Effects of minimum drinking age laws: a review and analyses of the literature from 1960 to 2000.

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Authors' objectives
To determine the effectiveness of a policy of a minimum legal drinking age (MLDA) of 21 years in reducing the consumption of alcohol by the under-21s and the occurrence of alcohol-related harm.

Searching
ETOH (from 1960 to 1999), MEDLINE (from 1966 to 1999), Current Contents (from 1994 to 1999) and Social Science Abstracts (from 1983 to 1999) were searched. The search terms were reported. Two previous literature reviews were also used to identify further studies.

Study selection
Study designs of evaluations included in the review
Empirical studies were sought. Longitudinal, time series, pre-test post-test, cross-sectional and repeated cross-sectional studies were included in the review.

Specific interventions included in the review
Laws relating to a legal minimum age for the purchase or consumption of alcohol were eligible for inclusion. The included studies assessed the lowering of the MLDA, the raising of the MLDA and comparisons of different MLDA's. The included studies were conducted in the USA and Canada.

Participants included in the review
The inclusion criteria for the participants were not explicitly stated. The authors stated that the majority of the participants included in the review were under 21 years old, and that many were college students.

Outcomes assessed in the review
The inclusion criteria specified alcohol consumption and alcohol-related problems such as the under-age purchase of alcohol and illegal drug use. The outcomes assessed in the review were alcohol consumption, drink-driving and car accidents, and health and social problems including suicide, homicide and vandalism.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Validity was assessed using the criteria sampling method, and the presence or absence of a comparator group. High methodological quality was defined as the inclusion of a longitudinal design, comparison groups and probability (random) sampling, or the use of a census. The authors did not state how the papers were assessed for validity, or how many reviewers performed the validity assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
A narrative synthesis of the studies was undertaken. The studies were grouped by the outcomes reported (alcohol consumption, traffic-related or other health and social outcomes). The numbers of analyses showing statistically positive or inverse relationships between the MLDA and outcome measure were tallied for each subset. A positive relationship was defined as a decrease in an outcome measure (e.g. alcohol consumption) associated with a decrease in MLDA, while an inverse relationship was defined as the opposite (e.g. an increase in alcohol consumption associated with a decrease in MLDA).

How were differences between studies investigated?
The authors compared the results of different study designs for each set of outcome measures. In particular, they compared the results of cross-sectional studies with those of higher quality longitudinal designs, defined by the authors as all analyses involving repeated measures of outcome (i.e. pre-test post-test, longitudinal and time series). Studies with comparison groups were also examined separately. The authors also discussed studies that examined college students separately from those that examined the general population.

Results of the review
A total of 241 analyses drawn from 132 papers were included in the review: 105 longitudinal, 42 time series, 43 pre-test post-test, 45 cross-sectional and 6 repeated cross-sectional designs. The number of participants or population size was not reported.

Forty-eight studies with 78 analyses examining the effect of a MLDA on alcohol consumption were found. In 27 analyses there was a statistically-significant inverse relationship between the MLDA and alcohol consumption, while in 5 analyses there was a statistically-significant positive relationship. Of the 33 analyses judged to be of higher quality, 11 showed a statistically-significant inverse relationship between the MLDA and alcohol consumption and one showed a statistically-significant positive relationship. Of the 24 analyses of college students, 3 reported a statistically-significant inverse relationship and 3 reported a significant positive relationship. The 3 high-quality studies showed no relationship.

Fifty-seven studies with 102 analyses of drink-driving and traffic accidents were found. Of these, 52 analyses showed a statistically-significant inverse relationship between the MLDA and accident-related incidents, while 2 showed a statistically-significant positive relationship. Of the 79 studies judged to be of higher quality, 46 showed a statistically-significant inverse relationship between the MLDA and traffic accidents; none found a statistically-significant positive relationship. There were 6 analyses of college students, of which 2 reported an inverse relationship and one a positive relationship. None of the high-quality studies were in college students.

Twenty-four studies with 61 analyses of health and social problems (excluding traffic crashes) were found. Ten of these analyses reported a statistically-significant inverse relationship between the MLDA and accident-related incidents, with 4 reporting a positive correlation. Of the 23 studies judged to be of higher quality, 8 showed a statistically-significant inverse relationship between the MLDA and outcome measures; none found a statistically-significant positive relationship. Thirty-four analyses of college students were found, of which 2 showed a statistically-significant inverse relationship and 3 showed a statistically-significant positive relationship. The 2 high-quality studies showed no significant relationship.

Authors' conclusions
The authors’ conclusions were that there was an inverse relationship between the MLDA and alcohol consumption and car accidents. The authors also stated that conclusions could not be drawn on the effects of the MLDA on college students due to the poor quality of the available studies on this population.

CRD commentary
The review question was broad, particularly in terms of the study design and measures of effectiveness. The search included several relevant databases, but few additional sources. The fact that it was restricted to English language studies may have led to the introduction of language bias, but this was made less likely by the fact that the intervention under consideration was restricted to North America. Only published studies were included; this may have led to publication bias, which can favour positive findings. The authors did not report using methods to minimise bias and...
errors in the study selection process, data extraction or quality assessment.

There was an attempt to assess validity by differentiating higher quality studies in the results. However, analyses with different measures of each outcome were combined in this review, which may have led to a considerable amount of heterogeneity in the study outcomes being summarised together. The use of a tally of positive, negative or no association studies to determine effectiveness is potentially misleading because it does not take bias or the strength of the association in each individual study into account, or the differences in characteristics between the studies. Consequently, the authors’ conclusions based on the preponderance of evidence should serve only as a precursor to a more rigorous analysis.

**Implications of the review for practice and research**

Practice: The authors stated that the MLDA of 21 years should be retained.

Research: The authors stated that studies with rigorous designs are needed to assess the impact of a MLDA of 21 years on college campuses.

**Bibliographic details**


**Other publications of related interest**


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Subject indexing assigned by NLM

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.