Gambling participation among adult Basketball players in Iceland
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MSc in Clinical Psychology
Forewords and acknowledgments

This research was conducted over three semesters, accounting for 30 of 120 ECT, to meet the requirements for a master’s degree in psychology at Reykjavik University. During the first semester, the theological section was prepared, focusing mostly on gambling conduct, match fixing, and identifying potential risk factors such as depression, anxiety and ADHD. Additionally, the foundation for applications to conduct the research was laid, such as the permission of the National Bioethics Committee and the Icelandic Data Protection Authority. After all the required permissions for conducting the research had been granted, the emphasis of the second semester was the execution of the research and data collection. The third and last semester was spent processing data and the writing of articles, as well as polishing and refining a large part of the research.

After countless hours of working on my research, there are numerous people that I want to extend my gratitude towards. Nobody can finish a master’s degree without the support of qualified professionals, friends and family. I would firstly like to thank the amazing people who represent the Icelandic Basketball Association, KKÍ, for their cooperation. From the time that the research was just an idea, the board directors of KKÍ were more than willing to assist me in any way possible.

I am extremely grateful to my supervisor Dr. Hafrún Kristjánsdóttir, Assistant Professor at the School of Science and Engineering at Reykjavík University, for her help. Her excellent guidance and constant support was invaluable to me through the whole process. Special thanks also go to Dr. Daniel Ólafsson for his contribution and assistance.

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also indebted to my mother in law, Susanna Schmidt, for her unselfish work of proofreading the report. Her guidance and support was of vital importance to me.

Lastly, special thanks go out to my partner, Einar Örn, for his patience, his endless support and unfailing encouragement, and his faith in me and my abilities.
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Abstract

Studies in the field of gambling behaviour among Icelandic general public and even Icelandic soccer players are relatively common. Despite that, none studies have been conducted about gambling behaviour among Icelandic basketball players. The purpose of this study was to: i) Examine the prevalence of total participation in gambling activities and problem gambling among Icelandic basketball players, ii) To examine the relationship between problem gambling anxiety, depression and ADHD symptoms in the same population and finally to examine in Icelandic basketball players have been involved in behaviour that could possibly be related to match fixing. Participants in this study were 277, basketball players between 18-42 years old, 61% male and 39% female. Five questionnaires were administered; Gambling behaviour, Problem Gambling Severity Index (PGSI), General Anxiety Disorder – 7 (GAD-7), Patient, Health Questionnaire – 9 (PHQ-9) and ADHD rating scale. These questionnaires were sent to the participants via Facebook. Results show that male basketball players, gamble significantly more than female players. The most common gambling activity by Icelandic basketball players was Lottery, but basketball gambling on foreign website was the second most common activity. Results also showed that 5.4% were problematic gamblers. For male, there was a correlation between problematic gambling and depression, anxiety and ADHD symptoms but not for female. About 28.6% of all participants knew about other players or coaches that had gamble on matches in their own division and 10.9% knew about players that had gambled on results on their own match. Of all participants 12.5% agreed that they had gambled on their own division and 13.3% had gambled on a game that they had played. The results indicate that both match fixing and problematic gambling might possibly be a problem in Icelandic Basketball, and it is important to educate basketball players about possible harmfulness of a regular gambling activity.

Keywords: gambling in sports, problematic gambling, basketball, match fixing, risk factors
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Wagering an amount of money on a bet or a game with erratic outcome, also called gambling, has gained rapidly increasing popularity the last several years. Lotteries, scratch cards, bingo and sports betting make up a considerable part of people’s everyday life. With gambling opportunities all around, mobile devices in conjunction with easy access to electronic payment methods have, especially for young people, enabled an increase in internet gambling (Hing, Russell, Vitartas & Lamont, 2016; Griffiths & Barnse, 2008; McBride & Derevensky, 2016).

Numerous studies have shown that gambling is a popular activity among adolescents and adults. According to those studies, vast majority, or about 70-90%, had gambled at least once in their lifetime and 60-80% had gambled in the previous 12 months before the study in question was conducted (Delfabbro & King, 2012; Derevensky, 2012; Griffiths, Hayer & Meyer, 2009; Williams, Volberg & Stevens, 2012). According to an Icelandic study from 2006 on gambling participation, conducted among 1.887 adolescents aged 13-18, a total of 8,1% of them had gambled at least once a week and 56,6% claimed to have gambled in the past year, a decrease from 79% in 2003 (Ólason, Sigurðardóttir & Jakob, 2006). A study from 2011 showed that 76% of the Icelandic adult population had gambled at least once during the previous year before the study was conducted, and 15% had gambled at least weekly. The study also showed that male participants were more likely than female participants to gamble (78% vs 74%) (Olason, Hayer, Brosowski & Meyer, 2015).

