Short Report

The effectiveness of ID readers and remote age verification in enhancing compliance with the legal age limit for alcohol

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Currently, two different age verification systems (AVS) are implemented to enhance compliance with legal age limits for the sale of alcohol in the Netherlands. In this study, we tested the operational procedures and effectiveness of ID readers and remote age verification technology in supermarkets during the sale of alcohol. Following a trained alcohol purchase protocol, eight mystery shoppers (both underage and in the branch's reference age) conducted 132 alcohol purchase attempts in stores that were equipped with ID readers or remote age verification or were part of a control group. In stores equipped with an ID reader, 34% of the purchases were conducted without any mistakes (full compliance). In stores with remote age verification, full compliance was achieved in 87% of the cases. The control group reached 57% compliance, which is in line with the national average. Stores with ID readers perform worse than stores with remote age verification, and also worse than stores without any AVS. For both systems, in addition to effectiveness, public support and user friendliness need to be investigated. This study shows that remote age verification technology is a promising intervention that increases vendor compliance during the sales of age restricted products.

Introduction

Age limits for the sale of alcohol should restrict the retail availability of these harmful products for minors and enhance public health. Alcohol use among adolescents is harmful and may cause direct negative consequences (such as accidents), and long-term drawbacks (such as lower performance in school).[1] In the Netherlands, the age limit for the sale of alcohol is 18 years, and alcohol can only be sold if the age of the customer has been verified. The law also conveys that age verification is not allowed if someone is unmistakably old enough;[2] therefore, retailers use a 'reference age' of 25 years.[3]

Two support systems are currently penetrating the market, ID readers and remote age verification technology.

ID readers

In stores equipped with ID readers, when alcohol (or another age restricted product) is scanned, the vendor has to determine if the purchaser is unmistakably old enough (so, above the reference age of 25 years of age). If yes, the purchase continues without asking for and reading of the ID. If the purchaser is not clearly 25 years of age or older, the vendor should ask for an ID, scan the ID, interpret the result (approve or decline) from the ID reader, and act accordingly. The ID reader is an independent system, not integrated with the cash register. The final responsibility for the sales rests with the vendor.

Remote age verification

In stores equipped with remote age verification, the technology is integrated with the cash register. When alcohol is scanned, the purchase can continue only after approval. The customer stands in front of a live video connection, and a remote agent validates if someone is older than the reference age (25 y/o). If not, an ID is requested (which has to be placed on a glass window-pane above a second camera), and the remote agent approves or declines the purchase.[4,5] Integrated with vending machines, remote age verification has demonstrated a compliance level of 96%.[4]

Methods

In the current study, we investigated the effectiveness of ID readers and remote age verification embedded in stores selling alcohol. Four 17-year-old and four 18- to 20-year-old, trained mystery shoppers (average looks, 50% male in both groups) visited 132 supermarkets in a span of four weeks. The outlets were equipped with ID reader technology ($n = 71$), remote age verification ($n = 31$), or were part of a control group with no support systems ($n = 30$). The underage shoppers conducted 62 purchase attempts, the mystery shoppers in the 'reference age' category conducted 70.

The script consisted of the purchase of a six pack of beer containing 5% alcohol. If an ID was requested (either by the vendor or by a remote agent), the mystery shopper would show their genuine ID (indicating an underage and illegal attempt or proving an adult and legal attempt). The Ethics Committee of the Faculty of Behavioral, Management and Social Sciences of the University of Twente approved the research protocol.

Results

For the ID reader age verification, in 72% of the purchase attempts an ID was requested by the vendor. When presented, the ID was scanned in 38% of all attempts, and two times the scanner gave a wrong result (35% of the initial purchases correct). Once, the vendor overruled the correct ID reader result (selling alcohol to an underage customer). Altogether, in 34% of all purchase attempts, the ID reader check-out procedure was entirely correct (full compliance).

Table 1 Operation procedures and compliance for ID readers and remote age verification

Age verification steps	1: System used	2: ID asked	3: System used	4: Correct result*	5: Full compliance
All					
ID reader AV (n = 71)		72%	38%	35%	34%
Remote AV (n = 31)	100%	90%		94%	87%
Control (n = 30)		67%			57%
Chi-square		P = 0.07		P = 0 .000	P = 0 .000
Underage mystery shoppers (17 y/o)					
ID reader AV (n = 31)		77%	39%	39%	36%
Remote AV (n = 16)	100%	88%		88%	81%
Control (n = 15)		67%			47%
Chi-square		P = 0 .38		P = 0 .001	P = 0 .012
Reference age mystery shoppers					
ID reader AV (n = 40)		68%	38%	33%	33%
Remote AV (n = 15)	100%	93%		100%	93%
Control (n = 15)		67%			67%
Chi-square		P = 0.13		P = 0 .009	P = 0 .000

*Correct results AV technology = refusal underage mystery shoppers and approval reference age mystery shoppers.

For the stores with a remote age verification system, in all purchase attempts (100%) the system was used. In 90% of the cases an ID was requested, and the remote age verification employee correctly judged 94% of all attempts (once without seeing an ID). In the end, one underage purchase was overruled by the vendor, who sold the alcohol despite the remote decline. Overall, 87% of all attempts reached full compliance.

In the control group (stores without any AV), IDs were requested in 67% of the attempts, and (full) compliance was reached in 57% of the attempts, which is in line with the national data (2013: 54% ID request and 47% compliance).[6] The ID request by remote agents is (marginally) significantly better than the ID request by vendors in regular shops and shops with ID readers; $\chi^2(1, N = 132) = 5.37$, $P = .07$.

