BMJ Open

Intended changes in smoking behaviour of Dutch young adults after an increase in excise tax: a cross-sectional survey

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To cite: Visscher K, Everaars B, Suijkerbuijk AWM, *et al*. Intended changes in smoking behaviour of Dutch young adults after an increase in excise tax: a cross-sectional survey. *BMJ Open* 2023;**13**:e065535. doi:10.1136/bmjopen-2022-065535

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2022-065535).

Received 30 June 2022
Accepted 17 November 2023

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ABSTRACT

Objectives Increasing the price of tobacco is one of the most effective measures to reduce the prevalence of smoking. In the Netherlands, the excise tax on tobacco increased by €1.14 in 2020, raising the price of a standard package of cigarettes to €8.00. This study investigates how young adults intend to change their smoking behaviour in the case of hypothetical price increases of a pack of cigarettes, and which background characteristics are associated with intended behaviour change.

Design A cross-sectional online survey was carried out between September and November 2020. Smokers indicated how they would react to several hypothetical increases in price. Four behavioural options were investigated: smoking less, quitting smoking, switching to another/cheaper product and buying cheaper cigarettes cross-border.

Participants Data were obtained from 776 Dutch smokers between 15 and 25 years.

Results At a hypothetical price of €10 per package, most respondents reported an intention to smoke less (67%), followed by switching to another/cheaper product (61%), quitting smoking (49%) and shopping for cigarettes cross-border (47%). Prior quit attempts, agreeing with the increase in excise tax and the intention to quit smoking in the future increased the odds of changing behaviour. Higher self-efficacy decreased the odds of behavioural change.

Conclusion Many young adults intend to change their smoking behaviour in the event of increased prices. Although intended behaviour can deviate significantly from actual behaviour, an increase in excise tax may result in a significant amount of quit attempts and reduced smoking among young adults.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study was carried out on a national sample of young adult smokers in the Netherlands.
⇒ Smokers reported how they would change their smoking behaviour in the event of several hypothetical prices of tobacco.
⇒ Intended behavioural changes might be biased by socially accepted or desired behaviours.
⇒ Cross-border effects of price increases might be underestimated due to the COVID-19 pandemic.

INTRODUCTION

The majority of adult smokers start to use tobacco products during their high school period.[1] Often, they perpetuate smoking and become addicted.[1 2] For instance, US figures show that nearly all (99%) adult daily smokers smoked their first cigarette before the age of 26, with the majority (88%) smoking their first cigarette by 18 years of age.[3] The most recent report of the Health Behaviour in School-aged Children study reported a prevalence of smoking among 15 years of 15% in Europe and Canada.[4] Smoking prevalence (daily and occasional smokers combined) among young Dutch adults in 2022 was 23.4% among 18–19 years, 27.2% among 20–24 years and 28.4% among 25–29 yeas.[5] Detailed figures of smoking prevalence among 15–25 years are not available. The decline in the percentage of schoolchildren (aged 12–16 years) who have ever smoked has stagnated and was around 17% between 2017 and 2019.[6] Every week hundreds of young people start smoking, which results over time in a high burden of disease, mortality and considerable healthcare expenditures.[7] Several factors are known as predictors of tobacco use such as costs, parental smoking, peer influences and attitudes of the environment towards smoking.[2 8–10]

In recent years, the Dutch government introduced several measures to decrease the prevalence of smoking: in 2020, cigarette packs became plain (all packages look identical), cigarettes in supermarkets are not visible to the consumer anymore and several public locations such as schools and sports clubs have become smoke-free areas. Moreover, campaigns were organised to help people quit smoking, and health insurance companies started to reimburse cessation support.[7] In addition to these measures, the excise tax has been increased twice in 2020. In January 2020, the excise taxes on a standard

pack of 20 cigarettes increased by €0.14, and in April, the excise taxes increased again by €1.00.[7] As a result, a standard pack of 20 cigarettes cost approximately €8.00 in the period between April 2020 and January 2021. According to the WHO, an increase in taxes is the most effective and cost-effective measure to reduce tobacco consumption.[11] Price increases stimulate cessation and decrease consumption among current smokers, and may prevent young adults from starting smoking.[4 12] Several studies suggest that young people are more sensitive to price increases compared with adults,[13–15] that is, the price elasticity of demand is greater. Price elasticity is a way to measure the relative change in tobacco consumption in relation to an increase in price. The price elasticity of smokers in general has been estimated to be around −0.4. In comparison, the elasticity of adolescent and young adult smokers has been estimated to be between −0.5 and −0.9.[13 14 16] This indicates that when the price of tobacco increases by 10%, consumption among youth decreases by 5%–9% on average, compared with 4% among all smokers.