Within the DSM-V framework, gambling disorder or former pathological gambling is the first non-substance related addictive disorder grouped with substance addictive disorders because of its comparable pathophysiological and clinical appearance and even treatment as substance disorders. It is graded from mild to severe according to the number of present diagnostic criteria, meeting at least 4 out of 10 in a 12-month period. Similar to substance disorders, a disordered gambling behaviour leads to a temporary or regular loss of control of
behaviour, here of gambling, with significant dysfunction and massive adverse personal, familiar or social consequences. Even with 3 or less diagnostic criteria fulfilled, gambling can be more than pastimes, causing problems and impairing daily life. In this thesis, the terms pathological and problem gambling are used in accordance with research material (DSM-V, 2014).

Research has shown that prevalence of problem gambling is ranging from 0,9% to 2,3%. In study by Wade at al (2012) results showed that problematic gambling (scoring ≥ 3 on DSM-IV screening instrument) prevalence in Britain was 0,9%. Problem gambling prevalence was higher in a meta-analysis conducted by Williams et al (2012) including prevalence surveys from 1975 – 2012. Average standardized past year problem gambling rate was estimated 2,3%. In Iceland, adult problematic gambling prevalence has increased in the last decade, from 1,6% (problem and moderate risk gambling) in 2005 to 2,5% in 2011. Male participants were more likely to be problematic gamblers then females, 4,7% of males participants being problematic gamblers but 0,7% of female participants (Olason et al., 2011).

By linking people’s love of sports with gambling, sports betting has become one of the world’s most popular types of gambling. It is not frequently seen as a natural or common part of sports, (Deans, Thomas, Derevensky & Daube, 2016). Despite the enormous popularity of sports betting, there is a lack of research elucidating gambling behaviour and gambling problem prevalence among (professional) sportsmen and -women. Results of various studies on American college students however indicate that student athletes have a double or triple higher risk of gambling and gambling problems than their fellow students (Kerber, 2005; Nelson et al., 2007; Nowak & Aloe, 2014). Furthermore, athletes in team sports are at higher risk of gambling and gambling disorder (Ellenbogen, Jacobs, Derevensky, Gupta & Paskus, 2008).
In 2016, an epidemiological research was conducted on gambling participation and problematic gambling among adult soccer players in Iceland. A total of 725 soccer players, age 18 - 41 years, participated in the study (75.4% male, 24.6% female). Results showed that 66% of participants gambled at least once a year and 21% gambled at least weekly. As in studies on general population male gambled more frequently than female. Gambling on soccer games was, as anticipated, the most popular betting form followed by scratch tickets (25.1%) and EGM’s (23.4%). Interestingly, participation in poker gambling (25.2%) was thrice as high as in population in general 8% (Einarsson, 2016; Óskarsson, 2016). In the same study problem gambling was evaluated with the PGSI. The results of that evaluation was that 3.3% of male and 0.6% of female participants were problem gamblers. Additionally, 7.2% participants were moderate risk gamblers. When problem gambling and moderate risk gambling groups were combined (score ≥ 3 on PGSI) it was shown that 13.8% of male players and 0.6% female players scored over cut off, categorized as problematic gamblers.

A series of studies reveals a comorbidity between certain mental disorders (e.g., anxiety, stress and depression) and gambling disorder. As Coman, Burrows and Evans (1997) found out, almost 75% of help seeking gamblers suffered from depression, whereas 61% had suicidal thoughts with 22% having attempted a suicide. There is coherence between depression, anxiety and stress disorder and erroneous gambling condition with increased level of problem gambling. In this vicious circle, the more you gamble, the more you develop symptoms of depression, anxiety or stress and vice versa (Oei, Lin & Raylu, 2008).

