to age-related improvements in well-being [19]. The current study examined gamblers meeting at least one DSM-5 disordered gambling criteria. A recent examination using the NESARC found older adults meeting at least four DSM-5 disordered gambling criteria were more likely than younger age groups to present with a comorbid psychiatric condition [20], suggesting more severe gamblers do not experience the age-related benefits proposed by the SAVI theory [19].

The development of late-onset gambling in older adults may be indicative of increasing vulnerability with age, including impaired health functioning as observed in this study. Some studies have suggested older adults may develop problem gambling behaviors later in life in part to cope with negative affect that may be related to the process of aging, including reduced social network and reduced physical capacity [65]. Alternatively, chronic gamblers may have learned how to control and manage their gambling issues over a long period of time, thereby limiting the presentation of gambling symptoms and co-occurring gambling issues, as observed in other addictions [66]. This study cannot directly address this issue directly because it is cross-sectional, and we did not differentiate between chronic gambling and late-onset gambling in older adults. However, our findings generally suggest that older adults, overall, present as a less severe gambling group than younger or middle age groups of gamblers. It is important to
note that this discrepancy in symptomatology may also be due, in part, to a lack of opportunity to meet these criteria given changes in employment and social relationships associated with old age, which have led some to call for gambling criteria designed specifically for older adults [67].

In young adults, comorbid prevalence rates, DSM-5 gambling disorder prevalence, and gambling severity as measured by number of diagnostic criteria met were all significantly greater than in the other two age groups. We found that younger adults were less likely to gamble to escape or relieve mood, which is similar to past research which has suggested that, despite experiencing gambling difficulties, young adults are often unlikely to acknowledge their gambling behaviors as problematic [68]. While prevention strategies and recommendations have been suggested to target adolescents and young adults [69-72], a review of adolescent gambling literature noted that it is unclear whether these programs impact problem gambling behaviors or prevalence [73].

Our hypothesis that age would moderate the relationship between quality of life and gambling severity was only supported for one of the eight health variables we examined; age moderated the relationship between social functioning and gambling severity. Among the younger and middle age gamblers, participants with poorer social functioning had the greatest gambling severity, whereas among older gamblers, this relationship was attenuated. This coincides with previous findings regarding early-onset gambling being associated with more severe symptomatology [63]. The moderating impact of age on the relationship between social functioning and gambling severity may become increasingly important to understand given the proliferation of online gambling opportunities, where young adults may be increasingly able to engage in harmful gambling behaviors without leaving the home or even being disqualified from gambling due to being under the age of majority. As previous research has found, younger problem gamblers differentiate from older gamblers in the frequency with which they gamble apart from family or friends and their overall involvement in non-gambling related extracurricular activities [62, 74]. For older adults, the relationship between lower social functioning and greater gambling severity was significant but weaker than in other age groups. This may suggest that some older adults simultaneously use gambling as a social interaction and experience a relatively high number of disordered gambling symptoms. Alternatively, older adult gamblers may have felt that their social activities were not interfered with by physical health or emotional problems if a chronic stressor had reduced their level of social support over a long period of time, as may occur in individuals with long-standing stressors according to the SAVI theory [19].

While previous research has found that psychological treatment targeted towards gambling improves other psychological symptoms, it should be noted that efficacious treatment options, including cognitive-behavioral therapy and motivational interviewing tend to include individualized feedback that takes overall symptomatology and gambling motives into account [75]. The results of the current study highlight the differing clinical presentation of individuals across the lifespan who meet at least one disordered gambling criterion. Specifically, the findings reinforce the importance of implementing treatment as soon as possible, particularly in young adults who present with greater severity and a higher prevalence of past-year comorbid disorders. Signs of problem gambling in older adults, alternatively, may be a sign of poorer general mental or physical functioning and should not be dismissed as a by-product of positive socialization.

