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Review
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Review

Association Between Smoke-Free Legislation in Hospitality Venues and Smoking Behavior of Young People: A Systematic Review

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Abstract

Introduction: While evaluations of indoor smoke-free legislation have demonstrated major public health benefits among adults, their impact on the smoking behavior of young people remains unclear. Therefore, we performed a systematic review of the association between smoke-free legislation in hospitality venues and smoking behavior of young people.

Aims and Methods: A systematic search was conducted in PubMed, Scopus, and Embase in June 2020. We searched for studies that assessed the association of any form of smoke-free legislation in any hospitality venue (eg, bar and restaurant) with a smoking behavior outcome (eg, initiation and current smoking) among young people (aged 10–24 years). .

Results: Our search yielded 572 articles of which 31 were screened based on full-text and 9 were included in the analysis. All studies were published between 2005 and 2016. The majority of studies used a quasi-experimental design. Four studies evaluated smoke-free legislation in hospitality venues specifically. Two studies reported that comprehensive, but not weaker, smoke-free legislation decreases progression to established smoking. Two other studies provided mixed results on which level of comprehensiveness of legislation would be effective, and which smoking outcomes would be affected. Five studies evaluated legislation that also included other workplaces. Out of these five studies, three studies found significant decreases in current smoking, smoking frequency, and/or smoking quantity, whereas two other studies did not.

Conclusions: Most of the studies found that smoke-free legislation in hospitality venues is associated with a decrease in smoking behavior among young people. Their results indicate the need for comprehensive smoke-free legislation without exemptions.

Implications: This is the first systematic review to provide insight into the relationship between smoke-free legislation in hospitality venues and smoking behavior of young people. Our findings show that there is a need for comprehensive smoke-free legislation without exemptions (such as designated smoking areas).

Introduction

Over the past decade, an increasing number of countries have implemented smoke-free legislation, eliminating tobacco smoke in indoor public places and workplaces.[1,2] The primary purpose of these measures is to protect the public and workers from the harmful effects of secondhand smoke exposure.[3] However, smoke-free legislation may additionally reduce smoking behavior. Studies among adults have reported a decrease in smoking prevalence[4,5] and an increase in quit attempts after the implementation of smoke-free legislation.[6,7] This effect may be driven by lower visibility of smoking, fewer opportunities to smoke, and diminished social acceptability of smoking.[8–10]

As nearly 90 percent of all adult smokers started smoking before the age of 18, prevention among young people is important.[11,12] Smoke-free legislation in hospitality venues seems especially promising in preventing smoking among young people, as young people (especially young adults) are more frequently in restaurants, bars, and nightclubs than older adults.[13] Many young people work in the hospitality industry. Moreover, smoking initiation among young people often takes place during weekends in settings where young people go out.[14] Therefore, young people's smoking behavior is likely to be affected by smoke-free legislation in these establishments. However, to date, no overview of the evidence is available on the association between smoke-free legislation in hospitality venues and smoking behavior among young people. The aim of this study was to conduct a systematic review of the association between smoke-free legislation in hospitality venues (eg, bars and restaurants) and smoking behavior (eg, initiation and current smoking) among young people (aged 10–24 years).

Methods

Search Strategy

We carried out a systematic literature search in June 2020 using three electronic databases: PubMed, Scopus, and Embase. Keywords included terms for young people (eg, adolescent and youth), smoke-free legislation (eg, smoking ban and smoke-free policy), and hospitality venues (eg, restaurant and bar). Appendix I presents the detailed search strings. As a secondary search, we screened the references of the articles that we included in this review.

Inclusion and Exclusion Criteria

Studies' titles and/or abstracts had to include: (1) (a subgroup of) young people (aged 10–24 years, as defined by the World Health Organization); (2) a form of smoke-free legislation; (3) a hospitality venue keyword; (4) a measure of smoking behavior (eg, current smoking and initiation); and (5) an analysis of the association between (2) and (4). The same inclusion criteria were applied during full-text screening.

We used three exclusion criteria. First, as we focused on regular combustible cigarettes only, studies were excluded that reported exclusively on products, such as e-cigarettes, heat-not-burn, snus/chewing tobacco, snuff, and hookah/shisha. Second, we excluded studies measuring perceptions on whether smoke-free legislation had influenced or would influence one's smoking behavior (eg, smoking initiation). Finally, studies on attitudes and beliefs toward smoke-free legislation or smoking were excluded. We did not exclude studies based on study design.

