BACKGROUND

- Over the past few years there has been increasing research interest into the functional consequences of consuming alcohol mixed with energy drink (AMED).
- At the same time, the proportion of research funded by industry has increased across all sectors. This has led to concerns that industry-funded AMED studies may be biasing reports of AMED effects, including two recent papers from Australia.\(^2\)
- Unusually neither paper employed any statistical analyses to test their contention.
- Here we compared outcomes from AMED studies, here focusing on industry and non-industry funded studies

METHODS

- Utilising the categorisation of McKetin et al.,\(^2\) 62 studies (9 industry-funded) were grouped as examining the relationship between AMED and:
  - alcohol consumption
  - alcohol-related harms
  - increased intoxication
  - alcohol impairment
  (each included different methodologies).
- We applied chi-squared analysis to examine if outcomes from industry-funded research differed significantly from those from non-industry-funded research.
- Secondly we specifically examined level of alcohol consumption and performed a meta-analysis of within-subjects studies (comparing AMED with alcohol alone) both including and excluding industry and non-industry-funded studies.

RESULTS: CHI-SQUARED ANALYSIS

- Chi-squared analyses were performed on the data presented in Tables 1-6 from McKetin et al.\(^2\) (table 1).
- Categorised outcomes were analysed for differences between industry and non-industry funded studies.
- Omitting NR data did not change any significance \((.123 \leq p \leq .972)\) nor did re-analysis using Fisher’s exact test where expectancy cells had N < 5 \((.065 \leq p \leq 1.00)\).
- From these data, the outcome of studies into consequences of AMED consumption is independent of the source of funding.

RESULTS: META-ANALYSIS

Separate meta-analyses were performed on within-subjects studies comparing alcohol consumption following AmED an alcohol alone both including and excluding industry funded studies.

<table>
<thead>
<tr>
<th>Nature of studies</th>
<th>N studies</th>
<th>N outcomes</th>
<th>Chi-square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>[industry involvement] [NR]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studies examining the relationship between ED/caffeine and alcohol consumption</td>
<td>16 [No] 4 [Yes] 24</td>
<td>6.189</td>
<td>.288</td>
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<tr>
<td>Studies examining the relationship between ED/caffeine and alcohol-related harms</td>
<td>8 [No] 2 [Yes] 26</td>
<td>1.472</td>
<td>.916</td>
<td></td>
</tr>
<tr>
<td>Experimental studies examining the relationship between ED or caffeine and alcohol-related harms</td>
<td>2 [No] 0 [Yes] 9</td>
<td>5.760</td>
<td>.124</td>
<td></td>
</tr>
<tr>
<td>Non-experimental studies examining whether ED alters alcohol intoxication</td>
<td>6 [No] 1 [Yes] 3</td>
<td>2.962</td>
<td>.076</td>
<td></td>
</tr>
<tr>
<td>Experimental studies examining whether ED/caffeine alters alcohol intoxication</td>
<td>16 [No] 4 [Yes] 2</td>
<td>1.062</td>
<td>.957</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Statistical comparison of outcomes from studies with and without industry involvement (all categories and data extracted from McKetin et al.), \(NR = \) not reported.

SUMMARY AND CONCLUSION

- Commentaries suggesting that industry funding may bias the reporting of outcomes of AMED studies\(^1\)\(^2\) may be based on relatively superficial appraisal of the literature.
- Using more widely-accepted analytical methods there appears to be no evidence to support this contention. Nevertheless research in this field needs to be carefully scrutinized whatever the source of funding.

REFERENCES