**Limitations**

The current study has a number of substantial strengths, including the use of DSM diagnostic criteria for comorbid conditions, and recruiting gamblers from a nationally representative sample rather than looking exclusively at those seeking treatment. However, this study, particularly the use of Wave 1 of the NESARC, has limitations that should be noted. Wave 1 of the NESARC examined DSM-IV-TR diagnostic criteria for comorbid psychiatric disorders, such that our psychiatric comorbidity findings might not generalize to the DSM-5. While DSM-5 disordered gambling was replicable within the NESARC without impacting the integrity of the diagnosis, the other disorders are not as clear-cut. As a result, the findings of this study reflect the DSM-IV view of psychiatric disorders. The NESARC utilized trained-lay interviewers to conduct the AUDADIS-IV instead of mental health professionals. Although trained lay interviewers do not have the same training as professionals, they have been shown to perform similarly to medical doctors in diagnosing disorders with a structured interview [76]. Another limitation comes from the timeliness of this research. This study utilizes data from NESARC Wave 1, collected from 2001 to 2002. Despite the age of the data, the NESARC was chosen as it offers a nationally representative large sample of gamblers, allowing for generalizability across locales and settings, making it ideal for the purposes of this research question. Further, more recent waves of the NESARC did not survey gambling. The research utilized cross-sectional data and did not allow for differentiation between early- and late-onset gambling, limiting the ability to infer causality.

Since the time of data collection, disordered gambling rates may have changed with the proliferation of available gambling methods, specifically online gambling, including Internet poker, and video lottery terminals. These methods may be of particular interest to both younger adults with poor social functioning and older adults with poor physical functioning. Online gamblers may differ from non-online gamblers, though research is inconsistent in terms of differences in severity and symptomatology [75, 78, 79]. Online gamblers are thought to be less likely to seek treatment [78]. Therefore, it can be challenging to determine how psychiatric comorbidity rates in online gamblers may differ from those in more traditional gamblers [78, 80]. One study of outpatient pathological gamblers in Sweden found that 89% of treatment-seeking patients reported online gambling as the focus of their gambling problem, and 58% of patient records indicated an additional psychiatric diagnosis unrelated to gambling [81].
Conclusion

The current study found that gambling-related features differ across the lifespan in gamblers presenting with as few as one disordered gambling symptom. Mental and physical functioning, comorbid psychiatric disorders, and the disordered gambling symptoms among individuals with at least one disordered gambling criterion were all found to differ significantly among younger, middle-aged, and older adults, with older adults having poorer physical functioning but fewer past-year comorbid psychiatric conditions than other age groups. In general, age influenced the clinical features associated with gambling. Older adults who experience gambling symptoms may still benefit from age-related strengths that are associated with fewer comorbid mental health problems. Young adults with gambling symptoms may present as more severe and require intervention as soon as possible to help prevent future difficulties. Further, age moderates the relationship between social functioning and gambling severity, highlighting the importance of social factors, including connectivity and isolation, in the prevention and treatment of gambling issues across the lifespan.