As has also been indicated in Table 1, the differences in full compliance for all attempts differ significantly; $\chi^2(1, N = 102) = 29.48$, $P = .000$. Focusing on the underage attempts, the results are significantly different, with 36% for ID readers, 81% for remote age verification and 47% for the control group; $\chi^2(1, N = 47) = 10.16$, $P = .012$. When focusing on the purchase attempts with mystery shoppers in the reference age group, significant results are also found, with 33% full compliance for ID readers, 93% compliance for remote age verification and 67% compliance for the control group; $\chi^2(1, N = 55) = 19.89$, $P = .000$.

Discussion

Stores equipped with ID readers have lower compliance than stores without any form of support for age verification. Stores equipped with remote age verification technology have higher compliance than stores with ID readers and higher compliance than stores with no AV technology.

Only 34% of the sales in stores with ID readers reached full compliance. All other attempts included the following mistakes, which are mainly to be attributed to the vendor: (1) an ID was not requested, (2) the ID reader was not used, (3) the ID reader gave an incorrect result, and (4) vendors ignored and overruled the ID reader results.

For the remote age verification technology, the system is integrated with the cash register and, therefore, is always used. The remote agents are far better at asking for IDs (90% versus 67% and 72%), and the system was correct in 94% of the cases. In comparison, a previous study (of vending machines) resulted in 96% compliance.[5] In the current study, 87% of all purchases were executed in full compliance. One time, the vendor did sell alcohol, despite the cash register being locked after rejection by the remote agent. An important benefit for the remote system is that non-compliance is randomly spread, and underage buyers cannot know

where non-compliance occurs, as knowledge of compliance is a relevant factor for alcohol availability.[7]

In conclusion, ID readers are ineffective because various steps in the age verification process are still a responsibility of the vendor. Conscious (e.g., overrule the ID reader result) and subconscious (e.g., forget to ask for an ID) human behaviours make this system ineffective in preventing underage alcohol sales. Remote age verification technology is very promising for two reasons: (1) the system is integrated with the cash register and vendors are not able to circumvent the results from the system, and (2) remote operators perform better than in-store vendors. Two possible explanations are that remote operators perform only that one task, and that remote agents are not confronted with customers face to face.

For AVSs, in addition to effectiveness, public support and user friendliness need to be investigated. This study shows that remote age verification technology is a promising intervention that increases vendor compliance during the sales of age restricted products.

Funding

Key points

- Studies evaluating the effectiveness of support systems for the sale of risky products (such as alcohol and tobacco) are very rare.
- ID readers, in its current design, turn out to be ineffective, and remote age verification shows high compliance.
- The main reason for non-compliance with legal age limit legislation is due to vendor behaviour.
- If governments and/or retailers truly wish to comply with legal age limits, ineffective systems should be banned, and only effective systems should be used.

References

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Anxious and depressive symptoms in the French Asbestos-Related Diseases Cohort: risk factors and self-perception of risk

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Background: Asbestos is known to be an independent risk factor for lung and pleural cancers. However, to date, little attention has been paid to the psychological effects of asbestos exposure among exposed subjects. The objectives of this study were to estimate the prevalence of anxious and depressive symptoms among >2000 French participants of the Asbestos-Related Diseases Cohort (ARDCO), 6 years after their inclusion, to identify the risk factors associated with those anxious and depressive symptoms and to evaluate the impact of the asbestos-risk perception. **Methods:** The ARDCO was constituted in four regions of France between October 2003 and December 2005, by including former asbestos workers. Between 2011 and 2012, participants of the ARDCO program were invited to undergo another chest CT scan 6 years after the previous scan. Participants were asked to complete questionnaires including asbestos exposure assessment, Hospital Anxiety and Depression Scale (HADS), asbestos-risk perception and self-perception of asbestos-related diseases. **Results:** Among the 2225 participants, 2210 fully completed questionnaires were collected and analyzed. The prevalence of symptoms of probable anxiety and probable depression was 19.7% and 9.9%, respectively. The risk of anxious and depressive symptoms was independently associated with self-perception of the intensity of asbestos exposure, asbestos-risk perception and self-perception of asbestos-related diseases. **Conclusion:** The results obtained in this large study confirm that previously asbestos-exposed subjects are likely to develop anxious and depressive symptoms. Finally, implications related to the prevention of anxiety and depression among asbestos-exposed workers is discussed.

Introduction

Asbestos exposure can be responsible for non-malignant diseases such as pleural plaques and asbestosis as well as malignant diseases, mainly mesothelioma and lung cancer.[1–4] The incidence of these diseases is clearly related to the intensity of asbestos exposure and the time since onset of exposure.[5–7] Asbestosis is well known to be an independent risk factor for lung cancer.[8] Smokers with rapid progression of asbestosis are at higher risk of developing lung cancer.[9] It has also recently been suggested that pleural plaques are independent risk factors for lung and pleural cancers.[10,11] Finally, it has been proposed that time and dose parameters should be included in the definition of the high-risk population requiring asbestos-related disease screening.[7] Moreover, if the impact of real risk as the likelihood that an individual can experience the effect of danger is very important on health,[12,13] risk

perception is also crucial to explain attitudes and behaviours.[14–16] Risk perception is the subjective assessment of the probability of a specified type of accident happening and how concerned we are with the consequences. To perceive risk includes evaluations of the probability as well as the consequences of a negative outcome. It may also be argued that an effect related to the activity is an element of risk perception. Perception of risk goes beyond the individual, and it is a social and cultural construct reflecting values, symbols, history and ideology.[16–19] In this case, uncertainty is closely related to risk perception[20,21] and psychological uncertainty is assumed to be an important mediator of human responses in situations with unknown outcomes.[22–24] Uncertainty is a psychological construct. It 'exists only in the mind; if a person's knowledge was complete, that person would have no uncertainty'.[21] Risk appears to mean different things to different people and actions and understandings