Study Selection

Two authors (HHG and YYCS) independently screened articles (title/abstract and full-text) for eligibility using Rayyan, an online app that facilitates the screening process for systematic reviews.[15]The obtained articles were screened based on title and abstract, followed by full-text screening. When opinions differed, consensus was reached through discussion between the first (HHG) and last author (MAGK).

Quality Assessment

To assess the methodological quality of the included studies, the Mixed Methods Appraisal Tool (MMAT)[16] was completed by two authors (HHG and AEK) in parallel. Findings were compared, and consensus about the quality of the included studies was reached by discussing inequalities between the two authors. The MMAT rates five criteria that are most relevant to appraise the methodological quality of studies. Each criterion is rated as "yes," "no," or "can't tell". In Appendix II, we briefly specify how each criterion was interpreted in the context of the current review.

Data Extraction and Analysis

Two authors (HHG and YYCS) independently extracted the following data for each included study: design, duration, baseline descriptive data of the participants, form of smoke-free legislation, type of smoking behavior outcome(s), and results. The included studies used a wide range of smoking behavior outcomes and different methods to assess the association between smoke-free legislation and smoking behavior. Because of this heterogeneity, a meta-analysis was not conducted. Instead, the results were arranged in a table and described narratively.

Results

Study Selection and Characteristics

Our initial search yielded 572 articles and 31 articles were screened based on full-text. Reasons for exclusion were, for example, focusing on non-regular combustible cigarettes and measuring adolescents' attitudes toward smoke-free legislation instead of their actual behavior. After reading the 31 articles full-text, 9 studies were included in the analysis. The most common reason for excluding full-text articles was the lack of results on (a subgroup of) young people. Figure 1 represents the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

The characteristics of each included paper are presented in Supplementary Table 1. Studies were published between 2005 and 2016. All studies were quantitative and non-randomized. Six studies used a longitudinal design, and three studies used a repeated cross-sectional design. Eight studies were performed in the United States and one in Spain. The age of the participants ranged from 12 to 24 years and sample size from 536 to 717.543.

Of the nine included papers, four specifically evaluated smoke-free legislation in hospitality venues,[17–20] while five studies evaluated legislation that also included other workplaces.[21–25] Legislation varied from comprehensive (completely smoke-free, without exemptions)[21–23,25] to partial (with exemptions).[24] In addition, four studies compared comprehensive with partial legislation.[17–20]

Two papers resulted from the same study.[19,20] The 2008 paper adds 2 years follow-up to the 2005 paper and adds smoking initiation as an outcome. Two other papers[17,18] used the same longitudinal survey data and partially overlapping methodology. We

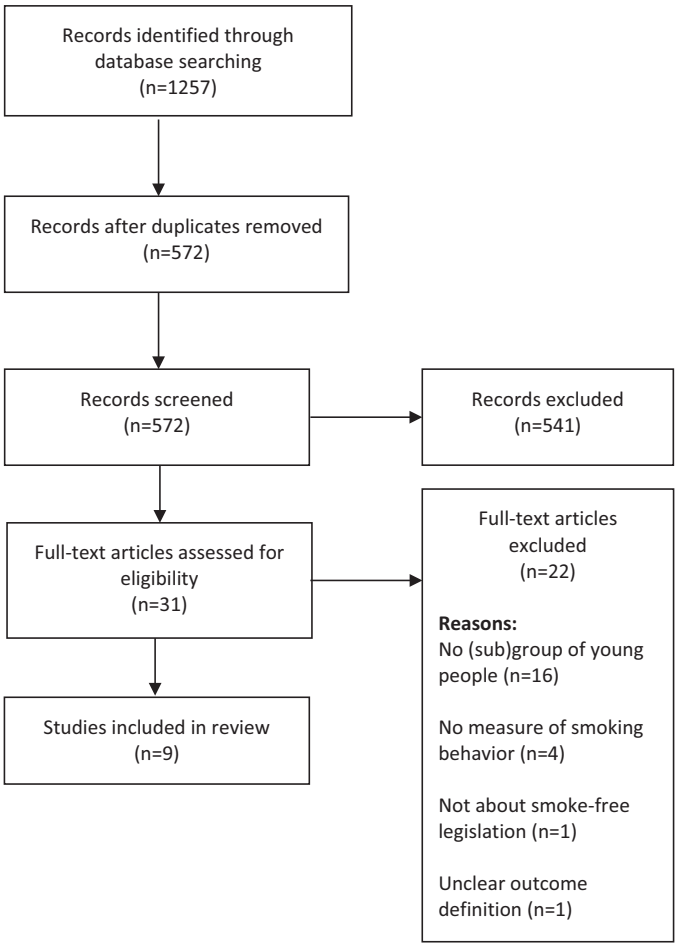

Figure 1. PRISMA flow diagram.

