



Review Article

How can a ban on tobacco sales to minors be effective in changing smoking behaviour among youth? — A realist review

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ARTICLE INFO

Keywords:

Tobacco smoking
Health policy
Adolescent behaviour
Minors

ABSTRACT

The aim of the study was to understand, from the perspective of youth, how and under which circumstances a ban on tobacco sales to minors can be effective in influencing youth smoking behaviour. We searched Medline, Embase, and PsychINFO in February 2016. A systematic search for studies about a ban on sales to minors and smoking behaviour was performed. Only studies that addressed potential mechanisms were included, resulting in thirty-three studies. We extracted evidence from 26 quantitative, 5 qualitative, and 2 mixed-methods studies, explaining how the ban may be effective in reducing smoking behaviour, and contextual factors that may influence these mechanisms. We identified two mechanisms and three contra-mechanisms. First, when direct access to commercial sources is limited, cigarette consumption may be reduced because minors have restricted access to commercial cigarettes. Minors' access to social sources and the various ways in which they continue to buy cigarettes by circumventing the ban, are two contra-mechanisms that undermine this effect. Second, when the ban is strongly enforced, an anti-smoking norm may be created and adolescents may smoke less as a result. One contra-mechanism may possibly undermine this effect: the 'forbidden fruit' effect. Whether these (contra-) mechanisms occur depends on contextual and individual factors such as level of enforcement, the minors' social network, and their dependence on smoking. The ban can be effective if well enforced. However, minors' access to social sources and their ways to circumvent the ban should be addressed to achieve its full potential.

1. Background

Most people start smoking before the age of 18 years old and often transition to regular smokers during young adulthood (Eurobarometer, 2015). Current tobacco control policies to prevent and reduce smoking have a strong focus on youth. One of such policies is the ban on tobacco sales to minors that has been implemented in numerous countries (OECD, 2013). The ban aims to limit access to commercially-sold cigarettes by setting a legal purchasing age. This age varies between countries, ranging from 16 to 21 years old.

Several studies have explored the association between a ban on sales to minors and tobacco use among youth (JR, 2011; Kwan et al., 2015; Friend et al., 2011; Stead and Lancaster, 2000; Lantz et al., 2000). All studies have highlighted the importance of enforcement in reducing illegal sales to minors (JR, 2011; Kwan et al., 2015; Friend et al., 2011; Stead and Lancaster, 2000; Lantz et al., 2000). DiFranza (2011) finds that if the ban is successful in disrupting the commercial supply of

cigarettes, then tobacco use among minors is expected to decline (JR, 2011). However, many studies also emphasize the fact that adolescents do not exclusively make use of commercial sources. Minors also access social sources of cigarettes. The Institute of Medicine developed a logic model to explain the link between a minimum age policy and underage tobacco use, by examining behavioural mechanisms (Kwan et al., 2015). The model emphasizes that the ban can affect smoking by deterring youth from using commercial sources. This is highly dependent on the level of enforcement of the ban. Moreover, according to this model, the ban can affect smoking by shaping the legal norm and changing beliefs and attitudes towards tobacco use.

While this model, as well as previous reviews, identify important ways in which the ban may affect smoking behaviour, the perspective of youth in relation to the ban has not been explored previously. The perspective of youth is important to examine as they are the target group of the ban. Their reaction will determine a substantial part of the effectiveness of the ban. With this in mind, we conducted a review with

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<https://doi.org/10.1016/j.ypmed.2018.08.013>

Received 7 April 2018; Received in revised form 23 July 2018; Accepted 21 August 2018

Available online 23 August 2018

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the aim to understand how youth respond to bans and sales on minors. We aim to understand, by taking a youth perspective, how and under which circumstances a ban on sales to minors can be effective in influencing youth smoking behaviour. This review can therefore provide evidence for the potential improvement of a ban on sales to minors.

2. Methods

We used a realist review approach as developed by Pawson. This approach is particularly suited for understanding the ‘mechanisms’ through which a policy intervention may succeed or fail to achieve the expected outcomes. By identifying these mechanisms, a realist review will not only show how a policy may succeed in influencing youth smoking, but also how the outcomes may vary across subgroups of youth, and how this may depend on wider circumstances such as forms of implementation.

In the review process, we followed the six steps formulated by Pawson: identifying the review question, formulating the initial programme theory, searching for primary studies, selecting and appraising included studies, extracting, analysing, and synthesizing relevant data, and refining the initial programme theory (Pawson, 2006).

2.1. Identifying the review question

This review aimed to answer the following question: how could a ban on tobacco sales to minors prevent or reduce smoking among adolescents? Among which groups and in which circumstances are such effects most likely to occur?