References

1. Barnes GM, Welte JW, Tidwell MCO, Hofman JH. 2011. Gambling on the lottery: Sociodemographic correlates across the lifespan. J Gambl Stud 27(4): 575-586. http://doi.org/10.1007/s10899-010-9228-7
2. Kurilla A. 2021. Is subtyping of gamblers based on the pathways model of problem and disordered gambling valid? a systematic review. J Gambl Stud 37: 983-1006. http://doi.org/10.1007/s10899-020-09995-6
3. Welte JW, Barnes GM, Tidwell MCO, Hofman JH. 2011. Gambling and problem gambling across the lifespan. J Gambl Stud 27(1): 49-61. https://doi.org/10.1007/s10899-010-9195-z
4. Welte JW, Barnes GM, Wieczorek WF, Tidwell MC, Parker J. 2002. Gambling participation in the U.S.: Results from a national survey. J Gambl Stud 18(4): 313-337. http://doi.org/10.1023/a:1021019915591
5. Dwyer B, Shapiro SL, Drayer J. 2017. Daily fantasy football and self-reported problem behavior in the United States. J Gambl Stud 34(3): 689-707. http://doi.org/10.1007/s10899-017-9720-4
6. Stucki S, Rihs-Middel M. 2007. Prevalence of adult problem and pathological gambling between 2000 and 2005: an update. J Gambl Stud 23(3): 245-257. https://doi.org/10.1007/s10899-006-9031-7
7. Delfabbro P, King D, Griffiths MD. 2013. From adolescent to adult gambling: an analysis of longitudinal gambling patterns in South Australia. J Gambl Stud 30(3): 547-563. http://doi.org/10.1007/s10899-013-9384-7
8. Shaffer HJ, Hall MN, Bilt JV. 1997. Estimating the prevalence of disordered gambling behavior in the United States and Canada: A meta-analysis. Harvard Medical School, Boston, MA, USA.
9. Nower L, Blaszczynski A. 2008. Characteristics of problem gamblers 56 years of age or older: A statewide survey of casino self-excluders. Psychol Aging 23(3): 577-584. http://doi.org/10.1037/a0013233
10. Verdura Vizzacino EJ, Fernández-Navarro P, Petry N, Rubio, G., & Blanco, C. 2014. Differences between early-onset pathological gambling and later-onset pathological gambling: data from the national epidemiologic survey on alcohol and related conditions (NESARC). Addiction 109(5): 807-813. http://doi.org/10.1111/add.12461
11. Engwall D, Hunter R, Steinberg M. 2004. Gambling and other risk behaviors on university campuses. Journal of American College Health 52(6): 245-255. http://doi.org/10.3200/JACH.52.6.245-256
12. Stuhldreher WL, Stuhldreher TJ, Forrest KYZ. 2007. Gambling as an emerging health problem on campus. Journal of American College Health 56(1): 75-88. http://doi.org/10.3200/JACH.56.1.75-88
13. Allami Y, Vitaro F, Brendgen M, Carbonneau R, Lacourse É, et al. 2017. A longitudinal empirical investigation of the pathways model of problem gambling. J Gambl Stud 33(4): 1153-1167. http://doi.org/10.1007/s10899-017-9662-6
14. Blaszczynski A, Nower L. 2002. A pathways model of problem and pathological gambling. Addiction 97(5): 487-499. https://doi.org/10.1046/j.1360-0443.2002.00015.x
15. Milosevic A, Ledgerwood DM. 2010. The subtyping of pathological gambling: a comprehensive review. Clinical Psychology Review 30(8): 988-998. https://doi.org/10.1016/j.cpr.2010.06.013
16. Zarate RR, Chapelski EE. 2005. Casino gambling among urban elders: Just another social activity? J Gerontol B Psychol Sci Soc Sci 60(2): S74-S81. https://doi.org/10.1093/geronb/60.2.s74
17. Hope J, Havir L. 2002. You bet they’re having fun!: Older Americans and casino gambling. J Aging Stud 16(2): 177-197. http://doi.org/10.1016/s0899-0406(02)00043-9
18. Tiwa C, Jackson AC, Tommey JE. 2014. Pathways to late-life problematic gambling in seniors: a grounded theory approach. Gerontologist 54(6): 1035-1048. https://doi.org/10.1093/geront/gnt077
19. Charles ST. 2010. Strength and vulnerability integration: A model of emotional well-being across adulthood. Psychol Bull 136(6): 1068-1091. http://doi.org/10.1037/a0021232
20. Nicholson R, Mackenzie C, Affifi TO, Sareen J. 2019. Effects of gambling diagnostic criteria changes from DSM-IV to DSM-5 on mental disorder comorbidity across younger, middle-aged, and older adults in a nationally representative sample. J Gambl Stud 35(1): 307-320. https://doi.org/10.1007/s10899-018-9801-z
21. World Health Organization. 2018. International classification of diseases for mortality and morbidity statistics (11th Revision).
22. Hoplay AAB, Nicki, R. M. 2010. Predictive factors of excessive online poker playing. Cyberpsychol Behav Soc Netw 13(4): 379-385. https://doi.org/10.1089/cyber.2009.0223
23. Raylu N, Oei TPS. 2002. Pathological gambling. A comprehensive review. Clin Psychol Rev 22(7): 1009-1061. http://doi.org/10.1016/s0272-7358(02)00101-0
24. Black DW, Moyer T, Schlosser S. 2003. Quality of life and family history in pathological gambling. J Nerv Ment Dis 191(2): 124-126. http://doi.org/10.1097/01.nmd.0000050942.86352.47
25. Crockford DN, El-Guebaly N. 1998. Psychiatric comorbidity in pathological gambling: a critical review. Can J Psychiatry 43(1): 43-50. https://doi.org/10.1177/07067437980430104
26. Afifi TO, Nicholson R, Martins SS, Sareen J. 2016. A longitudinal study of the temporal relation between problem gambling and mental and substance use disorders among young adults. Canadian Journal of Psychiatry 61(2): 102-111. http://doi.org/10.1001/jpm.2017.3158
27. Di Nicola M, De Risio L, Pettorruso M, Caselli G, De Crescenzo F, et al. 2014. Bipolar disorder and gambling disorder comorbidity: Current evidence and implications for pharmacological treatment. J Affect Disord 167: 285-298. http://doi.org/10.1016/j.jad.2014.06.023
28. Lynch WJ, Maciejewski PK, Potenza MN. 2004. Psychiatric correlates of gambling in adolescents and young adults grouped by age at gambling onset. Arch Gen Psychiatry 61(11): 1116-1122. https://doi.org/10.1001/archpsyc.61.11.1116
29. Parhami I, Motjabari R, Rosenthal RJ, Afifi TO, Fong TW. 2014. Gambling and the onset of comorbid mental disorders: A longitudinal study evaluating severity and specific symptoms. J Psychiatr Pract 20(3): 207-219. https://doi.org/10.1097/jpp.00000453020.98987.7c
30. Pietrzak RH, Molina CA, Ladd GT, Kerins GJ, Petry NM. 2005. Health and psychosocial correlates of disordered gambling in older adults. J Nerv Ment Dis 193(9): 562-574. http://doi.org/10.1097/01.nmd.0000150942.86352.ea
Comorbid Conditions Among Gamblers