The majority of studies on behavioural change following a price increase have investigated the effects of price increases on smoking cessation, reducing tobacco consumption or switching to alternative products.[13–15] Two studies from China and the USA collected behavioural responses to different levels of hypothetical price increases. These studies showed that 25%–75% of current smokers intended to smoke less and 10%–60% intended to quit if prices increased, depending on the level of the price increase.[17 18] In the Netherlands, buying tobacco in neighbouring countries where tobacco is cheaper, might be an additional behavioural option because of the short geographical distances. This study aimed to explore behavioural changes due to different hypothetical price increases among young Dutch adults. This study will investigate four behavioural options as a reaction to price increases: smoking cessation, smoking less, switching to other/cheaper tobacco products, and buying cigarettes across the border. In addition, associations between background characteristics of the sample and intended behavioural changes were assessed. Specific attention was paid to the hypothetical price of €10 per standard package, since the Dutch government intends to further increase the price of a standard package of cigarettes to €10 by 2024, which would represent approximately a 25% price increase compared with the current price of approximately €8 per standard package.

METHODS

Design

A cross-sectional study was conducted among Dutch tobacco-smoking young adults aged 15–24 years, using an online questionnaire.

Sample

Market agency 'Qrius' recruited 800 young adult smokers aged 15–25 years. Qrius is specialised in research among young people and has a large panel of young respondents. Since the research agency did not have prior information about whether their panel members smoked or not, it was not possible to directly invite only smokers. It was also known that higher educated young people were over-represented in the panel. Since we wanted to have a representative sample of smokers, and because precise information about the relation between smoking and educational level in this age group was lacking, Qrius first sent out a short questionnaire among 300 random respondents between 15 and 25 years, with no other aim than to retrieve the educational level of smokers in their panel. The results from this short questionnaire indicated that approximately 50% of those who reported to smoke, finished or attended higher education and 50% finished or attended lower education (in the Dutch school system, children from about 12 years are divided into different school levels: vmbo/mbo (classified as low), havo/hbo (classified as high) or vwo/wo (classified as high). For more information about the Dutch school system: https://www.thelifenet.eu/living/educational-system/). Therefore, we aimed for 50% higher educated smokers, and 50% of lower educated smokers in our final sample. The educational level is assigned both to those who have completed education and those who are still attending school at the respective levels. We intended to include 800 smokers between 15 and 25 years, with an equal distribution of 80 participants from 10 age cohorts. Members of the panel of the research agency were invited via email and received a link to the survey. To determine smoking status, the participants were asked: 'do you (occasionally) smoke?'. If the answer was yes, the remaining questions of the survey were presented. If the answer was no, the participant was not included in the study. To fill the strata both for age and educational level, the research agency used the method of purposive sampling.

Measures

We based our questionnaire on a previous study among adult smokers.[19] The questionnaire included items on sociodemographics, including place of living, questions about smoking history and current smoking behaviour, such as smoking behaviour during the COVID-19 pandemic, being a daily or an occasional smoker and the number of cigarettes smoked per day. The questionnaire also included additional questions about disposable income, social environment, attitude of social environment towards smoking cessation, the degree to which it is accepted to smoke in certain situations and self-efficacy. Self-efficacy was measured by the General Self-Efficacy Scale (GSES), a 10-item psychometric scale designed to measure a person's belief in their ability to succeed in particular demanding situations.[20] A higher score implies a higher degree of self-efficacy. GSES was included in the survey as previous research showed that self-efficacy is an important aspect of behavioural change among people who smoke.[21] Furthermore, participants were asked whether their parents knew about their smoking

behaviour, if they had intentions to quit smoking in the future (in 1 month, 6 months, ever, do not know or no intentions to quit), whether they agreed with an increase in excise tax on tobacco in general, and if they would agree with an increase in excise tax if this money would be used for smoking cessation programmes. The latter two questions used a five-point Likert scale ranging from completely agree to completely disagree. Social smoking environment was measured by taking an average score of the share of friends, family, colleagues and classmates that smoke. This average score ranged between 0 (indicating that the respondent was a sole smoker in his or her environment) and 4 (indicating all people smoked in his or her environment). The degree to which smokers think it is acceptable to smoke in certain situations was measured by taking an average score of the answers to six different statements regarding smoking in certain situations. The scores per statement ranged from 0 (very unacceptable) to 4 (very acceptable).

