Disordered gamblers with risky alcohol habits benefit more from motivational interviewing than from cognitive behavioural group therapy

Henrik Josephson, Per Carlbring, Lars Forsberg, Ingvar Rosendahl

Background. Effective psychological treatment, including cognitive behavioural therapy (CBT) and motivational interviewing (MI), is available for disordered gambling. To advance the development of treatment for disordered gambling, it is critical to further investigate how comorbidity impacts different types of treatments. The purpose of this study was to investigate whether screening for risky alcohol habits can provide guidance on whether disordered gamblers should be recommended cognitive behavioural group therapy (CBGT) or MI.

Methods. The present study is a secondary analysis of a previous randomized controlled trial that compared the effects of CBGT, MI and a waitlist control in the treatment of disordered gambling. Assessment and treatment was conducted at an outpatient dependency clinic in Stockholm, Sweden, where 80 disordered gamblers began treatment. A modified version of the National Opinion Research Centre DSM-IV Screen for gambling problems (NODS) was used to assess disordered gambling. The Alcohol Use Disorders Identification Test (AUDIT) was used to screen for risky alcohol habits.

Results. The interaction between treatment and alcohol habits was significant and indicates that disordered gamblers with risky alcohol habits were better helped by MI, while those without risky alcohol habits were better helped by CBGT.

Conclusions. The results support a screening procedure including the AUDIT prior to starting treatment for disordered gambling because the result of the screening can provide guidance in the choice of treatment. Disordered gamblers with risky alcohol habits are likely to be best helped if they are referred to MI, while those without risky alcohol habits are likely to be best helped if they are referred to CBGT.

1 Disordered gamblers with risky alcohol habits benefit more from motivational interviewing than

2 from cognitive behavioural group therapy

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21 **Introduction**

22 Worldwide, 0.3 to 5.3% of adults suffer from gambling problems (Wardle et al., 2010).

23 Disordered gambling is a diagnosis described in the Diagnostic and statistical manual of mental

24 disorders, 5th edition (DSM-5) (American Psychiatric Association, 2013), as a persistent and

25 recurrent problematic gambling behavior leading to clinically significant impairment or distress.

26 The diagnosis shares several characteristics with substance-related disorders. Common features

27 include preoccupation, increased tolerance, loss of control, withdrawal symptoms, and family

28 and job disruption (American Psychiatric Association, 2013).

29

30 Meta-analyses and systematic reviews have provided evidence for the efficacy of psychological

31 treatment for disordered gambling (Gooding &Tarrier, 2009; Hodgins, Stea & Grant, 2011;

32 Yakovenko et al., 2015). Results from a meta-analysis revealed that various forms of CBT and

33 MI showed large and significant effect sizes in the $0 - 3$ month time window post treatment, with

34 enduring effects up to 24 month (or later) follow up periods (Gooding &Tarrier, 2009). Effect

35 sizes were highly significant despite variability in terms of populations being treated, severity of

36 gambling problem and type of gambling (Gooding &Tarrier, 2009).

37

38 It is well known that disordered gambling is highly comorbid with other psychiatric disorders

39 (Petry, Stinson & Grant, 2005; Lorains, Cowlishaw & Thomas, 2011; Bischof et al., 2013). Data

40 derived from a large national sample in the United States indicate that the most frequently

41 reported lifetime comorbid condition among disordered gamblers was alcohol use disorders (73.2

42 %) (Petry, Stinson & Grant, 2005), the corresponding figure in a large German study was 61.7%

43 (Bischof et al., 2013). Results from a recent review on co-morbidity among treatment-seeking

44 problem gamblers point in the same direction, with rates of current alcohol use disorders at

45 21.2% (Dowling et al., 2015). Most regular video lottery terminal (VLT) gamblers (73%) said

46 that they prefer to drink alcoholic beverages while gambling (Stewart et al., 2002), and up to

47 80% of non-disordered gamblers reported a consumption of four to ten alcoholic drinks during

48 their last gambling session (Baron & Dickerson, 1999). In other words, gamblers often drink

49 while gambling, and those who do tend to engage in more risky gambling behaviors

50 (Ledgerwood et al., 2009; Cronce & Corbin, 2010). Disordered gamblers with co-occurring

51 alcohol use disorders reported greater levels of problematic gambling(Welte et al., 2004), and

52 were more likely to have psychiatric comorbidity compared to disordered gamblers without

53 alcohol use disorders (Abdollahnejad, Delfabbro & Denson, 2014). In addition, gamblers with