Age Differences in Overall Functioning, Gambling-Related Symptoms, and Comorbid Conditions Among Gamblers

Mackenzie et al.

1. Introduction
2. Methodology
3. Results
4. Discussion
5. Conclusion

References

1. Petrak RH, Morasco BJ, Blanco C, Grant BF, Petry NM. 2007. Gambling level and psychiatric and medical disorders in older adults: results from the national epidemiologic survey on alcohol and related conditions. Am J Geriatr Psychiatry 15(4): 303-313. doi.org/10.1097/jgp.0b013e31802a0d5e

2. Qigley L, Yavorko N, Hodgins DC, Dobson KS, El-Guebaly N et al. 2014. Comorbid problem gambling and major depression in a community sample. J Gambl Stud 31(4): 1135-1152. doi.org/10.1007/s10899-014-9488-8

3. Rash C, Weinstein J, Van Patten R. 2016. A review of gambling disorder and substance use disorders. Subst Abuse Rehabil 7:3-13. doi.org/10.2147/SAR.S83460

4. Lorains, F.K., Cowlishaw, S., & Thomas, S. A. (2011). Prevalence of comorbid disorders in problem and pathological gambling: Systematic review and meta-analysis of population surveys. Addiction, 106(3), 490-8. doi.org/10.1111/j.1360-0443.2010.03300.x