The next part of the questionnaire included a series of trade-off questions, in which participants were asked to anticipate their smoking behaviour at a range of hypothetical prices. These series of trade-off questions were repeated for the four different behavioural changes under study: (1) smoking less, (2) quitting smoking, (3) switching to another/cheaper tobacco product and (4) buying tobacco across the border. For each of these behavioural changes, the respondents were asked whether they would or would not change their behaviour. For example, for the option of smoking less, the answer options were 'I will smoke less' and 'I will not smoke less'. Online supplemental appendix 1 shows the complete questionnaire including the prices used in the trade-off questions. The trade-off questions included hypothetical prices for a standard package of cigarettes (20 pieces, €8.00 on average at the time of interview) which ranged from €8.50 (representing a 6.2% price increase) to €16.00 (representing a 100% price increase). For all four behaviour changes, respondents were asked whether they would change their behaviour or not, at the hypothetical prices displayed. When respondents indicated to change their behaviour, a lower hypothetical price was displayed, and the question was asked again. In case the respondent indicated not to change their behaviour at a certain price, the next price displayed was a higher price, followed by the same question. Participants were also able to indicate no behavioural change 'ever' at any of the displayed prices. The data were collected between the end of September and mid-November 2020.

Analyses

The following variables were dichotomised for analytical purposes: monthly disposable income (0: less than €150, 1: €150 or more), living close to the border (0: 75% of sample living furthest away from the border (between a mean distance of 33.9 km and 96.7 km from the border), 1: 25% living nearest to the border (a mean distance of 8.6 km from the border)), agreeing with excise tax (0: totally disagree, disagree and do not know, 1: totally agree and agree), intentions to quit smoking in the future (0: no intentions, 1: intentions to quit within 1 or 6 months, or ever), attitude of social environment towards smoking cessation (0: significant others would not be happy or would not care, 1: significant others would be (very) happy), paying for tobacco oneself (0: rarely, never, 1: sometimes, usually, always), changes in smoking behaviour due to the COVID-19 pandemic (0: less smoking or no change, 1: more smoking).

For every hypothetical price presented, the percentage of respondents who intended to change their behaviour was calculated. An indifference point was calculated for each behavioural option for each participant, by averaging the price at which the participant intended to change their behaviour, and the nearest price at which the participant intended not to.

Four multivariable logistic regression analyses were performed to investigate which variables were associated with the intention to change behaviour, for each of the four behaviours at a price of €10 per package. To determine which variables to include, univariate logistic regression analyses were performed to assess associations between participants' characteristics (age, gender, educational level, number of cessation attempts, the number of cigarettes smoked per day, years of smoking, the degree to which smokers think it is acceptable to smoke in certain situations, self-efficacy) and the intention to change behaviour at €10 per package. Variables were included in the multivariable regression model if the p value of the univariate analyses was below 0.20. Analyses were performed in StataSE V.16.

Patient and public involvement

None.

RESULTS

The survey was completed by 776 smokers. All age cohorts were filled as intended (minimum of 80 observations), except for the youngest cohorts of 15 (n=51), 16 (n=69) and 17 years old (n=67). The other age groups all included 84 participants. Table 1 presents the characteristics of the full sample, and for daily smokers and occasional smokers separately. Almost half of the participants (47%) indicated that they smoked occasionally. Occasional smokers were more often higher educated, whereas daily smokers were more often lower educated. Occasional smokers smoked for a shorter period of time and smoked fewer cigarettes per day compared with daily smokers. A smaller percentage of occasional smokers reported that their parents were aware of their smoking, compared with daily smokers. Both daily (73%) and occasional smokers (79%) showed a high percentage of future quit intentions. Among the full sample, approximately half of the participants had previously attempted to quit smoking.