After the turn of the millennium, particular attention is turned to ascertain a possible relationship between disordered gambling and attention deficit hyperactivity disorder (ADHD), the most commonly diagnosed behavioural disorder in children with impaired attention skills, hyperactivity and impulsivity and a prevalence between 3% and 5% (Derks, Hudziak, Dolan, Ferdinand & Boomsa, 2006; Shead, Derevensky, Gupta, 2010). Carlton and
Manowicz (1998) found that adult disordered gamblers had a higher than average age of childhood ADHD. Another study from 2009 showed that problem gamblers are more likely to gamble much and have symptoms of ADHD. Persistence of ADHD, i.e., maintained ADHD throughout childhood and young adulthood, had a stronger correlation with gambling problems than desistance, i.e., only childhood ADHD. In a group of persisters where 79% had gambled the prior 12 months, along with 77% in a group of desisters, the first mentioned had a 14% more likelihood of increased gambling problem graveness. Participants with sustained ADHD reported a significantly higher rate (19%) matching criteria for problem gambling than those with only childhood ADHD (5%); the latter similar to the control group (Breyer et al., 2009; Shead et al., 2010).

Lastly but not least it is important to mention match fixing in relation to gambling problems among athletes. Match fixing is a serious problem worldwide among athletes as well as stakeholders, but fortunately, at least in Europe, the Union of European Football Associations (UEFA) along with the EU, fight organized match-fixing, inter alia, by educating young and upcoming players and thereby aim at prevention and recognition of match fixing as criminal offence (Union of European Football Associations, 2014). The Óskarson 2016 and Einarsson, 2016 studies found that 7% of Icelandic soccer players admitted to have gambled on their own team, but 2% that they had gambled on in-play events in matches. These results are striking in light of the fact that up to 23% of participants knew about other players or coaches that had bet on their own matches or an in-play in their own team (Einarsson, 2016; Óskarsson, 2016). By betting on the own team, the assumed basic ethical rules of fair-play, integrity and respect are may be threatened by match-fixing, as seen by the incidents in basketball (NBA in 2007) and handball (French league in 2012) (Sage, 2012; Walley, 2017).
Since there a few research have been conducted on gambling participation, gambling problems and potential match fixing among athletes in general, none on basketball players specifically, the purpose of this study was to: i) examine the prevalence of total participation in gambling activities and problem gambling among Icelandic basketball players, ii) examine the relationship between problem gambling and anxiety, depression and ADHD symptoms in the same population and finally to examine if Icelandic basketball players have been involved in behaviour that could possibly be related to match fixing.

**Method**

**Participants**

All participants are both male and female basketball players, 18 years and older, playing with a team that is registered in the league competitions of the Icelandic basketball association (Körfuknattleikssamband Íslands, KKÍ). According to KKÍ, there are 659 players in 56 team belonging to this group who are registered in a competition on their behalf. Participants in total were 277 basketball players, corresponding to 42,0 % of the total population. Age span was from 18 to 42 years, with 164 male and 104 female. The most common age group among male and female was 18-20 years or 36,8% of all participants while only 6 participants were 42 or older.
Table 1. Survey participation of basketball players by divisions

<table>
<thead>
<tr>
<th>Division</th>
<th>Number of participants in division</th>
<th>Number of players in division</th>
<th>Ratio of division (%)</th>
<th>Ratio of sample (%)</th>
<th>Ratio of population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominos-division (male)</td>
<td>83</td>
<td>165</td>
<td>50,3</td>
<td>30,0</td>
<td>12,6</td>
</tr>
<tr>
<td>Dominos-division (female)</td>
<td>65</td>
<td>111</td>
<td>58,6</td>
<td>23,5</td>
<td>9,9</td>
</tr>
<tr>
<td>1st division (male)</td>
<td>45</td>
<td>135</td>
<td>33,3</td>
<td>14,1</td>
<td>6,8</td>
</tr>
<tr>
<td>1st division (female)</td>
<td>39</td>
<td>108</td>
<td>36,2</td>
<td>16,2</td>
<td>5,9</td>
</tr>
<tr>
<td>2nd division league (male)</td>
<td>13</td>
<td>70</td>
<td>18,6</td>
<td>4,7</td>
<td>2,0</td>
</tr>
<tr>
<td>3th division (male)</td>
<td>23</td>
<td>70</td>
<td>33,0</td>
<td>8,3</td>
<td>3,5</td>
</tr>
</tbody>
</table>

9 participants declined to answer

Measures

Gambling behavior. Questions were asked about participating in 23 different types of gambling the last 12 months before the survey was conducted. In the beginning players got yes/no questions about their participation in each type of gambling behavior. Questions were asked about following gambling behaviors: Sports online (Lengjan, 1x2 or other foreign websites), live sports ("Lengjan live" or on foreign websites), Local sports events (note on Lengjan or 1x2) poker (local poker, on the internet or competition poker), other cards than poker (for example bridge and card game), Casino or other gambling on the internet (for example 21, roulette or dice game), gambling machine, bet on their own performance in sports (for example golf, snooker or bowling), lotto, lottery and bingo.