5. Dowling NA, Cowlishaw S, Jackson AC, Merkouris SS, Francis KL, et al. 2015. Prevalence of psychiatric co-morbidity in treatment-seeking problem gamblers: a systematic review and meta-analysis. Aust N Z J Psychiatry 49(6): 519-539. doi.org/10.1177/0004867415577774

6. Kessler RC, Hwang I, LaBrie R, Petukhova M, Sampson NA, et al. 2014. DSM-IV pathological gambling in the national comorbidity survey replication. Psychol Med 38(9): 1351-1360. doi.org/10.1017/S0033291708029900

7. Sundqvist K, Rosendahl I. 2019. Problem gambling and psychiatric comorbidity - risk and temporal sequencing among women and men: results from the Swedlogs case-control study. J Gambl Stud 35(3): 757-771. doi.org/10.1007/s10899-019-09853-2

8. Jolly T, Trivedi C, Adnan M, Mansuri Z, Agarwal V. 2021. Gambling in patients with major depressive disorder is associated with an elevated risk of suicide: insights from 12-years of nationwide inpatient sample data. Addict Behav 118: 106872. doi.org/10.1016/j.addbeh.2021.106872

9. Granero R, Penelo E, Stinchfield R, Fernandez-Aranda F, Savidou LG, et al. 2014. Is pathological gambling moderated by age? J Gambl Stud 30(2): 475-492. doi.org/10.1007/s10899-013-9369-6

10. Kim SW, Grant JE, Eckert ED, Faris PL, Hartman BK. 2006. Pathological gambling and mood disorders: Clinical associations and treatment implications. J Affect Disord 92(1): 109-116. doi.org/10.1016/j.jad.2005.12.040

11. Nelson SE, Gebauer L, LaBrie RA, Shaffer HJ. 2009. Gambling problem symptom patterns and stability across individual and timeframe. Psychol Addict Behav 23(3): 523-533. doi.org/10.1037/a0016053

12. Grant BF, Dawson DA. 2006. Introduction to the national epidemiologic survey on alcohol and related conditions. Alcohol Res Health 29(2): 74-78.

13. American Psychiatric Association. 2013. Diagnostic and statistical manual of mental disorders. 5th edition. Arlington, VA.

14. Cox BJ, Enns MW, Michaud V. 2004. Comparisons between the south oaks gambling screen and a dsm-iv-based interview in a community survey of problem gambling. Can J Psychiatry 49(4): 258-264. doi.org/10.1177/07067437044900406

15. Blanco C, Hasin DS, Petrty N, Stinson FS, Grant BF. 2006. Sex differences in subclinical and DSM-IV pathological gambling: Results from the national epidemiologic survey on alcohol and related conditions. Psychological Medicine 36(7): 943-953. doi.org/10.1017/S0033291706007410

16. Chamberlain SR, Stockel J, Redden SA, Odlung BL, Grant JE. 2017. Latent class analysis of gambling subtypes and impulsive/compulsive associations: time to rethink diagnostic boundaries for gambling disorder? Addict Behav 72: 79-85. doi.org/10.1016/j.addbeh.2017.03.020

17. Grant JE, Chamberlain SR, Schreiber LRN, Odlung BL, Kim SW. 2011. Selective decision-making deficits in at-risk gamblers. Psychiatry Res 189(1): 115-120. doi.org/10.1016/j.psychres.2011.05.034

18. Toce-Gerstein M, Gerstein DR, Volberg RA. 2003. A hierarchy of gambling disorders in the community. Addiction 98(12): 1661-1672. doi.org/10.1111/j.1360-0443.2003.00845.x

19. Weinstock J, Apri I, Kalimi S. 2017. Is subclinical gambling really subclinical? Addict Behav 73: 185-191. doi.org/10.1016/j.addbeh.2017.05.014

20. Strong DR, Kahler CW. 2007. Evaluation of the continuum of gambling problems using the DSM-IV: Addiction 102(5): 713-721. doi.org/10.1111/j.1360-0443.2007.01789.x