have, therefore, considered these studies in close relation to one another. Supplementary Table 2 presents which outcome measurements were used in each study. Two studies assessed smoking initiation,[17,18] two assessed progression to established smoking,[19,20] five assessed current smoking,[17,21,23–25] four assessed smoking frequency,[17,21–23] two assessed smoking quantity,[21,22] and one assessed smoking relapse.[18]

Quality of Included Studies

Supplementary Table 3 presents the results of the quality assessment, using the MMAT. The majority of the studies used appropriate outcome measures, reported complete outcome data, and controlled both for individual characteristics and for other tobacco control efforts. However, for some studies, it was not clear whether they used a representative study population. In addition, only one study provided information about whether the intervention was administered as intended (ie, the level of implementation and enforcement of the smoke-free policy).

Associations by Smoking Outcome

Smoke-Free Legislation in Hospitality Venues Only

Both current smoking and smoking frequency were assessed in only one paper.[17] This paper found that comprehensive smoke-free legislation in bars was significantly associated with lower odds of current smoking and with a decrease in smoking frequency among smokers.

Smoking initiation was assessed in two papers.[17,18] These papers found that comprehensive smoke-free legislation in bars was not significantly associated with smoking initiation. In addition, one of the papers found that partial smoke-free legislation was significantly associated with a decrease in smoking initiation.[18]

Smoking relapse was assessed in one paper,[18] which showed that comprehensive smoke-free legislation in bars was not significantly associated with smoking relapse. Partial smoke-free legislation was significantly associated with a decrease in relapse into non-daily smoking but not significantly associated with relapse into daily, light, or heavy smoking.

Progression to established smoking was described in two papers.[19,20] Both papers found that comprehensive smoke-free legislation in restaurants was associated with lower odds of progression to established smoking.

Smoke-Free Legislation in Hospitality Venues and Other Workplaces

Current smoking was assessed in four studies that covered wider workplace smoke-free legislation.[21,23–25] In line with the paper on hospitality venues only,[17] two studies[23,25] reported that smoke-free legislation was significantly associated with a decrease in the percentage of current smokers. However, the two other studies[21,24] did not find a significant association between smoke-free legislation and current smoking.

Smoking frequency was assessed in three studies that included smoke-free legislation in workplaces other than hospitality venues.[21–23] Two studies[22,23] found, like the study on hospitality venues only,[17] that smoke-free legislation was significantly associated with a decrease in smoking frequency, whereas the other study[21] did not find this association.

Smoking quantity was assessed only in two studies on wider workplace smoke-free legislation.[21,22] One study[22] found that smoke-free legislation was significantly associated with a decrease in smoking quantity, whereas the other study[21] did not find this association.

Discussion

Key Findings

Four papers evaluated smoke-free legislation in hospitality venues specifically. Two papers from the same study from Massachusetts reported that comprehensive, but not weaker, smoke-free legislation in restaurants decreased progression to established smoking. Two papers based on a US national survey provided mixed results on which level of comprehensiveness of legislation would prevent smoking, and which smoking outcomes would be affected. Of the five studies evaluating broader workplace smoke-free legislation, three found significant decreases in current smoking, smoking frequency, and/or smoking quantity.

Strengths and Limitations

This is the first literature review to systematically assess the relationship between smoke-free legislation in hospitality venues and smoking behavior among young people. The majority of studies were longitudinal and compared data before and after smoke-free legislation was implemented. Furthermore, many studies used a quasi-experimental design, which additionally includes one or more control groups (ie, where smoke-free legislation was not implemented) to minimalize the possibility that observed changes would also have occurred without smoke-free legislation. Yet, due to their observational nature, these studies cannot completely rule out potential confounding by local factors or the possibility that adoption of smoke-free legislation is more likely in localities where smoking is already declining more rapidly.