PGSI (Ferris & Wynne, 2001) is a self-report scale, used for screening and measuring the severity of problem gambling within the last 12 months. Participants who admitted to have gamble at least once during the last 12 months were asked to answer further questions about
their gambling behaviour. The severity of problem gambling is reflected in a nine item scale; four items turn to the behaviour of problem gambling: Bet, tolerance, chase and loan, while the other five items involve the consequences of gambling: Awareness of trouble, negative criticism, feelings of guilt, health problem and financial problem. The response options of the scale are evaluated on a 4-point Likert scale, never (0), sometimes (1), often (2) and very often (3). The total score of the list span the gap from 0-27, with 0 points indicating no risk of problem gambling, 1-2 points indicating low risk of problem gambling, 3-7 points indicating moderate risk of problem gambling and eight points or more indicating the behaviour of problem gambling. The psychometric properties of the scale have been tested both in Iceland and abroad, and have proven useful (Ferris & Wynne, 2001; Holtgraves, 2009; Olason et al., 2015; Orford, Wardle, Griffiths, Sproston & Erens, 2010; Stone et al., 2015).

GAD-7 (Spitzer, Kroenke, Williams & Löwe, 2006) is a self-report seven item scale, used for screening and measuring the severity of symptoms of general anxiety disorder (GAD). Even though the scale has been developed as an instrument to assess and estimate the severity of GAD symptoms, studies have suggested that GAD-7 is suitable for the purpose of screening for anxiety symptoms and their severity. Based on a recently passed period of two weeks, it collects information about the frequency of certain anxiety features. The response options of the scale are evaluated on a 4-point Likert scale, never (0), sometimes (1), often (2) and very often (3). The total score of the scale range is 0-21 points. Interpretation of scores is as follows: 5-9 points: mild anxiety symptoms, 10-14 points: moderate anxiety symptoms, 15-19 points: severe anxiety symptoms. The psychometric properties of the scale have been tested both in Iceland and abroad, and in both cases they have proved good (Spitzer et al. 2006; Ingólfsdóttir, 2014).
PHQ-9 (Kroenke, Spitzer & Williams, 2001), is a self-report scale, used for screening and evaluating the severity of depression. The scale is nine, measuring how often in the last two weeks the respondent has experienced certain problems such as feeling tired and having little energy or feeling bad. The response options of the scale are evaluated on a 4-point Likert scale, never (0), sometimes (1), often (2) and very often (3). The answers are drooped down from 0-3. The score range is from 0-27 points. Interpretation of scores is as follows: 5-9 points: Mild depressive symptoms, 10-14 points: moderate depressive symptoms, 15-19 points: Moderate to severe depressive symptoms; 20-27 points: Severe symptoms. Studies have shown that if an individual scores over 10 points on PHQ-9, he is likely to suffer from depression. The theoretical features of the scale have been tested both in Iceland and abroad and have proven useful (Gústavsson, 2016; Kroenke et al., 2001; Pálsdóttir, 2007).

ADHD rating scale (Ólason, Magnússon & Grétarsson, 2006), is a self-report scale, used for screening and evaluating the severity of attention-deficit/hyperactivity disorder (ADHD). The questionnaire items are based on 18 DSM-IV behavioural criteria for ADHD, where nine questions measures symptoms of attention and nine questions measure symptoms of hyperactivity and impulse. The response options of the scale are evaluated on a 4-point Likert scale, never (0), sometimes (1), often (2) and very often (3). According to findings made on ADHD, the reliability of the scale, for screening for current ADHD symptoms among Icelandic adults is sufficient, \( \alpha = 0,82 \) (Magnússon et al, 2006; Ólafson, Magnússon & Grétarsson, 2006).

Procedure

Initially the researcher contacted the Icelandic Basketball Federation (KKÍ) for a list of all registered players 18 years or older in every team in every division. An electronic questionnaire was established on the website QuestionPro®. The questions included
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background information, gambling behaviour, attitude towards gambling, depression, anxiety and ADHD. A promotional letter about the study was sent to director or board members of all the teams in question. In the same letter, the researcher asked for some contacts information within each club, e.g. the captain of each team. Afterwards the researcher contacted those persons and asked them to post standard promotional text about the survey and a link to the questionnaire on their players’ Facebook group. After clicking the link, participants were unable to respond until they had given informed consent for participation. It was clear from the beginning that each participant could deny participation or cancel participation at any time. Participants also knew that complete anonymity was ensured and the results of individual participants could not be traced. Two weeks later the researcher sent a reminder to all members to participate in the survey. Permission for the study was obtained from National Bioethics Committee in Iceland (VSNb20171100004/03.01).