Table 1 Demographic and smoking characteristics of full sample and for daily smokers versus occasional smokers separately

Variable	Full sample (n=776)	Daily smokers (n=411)	Occasional smokers (n=365)
Age (mean (SD))	19.81 (2.76)	19.88 (2.73)	19.73 (2.8)
Gender (%)			
Female	60.57	58.64	62.74
Male	38.92	40.88	36.81
Other	0.52	0.49	0.55
Educational level (%)			
Low	56.57	69.34	42.19*
High	43.43	30.66	57.81
No of cigarettes per day (mean (SD))	5.58 (6.20)	9.32 (6.22)	1.36 (2.13)*
Years of smoking (mean (SD))	3.15 (2.59)	3.78 (2.77)	2.44 (2.17)*
Parents do not know about smoking (%)	21.13	10.46	33.15*
Intends to quit smoking in the future† (%)	75.52	72.51	78.9*
Smokes more since COVID-19 pandemic (%)	31.57	39.66	22.47*
Self-efficacy score (mean (SD))‡	2.90 (0.47)	2.93 (0.48)	2.86 (0.47)
Ever made a quit attempt (%)	51.55	56.93	45.48

*p<0.05 t-test comparison between daily and occasional smokers.
†Participants who do not know if they ever want to quit smoking in the future were classified as not having plans to quit smoking.
‡Cronbach's alpha reliability for the self-efficacy scale was 0.83.

The percentage of respondents who intended to change their behaviour at the different hypothetical prices is presented in figure 1. For every hypothetical price, smoking less was the behavioural change most often intended. At the lowest price increase of €0.50—resulting in a price of €8.50 for a standard package of cigarettes—46% of the respondents indicated that they would lower their tobacco consumption. At this price, 34% of the respondents intended to switch to another/cheaper tobacco product, 31% intended to shop cigarettes cross-border and 24% intended to quit smoking. At a price of €9.50 or higher, smoking cessation was intended by a higher share compared with shopping cross-border. Overall, cross-border travel to buy cheaper cigarettes appeared to be the least attractive behavioural change.