54 alcohol problems are at an increased risk of relapse after quitting gambling (Hodgins & El-

55 Guebaly, 2010).

56

57 In a study that mapped the drinking patterns of disordered gamblers, entry into gambling

58 treatment was temporally associated with reductions in alcohol use, but gamblers with risky

59 alcohol habits were still less likely to adhere to gambling treatment (Rash, Weinstock & Petry,

60 2011). One study suggested that alcohol problems were linked to poor compliance in individual

61 CBT treatment for disordered gambling (Milton et al., 2002). The study reported that disordered

62 gamblers with alcohol problems were 2.5 times more likely to drop out of treatment than

63 disorderd gamblers without alcohol problems (Milton et al., 2002). This result has failed to be

64 replicated in subsequent research on individual CBT (Leblond, Ladouceur & Blaszczynski,

65 2003) and multimodal CBT (Stinchfield, Kushner & Winters, 2005). However, there is a lack of

66 research on whether different treatment forms, such as CBT and MI, differ in sensitivity to co-

67 occurring alcohol problems. To advance the development of treatment for gambling disorders, it

68 is critical to investigate further how comorbidity impacts different types of treatments for

69 disordered gambling (Petry, Stinson & Grant, 2005; Hodgins, Stea & Grant, 2011; Dowling et

70 al., 2015).

71

72 Because the presence of an alcohol use disorder is the most common comorbid condition among

73 disordered gamblers (Petry, Stinson & Grant, 2005; Bischof et al., 2013 Dowling et al., 2015),

74 and contributes to a loss of control over gambling (Ledgerwood et al., 2009; Cronce & Corbin,

75 2010), greater gambling severity (Welte et al. 2004), higher rates of psychiatric comorbidity

76 (Abdollahnejad, Delfabbro & Denson, 2014), an impaired adherence to gambling treatment

77 (Milton et al., 2002; Rash, Weinstock & Petry, 2011), and an increased likelihood of gambling

78 (Hodgins & El-Guebaly, 2010), it is of great clinical interest to see if the condition affects the

79 outcome of widely used therapies, such as CBGT and MI, to different extents. The purpose of

80 this study was to investigate whether screening for risky alcohol habits can provide guidance on

81 whether disordered gamblers should be recommended CBGT or MI.

82

83

84 **Methods**

85 *Design*

86 The present study is a secondary analysis of a previous randomized controlled trial that compares

87 the effects of CBGT, MI and a waitlist control in the treatment of disordered gambling

88 (Carlbring et al., 2010).

89

90 *Recruitment and Participants*

91 Between June 2005 and December 2006, 80 disordered gamblers began treatment at an

92 outpatient dependency clinic in Stockholm, Sweden. A total of 53 trial participants were

93 included in the present study. Reasons for exclusion were not providing baseline data ($n = 2$),

94 and not providing data at the six-month treatment follow up ($n = 25$). Participants received two

95 cinema tickets for participating in the treatment follow-up. The study was approved by the

96 regional ethics committee in Stockholm (2005/5:5), and informed written consents were

97 collected from the participants.

98

99 *Measures*

100 The National Opinion Research Centre DSM-IV Screen for gambling problems (NODS)

101 (Gerstein et al., 1999), modified to assess gambling at one month instead of one year, was used

102 to assess disordered gambling. The use of the 1-month version of the instrument has not seemed

103 to affect the instrument's reliability or validity. A comparison of the internal consistency between

104 the NODS lifetime version, past year version and 3-month version has shown Cronbach's alphas

105 of 0.86, 0.87 and 0.87 respectively (Wulfert et al., 2005). The total score, ranging from 0 to 10, is

106 normally used to identify pathological gambling according to DSM-IV (scores 5 and above). The

107 instrument was modified to assess disordered gambling according to DSM-5, by eliminating the

108 illegal acts criterion and lowering the threshold for diagnosis to 4 criteria out of 9 possible.

109   Recent research indicates that the increased sensitivity of the DSM-5 disordered gambling

110   diagnosis successfully identifies a broader group of gamblers with clinically significant gambling

111   related problems (Rennert et al., 2014). Participants included in the present study were those

112   assigned with NODS scores of 4 through 9 at baseline.