**Statistical analysis**

In total of 337 participants began answering the questionnaire and a total of 186 participants answered all the questions on the list. A total of 277 participants answered the baseline questions and questions about gambling behaviour, and their answers were used for processing. Therefore a different number of participants and answers are behind the analysis. A Chi-square test was performed on total gambling participation and demographics.

Participants were divided into two groups in terms of problematic gambling. Those who scored zero points on PGSI were categorized as non-problem gamblers those who scored one or two points were categorized as low risk gamblers and those who scored three points or more were categorized as problematic gamblers. Chi-square test was performed on total gambling participation and PGSI categorization. Bivariate correlation was calculated to find correlation between GAD-7, PHQ-9, ADHD rating scale and PGSI scores. Independent sample t-test was performed to evaluate if there were difference between the groups (non
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problem gamblers and low risk gamblers were combined into one group, non problem gambling) in scores on GAD-7, PHQ-9 and ADHD-rating scale.

Results

Gambling participation

The total number of participants in this study was 277. Of 245 participants who answered question about their gambling activity the past 12 months, 112 (45,7%) said they had gambled. Male were much more likely to gamble than female, 88 (57,5%) of all male had gamble the last 12 months, considering that only 23, (25,8%) of all female did such an act. Table 2 demonstrates that there are significant differences between the genders participating in gambling activities, \( \chi^2 (2) = 26,087, p<0,001 \).

Table 2. Gambling participation among male and female

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>At least once, the last 12 months</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (n= 153)</td>
<td>42,5</td>
<td>57,5</td>
<td>26,087*</td>
</tr>
<tr>
<td>Female (n= 89)</td>
<td>74,2</td>
<td>25,8</td>
<td></td>
</tr>
</tbody>
</table>

*\( p \leq 0,001 \)

In the highest basketball division in Iceland, the Dominos division, male gambled around double the amount of the female, and only 27,3% of female players had gamble in the past 12 months before the study as opposed to 52,8% of male participants, \( \chi^2 (12) =31,698, p<0,00 \).

On the male side, there was significant difference between gambling frequency and division. Those participants who was playing in a lower division, was more likely to gamble, than those who was playing in higher divisions, \( \chi^2 (6) =18,343, p<0,005 \). The difference between gambling activity in male’s Dominos division and 3\(^{rd}\) division was 10%. The difference between gambling activity between players in female’s Dominos division and in the 2\(^{nd}\) division was only 1,6% (table 3).
Table 3. Gambling frequency by gender and division

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>At least once, the last 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominos-division (n=55)</td>
<td>72,7</td>
<td>27,3</td>
</tr>
<tr>
<td>1st division (n= 35)</td>
<td>74,3</td>
<td>25,7</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominos-division (n=72)</td>
<td>44,4</td>
<td>52,8</td>
</tr>
<tr>
<td>1st division (n=41)</td>
<td>46,3</td>
<td>53,7</td>
</tr>
<tr>
<td>2nd division (=13)</td>
<td>30,8</td>
<td>69,3</td>
</tr>
<tr>
<td>3rd division (=22)</td>
<td>31,8</td>
<td>63,6</td>
</tr>
</tbody>
</table>

3 participants decline to answer

Lottery was the most popular overall gambling activity by Icelandic basketball players, but the second most popular gambling activity was basketball gambling on foreign website. When it comes to daily betting activity, around 15% of those who gamble on another live sport did so on a daily basis and around 10% gambled on different sports for example handball, golf or soccer. Table 4 illustrates total gamble frequency among participants, and what kind of an activity they were involved in.
Table 4. Total gambling frequency

