# Predicting the intention to either quit smoking or quit the currently used contraceptive method in women who combine smoking with ethinylestradiol-containing contraceptives.


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## Abstract

***Objective***

Combining smoking with contraceptive methods containing ethinylestradiol increases the risk at several health issues, such as thrombosis, cardiovascular diseases and pulmonary embolism. It is therefore important that women are informed about this risk and are encouraged to either quit with smoking or their contraceptive method. To determine whether to stimulate women to quit smoking or quit their contraceptive method, this research is designed to find out which determinants can predict the intention to quit smoking or the currently used contraceptive method in women who smoke and use contraceptives containing ethinylestradiol.

***Study design and setting***

A questionnaire was sent out to all women in the age category 25-60 from the general practice Huisartsen Oude Turfmarkt in Amsterdam, the Netherlands. 68 Women were included in the final research sample because they combined smoking with contraceptives containing ethinylestradiol. The questionnaire was based on the four determinants from the Protection Motivation Theory; perceived severity, perceived vulnerability, perceived response efficacy and perceived self-efficacy. These four determinants and the outcome measures *'intention to quit smoking*' and *'intention to quit currently used contraceptive method*' were measured on a 5 point Likert scale. Based on the data, two prediction models were tested using backwards selection.

***Results***

The average intention to quit smoking was higher (3,26) than the average intention to quit the currently used contraceptive method (2,47). The determinants perceived vulnerability, education level and reason for contraceptive use significantly predicted the intention to quit smoking. The determinants perceived self-efficacy and education level significantly predicted the intention to quit the currently used contraceptive method.

***Conclusion***

In order to minimize the number of women that combine smoking with contaceptives containing ethinylestradiol, general practitioners should examine whether women have the characteristics that can predict a high or low intention to quit smoking. Women with a high education level, a high perceived vulnerability and women who specifically use their contraceptive method in order to control their menstrual cycle should be stimulated to quit smoking. For women with a low education level and a low perceived vulnerability, who don't specifically use their contraceptive method for their menstrual cycle control, it might be more effective to advise them to switch to another form of contraception. Further research, with a larger research population and follow-up studies, is needed in order to form guidelines that are generalizable for the entire population.

# Inhoudsopgave

# 1. Introduction

### *1.1. Background information*

Smoking is known to increase the risk of several health problems (Das, 2003). Besides the fact that it increases the risk of serious diseases such as cancers or respiratory diseases, smoking also weakens blood vessels and increases the risk of thromboembolism, which is the formation of blood clots (Severinsen et al., 2009). Blood clots can get stuck in the brain, heart or lungs, which can cause serious circulation disturbances such as pulmonary embolism, stroke or heart attack (Beckman et al., 2010). In the worst case blood clots can have fatal effects (U.S. Department of Health and Human Services, 2014).

Another factor that increases the risk of thromboembolism is the use of certain contraceptive methods. The combined oral contraceptive pill mainly consists of two types of artificial hormones, ethinylestradiol which is derived from estrogens and progestin which is derived from progesterone. Ethinylestradiol affects the lipid profile of the blood, causing a thickening of the blood. In addition, it increases the synthesis of clotting factors by the liver. The higher the dose of ethinylestradiol in the contraceptive pill, the higher the risk of thromboembolism (Martin et al., 2018). Since progestin-only pills do not cause an increased risk at thromboembolism, the focus of this paper is only on oral contraceptives containing ethinylestradiol (Mantha et al., 2012). Besides combined oral contraceptive pills, there are two other forms of contraception that contain ethinylestradiol. Research has shown that the combined vaginal contraceptive ring (NuvaRing) and the hormonal Evra-patch have the same prothrombotic potential as combined oral contraceptives (Jick et al., 2010; Kolacki & Rocco, 2012). The NuvaRing and the Evra-patch are therefore also included in this study, besides the oral contraceptive pill.

Research that focussed on the oral contraceptive pill showed that the combination of smoking and oral contraceptive use increases the risk of heart attacks, strokes and thromboembolic diseases, especially in women above the age of 35 (Goodman & Snyder, 2007; Goldmann, 2003; Schein, 1995). Acute myocardial infarction rarely occurs among non-smoking European oral contraceptive users under the age of 35 years of age (attributable risk: 3 per $10^6$ woman years) (Poulter et al., 1997). In smoking young women that use oral contraceptives the extra risk of myocardial infarction is small (35 per $10^6$ woman years). However, in smoking oral contraceptive users over the age of 35, the risk is considerable: 400 per $10^6$ woman years. Research showed that the number of smoked cigarettes affects the magnitude of the associated risk of acute myocardial infarction in women who use oral contraceptives (Poulter et al., 1997). Among women smoking ten or more cigarettes per day, oral contraceptive users have a higher relative risk of 87.0 at acute myocardial infarction than women who don't use oral contraceptives. Since smoking on its own only gives a relative risk of 11.0 when compared to non-smokers, and oral contraceptive use on its own only gives a relative risk of 4.0 when compared to non-users, the relative risk of 87.0 for