21. Hasin DS, Stinson FS, Ogburn E, Grant BF. 2007. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from the national epidemiologic survey on alcohol and related conditions. Arch Gen Psychiatry 64(7): 830-842. doi.org/10.1001/archpsyc.64.5.566

22. Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, et al. 2003. The alcohol use disorder and associated disabilities interview schedule-iv (audad-iv): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. Drug Alcohol Depend 71(1): 7-16. doi.org/10.1016/s0376-8716(03)00070-x

23. Ware J, Kosinski M, Keller SD. 1996. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. Med Care 34(3): 220-233. doi.org/10.1097/00005650-199603000-00000

24. Petry NM. 2002. A comparison of young, middle-aged, and older adult treatment-seeking pathological gamblers. Gerontologist 42(1): 92-99. doi.org/10.1093/geront/42.1.92s

25. Reynolds K, Petrak RH, El-Gabralawy R, Mackenzie CS, Sareen J. 2015. Prevalence of psychiatric disorders in U.S. older adults: Findings from a nationally representative survey. World Psychiatry 14(1): 74-81. doi.org/10.1002/wps.20193

26. Franks P, Gold MR, Fiscella K. 2003. Sociodemographics, self-rated health, and mortality in the U.S. Soc Sci Med 56(12): 2505-2514. doi.org/10.1016/S0277-9536(02)00281-2

27. Kim SH, Jo MW, Ahn J, Ock M, Shin S, et al. 2014. Assessment of psychometric properties of the Korean SF-12 v2 in the general population. BMC Public Health 14(1): 1086. doi.org/10.1186/1471-2458-14-1086

28. Kontodimopoulos N, Pappa E, Niakas D, Tountas Y. 2007. Validity of SF-12 summary scores in a Greek general population. Health Qual Life Outcomes 5: 55. doi.org/10.1186/1477-7525-5-55

29. Kerber CS, Black DW, Buckwalter K. 2008. Comorbid psychiatric disorders among older adult recovering pathological gamblers. Issues Ment Health Nurs 29(9): 1018-1028. doi.org/10.1016/j.imsn.2008.02.001

30. Bonnaire CL, Kovess V, Guignard R, Richard JB, Du-Roscoet E, et al. 2016. Life events, substance use, psychological distress, and quality of life in male and female French gamblers. Ann Clin Psychiatry 28(4): 263-279.

31. Cunningham-Williams RM, Grucza RA, Cotther LB, Womack SB, Books SJ, et al. 2005. Prevalence and predictors of pathological gambling: Results from the St. Louis personality, health and lifestyle (SLPHL) study. J Psychiatr Res 39(4): 377-390. doi.org/10.1016/j.jpsychires.2004.09.002

32. Kong G, Tsai J, Krishnan-Sarin S, Cavallo DA, Hoff RA, et al. 2014. A latent class analysis of pathological-gambling criteria among high school students: associations with gambling, risk and health/functioning characteristics. J Addict Med 8(6): 421-430. doi.org/10.1097/ADM.0000000000000074

33. Jiménez-Murcia S, Alvarez-Moya EM, Stinchfield R, Fernández-Arana-
Age Differences in Overall Functioning, Gambling-Related Symptoms, and Comorbid Conditions Among Gamblers

Mackenzie et al.