<table>
<thead>
<tr>
<th>Type of gambling (n)</th>
<th>Less than once a month (%)</th>
<th>1-3 times a month (%)</th>
<th>1-2 times a week (%)</th>
<th>3-6 times a week (%)</th>
<th>Daily (%)</th>
<th>Decline to answer (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports gambling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basketball gambling on foreign website (41)</td>
<td>70,7</td>
<td>4,9</td>
<td>12,2</td>
<td>7,3</td>
<td>4,9</td>
<td>-</td>
</tr>
<tr>
<td>Basketball live betting on foreign website (23)</td>
<td>56,5</td>
<td>4,3</td>
<td>21,7</td>
<td>8,7</td>
<td>4,3</td>
<td>4,3</td>
</tr>
<tr>
<td>Another sport gambling on foreign website (30)</td>
<td>53,3</td>
<td>16,7</td>
<td>13,3</td>
<td>6,7</td>
<td>10,0</td>
<td>-</td>
</tr>
<tr>
<td>Another sport live betting on foreign website (20)</td>
<td>45,0</td>
<td>20,0</td>
<td>20,0</td>
<td>-</td>
<td>15,0</td>
<td>-</td>
</tr>
<tr>
<td>Another sport gambling on Lengjan (10)</td>
<td>60,0</td>
<td>30,0</td>
<td>-</td>
<td>-</td>
<td>10,0</td>
<td>-</td>
</tr>
<tr>
<td>Poker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poker with cards (30)</td>
<td>93,3</td>
<td>-</td>
<td>-</td>
<td>3,3</td>
<td>3,3</td>
<td>-</td>
</tr>
<tr>
<td>Internet poker (14)</td>
<td>64,3</td>
<td>7,1</td>
<td>14,3</td>
<td>-</td>
<td>14,3</td>
<td>-</td>
</tr>
<tr>
<td>Secret Casino (5)</td>
<td>20,0</td>
<td>-</td>
<td>40,0</td>
<td>-</td>
<td>20,0</td>
<td>20,0</td>
</tr>
<tr>
<td>Slot machines (33)</td>
<td>75,8</td>
<td>12,1</td>
<td>6,1</td>
<td>3,0</td>
<td>3,0</td>
<td>-</td>
</tr>
<tr>
<td>Lottery (48)</td>
<td>81,3</td>
<td>8,3</td>
<td>6,3</td>
<td>-</td>
<td>2,1</td>
<td>2,1</td>
</tr>
<tr>
<td>Scratch cards (35)</td>
<td>82,9</td>
<td>11,4</td>
<td>-</td>
<td>-</td>
<td>2,9</td>
<td>2,9</td>
</tr>
<tr>
<td>Bingo (19)</td>
<td>89,5</td>
<td>5,3</td>
<td>-</td>
<td>-</td>
<td>5,3</td>
<td>-</td>
</tr>
</tbody>
</table>

Problematiс gambling

Most players either did not gamble, or show non-problem gambling behaviour (88,3%). However 6,3% of players fall under the criteria of low-risk gambling and 5,4% are considered problematic gamblers. Problematic gambling was much more common among male than female players $\chi^2 (4) =18,666, p<0,01$.

Table 5 show the total frequency of problematic gambling divided by gender and divisions. Two females (1,7%) fall under the criteria of problem gambling and only one
female (0.8%) was part of the low-risk gambling group. However, almost 9% of male participants showed problematic gambling behaviour and just under 11% of them showed low-risk gambling behaviour.

**Table 5. Total frequency of problem gambling divided by gender and divisions**

<table>
<thead>
<tr>
<th>Gender (n)</th>
<th>Division (n)</th>
<th>Non-problem gambling %</th>
<th>Low-risk gambling %</th>
<th>Problematic gambling %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (151)</td>
<td>Male (n=83)</td>
<td>78.3</td>
<td>15.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Female (116)</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; division male (n=45)</td>
<td>75.6</td>
<td>8.8</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; division male (n=13)</td>
<td>76.9</td>
<td>15.4</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; division male (n=23)</td>
<td>91.3</td>
<td>-</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>Dominos-division female (n=65)</td>
<td>95.4</td>
<td>1.5</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>1&lt;sup&gt;st&lt;/sup&gt; division female (n=39)</td>
<td>97.4</td>
<td>-</td>
<td>2.6</td>
</tr>
</tbody>
</table>

9 participants decline to answer

There was no significant difference between problematic gambling and division, neither for male divisions $\chi^2 (10) = 18.182, p<0.001$ nor female divisions, $\chi^2 (4) = 1.853, p<0.001$.

**Relationship between PGSI score and depression, anxiety and ADHD symptoms**

Correlation was found between PGSI score and anxiety, depression and ADHD symptoms for the total sample. Stronger relationship was found between the above-mentioned variables among male players than in the total sample but interestingly no relationship was found between
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depression, anxiety and ADHD symptoms and PGSI score among female players (see table 6).