women who combine these two factors seems extremely high. This suggests that there may be a synergistic effect, meaning that the combined effect of smoking and oral contraceptive use on the risk of acute myocardial infarction is greater than the effect of these behaviors on its own (Poulter et al., 1997). These findings are consistent with previous studies (Chasan-taber & Stampfer, 1998; Nightingale et al., 2000; Petitti et al., 1979). A similar synergistic effect of smoking and contraceptive use is suggested for the risk of ischemic stroke (Poulter et al., 1996). Another research (Farley et al., 1998) showed that among smokers, the cardiovascular mortality attributable to the use of oral contraceptives was estimated to be about 1 per 100 000 among women aged <35 years, and about 1 per 10 000 among women who are older than 35 years.

Although these studies only included the oral contraceptive pill, comparable results could be expected for the NuvaRing and the Evra-patch, since they have the same prothrombotic potential as combined oral contraceptives. Because of this significant increase in risk of cardiovascular diseases when women reach the age of 35, women who smoke and use contraceptives containing ethinylestradiol, should be advised to quit smoking or quit using their contraceptive method before the age of 35. Although quitting smoking would be the best option as it brings along many additional health benefits, a similar case study in 2017 showed that a larger amount of women chose to quit using oral contraceptives. Whereas 13% of the women reported that they stopped smoking after they got an informative letter from the general practitioner, 43% completely quit using oral contraceptives and 29% switched to different form of contraception (Oosterlee et al., 2017). It was however not studied whether there were certain corresponding characteristics between the women within these three groups or which determinants might have influenced the decision to quit smoking or quit their contraceptive method. A progestin-only contraceptive pill or other contraceptive methods such as a hormonal- or copper intrauterine device (IUD), hormonal implant, hormonal injection or condom use could be a safe alternative for women who cannot quit smoking (Brand et al., 2011).

### *1.2. Protection Motivation Theory*

There are several theoretical social-cognitive models developed to explain certain health (risk) behavior, such as combining oral contraceptives with smoking. One of those models is the Protection Motivation Theory founded by R. Rogers in 1975 (*figure 1.1*). The protection motivation theory is based on two processes that determine the intention to change a certain behavior. The first process describes the *threat appraisal*, which is subcategorized by the perceived severity of the threat and the perceived vulnerability to the threat. A higher risk perception will lead to a larger intention to change a certain behavior.

The second process describes the *coping appraisal*, which is also subcategorized by two factors. The first factor is the perceived response efficacy, which means whether the individual expects the recommended response to lead to a reduction of the threat. The second factor which is

part of the coping appraisal is the perceived self-efficacy, which means whether the individual expects himself to be capable of performing the recommended response. Individuals with a high perceived response- and self-efficacy have larger intentions to change their behavior.

