Review

Population-level interventions to reduce alcohol-related harm: An overview of systematic reviews

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ARTICLE INFO

ABSTRACT

Objective. To analyse available review-level evidence on the effectiveness of population-level interventions in non-clinical settings to reduce alcohol consumption or related health or social harm.

Method. Health, social policy and specialist review databases between 2002 and 2012 were searched for systematic reviews of the effectiveness of population-level alcohol interventions on consumption or alcohol-related health or social outcomes. Data were extracted on review research aim, inclusion criteria, outcome indicators, results, conclusions and limitations. Reviews were quality-assessed using AMSTAR criteria. A narrative synthesis was conducted overall and by policy area.

Results. Fifty-two reviews were included from ten policy areas. There is good evidence for policies and interventions to limit alcohol sale availability, to reduce drink-driving, to increase alcohol price or taxation. There is mixed evidence for family- and community-level interventions, school-based interventions, and interventions in the alcohol server setting and the mass media. There is weak evidence for workplace interventions and for interventions targeting illicit alcohol sales. There is evidence of the ineffectiveness of interventions in higher education settings.

Conclusion. There is a pattern of support from the evidence base for regulatory or statutory enforcement interventions over local non-regulatory approaches targeting specific population groups.

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Introduction

Alcohol is the world's third largest disease risk factor causing 2.5 million deaths annually worldwide (World Health Organization, 2011). It results in substantial societal costs through healthcare costs, crime and productivity losses (Anderson et al., 2009). Implementing effective population-level interventions to reduce the negative consequences of alcohol consumption is therefore a major public health priority (Beaglehole et al., 2011). The drivers and consequences of alcohol consumption span a range of biological, behavioural, social and economic dimensions. Addressing the complex causal pathways of alcohol-related harm therefore requires interventions targeting multiple points along this pathway. Numerous primary studies and systematic reviews have assessed the effectiveness of alcohol interventions. However, making valid judgements on the strength of the overall evidence base remains a challenge due to the diversity of proposed intervention mechanisms and the heterogeneity of outcome measures used. Understanding this evidence base is critical given the propensity for alcohol industry bodies to cite a weak evidence base when challenging policy implementation (Babor and Robaina, 2012).

This overview of systematic reviews, a methodology recognised by the Cochrane Collaboration (Becker and Oxman, 2011), provides a comprehensive, up-to-date analysis for policymakers and researchers of review-level evidence on population-level interventions to reduce alcohol consumption or its adverse health effects.

Methods

Medline, Embase, Cochrane, Social Policy and Practice, DARE[1], Cochrane, Campbell and NICE databases were searched for systematic reviews of primary studies assessing the effectiveness of population-level interventions to reduce alcohol consumption or related harm using controlled, before–after or time-series study design. The review protocol is available on request. Search strategies, available in the web-appendix, were based on a conceptual framework (Fig. 1) of the causal pathways connecting proximal drivers of alcohol consumption to distal alcohol-related health and social outcomes.

Systematic reviews were retrieved using a validated search filter (Montori et al., 2005) that balanced high sensitivity with good specificity. The search, run on October 9, 2012, was not limited by language or to peer-reviewed journal. Reviews published before 2002 were excluded in order to provide the most up-to-date evidence.

Study screening

6778 unique articles were screened, using EPPI-Reviewer 4, against the following inclusion criteria:

1. Does the study have a stated aim to evaluate interventions to reduce alcohol use and/or related harm, *and* report outcome data on alcohol use and/or related harm?
2. Does the study concern intervention effectiveness?
3. Is at least one of the interventions reviewed population level?
4. Is the study a systematic review?

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[1] Abbreviations: AI — American Indian, AMSTAR — Assessment of Multiple Systematic Reviews, AN — Alaskan Native, AOD — Alcohol Outlet Density, BAC — blood-alcohol concentration, DARE — database of Abstracts of Reviews of Effects, DD — drink-driving, GDL — graduated driver licence, IQR — inter-quartile range, MDLA — minimum legal drinking age, NICE — National Institute for Health and Clinical Excellence, PRISMA — Preferred Reporting Items for Systematic Reviews and Meta-Analyses, RCT — randomised controlled trial, RDD — riding with a drink-driver, SRE — sexual and reproductive health education

Reviews were judged to be systematic if they reported search strategy details, inclusion and exclusion criteria, and clearly identified all included studies. Interventions involving interaction between health professionals and individuals or groups were excluded, as were interventions selectively targeting high-risk individuals, such as those convicted of alcohol-related offences.

At each screening stage, 10% of the abstracts or full-texts were independently dual-screened. Classification disagreements were then discussed, reconciled and the remaining articles screened individually. The articles were checked for duplicate publication and updates; only the most comprehensive or recent review was included. Overviews of reviews were excluded unless they also reviewed primary studies; their included reviews were screened for inclusion in this overview. Key experts in the field were contacted to check for missed reviews. Fig. 2 shows the PRISMA flow diagram (Moher et al., 2009) of numbers progressing through screening.

Data extraction

Data were extracted from included reviews using a standardised form collecting information on research aim, study inclusion criteria, outcome indicators assessed, results and a summary of the author's conclusions, recommendations and limitations. Each review's quality was independently scored by two reviewers using the validated AMSTAR tool (Shea et al., 2007). The reviews were categorised into high (AMSTAR score 9–11), medium (6–8) or low (0–5) quality. This rating reflects the quality of the review rather than its constituent primary studies. Ten percent of the reviews were fully dual-extracted and reconciled. Data extraction for the remaining reviews was conducted by a single reviewer and checked for accuracy by a second.

Data were also extracted on the number of eligible primary studies reported in each review that quantified the effect of a population-level intervention on alcohol-related harm or consumption using a controlled or before–after design. Only review conclusions judged to be based on population-level interventions were extracted. Multi-component interventions consisting of both individual-level and population-level components were only considered eligible for this overview if the population-level component was judged to be more than simply reinforcement of an individual-level intervention. Each primary study was categorised according to study design and the presence of statistically-significant beneficial or harmful alcohol-related outcomes.

Data analysis

A narrative synthesis of the data was conducted overall and by policy area. A meta-analysis was not undertaken given the heterogeneity of interventions and outcome variables. Primary study data are only used to offer a more detailed description of reviews and to illustrate the size of the primary evidence base within each policy area. Intervention effect sizes are only reported if the original review synthesised effect sizes.

Results

Fifty-two primary reviews were included, of which nine conducted meta-analyses. Twelve reviews were rated high quality, 29 medium and 11 low. No reviews reported funding by alcohol industry organisations; however, review funding was inconsistently reported. The reviews were categorised according to ten broadly-defined policy areas as shown in Table 1. Reviews covering two policy areas were categorised according to their main focus, with findings outside this category discussed within the other relevant policy section. Table 2 summarises the main findings for each included review by policy area. No non-English language reviews met our inclusion criteria.

Fig. 3 shows the number of eligible studies in each review, ranging from 1 to 84, categorised by the proportion of eligible studies reporting significant beneficial effects on alcohol consumption or