Table 6. Correlation between problem gambling and anxiety, depression and ADHD for total sample and gender

<table>
<thead>
<tr>
<th></th>
<th>Total sample</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.14*</td>
<td>0.25**</td>
<td>-0.04</td>
</tr>
<tr>
<td>Depression</td>
<td>0.15**</td>
<td>0.30**</td>
<td>-0.06</td>
</tr>
<tr>
<td>ADHD</td>
<td>0.22**</td>
<td>0.34**</td>
<td>-0.07</td>
</tr>
</tbody>
</table>

**: Correlation is significant at the 0.01 level; * correlation is significant at the 0.05 level.

Those players that were categorized as problematic gamblers scored higher on ADHD rating scale than players with no gambling problems but no difference was found between the groups at GAD-7 and PHQ-9 (see table 7).

Table 7. Difference between problem gambling and ADHD, anxiety and depression

<table>
<thead>
<tr>
<th></th>
<th>Problem gambling</th>
<th>Non-problem gambling</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(Stdv)</td>
<td>M(Stdv)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAD-7</td>
<td>2.26 (3.66)</td>
<td>3.39 (3.65)</td>
<td>-1.27</td>
<td>0.205</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>2.71 (4.45)</td>
<td>4.67 (4.86)</td>
<td>-1.81</td>
<td>0.071</td>
</tr>
<tr>
<td>ADHD RS</td>
<td>4.84 (7.19)</td>
<td>8.61 (8.09)</td>
<td>-2.15</td>
<td>0.032</td>
</tr>
</tbody>
</table>

Match fixing

Participants were also asked questions on match fixing; about themselves, their teammates and coaches, and potential participation in such activity. 28.6% of respondents said that they knew of teammates or coaches that had gamble on matches in their own division and 10.9% claimed that they knew about players that had gamble on results on their own match.

However, when participants were asked about their own gambling activity and if they ever
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gambled on a game in their own division, 12.5% of participants agreed to have done so very or rather often. Finally, a total of 13.3% of participants admitted to having gambled on a game that they played. Only one participant claimed to have bet on his own team losing. Both participants (n=2) that admitted to having gambled on their own team, disclosed that they gambled daily on some kind of basketball-related activities.

Like in other gambling activities there were some gender difference in gambling on games in the participant’s own division. Only one female admitted to such activities compared to 14 males. Since male players gamble on their own team more frequently than female, further analysis was made on the division which the players claimed to be playing in (table 8). Participants in 1st division had gambled comparatively most on their own team, but 6.9% participants did so in Dominos division and 4.5% in 3rd division. The difference between division and participation gambling on their own team was not significant ($\chi^2(30)=29.646; p>0.05$).

<table>
<thead>
<tr>
<th>Division (n)</th>
<th>Gambling on their own team (%)</th>
<th>Do not gamble on foreign websites or at all (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominos division (51)</td>
<td>7.8</td>
<td>92.2</td>
</tr>
<tr>
<td>1st division (33)</td>
<td>15.2</td>
<td>84.8</td>
</tr>
<tr>
<td>2nd division (10)</td>
<td>20.0</td>
<td>80.0</td>
</tr>
<tr>
<td>3rd division (15)</td>
<td>13.3</td>
<td>86.7</td>
</tr>
</tbody>
</table>

Gambling on in-play events in matches in participants own division was also examined among participant. When participants were asked if they knew of other players that had gambled on in-play events in matches in their own division 19.0% claimed to know of players that had done so. When the same question was directed to participants themselves
4.2% admitted that they have pursued such an activity very often. Participants were then asked if they knew some other basketball players who had gambled on in-play events in matches involving their own team and 9.5% of respondents claimed that they know of other who had participated in such activity. Further 2.5% (n=5) of participants knew players that had gambled on in-play events and claimed that those players had guaranteed that the specific event would take place. However, only two participants of those who had gamble on foreign website agreed to have gamble on in-play events in matches involving their own team and one of them admitted to have made sure that such in-play event did happen in the game.

Participants were asked if they knew some players or coaches that had given information to foreign gambling website about their team and/or other teams, 6.4% know some players or coaches that had given such information. However 11.2% of those who had been approached by an agent from a foreign gambling website, about information about their team, 17 participants did not give any information, but 6 participants did. Interestingly there were three participants that had been offered money for making sure that certain event would happen in their game. Two participant decline to answer this question.