113

114   The Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 2001) was used to assess

115   presence of risky alcohol habits. The instrument is a 10 item multiple-choice self-report

116   inventory with a total score ranging from 0 to 40. Scores between 0 – 7 for men and 0 – 5 for

117   women indicate low risk drinking. Scores between 8 – 15 for men and 6 – 13 for women indicate

118   hazardous and harmful alcohol use. Scores between 16 – 19 for men and 14 – 17 for women

119   indicate a medium level of alcohol problems with probable presence of an alcohol-related

120   diagnosis. Finally, scores above 19 for men and 17 for women indicate a high level of alcohol

121   problems, with probable presence of an alcohol-related diagnosis. The AUDIT accurately

122   assesses the severity of problematic alcohol use behaviours across a wide range of contexts and

123   populations at risk (Allen et al., 1997). When administered as part of a larger test battery in a

124   primary care setting, the AUDIT showed a test–retest reliability at a 6-week interval with a

125   correlation of r=0.88, and an internal consistency reliability of $\alpha = 0.85$ (Daeppen et al., 2000) .

126   AUDIT scores were dichotomized in the present study: scores of 8 and above for males, and 6

127   and above for females were labelled as hazardous and harmful alcohol use.

128

129   *Diagnostic and data collection procedures*

130   Prior to starting treatment, all participants went through a 60 to 90-minutes in-person interview,

131   conducted by a clinical psychologist trained in the assessment procedures. The interview

132   included demographic questions and a set of self-report measures, including the NODS and

133   AUDIT. The participants were asked to fill out the set of self-report measures again at six-month

134   follow-up.

135

136   *Treatments*

137   The CBGT treatment ($n = 25$) was administered in closed groups with one 3-hour session per

138   week for 8 weeks. The treatment was manualised (Ortiz, 2006) and each session focused on a set

139   theme. Psychoeducation, exercises, distributing and follow up homework were included in the

140   sessions. A recurrent feature throughout the treatment was exercises aimed at reducing the urge

141   to gamble by imaginary exposure and response prevention. The treatment was partly focused on

142   cognitive restructuring, and partly on encouraging clients to try alternative behavioural

143   strategies. In addition, another important treatment component dealt with identifying personal

144   high-risk situations for gambling, and increasing participants' skills to cope with these situations

145   in a more functional way.

146

147   The MI treatment ($n = 28$) was administered individually throughout four 50 minutes sessions.

148   The first two sessions were one week apart, and the last two sessions were three weeks apart. In

149   total, treatment was administered over 8 weeks – the same as the CBGT condition. The therapists

150   used the MI approach as described by Miller and Rollick in 2002, including showing empathy,

151   eliciting the patient's own reasons for making a change, collaboration and autonomy support,

152   developing discrepancy between ongoing problematic behaviors and internal goals and values,

153   and supporting the participant's confidence in their own abilities. Techniques such as asking

154   open-ended questions and reflective listening were used throughout the sessions. If the patients

155   were ready to change, they were encouraged to make a decision about changing their gambling

156   behaviour, and to make a change plan. The therapists had access to a semistructured manual in

157   which these standard MI principles were described and exemplified in the context of problem

158   gambling (Forsberg, Forsberg & Knifström, 2010).

159

160   *Treatment fidelity*

161   The therapists administering the CBGT received continuous supervision. All sessions were

162   audio taped and 20% were randomly selected for coding by an independent licensed clinical

163   psychologist with psychotherapist training and experience in the specific treatment method.

164   According to the treatment manual (Ortiz, 2006) a total of 375 agenda points should be covered.

165   The coding showed 93% adherence to the manual.

166

167   To test MI treatment integrity, all sessions were audio taped and 20% of the sessions were

168   randomly selected to be coded by independent and blinded coders using the Motivational

169   Interviewing Treatment Integrity Code 2.0 (MITI) (Moyers et al., 2003). The MI competency in

170   the delivered sessions was deemed acceptable using the given reference values for MI

171   proficiency in the coding manual (Moyers et al., 2003). Supervision of the MI treatment was

172   based on assessment of the therapists' audio-taped sessions. Results from the coding were used

173   to facilitate specific feedback.

174

175   *Statistical analyses*

176   Analyses were done using SPSS 22.0 and STATA 14.0. An independent samples *t*-test and a

177   Chi-Square test were used to determine whether the two treatment groups differed in pre-

178   treatment characteristics. The same test statistics was also used to investigate if participants who

179   were lost at follow-up ($n = 25$) differed in pre-treatment characteristics compared to participants

180   who completed the follow-up measurements.