64. Nicholson R, Mackenzie C, Afifi TO, Keough M, Sareen J. 2019. An examination of comorbid psychiatric disorders in disordered gamblers versus other substance-related disorders. *J Gambl Stud* 35(3): 829-847. https://doi.org/10.1007/s10899-019-09838-y

65. Parke A, Griffiths M, Pattinson J, Keating D. 2018. Age-related physical and psychological vulnerability as pathways to problem gambling in older adults. *J Behav Addict* 7(1): 137-145. https://doi.org/10.1556/2006.7.2018.18

66. Boeri MW, Sterk CE, Elifson KW. 2008. Reconceptualizing early and late onset: A life course analysis of older heroin users. *The Gerontologist* 48(5): 637-645. http://doi.org/10.1093/geront/48.5.637

67. Smith M, Hategan A, Bourgeois JA. 2017. Geriatric gambling disorder: challenges in clinical assessment. *Int Psychogeriatr* 29(12): 2105-2106. https://doi.org/10.1017/S1041610217001843

68. Hardoon K, Derevensky JL, Gupta R. 2003. Empirical measures vs. perceived gambling severity among youth: Why adolescent problem gamblers fail to seek treatment. *Addictive Behaviors* 28(5): 933-946.

69. Blinn-Pike L, Worthy SL, Jonkman JN. 2010. Adolescent gambling: A review of an emerging field of research. *The Journal of Adolescent Health* 47(3): 223-236. http://doi.org/10.1016/j.jadohealth.2010.05.003

70. Dickson LM, Derevensky JL, Gupta R. 2002. The prevention of gambling problems in youth: a conceptual framework. *J Gambl Stud* 18(2): 97-159. https://doi.org/10.1023/a:101557115049

71. Larimer ME, Neighbors C, Lostutter TW, Whiteside U, Cronce JM, et al. 2012. Brief motivational feedback and cognitive behavioral interventions for prevention of disordered gambling: a randomized clinical trial. *Addiction* 107(6): 1148-1158. https://doi.org/10.1111/j.1360-0443.2011.03776.x

72. Lostutter TW, Lewis MA, Cronce JM, Neighbors C, Larimer ME. 2014. The use of protective behaviors in relation to gambling among college students. *J Gambl Stud* 30(1): 27-46. https://doi.org/10.1007/s10899-012-9343-8

73. Wilber MK, Potenza MN. 2006. Adolescent gambling: research and clinical implications. *Psychiatry* 3(10): 40-48.

74. Lussier I, Derevensky JL, Gupta R, Bergevin T, Ellenbogen S. 2007. Youth gambling behaviors: An examination of the role of resilience. *Psychology of Addictive Behaviors* 21(2): 165-173. https://doi.org/10.1037/0893-164X.21.2.165

75. Petry NM, Ginley MK, Rash CJ. 2017. A systematic review of treatments for problem gambling. *Psychol Addict Behav* 31(8): 951-961. https://doi.org/10.1037/adb0000290

76. Amstadter AB, Richardson L, Acierno R, Kilpatrick DG, Gabboudy MT, et al. 2010. Does interviewer status matter? An examination of lay interviewers and medical doctor interviewers in an epidemiological study in Vietnam. *Int Perspect Vet* 5(1): 55.

77. Petry NM, Weinstock J. 2007. Internet gambling is common in college students and associated with poor mental health. *Am J Addict* 16(5): 325-330. https://doi.org/10.1080/10550490701525673

78. Gainsbury SM. 2015. Online gambling addiction: the relationship between internet gambling and disordered gambling. *Curr Addict Rep* 2(2): 185-193. http://doi.org/s10429-015-0057-8

79. Welte JW, Barnes GM, Tidwell MC, Hoffman JH. 2009. The association of form of gambling with problem gambling among American youth. *Psychol Addict Behav* 23(1): 105-112. https://doi.org/10.1037/a0013536

80. Hing N, Russell AM, Gainsbury SM, Blaszczynski A. 2015. Characteristics and help-seeking behaviors of Internet gamblers based on most problematic mode of gambling. *J Med Internet Res* 17(1): e13. https://doi.org/10.2196/jmir.3781

81. Håkansson A, Måndhed E, Zaar M. 2017. Who seeks treatment when medicine opens the door to pathological gambling patients – psychiatric comorbidity and heavy predominance of online gambling. *Frontiers in Psychiatry* 8: 255. https://doi.org/10.3389/fpsyt.2017.00255