**Discussion**

As noted before, the purpose of this study was to: i) Examine the prevalence of total participation in gambling activities and problem gambling among Icelandic basketball players, ii) To examine the relationship between problem gambling and anxiety, depression and ADHD symptoms in the same population and finally to examine if Icelandic basketball players have been involved in behaviour that could possibly be related to match fixing.

Gambling participating among Icelandic basketball players is 45.7% which is lower than among the general public, as indicated in earlier Icelandic studies from 2005 (69%) 2007 (67%) and 2011 (76%) (Olason et al., 2011). Results from a similar research in 2016 on Icelandic soccer players shows 20% more prevalence of gambling activity among soccer
players than basketball players in Iceland (Einarsson, 2016; Óskarsson, 2016). Like in
previous studies, there was a gender difference when it comes to participating in gambling
activities. Male basketball players, are more than half likely (57.5%) to engage in some kind
of gambling activity than female basketball players (25.8%). These results are consistent with
results of other studies both in Iceland and abroad (Gupta & Derevensky, 1998; Poushter,
2016; McBride & Derevensky, 2016; Romild, Svensson & Volberg, 2015; Olason et al.,
2011; Oei et al., 2008).

The most common gambling activity among Icelandic basketball players the 12
months previous to the research, was lottery and the second most common was basketball
gambling on foreign website, while most soccer players seems to spend most of their time in
soccer gambling on foreign website. That’s partly not in line with research on Icelandic
soccer players where the most common gambling activity was soccer betting (Óskarsson,
2016).

Problematic gambling among Icelandic basketball players does exist. Of all
participant, 5.4% fall under the criteria of problematic gambling and 6.3% of low risk
gambling meaning that the prevalence of problematic gambling was little less than in
Einarsson, 2016 and Óskarsson, 2016, studies were 7.6% of Icelandic soccer players felt
under the criteria of problematic gambling. It is interesting to note that more male soccer
players seems to suffer from problematic gambling than male basketball players. According
to studies on general public in Iceland 7.6% of the participants in the age group 18-25
suffered from problematic gambling witch in line with current study but when it comes to the
age group 26-40 years that prevalence of problematic gambling is somewhat lower 2.2%
(Olason et al., 2011).

The results show a correlation between problem gambling problems and ADHD,
depression and anxiety symptoms. Gambling problems increases the amount of points the
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players get on a screening lists for anxiety, depression and ADHD. This is true for the male players but this relationship was not found for the female players. These results are similar to earlier results on soccer players in Iceland were this quite strong correlation was also found for the male players but not female players. These results are also consistent with other results based on studies on general public, where it was found that the more you develop symptoms of depression, anxiety or stress, the more likely is that you suffer from problematic gambling (Oei et al., 2008). Same results have been found for individuals with ADHD (Breyer et al., 2009; Shead et al., 2010).

One of the main purpose of this study was to examine if Icelandic basketball players have been involved in illegal activity like match fixing. The results are striking, 28.6% of players said they knew some players or coaches that had gamble on matches in their own division and 10.9% knew about players or coaches that had gamble on results on their own match. Compared to soccer players these dishonest and unethical activities seems to be less common among basketball players. Half of the soccer players in Iceland knew about players or coaches that had gamble on matches in their own division and 23% knew about other players or coaches that had gambled on their own match. However, these results should be taken with caution as some players may have known the same player or coach who pursued such an activity.

When participant were asked about their own gambling activity and if they have gambled on a game in their own division 12.5% said they had, and little more or 13.3% said they had gambled on a game that they played. One may wonder whether these results are as reliable as those above as they refer to individual themselves. Based on these results, it can be estimated that match fixing does exist in Icelandic basketball and this problem may potentially grow in basketball as in sports in general.
There are some limitation to this study. First, the methodology of the study where the data was collected through Facebook-groups for every club. Many players started and opened the questioner but did not complete the list or answered all the questions on it. Still the participation rate was 42%, meaning that 42% of the whole population participate in the study. It should, however be kept in mind that the sample is self-selected. In addition, the format of the study was a haphazard sample with cross section, but such a research design limits the generalizations value.

It is quite clear that researches in this area of gambling is further needed. According to these results, do Icelandic basketball players conduct gambling and some even do or will face problem in this area. In addition there is indication that match fixing takes place in the sport of basketball. It is clear that further research is needed in this area, and it is important to implement methods of prevention, to make sure that players and the staff of the clubs are fully aware of the potential danger and harmful consequences of regular participation in gambling activities.
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Reference


Einarsson, T.Þ. (2016). *Gambling and football: Epidemiological research on gambling*


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