## Supplementary material

### Effects of exercise on depression in AUDs

<table>
<thead>
<tr>
<th>Study name</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hallgren et al</td>
<td></td>
<td>-0.254</td>
<td>-1.214</td>
<td>0.705</td>
<td>0.603</td>
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<tr>
<td>Vedamurthachar et al</td>
<td></td>
<td>-1.657</td>
<td>-2.293</td>
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<tr>
<td>Giesen et al</td>
<td></td>
<td>-0.537</td>
<td>-1.239</td>
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<tr>
<td>Lehofer, M et al.</td>
<td></td>
<td>-0.830</td>
<td>-1.602</td>
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<td>-1.315</td>
<td>-0.573</td>
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</tbody>
</table>

![Graph showing the effects of exercise on depression in AUDs]

The graph illustrates the comparison between exercise and control groups, showing the standard difference in means and 95% confidence intervals for each study. The x-axis represents the standard difference in means, with marks indicating favoring exercise or control.
Effects of exercise on VO2 in AUDs

<table>
<thead>
<tr>
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<th>Upper limit</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weinstock et al</td>
<td></td>
<td>0.595</td>
<td>-0.056</td>
<td>1.245</td>
<td>0.073</td>
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<td>Brown et al.</td>
<td></td>
<td>0.187</td>
<td>-0.335</td>
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<td>Sinyor et al</td>
<td></td>
<td>0.938</td>
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<td></td>
<td></td>
<td>0.565</td>
<td>0.111</td>
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</table>

-4.00 -2.00 0.00 2.00 4.00

Favours control  Favours exercise
Effects of exercise on heart rate in AUDs

<table>
<thead>
<tr>
<th>Study name</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gary &amp; Guthrie</td>
<td></td>
<td>-1.365</td>
<td>-2.339</td>
<td>-0.392</td>
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<tr>
<td>Lehofer, M et al.</td>
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</table>

-4.00 -2.00 0.00 2.00 4.00

Favours exercise  Favours control
Effects of exercise on anxiety in AUDs

<table>
<thead>
<tr>
<th>Study name</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
</tr>
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<tbody>
<tr>
<td>Hallgren et al</td>
<td></td>
<td>-0.288</td>
<td>-1.248</td>
<td>0.673</td>
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<td>Weber, A</td>
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<td>-0.247</td>
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<td>Lehofer, M et al.</td>
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<td>-0.823</td>
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</table>

Std diff in means and 95% CI

-4.00  -2.00  0.00  2.00  4.00

Favours exercise  Favours control
Effects of exercise on self-efficacy in AUDs

<table>
<thead>
<tr>
<th>Study name</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weber, A</td>
<td></td>
<td>0.704</td>
<td>-0.088</td>
<td>1.497</td>
<td>0.081</td>
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<tr>
<td>Steinsmeier-Pelster</td>
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<td>1.040</td>
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<td>Lehofer, M et al.</td>
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<tr>
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<td></td>
<td>0.366</td>
<td>-0.665</td>
<td>1.397</td>
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</tr>
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</table>

Favours control   Favours exercise
**Narrative summary of studies reporting alcohol consumption outcomes**

Focusing on the primary outcome, results from the pooled analyses indicate no significant reduction in alcohol consumption compared to the control group. However, it is noteworthy that for each of the three drinking outcomes reported (average daily consumption, average weekly consumption, and AUDIT total), the trend favoured the exercise condition. The five studies reporting usable alcohol consumption data were heterogeneous in terms of age range, gender, participant diagnosis and study design, making comparison of the findings and generalizability difficult. Three investigations were described as pilot/preliminary studies, with 18, 31 and 49 participants, respectively. One pilot study included an active control group comparator and found no differences in post-treatment alcohol consumption.

Weinstock et al (2014) compared the effects of motivational enhancement therapy (MET) to increase exercise, with MET plus 8 weeks of contingency management (CM) for adhering to specific exercise activities. The MET+CM condition showed an increased frequency of exercise compared to MET alone, but other indices of exercise, physical fitness and alcohol use did not differ between groups over time. A previous review by the authors indicated a bias in exercise for depression studies with active control group comparitors, potentially lowering the magnitude of the effect of exercise. Also relevant is that two studies used yoga-based interventions, with one reporting significant effects on alcohol consumption favouring the yoga group and the other indicating a positive trend among the yoga participants. A further three studies used aerobic exercise (e.g. running and aerobic classes), with two of these reporting significant reductions in alcohol consumption among exercise participants compared to control. One of the more recent and methodologically rigorous of these trials was conducted by Brown et al (2014).

Forty-nine sedentary adults aged 18-65 years who met the DSM-IV-TR criteria for alcohol dependence were randomized to either a 12-week moderate-intensity supervised group aerobic exercise intervention, or a ‘brief advice to exercise’ intervention, consisting of a single 15-20 minute discussion about the psychological and physiological benefits of exercise (including public health recommendations for exercise frequency, intensity and duration). Results showed that individuals in the exercise group reported significantly fewer drinking and heavy drinking days, relative to the brief advice condition during treatment. Higher levels of exercise participation appeared to facilitate alcohol recovery, regardless of intervention
arm; however, assignment to the supervised exercise group appeared to further enhance the positive effect of exercise on consumption levels.¹

References