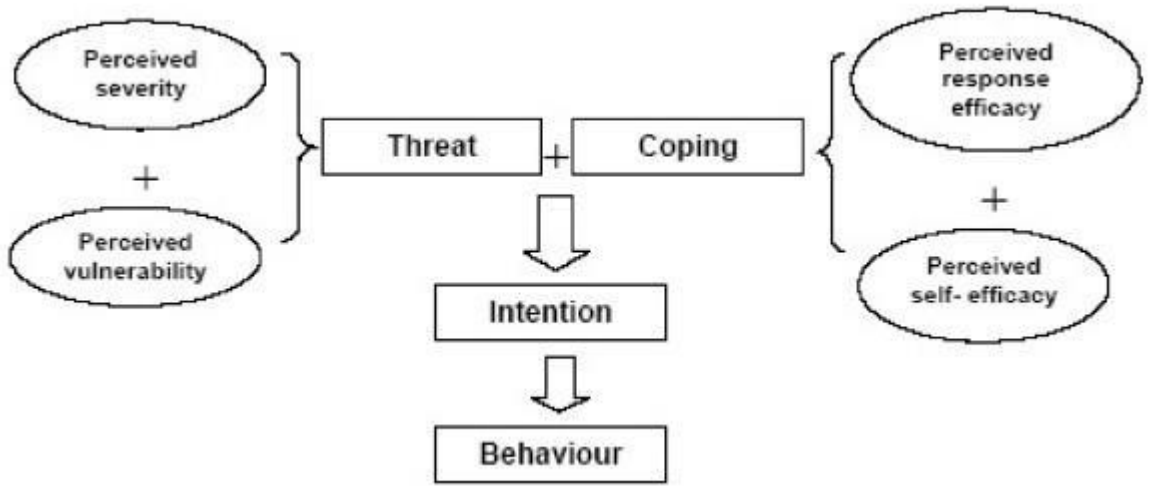


*Fig 1.1 Protection Motivation Theory (Lee et al., 2017)*

Within this research, the perceived severity of health issues caused by using both contraceptives containing ethinylestradiol and smoking, together with the perceived vulnerability or the chance people think they have at getting these health issues, can have a large impact on the intention to quit combining smoking with (oral) contraceptives. In addition, the perception of how positive the effect of quitting smoking/(oral) contraception on an individual's health will be and whether an individual finds herself capable of quitting the smoking/(oral) contraception combination can also determine the intention to change this behavior. For smoking cessation, it is already known that the determinants attitude and self-efficacy play a large role in the reduction intention (Zeko, 2008). There is no similar research for quitting contraceptives yet, since contraceptives containing ethinylestradiol on its own give a much lower health risk than the combination with smoking and the intention to quit is therefore not well studied. However, research has shown that the main reason for women to choose the oral contraceptive pill over other forms of contraception are the easy use, regular menstrual bleeding and relief from menstrual pain (Egarter et al., 2013). These determinants might play a role in the decision whether to quit the currently used contraceptive method or not.

In the case of smoking, other constructs might be considered as well. Previous research by Zeko (2008) that looked into the variables that determine the intention to reduce the level of smoking found that the demographic variables gender, age and educational level play a role in the intention to reduce smoking. In addition, the current smoking behavior contributes to the intention

of reducing smoking. For example, it has been shown that the more dependent the smoker is of nicotine, the less he/she has the intention to reduce smoking in the future (Zeko, 2008).

Although the intention to reduce smoking is likely to have similar predictive variables as the intention to quit smoking, research is needed to determine if the variables for these outcomes correspond. Furthermore, there is no such research done yet specifically among women who use oral contraceptives. The intention to quit smoking could be different for these women, since they are exposed to additional health issues when compared to smoking women who don't use ethinylestradiol-containing contraceptives. Oosterlee et al. (2017) examined the number of women that quit smoking and the number of women that quit oral contraceptives as a result of an informative letter about this potentially harmful combination. However, it was not investigated if there were any distinctive variables within these two groups that could be of predictive value for the intention to quit smoking or quit (oral) contraceptives. Determining these predictive variables could contribute to make a guideline for medical professionals which assists in providing individual advice to women that smoke and use contraceptives containing ethinylestradiol. These personal recommendations could lead to a more effective approach in reducing the amount of women that use the harmful combination, since women with different backgrounds or behavior might need a different persuasive approach.

### *1.3 Aims*

To determine whether to stimulate women to quit smoking or quit their contraceptive method, this research is designed with the main research question: which determinants can predict the intention to quit smoking or quit the currently used contraceptive method in women who smoke and use contraceptives containing ethinylestradiol? The sub questions that are addressed are as follows:

- What are characteristics of women who smoke and use contraceptives containing ethinylestradiol.
- Do the threat- and coping perceptions as explained in the Protection Motivation Theory influence whether women intend to quit smoking or intend to quit their current contraceptive method.
- How can we use this information to persuade different types of women to quit the combination?

## 2. Method

### *2.1. Study design*

In this cross sectional study, data was gathered using a questionnaire (Appendices 1 and 2). The goal of the questionnaire was twofold: 1) gather data and 2) persuade women to stop with the

combination of smoking and contraceptives containing ethinylestradiol . The questionnaire was based on the Protection Motivation theory.

### *2.2. Research population*

The research population included all women within the age category of 25 to 60, from the Huisartsen Oude Turfmarkt, who smoke and use oral contraceptives. This age category was chosen in order to alarm not only the women who are 35 years and older about their risk behaviour, but also the women who are approaching that age. The maximum age of 60 is based on the fact that the average menopausal age of women in the Netherlands is 51.5, ranging from 46 to 56 years (Bonink, 2006). Women who do not smoke or don't use the combined oral contraceptive pill, NuvaRing or Evra patch were excluded from the research population. The questionnaire was sent to a total of 5504 women, of which 228 email-addresses appeared to be invalid. 1433 Women filled in the questionnaire of whom 1251 women signed informed consent. For 96 women the questionnaire ended after the first question, because they filled in to be 24 years old or younger, those women were removed from the database. Of the 1155 women left, 68 women used the combination of smoking and ethinylestradiol-containing contraceptives. These 68 women were included in the analyses.