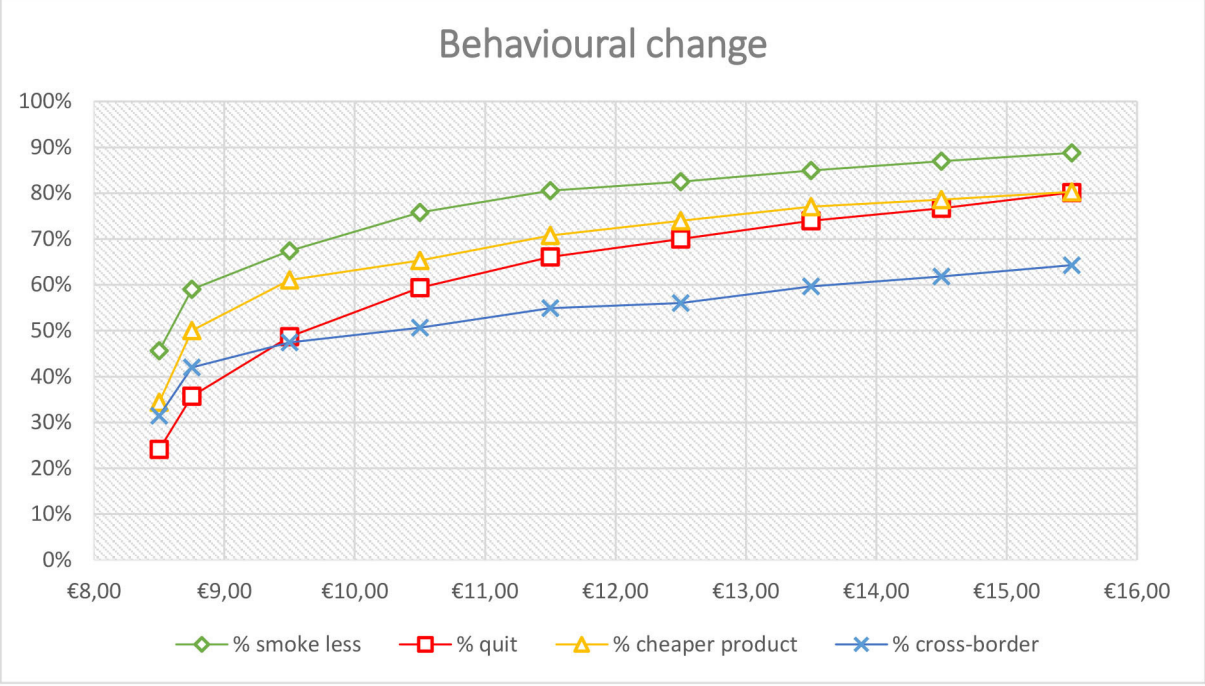

Figure 1 Cumulative percentage of intended behavioural change at various hypothetical prices.

Table 2 Logistic regression results for behavioural changes (dependent variables) at a hypothetical price of €10 per package

	Smoke less at €10 aOR (95% CI)	Quit smoking at €10 aOR (95% CI)	Switch to another/ cheaper product at €10 aOR (95% CI)	Buy across the border €10 aOR (95% CI)
Age	1.06 (0.98 to 1.15)	1.09* (1.01 to 1.18)	1.04 (0.97 to 1.12)	1.03 (0.96 to 1.11)
Gender	0.88 (0.62 to 1.25)	0.85 (0.60 to 1.19)	0.98 (0.72 to 1.34)	0.80 (0.58 to 1.09)
High level of education	1.33 (0.91 to 1.95)	0.76 (0.53 to 1.09)	1.29 (0.92 to 1.81)	1.02 (0.73 to 1.42)
Monthly disposable income ≥€150	0.61* (0.42 to 0.89)	0.72 (0.50 to 1.04)	0.88 (0.63 to 1.24)	0.79 (0.56 to 1.11)
Living close to the border	1.24 (0.84 to 1.85)	1.02 (0.70 to 1.49)	0.91 (0.64 to 0.29)	1.61** (1.14 to 2.27)
Years of smoking	0.97 (0.88 to 1.06)	0.98 (0.90 to 1.07)	0.90* (0.83 to 0.98)	0.98 (0.91 to 1.06)
No of cigarettes per day	0.94*** (0.91 to 0.97)	0.94** (0.91 to 0.98)	1.01 (0.98 to 1.03)	1.01 (0.98 to 1.04)
Ever made a quit attempt	1.57* (1.09 to 2.27)	1.15 (0.81 to 1.64)	1.47* (1.06 to 2.03)	1.48* (1.07 to 2.03)
Plans to quit smoking in the (near) future	1.54*** (1.30 to 1.82)	1.89*** (1.59 to 2.25)	1.09 (0.94 to 1.27)	1.20* (1.04 to 1.39)
Smokes more since COVID-19 pandemic	0.78* (0.61 to 0.98)	0.67*** (0.54 to 0.84)	0.98 (0.80 to 1.21)	1.04 (0.85 to 1.28)
Smokers in social environment	1.26 (0.99 to 1.59)	0.87 (0.70 to 1.09)	1.27* (1.03 to 1.57)	1.40** (1.13 to 1.72)
Significant others would be happy with cessation	1.92** (1.33 to 2.78)	1.28 (0.89 to 1.84)	1.34 (0.96 to 1.87)	0.86 (0.62 to 1.20)
Level of acceptance of smoking in social situations	0.76 (0.57 to 1.01)	0.82 (0.63 to 1.07)	0.92 (0.72 to 1.18)	1.17 (0.92 to 1.50)
Agrees with excise tax increase	1.58* (1.06 to 2.36)	1.45* (1.00 to 2.09)	1.08 (0.77 to 1.53)	1.36 (0.96 to 1.91)
Agrees with excise tax increase if additional revenues are used in smoking cessation programmes	1.03 (0.71 to 1.48)	1.09 (0.77 to 0.55)	1.02 (0.74 to 1.42)	0.79 (0.58 to 1.10)
Self-efficacy score	0.66* (0.46 to 0.96)	0.66 (0.46 to 0.94)	0.54*** (0.38 to 0.75)	0.71 (0.52 to 0.99)

*p<0.05, **p<0.01, ***p<0.001.