2.2. Formulating the initial programme theory

An initial programme theory was developed between November 2015 and February 2016, on the basis of a scoping review of the literature on tobacco age of sale policies. This review yielded ideas of how the ban might work and what contextual elements could influence the mechanisms involved. To systematize these initial ideas, a number of behavioural models was used: the Theory of Planned Behaviour, Social Cognitive Theory, and the Health Belief Model (Bektas et al., 2010; Redding Colleen et al., 2000; The Theory of Planned Behavior, 2013).

From the Theory of Planned Behaviour we developed the idea that the ban may lead to potential changes in smoking norms, which could in turn influence smoking behaviour. The Social Cognitive theory elucidated the role of personal and environmental determinants that may influence the way an individual reacts to the ban. Lastly, the Health Belief Model underlined the role of perceptions and beliefs in health behaviour. According to this model, the influence of the ban on smoking behaviour depends on minors' perception of access to cigarettes or acceptability of smoking. We also used elements from the conceptual model created by the International Tobacco Control Policy Evaluation Project, particularly its distinction between policy-specific variables and policy relevant outcomes (Fong et al., 2006).

A summary of the resulting theory is presented in Table 1. Two core mechanisms were identified through which a ban on sales to minors

may affect smoking behaviour. A ban can influence an individual's access to cigarettes (M1) and it can affect an individuals' norms and thereby his/her motivation to obtain cigarettes (M2), resulting in a change in smoking behaviour (Stead and Lancaster, 2000; Richardson et al., 2009; Lynch and B, 1994; Willemsen and De Zwart, 1999; Hamilton et al., 2008). How and whether these mechanisms take place depends on context.

2.3. Searching and selecting primary studies

Guided by the initial programme theory, a systematic literature search was performed. A medical librarian assisted in the development of the search terms. These terms were constructed with the use of MeSH terms and concepts identified in previous literature on the topic (see Supplementary File). The following databases were screened for relevant literature: Medline, Embase, and PsychINFO. The search was conducted in February 2016. No restriction on publication year was applied.

2.4. Selecting and appraising studies

The selection of studies was done by two independent reviewers (PAWN and TGK) in two stages; one based on title and abstract and one on full-texts. Due to time constraints, the full-text screening was completed by PAWN after a random sample of 15 articles had been screened by both PAWN and TGK in order to test and fine-tune the selection criteria and ensure consensus. The content of the title/abstract had to include the words ‘adolescents’ (and synonyms), ‘smoking’ (idem), and ‘ban on sales to minors’ (idem). The full-text selection aimed to identify studies that included relevant evidence on the potential effect of the ban on adolescents' smoking behaviour (see Supplementary File for criteria). Studies testing retailer compliance were only included if compliance was linked to smoking behaviour, because we were interested in mechanisms at the level of the minor not the retailer. Six studies evaluated the USA Purchase, Use, Possession laws; these were excluded as they are a different intervention than a ban on sales to minors. We also excluded articles that focussed on illegal sales only, that lacked a smoking outcome, and/or that focused solely on minor's attitudes towards the ban. Five studies were excluded because no full-text in English was available. Thirty-three studies were included in the final analysis, of which 26 quantitative, 5 qualitative, and 2 mixed-methods studies (see Fig. 1).

Following Realist And Meta-narrative Evidence Syntheses: Evolving Standards (RAMESES) guidelines, the quality of studies was appraised in terms of rigor and relevance (Wong et al., 2013). Rigor is the methodological quality of a study and it was assessed independently by two authors (PAWN and TGK). If both agreed that the quality of a study was weak, then the study was excluded. Rigor was not sufficient if the sample population was not suitable to investigate the research question and/or if the internal/external validity were inadequate. No articles were excluded based on rigor.

The relevance criterion refers to whether the evidence “can contribute to theory building and/or testing...” (Wong et al., 2013). Relevance was determined by whether a study contained sufficiently detailed information on mechanisms proposed in our initial programme theory. Studies with high relevance were primarily used to test, substantiate and refine the mechanisms of interest. Studies with low relevance, i.e. with sparse evidence about mechanisms of interest, were only used to provide supporting evidence. No studies were excluded based on relevance. See Supplementary File for relevant characteristics of studies.

2.5. Extracting, analysing, and synthesizing relevant data

The following information was extracted per study: title, author, year, setting, study design, aim, participants, legal purchasing age,

Table 1
Initial programme theory illustrating the relationship between a ban on sales to minors and smoking behaviour, among adolescents.

Contextual factors	Mechanisms	Outcome
Level of enforcement	M1: The ban may lead to a reduction in perceived access to commercial cigarettes	Non-smoking minors are prevented from smoking
Gender		Smoking minors reduce their consumption of cigarettes
Age	M2: The ban may create an anti-smoking norm (social and individual)	Smoking minors quit smoking
Smoking experience		
Social network		

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