### *2.3. Questionnaire*

The online survey software Qualtrics was used to compose the questionnaire. A link to the questionnaire was sent out via email to all the women born between 1959 and 1994 from the general practice, who's contact details were obtained from the general practitioner's patient database. The questionnaire consisted of 48 questions, subdivided into eight categories. The first questions were about demographic factors, current smoking behavior and contraceptives. Additional potential determinants that were included in the prediction model were based on the four factors in the Protection Motivation Theory: perceived severity, perceived vulnerability, perceived response efficacy and perceived self-efficacy. The last questions of the questionnaire were about the outcome measures; the intention to quit smoking and the intention to quit using the currently used contraceptive method. All the potential predictive determinants based on the Protection Motivation Theory, as well as the outcome measures, were measured on a 5-point Likert Scale, asking to what extent participants agreed with a certain statement. The questions could be answered with the following options: strongly agree (1), agree (2), neutral (3), disagree (4), strongly disagree (5). This led to average scores for all determinants from the Protection Motivation Theory and the outcome measures, these average scores were used in the analyses.

*Demographic factors*

Age was measured on a ratio scale and education level was measured on an ordinal scale. Education level was recoded into two groups (no academic degree / academic degree), because the original distribution (primary school / high school / vocational education / higher vocational education / academic degree / doctors degree) yielded too small sample groups. The new groups (no academic degree / academic degree) were based on the results of the Dutch national health survey, which indicated that people with an academic degree or higher smoke less often than people without an academic degree (CBS, 2017).

Ethnic background was measured on a nominal scale and women were asked whether they have lived the majority of their youth in the Netherlands. Ethnicity was excluded from the prediction model because no statements can be made about the effect of ethnicity, since 57 (83,8%) of the respondents were Dutch and the remaining 11 respondents all had different backgrounds. For the same reason, the variable 'lived majority of childhood in the Netherlands' was excluded from the prediction model.

*Cigarette dependence*

Women were asked whether they smoke never, sometimes, regularly, often or very often. Respondents answering 'never' to this question were referred to the end of the questionnaire. Next, cigarette dependence was measured using the validated cigarette dependence scale (cds-5), which consists of five questions. A new variable for cigarette dependence was made by scoring the answers according to the cds-5 and summing up these five scores. This resulted in a total score for cigarette dependence, with scores ranging from 5 to 25 (Etter et al., 2003).

*Contraceptive use*

Women were asked if they use (oral) contraceptives containing ethinylestradiol, since (oral) contraceptives which do not contain ethinylestradiol don't give increased health risks when combined with smoking. Answering 'no' to this question referred women to the end of the questionnaire.

*Reasons for contraceptive use*

The reason why women use their method of contraception was measured on a nominal scale, retrieved from a questionnaire formed by Egarter et al. (2013). The question could be answered with '*easy to use', 'reliable', 'recommended by my doctor', 'control over menstrual cycle', 'as an aid against acne or menstrual pain'* or '*other'*.

*Perceived severity*

Six questions were asked in order to measure the perceived severity, for which the Risk Behavior Diagnosis Scale provided by Witte et al. (1996) was used. Participants were asked if they consider the combination of smoking and their contraceptive method as a health threat. An example is '*I consider the risk at cardiovascular diseases to be high when smoking is combined with the birth control pill / ring / patch'*.

*Perceived vulnerability*

To be able to get an indication of the perceived vulnerability, eight questions were asked for which the Risk Behavior Diagnosis Scale provided by Witte et al. (1996) was used. Women were asked whether they think their personal health will suffer from combining smoking and their contraceptive method, by statements such as '*I think I am at additional health risk because I combine smoking with the birth control pill / ring / patch'*.

*Perceived response efficacy*

Six questions were asked to measure the perceived response efficacy, for which a response efficacy scale provided by Umphrey (2004) is used. Women were asked if they believe that they would reduce their health risks when they quit the combination, by stastements such as '*I think I can lower my risk at cardiovascular disease by quitting the combination of smoking and the birth control pill / ring / patch*.

*Perceived self-efficacy*

Four questions were asked to get insight in the perceived self-efficacy, for which a health self-efficacy scale provided by Lee et al. (2008) was used. Ít was measured too what extent women felt capable of quitting the combination, with statements such as '*If I intend to stop with the combination of smoking and the birth control pill / ring / patch, I will certainly succeed'.*

*Outcome measures*

The two outcome measures 'intention to quit smoking' and 'intention to quit oral contraceptives' were both measured by five questions, such as '*At the moment I intend to quit smoking',* and *'I intend to find out what other forms of birth control could be good alternatives for me, instead of using the pill / ring / patch'*.