As shown in figure 1 relative to the initial price of €8, there was a sharp increase in the intention to change behaviour at the lowest price increase (€8.50). After this first price increase presented, the percentage of respondents who reported intent to change their behaviour gradually declined as the price increased, for all four behaviours. Smoking less was the behavioural change that the respondents intended most often, followed by buying cheaper products and quitting. Furthermore, the figure shows that buying tobacco cross-border was less sensitive to price increases compared with the other behavioural options. A significant part of the responders did not report intentions to change behaviours, even at the highest prices presented. This shows that some smokers are insensitive to price increases.

Table 2 shows the associations (as adjusted ORs) between background factors and the four possible behavioural changes in the event the price of a standard package of cigarettes would increase to €10. This price was chosen because the Dutch government plans to increase the price for a pack of cigarettes to €10 as of April 2024. For every behavioural option, different characteristics showed to have an association with the intended behaviour. No single background characteristic was associated with all four behavioural changes. Age was only significantly associated with quitting smoking, and respondents with a higher age reported stronger intent to stop smoking more often at a price of €10. Respondents with a disposable monthly income equal to or higher than €150 were less likely to report an intention to decrease their tobacco consumption compared with the share of the sample that has a lower disposable income. Disposable income was not associated with other behavioural options. Smoking more cigarettes per day was associated with lower intentions to quit smoking or smoke less at a price of €10 per package. Intentions to quit smoking and smoke less increased as smokers agreed more with an increase in excise taxes. Having previously tried to quit smoking increased the chances of changing behaviour at increasing prices, except for quitting. Being surrounded by more smokers in one's environment, and living close to the border increased the intentions to buy cigarettes across the border.

DISCUSSION

This study aimed to estimate intended changes in smoking behaviour of Dutch young adult smokers in

the event of hypothetical future price increases of cigarettes. Smoking less was found to be the most common behavioural change, followed by switching to another/cheaper product, cessation of smoking and shopping for cigarettes cross-border.

Smokers with a higher cigarette consumption reported less often intentions to quit smoking or smoke less at a price of €10 per package. This suggests that smokers who smoke less are more inclined to change behaviour at increasing prices. One explanation may be that these smokers are not yet, or less addicted and do not consider smoking to be worth the higher prices. Smokers who smoke more cigarettes per day might think that they are not able to stop smoking since they are more addicted due to more exposure to nicotine and may have failed quitting multiple times already.[22 23]

Reported intentions to quit smoking and smoke less increased as smokers agreed more strongly with an increase in excise taxes. We found that if smokers have intentions to quit smoking in the future, or if they have attempted to quit before, they intend to change their behaviour at lower price increases. This is in line with previous research that reports that cessation attempts in the past are positively correlated with intentions to quit in the future.[24–26] Being surrounded by more smokers in one's social environment increased the intentions to buy cigarettes across the border. This could be explained by the idea that buying across the border may be more worthwhile if the efforts could be shared with others. Self-efficacy was shown to be negatively correlated with the intentions of quitting smoking and switching to another/cheaper product. That is to say, those who are convinced of their ability to influence events that affect their lives will less likely change their behaviour at increasing prices. They might feel more confident in their ability to change their behaviour if smoking becomes less attractive to them. Previous research about self-efficacy and smoking behaviour showed that people with higher self-efficacy have higher chances to successfully quit smoking (or to not start smoking at all),[21 27–29] but it may also hinder smoking cessation[30] Future research could examine further the relationship between self-efficacy and intentions to change smoking behaviour at higher prices.

Previous studies that focused on behavioural change in the event of increasing tobacco prices have used slightly different designs. Therefore, our results are not directly comparable. Nevertheless our findings are partly in line with prior literature. Some studies find that reducing the number of cigarettes smoked is the behavioural change made most often at hypothetical price increases, whereas other studies find other behavioural options, such as trying to stop smoking, to be more prevalent.[17 18 31] Additionally, smoking prevalence and/or smoking culture may be different in other countries, making it difficult to directly compare studies.

This study investigated intended behaviour change given hypothetical increasing prices. A limitation of this method, as with all surveys, is that people may be inclined to give socially acceptable answers. Moreover, intended behaviour can significantly deviate from actual behaviour.[19] Therefore, the respondents' indicated behaviour cannot be interpreted as a precise measure of observed behaviour in the event prices should increase to a specific level. However, the relative attractiveness of the four behavioural options can stimulate and give input for debate about tobacco policy. One policy implication related to our finding that many smokers intend to buy cross-border after price increases is that it is important to align tobacco excise taxes (and tobacco price levels in general) with neighbouring countries.