Other limitations to the reviewed literature need to be acknowledged as well. First, since eight out of the nine studies originated in the United States, it is unclear whether smoke-free legislation in hospitality venues would have similar effects on young people's smoking behavior in other countries. It is surprising that virtually none of the included studies were conducted in other parts of the world, such as Asia, South America, Africa, and Europe. We expected more research from European countries, as most have introduced some form of smoke-free legislation in hospitality venues and have high research budgets.[1] Remarkably, the only European study included in this review did not find evidence for an effect. The impact of smoke-free may depend on the presence of other tobacco-related legislation, such as publicity campaigns and minimum ages to buy cigarettes or to visit bars. This is something that should be taken into account in future studies.

A second limitation is that five out of the nine studies evaluated more comprehensive workplace smoke-free legislation, including non-hospitality workplaces, making it difficult to assess the relative contribution of each. Nevertheless, we expect the reported impact on young people's smoking to be mainly attributed to smoke-free legislation in hospitality venues, because young people visit these venues as customers and predominantly work in the hospitality or retail industry (eg, shops and supermarkets),[26] of which the latter was often already smoke-free.

Third, comparability between studies was limited due to considerable variation in study designs, smoking behavior outcomes and their definitions, and statistical methods. In addition, some studies were relatively small or based on the same survey data. This reduced the possibilities for a meta-analysis.

Finally, the quality assessment revealed that the studies included in this review did not evaluate to what extent smoke-free legislation was implemented and enforced. This is, however, important since previous studies have shown that while some-free legislation could have important effects, in theory, the actual effect may be strongly dependent on how legislation is implemented in practice.[27–29]If legislation is not enforced, effects may be reduced, nullified, or even reversed. Further study on this topic is, therefore, strongly recommended.

Interpretation of Findings

We found that smoke-free legislation in hospitality venues and other workplaces is often associated with lower odds of current smoking and with a decrease in smoking frequency among smokers. Lower odds of current smoking may be explained by smokers quitting in response to smoke-free legislation.[4,30] In addition, since smoke-free legislation limits smoking opportunities,[31,32] the number of cigarettes smoked is likely to decrease as well.

Comprehensive smoke-free legislation is often associated with a decrease in smoking behavior outcomes. Previous studies have also shown that smoke-free legislation may have a greater impact on the smoking behavior of adults if legislation is comprehensive without exemptions (such as smoking in designated areas).[33–36] This may explain why the study on the Spanish population[24] reported that smoke-free legislation was not significantly associated with a decrease in current smoking. Although the clean indoor air law passed in Spain bans all smoking in workplaces, it was only partial in bars and restaurants. In fact, a study evaluating this law found that exposure to environmental tobacco smoke was considerably reduced in workplaces but much less so in bars and restaurants.[37]

Song et al.[17] found that comprehensive smoke-free legislation was significantly associated with a decrease in current smoking and smoking frequency but not with smoking initiation. Shang[18] also found that comprehensive smoke-free legislation was not significantly associated with initiation. A possible explanation for this might be that the minimum age for drinking alcohol in the United States is 21, making it less attractive (and often more difficult) for minors to visit bars and nightclubs. Since nearly 90% of all smokers start smoking before the age of 18,[12] smoke-free legislation in bars or nightclubs may not affect the initiation of smoking when young people have limited exposure to these venues before initiation occurs.

As a result of prohibiting indoor smoking in hospitality venues, smokers may shift to terraces or just outside of bars and restaurants. Kennedy et al.[38] found that outdoor smoking in front of hospitality venues increased from 34% before to 76% after smoke-free legislation was implemented in France. This emphasizes that, to avoid that smoke-free legislation has less or no impact on young people's smoking behavior, terraces or the areas just outside hospitality venues should be included in smoke-free legislation.

Conclusions

According to most of the studies, smoke-free legislation in hospitality venues was associated with a decrease in smoking behavior among young people, most likely by increasing smoking cessation and decreasing progression from experimental smoking toward established smoking. Comprehensive smoke-free legislation appears to be more effective than weaker legislation. Future research should assess the effect of smoke-free legislation in hospitality venues on young people's smoking behavior in non-US settings.

Supplementary Material

A Contributorship Form detailing each author's specific involvement with this content, as well as any supplementary data, is available online at https://academic.oup.com/ntr.

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Declaration of Interests

None declared.

Data Availability

The data that support the findings of this study are available on request from the corresponding author, HHG.

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