181   Analysis of covariance (ANCOVA) of the NODS-scores at six-month follow-up was used with

182   NODS score at pre-treatment as a quantitative control variable. Two categorical factors:

183   treatment (MI vs. CBGT), and AUDIT (Risky alcohol habits vs. Not risky alcohol habits), with

184   an interaction term were included in the model. Marginal means were calculated from the

185   ANCOVA model and visualized via a bar-plot of the margins. To assess the difference between

186   the CBGT and the MI treatment adjusted for alcohol habits, contrasts of discrete marginal effects

187   were estimated and tested.

188

189   **Results**

190   *Pre-treatment variables*

191   Table 1 shows point estimates and the distribution of some basic characteristics of the

192   participants (n = 53). No statistically significant differences in characteristics were found

193   between the two treatment groups.

194   ___________________

195   **Insert Table 1 about here**

196   ___________________

197

198   *NODS-scores at 6-months follow-up*

199   The interaction between treatment and alcohol habits in the ANCOVA-model was significant (F

200    $(1, 48) = 5.39; p = 0.025$), and indicates that the effect of treatment depends on the patient's

201   alcohol habits. Marginal means calculated from the ANCOVA model showed that disordered

202   gamblers with risky alcohol habits who received MI treatment had a mean NODS score of 1.9 at

203   six-month follow-up. As the low average NODS score suggests, a strikingly large proportion

204   (81.8 %) of the participants in this group no longer met the criteria for disordered gambling at the

205   six-month follow-up. For disordered gamblers with risky alcohol habits who received CBGT, the

206   corresponding NODS score was 4.0, with a lower proportion of participants (30.0%) who no

207   longer met the criteria for disordered gambling at follow-up.

208   The contrasts between MI and CBGT, shown in Figure 1, were significantly different between

209   participants with no risky alcohol habits and participants with risky alcohol habits ($t(48) = 2.32$;

210    $p = 0.025$).

211   ____________________

212   **Insert Figure 1 about here**

213   ____________________

214   *Analyses of missing data*

215   There were 25 patients, equally distributed between the two treatment groups CBGT ($n = 13$) and

216   MI ($n = 12$), who did not participate in the six-month follow-up. There were no statistically

217   significant differences in terms of sex, age, or pretreatment scores on NODS and AUDIT

218   between those who took part in the six-month follow-up and those who did not. (no p-values

219   lower than 0.40)

220

221   **Discussion**

222   The findings in this study indicate that disordered gamblers respond differently to CBGT and MI

223   depending on whether they have risky alcohol habits at pre-treatment or not. Disordered

224   gamblers who also have risky alcohol habits appear to have a better chance of benefitting from

225   gambling treatment if treated with MI, and conversely, patients with no risky alcohol habits

226   appear to have a better chance of benefitting from treatment that includes CBGT. The results are

227   clinically relevant because they can be used to facilitate the referral of individuals with gambling

228   problems to the treatment that will help them best.

229   The present research question was posed to empirically test the common belief that comorbidity

230   indiscriminately affects all forms of treatments negatively. The findings raise the question why

231   MI appears to be more efficient than CBGT when treating disordered gamblers with risky

232   alcohol habits, and conversely, why CBGT appears to be more efficient when patients do not

233   have risky alcohol habits.

234

235   In a recent study on the personality traits of problem gamblers with and without alcohol

236   dependence, disordered gamblers with co-occurring lifetime alcohol dependence reported a

237   personality style characterized by resistance to externally motivated treatment approaches

238   (Lister, Milosevic & Ledgerwood, 2015). This resistance might be better addressed with MI than

239   CBGT treatment because MI is a non-authoritarian, collaborative method that focuses on

240   building intrinsic motivation (Miller & Rollick, 2013).

241   Further, the results might be partly explained by the fact that there were more opportunities to

242   tailor treatment in the individually administered MI treatment. MI is a compassionate treatment

243   where the patient is likely to comfortably raise personal issues (Miller & Rollick, 2013), that

244   may pose obstacles to treatment if they are not given space. If the patient also had risky alcohol

245   habits, this could be addressed in treatment if it would help the patient move towards the target

246   behavior to stop or reduce gambling. The advantage of having the opportunity to address

247   multiple behaviour targets in the MI treatment may have had a significant impact on the outcome

248   because the two addictive behaviors are likely to trigger, reinforce and maintain each other.

249   Alcohol is usually readily available in casinos, racetracks and other gambling environments, and

250   gambling under the influence of alcohol is associated with higher risk-taking (Ledgerwood et al.,

251   2009; Cronce & Corbin, 2010). Conversely, events that occur during the time of gambling (e.g.