One major limitation to our study is that it was performed during the COVID-19 pandemic, which may have had serious impact on smoking behaviour, both positively (with more attention for lifestyle as a risk factor for COVID-19) and negatively (following from stress and mental problems induced by COVID-19 and the measures to mitigate the pandemic[32]). Travelling abroad was discouraged during the pandemic, which might have led to an underestimation of the willingness to buy cheaper cigarettes cross-border. In our sample, about 30% indicated smoking more since the onset of the pandemic. Three recent studies among Dutch smokers reported that some smokers smoked less due to COVID-19 and some smoked more. Overall, smoking seems to have increased.[32–34] A study among adults from England reported that 12% of the quit attempts were triggered by COVID-19.[35] Dutch adult smokers report similar percentages: 13% of smokers who recently quit reported that COVID-19 was one of the main reasons to quit smoking.[19] These exceptional circumstances should be taken into account when interpreting the findings of this study.

Another limitation of this study was the slight underrepresentation of younger smokers. Smokers in the age of 15–17 appeared difficult to reach, this could be due to the fact that only few young people of this age smoke, but also to the fact that parents had to give their consent for participation in our study for 15 years. We used current and past school level as a proxy for educational level of survey participants. However, because there are no recent national data on school levels among Dutch smoking youth, we cannot guarantee full representativeness of our study sample.

Literature suggests that many occasional smokers do not identify themselves as smoker.[36 37] As identification as a smoker was one of the criteria for participation in the study, this might have influenced the representativeness of the sample.

A high proportion of young adult smokers indicated that they would change their behaviour at increasing prices. We know from earlier price increases that the effects are smaller than the results of this study report. This is likely a consequence of the difference between intended and actual behaviour. Our finding that the majority of smokers intended to change their behaviour at a price of €10 per package should be relevant to policymakers. Tobacco control policies should not only focus

on motivating people to change their behaviour, but also on helping smokers to align their intended and actual behaviour. Investigating how to do this is an issue for future research.

CONCLUSION

This study showed that if the price of tobacco increases, a significant proportion of young smokers will consider changing their smoking behaviour. If the price of a package of cigarettes were to increase to €10 per pack, as planned by the Dutch government, the majority of Dutch young adult smokers intend to change their smoking behaviour. But even at smaller price increases, a considerable number of respondents indicated to consider changing their smoking behaviour. Most reported that they will do so by smoking less. Having intentions to quit, having attempted to quit and agreeing with stop smoking policies overall increases the intentions to change smoking behaviour. Buying tobacco cross-border is intended more often when the respondents' social environment includes more smokers and when the distance to the border is smaller. If these statements are realised, increasing prices will likely result in a significant reduction in tobacco consumption among current smokers. Smaller West-European countries such as the Netherlands should aim to align tobacco pricing policies with neighbouring countries, as single-country price increases may be less effective when a large part of the population lives within travel distance of neighbouring countries.

Acknowledgements We thank Marieke Hiemstra and Corentine Fargeix for reviewing earlier versions of this paper.

Contributors KV and GAdW were involved in planning of the study. KV, BE, AWMS and ML conducted the research. KV and BE analysed the data and wrote the first draft of the manuscript. All authors provided revisions on the manuscript. All authors read and approved the submitted manuscript. GAdW is responsible for the overall content as guarantor

Funding This study was funded by an unrestricted grant from Gezondheidsfondsen voor Rookvrij to the National Institute of Public Health and the Environment. Gezondheidsfondsen voor Rookvrij is an initiative of the Dutch Heart Foundation, the Dutch Lung Fund and KWF Cancer Foundation.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval The Center for Clinical Expertise of the National Institute for Public Health and the Environment stated that the research proposal does not fulfill the conditions as stated in the law for medical research involving human subjects. Therefore, it was exempted from a full approval by a medical ethics research committee. To participate, an informed consent had to be signed, and participants under the age of 16 required parental consent.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party and are not publicly available. The data underlying this article were provided by Qrius under licence. Data will be shared on request to the corresponding author with permission of Qrius.

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