*Persuasive message*

Depending on the answers filled in in the questionnaire, women were either forwarded to a gain framed message or a loss framed message with a link to a smoking cessation program. Besides promoting smoking cessation, women were stimulated to contact approach their doctor for advice

about other contraceptive methods. A more detailed explanation, as well as the gain- and loss framed messages, has been added in Appendix 3.

### *2.4. Statistical analysis*

Statistical analysis was performed using IBM SPSS Statistics 25. Determinants and outcomes variables were checked for normality. Although some variables had a significant Kolmogorov-Smirnov test, the Q-Q plots of all variables showed a (very close to) normal distribution. It is therefore assumed that the assumption of normality has been met. For every construct, a reliability analysis was done. These all showed a high reliability, with all variables having a Cronbach's alpha > 0,80.

The variable cigarette dependence was also checked for normality. Results showed a very significant Kolmogorov-Smirnov test and an extreme skewness to the right. Therefore, data transformation was performed. Performing a square, square-root, reciprocal, cube-root and log-transformation did however not lead to a normal distribution. Therefore, a median split was used. In addition, a reliability analysis was done on the original questions and this showed a high reliability with a Cronbach's alpha > 0,80.

Frequency tests and bivariate correlation tests were done in order to analyze the frequencies, means and standard deviations and to check for correlations between the different constructs. Reliability was checked with the Cronbach's Alpha test, for all four constructs from the Protection Motivation Theory, as well as the outcome measures. To analyze the predictive value of the variables from the questionnaire, two prediction models were made by using the backward selection method as described by Twisk (2017). A multiple linear regression model was used, since both the intention to quit smoking and the intention to quit (oral) contraceptives were linear. The prediction models have a significance cut-off value of 0,05.

## 3. Results

### *3.1. Sample characteristics*

The sample that was used for both prediction models was formed by patients from the general practice Huisartsen Oude Turfmarkt, and consisted of 68 women that smoke and use an ethinylestradiol-containing form of contraception. The average age of the population group was 30,6 years. The vast majority of the women were of Dutch decent and 77,9 % of the women in the final research sample had an academic degree or higher. Further sample characteristics are displayed in Table 1.

| Variable | Coding | Frequency(%) |
|---|---|---|
| Age | In years | 30,6 (6,6)* |
| Childhood in NL | Yes<br>No | 56 (82,4)<br>12 (17,6) |
| Ethnicity | Dutch<br>Otherwise | 57 (83,8)<br>11 (16,2) |
| Education level | No academic degree<br>Academic degree | 15 (22,1)<br>53 (77,9) |
| Cigarette Dependence | Low<br>High | 33 (48,5)<br>35 (51,5) |
| Years of contraceptive use | In years | 9,1 (7,0)* |
| Reason for contraceptive use | Easy to use<br>Reliable<br>Recommended by my doctor<br>Control over menstrual cycle<br>As an aid against acne or menstrual pain<br>Otherwise | 20 (29,4)<br>6 (8,8)<br>13 (19,1)<br>12 (17,6)<br>13 (19,1)<br>4 (5,9) |
| Easy to stop/switch contraceptive use | 5 Likert scale | 2,9 (1,2)* |

*Table 1. Population characteristics. *mean (sd)*

### *3.2. Means and correlations*

Table 2 presents the means and standard deviations for the four factors of the Protection Motivation Theory, as well as for the outcome measures '*Intention to quit smoking*' and '*Intention to quit current contraceptive method*'. In addition, the correlations between the four factors and the outcome measures are displayed. The mean score for intention to quit smoking was 3,26 and the mean score for intention to quit current contraceptive method was 2,47. A paired samples t-test showed that this difference was significant. Considering a score of 3.00 is neutral, a score of 3.26 means that on average women only slightly intend to quit smoking and a score of 2.47 shows that on average, women are slightly opposed quitting their currently used contraceptive method.