252   winning and losing) may trigger alcohol consumption (Zack et al., 2005). Multiple behaviour

253   targets in MI treatment have been studied in other fields of addiction, and have proven to be

254   effective in motivating people to simultaneously reduce their usage of tobacco, alcohol and

255   cannabis (McCambridge & Strang, 2004). In a review on smoking cessation during substance

256   abuse treatment, Baca and Yahne (2009) concluded that targeting smoking cessation enhances

257   outcome success.

258

259   An additional advantage to be able to address risky alcohol habits in treatment is that disordered

260   gamblers might have the same reasons for alcohol consumption that they have for gambling

261   (Stewart et al., 2008), and these reasons could then be highlighted and tackled from different

262   angles .

263

264   In the CBGT treatment, on the other hand, the possibility of tailoring treatment to fit any

265   comorbid conditions was very small because the treatment was group-based and strictly followed

266   a manual (Ortiz, 2006). The superior effect of CBGT on patients who did not have risky alcohol

267   habits can probably be explained by the extensive treatment that included a wide range of

268   psychoeducative elements, exercises and homework assignments that all addressed various

269   aspects of problem gambling (Ortiz, 2006)

270

271   *Strengths and limitations of the study*

272   The study addressed the important issue of understanding moderators of treatment effects. The

273   two treatment arms compared were evidence-based effective treatment methods for problem

274   gambling, and treatment outcome was measured at six-month post-treatment, which implies that

275   the results presented were persistent. The potential moderator (risky alcohol habits) included in

276   the analysis was selected for two main reasons. Firstly, it is the most common comorbid

277   condition among disordered gamblers (Petry, Stinson & Grant, 2005; Bischof et al., 2013), and

278   secondly, earlier findings indicate that the condition is an aggravating factor in treatment that

279   correlates with an impaired adherence to treatment (Milton et al., 2002; Rash, Weinstock &

280   Petry, 2011), and an increased risk of gambling relapse (Hodgins & El-Guebaly, 2010). The

281   inclusion of additional potentially predictive comorbid conditions in the analysis, such as drug,

282   mood, anxiety, and personality disorders would have been preferable. The small sample limited

283   the number of predictor variables that could be analysed in the model.

284

285   The modified version of the NODS (assessing gambling at one month instead of one year) has

286   not been evaluated. However, shortening the window of time from one year to 3 months doesn't

287   appear to affect the instrument's reliability or validity (Wulfert et al., 2005). An apparent benefit

288   of a shorter-term version of the NODS is that it can serve as a convenient treatment outcome

289   measure. It is a limitation that it is unclear to what extent the results can be explained by

290   different modes of treatment (individual vs. group), and to what extent it can be explained by

291   unique factors that can be attributed to each treatment. A considerable limitation is that there

292   was no control group. It is therefore unknown whether the participants' reported reductions of

293 symptoms of gambling disorder during the six-month post treatment follow-up were the results

294 of the treatment or just spontaneous recovery. About one-third of individuals with gambling

295 problems are believed to recover without formal treatment (Slutske, 2006).

296

297 *Generalizability*

298 There were missing data at the 6-month follow-up. However, there were no statistically

299 significant differences between those who participated and those who did not participate in the

300 follow-up in terms of, sex, age, severity of problem gambling and alcohol problems at baseline.

301 It appears reasonable to conclude that it is possible to generalise the findings to gamblers seeking

302 treatment for gambling problems extensive enough to meet the criteria for "disordered

303 gambling." The findings are interesting from a health-planning perspective, and are valid for

304 both CBGT and MI, which are two commonly used evidence-based treatments for gambling

305 disorders (Gooding &Tarrier, 2009; Hodgins, Stea & Grant, 2011; Yakovenko et al., 2015)

306

307 *Future research*

308 Firstly, the results from this study need to be replicated to ensure that these associations are not

309 sample-specific. We have no obvious theoretical explanation for why treatment matching with

310 risky alcohol habits would improve gambling outcomes. In order to confirm our results, future

311 studies have to a priori state the hypothesis that problem gamblers with risky alcohol habits will

312 benefit more from MI than from CBGT, and that disordered gamblers with no risky alcohol

313 habits will be more helped by CBGT than by MI. Moreover, further research is needed to

314 investigate how other comorbid conditions, such as anxiety and depression, affect the efficacy of

315   treatment. It would also be useful to learn more about the impact of comorbidity on individual

316   CBT.

317

318   *Conclusions*

319   The results support a screening procedure including the AUDIT prior to starting treatment for

320   disordered gambling because the result of the screening can provide guidance in the choice of

321   treatment. Problem gamblers with risky alcohol habits are likely to be best helped if they are

322   referred to MI treatment, while those without risky alcohol habits are likely to be best helped if

323   they are referred to CBGT.