Notable is that significant correlations are demonstrated between perceived severity, perceived vulnerability and perceived response efficacy, whereas perceived self-efficacy has no significant correlations with one of the other determinants based on the Protection Motivation Theory. The intention to quit smoking was significantly correlated to the perceived vulnerability and the perceived response efficacy. The intention to quit the currently used contraceptive method only showed a significant correlation with pereived self-efficacy.

| Constructs | | Mean | sd | Cronbachs Alpha | Correlations | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1. | 2. | 3. | 4. | 5. | 6. |
| **1.** | Perceived severity | 3.39 | 0.79 | 0,88 | 1 | | | | | |
| **2.** | Perceived vulnerability | 3.19 | 0.85 | 0,93 | 0.57** | 1 | | | | |
| **3.** | Perceived response efficacy | 3.88 | 0.88 | 0,98 | 0.50** | 0.54** | 1 | | | |
| **4.** | Perceived self-efficacy | 3.80 | 0.99 | 0,91 | 0.13 | -0.13 | 0.02 | 1 | | |
| **5.** | Intention to quit smoking | 3.36 | 0.98 | 0,83 | 0.09 | 0.28* | 0.26* | 0.07 | 1 | |
| **6.** | Intention to quit current contraceptives | 2.47 | 1.20 | 0,92 | 0.17 | 0.14 | 0.15 | 0.26* | 0.21 | 1 |

**Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

*Table 2. Means, standard deviations, reliability and correlations between constructs*

### *3.3. The intention to quit smoking*

The prediction model for the intention to quit smoking was created by using a multivariable linear regression analysis including perceived severity, perceived vulnerability, perceived response efficacy, perceived self-efficacy, age, education level, cigarette dependence, years of current contraceptive use, ability to quit current contraceptive method and the reason to use the current contraceptive method. Significant predictive determinants in the base model were perceived vulnerability (B=0,48), having and academic degree (B=0,59) and having ‘control over menstrual cycle’ as the main reason to use the currently used contraceptive method (B=0,79).The end result of the backward selection process is the final prediction model for the intention to quit smoking, shown in table 3. To check whether the significant variance in outcome measures can be explained by this prediction model, an F-test was performed. This gave a siginifcant p value of 0,03.

The prediction model for the intention to quit smoking includes: perceived vulnerability, education (having an academic degree) and having ‘control over menstrual cycle’ as the main reason to use the currently used contraceptive method. The model indicates that an increase of 1

point in score for perceived vulnerability corresponds to 0,37 points increase for intention to quit smoking. Furthermore, having 'control over menstrual cycle' as the main reason for the currently used contraceptive method corresponds to 0,79 points increase for intention to quit smoking when compared to the reference category 'easy in use', which is the most common reason for women to use the contraptive pill, ring or patch (Egarter et al., 2013). Lastly, having an academic degree corresponds to 0,61 points higher intention to quit smoking than not having an academic degree.

| | **Base model** | | | **Final model** | | |
|---|---|---|---|---|---|---|
| | **B** | **SE** | **P-value** | **B** | **SE** | **P-value** |
| **Perceived Severity** | -0.10 | 0,22 | 0,64 | | | |
| **Perceived Vulnerability** | 0,48 | 0,19 | 0,02 | 0,37 | 0,13 | 0,01 |
| **Perceived Response Efficacy** | 0,05 | 0,18 | 0,77 | | | |
| **Perceived Self-Efficacy** | 0,06 | 0,16 | 0,69 | | | |
| **Age** | -0,04 | 0,03 | 0,10 | | | |
| **Education level**<br>No academic degree<br>Academic degree | <br>REF<br>0,59 | <br>-<br>0,32 | <br>-<br>0,07 | <br>REF<br>0,61 | <br>-<br>0,29 | <br>-<br>0,04 |
| **Cigarette Dependence**<br>Low<br>High | <br>REF<br>-0,11 | <br>-<br>0,30 | <br>-<br>0,71 | | | |
| **Years Contraceptive use** | 0,01 | 0,02 | 0,53 | | | |
| **Quit Contraceptives** | 0,15 | 0,11 | 0,17 | | | |
| **Reason Contraceptive**<br>Easy in use<br>Reliable<br>Recommended<br>Control<br>Aid<br>Otherwise | <br>REF<br>0,04<br>-0,13<br>0,79<br>0,13<br>0,37 | <br>-<br>0,47<br>0,36<br>0,37<br>0,37<br>0,64 | <br>-<br>0,93<br>0,72<br>0,03<br>0,73<br>0,56 | <br>REF<br>0,29<br>-0,02<br>0,79<br>-0,06<br>-0,18 | <br>-<br>0,45<br>0,33<br>0,35<br>0,34<br>0,50 | <br>-<br>0,52<br>0,96<br>0,03<br>0,87<br>0,73 |

*Table 3. Base model and final prediction model for intention to quit smoking.*

### *3.4. The intention to quit the currently used contraceptive method*

The prediction model for the intention to quit the currently used contraceptive method was created by using a multivariable linear regression analysis including perceived severity, perceived

vulnerability, perceived response efficacy, perceived self-efficacy, age, education level, cigarette dependence, years of current contraceptive use, ability to quit current contraceptive method and the reason to use the current contraceptive method. A significant predictive determinant in the base model was perceived self-efficacy (B=0,38). The end result of the backward selection process is the final prediction model for the intention to quit the currently used contraceptive method, shown in table 4. To check whether the significant variance in outcome measures can be explained by this prediction model, an F-test was performed. This gave a siginifcant p value of >0,01.