324

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328

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473 Table 1. Participants' characteristics at pre-treatment includning 95% confidence interval

474 (CI95%)

Characteristics	CBGT ($n = 25$)		MI ($n = 28$)		
	Mean	CI95%	Mean	CI95%	p-
NODS *No risky alcohol habits*	6.1	5.1 – 7.2	6.0	5.1 – 6.9	0.84
NODS *Risky alcohol habits*	6.2	5.3 – 7.1	5.7	5.1 – 6.3	0.33
AUDIT *No risky alcohol habits*	2.2	0.9 – 3.5	3.6	2.3 – 4.9	0.11
AUDIT *Risky alcohol habits*	15.7	12.3 – 19.1	16.1	8.8 – 23.4	0.92
Age	43.0	37.5 – 48.4	40.8	35.9 – 45.6	0.53
	Proportion		Proportion		p-
Risky alcohol habits	40.0		39.3		0.96
Female	20.0		17.9		0.84

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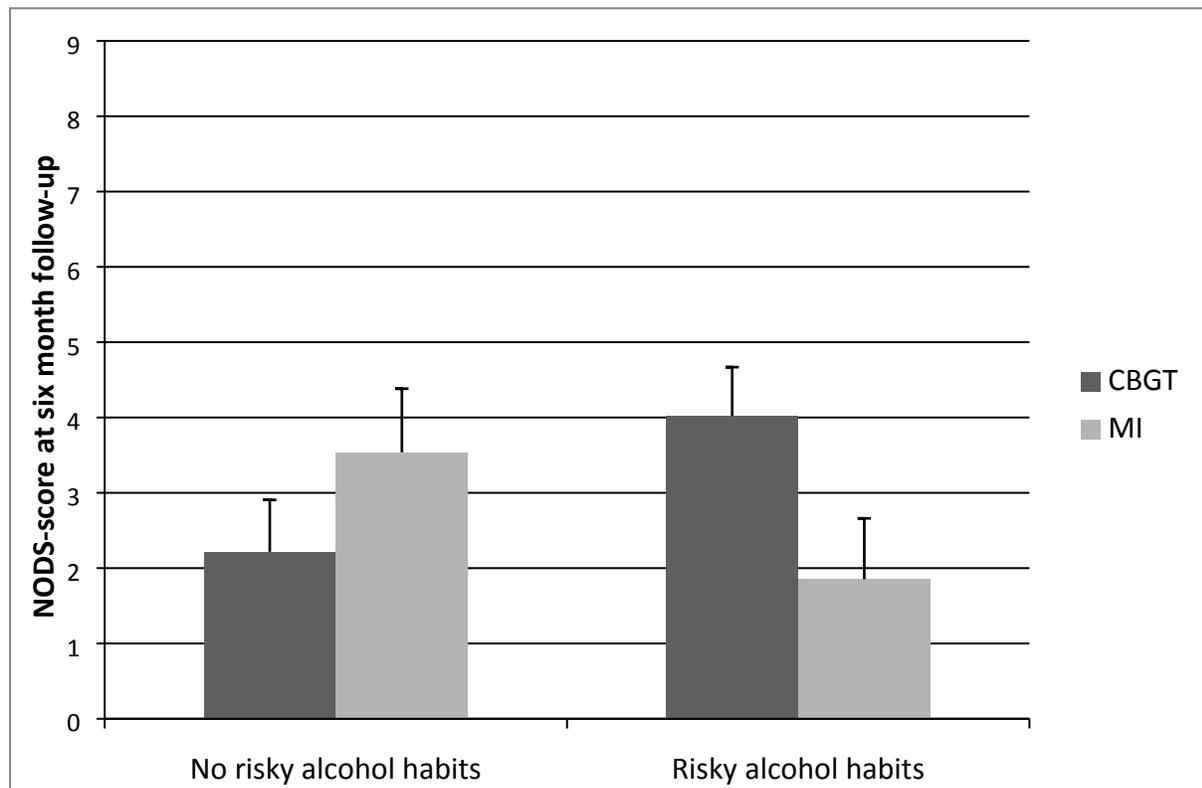
Figure 1. Marginal means and standard errors for interaction effects between treatment and

alcohol habits

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