The prediction model for the intention to quit the currently used contraceptive method includes: perceived self-efficacy and education (having and academic degree). This model also includes the variable education, just like the model for the intention to quit smoking. However, in this prediction model having an academic degree does not correspond to a higher, but to 0,83 points lower intention to quit the currently used contraceptive method. Besides education level, the score for perceived self-efficacy is of predictive value in the final model. An increase of 1 point in score for perceived self-efficacy corresponds to 0,38 point increase in intention to quit the currently used contraceptive method.

| | **Base model** | | | **Final model** | | |
|---|---|---|---|---|---|---|
| | **B** | **SE** | **P-value** | **B** | **SE** | **P-value** |
| **Perceived Severity** | 0,24 | 0,27 | 0,39 | | | |
| **Perceived Vulnerability** | 0,43 | 0,24 | 0,86 | | | |
| **Perceived Response Efficacy** | 0,10 | 0,23 | 0,66 | | | |
| **Perceived Self-Efficacy** | 0,38 | 0,18 | 0,03 | 0,38 | 0,14 | <0,01 |
| **Age** | 0,01 | 0,03 | 0,66 | | | |
| **Education level**<br>No academic degree<br>Academic degree | REF<br>-1,30 | -<br>0,39 | -<br>0,45 | REF<br>-0,83 | -<br>0,33 | -<br>0,02 |
| **Cigarette Dependence**<br>Low<br>High | REF<br>-0,01 | -<br>0,04 | -<br>0,87 | | | |
| **Years Contraceptive use** | -0,00 | 0,03 | 0,95 | | | |
| **Quit Contraceptives** | 0,21 | 0,14 | 0,13 | | | |
| **Reason Contraceptive** | | | | | | |

| | | | | |
|---|---|---|---|---|
| Easy in use | REF | - | - | |
| Reliable | -0,94 | 0,58 | 0,11 | |
| Recommended | -0,76 | 0,45 | 0,10 | |
| Control | -0,49 | 0,46 | 0,29 | |
| Aid | -0,68 | 0,46 | 0,15 | |
| Otherwise | -1.11 | 0,80 | 0,17 | |

*Table 4. Base model and final prediction model for intention to quit contraceptive method.*

## 4. Discussion

The goal of this research was to examine whether there are determinants for the intention to quit smoking and the intention to quit using the currently used contraceptive method, in women who combine smoking with a contraceptive method containing ethinylestradiol.This is needed in order to determine what the most effective way is to minimize the amount of women that use this combination. Prediction models were made for the intention to quit smoking and the intention to quit the current contraceptive method, using backwards selection.

Results showed that the average intention to quit smoking in this research sample is higher than the intention to quit the currently used contraceptive method.This is contradictory to the results of Oosterlee et al. (2017), where the vast majority of women chose to quit their current contraceptive method. The fact that the intention to quit smoking is higher is a promising fact, since this is the option that brings along the most health benefits. The contradictory results could however be explained by the fact that this research measures the intention to quit smoking whereas Oosterlee et al. (2017) measured actual smoking cessation.

Women intend to quit smoking when they have a high perceived vulnerability, meaning they believe they are at high risk to develop health issues because they combine smoking with their contraceptive method. This could be explained by the fact that people with a high vulnerability are likely to not only acknowledge the health issues caused by the combination, but also by smoking itself. For this reason, these women might rather quit smoking and prevent more health risks than quit using the current contraceptive method and only prevent the risks related to this combination. Besides, multiple studies have shown that a high perceived vulnerability is predictive for smoking cessation (Borelli et al., 2010).

Women who use their current contraceptive method because they want to have control over their menstrual cycle are also more likely to quit smoking than women who use their current contraceptive method because it is easy in use**.** This could be explained by the fact that the contraceptive pill, Evra patch or NuvaRing allow women to plan their menstrual cycle. This is an advantage that no other contraceptive methods offer (Dieben et al., 2002; Zieman et al., 2002), whereas multiple other forms of contraception could be considered easy in use. Therefore, women who use the pill, ring or patch because it is easy in use might easier switch to another form of contraception that women who specfically use their method in order to controll their menstrual cycle.

Thirdly, women with a high education level (academic degree) more often intend to quit smoking than women with a lower education level. These results are in line with previous research, which indicated that women with a high education level more often quit smoking than women with a low or average education level (Monden, 2002).

Besided these determinants for the intention to quit smoking, this research resulted in two determinants for the intention to quit the currently used contraceptive method. The first determinant is education level. Results showed a negative correlation between having an academic degree and the intention to quit the current contraceptive method, meaning women with an academic degree have a lower intention to quit their current contraceptive method than women with no academic degree. This can be explained by the fact that women with an academic degree have higher intentions to quit smoking. Since quitting smoking is sufficient to decrease the risk at the related health consequences, it would be unneccasary to also quit the current contraceptive method.

The second determinant that predicted the intention to quit the current contraceptive method was perceid self-efficacy. While Zeko (2008) concluded that perceived self-efficacy was a predictor for the intention to reduce smoking, in this research perceived self-efficacy appears to be a predictor for the intention to quit the currently used contraceptive method. This can be explained by the fact that in Zeko's research the perceived self-efficacy to quit smoking was measured, whereas in this research the self-efficacy to quit the combination was measured. Women who indicated to find themselves capable of quitting the combination had a higher intention to quit their contraceptive method. This could be because women might see quitting their contraceptive method as not very challenging, which correlates to a high perceived self-efficacy.

***Strengths, limitations and further research***

A very good outcome of this research is that 5276 women are warned about the risks of combining smoking and contraceptive method containing ethinylestradiol. The email that was sent out to all those women included an informative text about these risks, prior to the link to the questionnaire. It was deliberately chosen to provide this information at the beginning of the survey in order to warn all women, also those who did not fill in the questionnaire, about the health risks associated with the combination.

A second positive outcome is that during the process of this research, it was found out that the contraceptive choice tool that is provided by Huisartsen Oude Turfmarkt does not include questions about age or smoking behaviour. As a result of this research, the choice tool can be adjusted and improved in order to prevent the tool from advising women who smoke and are 35 years or older to choose the combined contraceptive pill, NuvaRing or Evra patch.

However, there are some limitations that should be considered in future research. Although the final prediction models resulted in significant predictors for both outcome measures, the research sample was relatively small which might have had an influence on the outcomes of this

research. In future research, a larger research population is demanded to obtain more data and generate accurate models with a higher validity and reliability.

Another factor that might have influenced the results is the usage of a 5-point Likert scale. With a 5-point Likert scale, respondents often tend to choose the middle answers and avoid the ends of the scale, which was also the case for this research. As a consequence, not many results will be of significant value. Future studies should consider to use a broader scale or a different measurement method.

An additional limitation of this study is that the research sample of 68 women is not generalizable for the entire population. There was little variance in ethnic background and education level. Ethnicity was not included in the prediction model, while previous research showed that this could be of importance since contraceptive use and smoking behaviour varies among women with different ethnic backgrounds (CBS, 2016; Picavet, 2012). Because of these limitations in variance, conclusions from this research can not be applied to the general public.

Some variables were distributed in such a way that new groups had to be formed in order to include them. Cigarette dependence was supposed to be included as a continuous variable, but because of the extreme skew to the right, a median split was used. This led women with a score of 8 on a scale from 5 to 25 points to be classified with 'high dependence', while their dependence score was actually very low . A research population with more respondents with a high dependence is likely to indicate different results. More logical cut off values for the different categories (low or high dependence) could be used, and a more useful comparison of different groups could be done.

Future studies should also include a follow-up survey to measure whether women who intend to quit smoking or their contraceptive method turned words into actions and actually quit with the combination. Although it is often assumed that intentions to change health behaviour are the best predictors of change (Schwarzer & Luszczynska, 2008), intentions do not always lead to actions and there is often a so called intention-behaviour gap (Sheeran, 2002).

***Recommendations***

This research has shown that it is very important to inform women about the possible consequences of combining smoking with contraceptives containing ethinylestradiol. The perceived severity and perceived vulnerability of just a little higher than 'neutral' indicate that the knowledge and perceived risks are not as high as desired. Besides providing individual advise using a loss- or gain framed message, previous research has shown that another effective way of effective health communication is by using tailored messaging (Brug et al., 1999). Based on the prediction models, different women need different approaches when the main goal is to reduce the amount of women that combine smoking with contraceptives containing ethinylestradiol. Education level, perceived vulnerability, perceived self-efficacy and reasons for contraceptive use must be taken into account when advising women whether to quit smoking or quit their contraceptive method. Although all

women should first be advised to quit smoking, since the average intention to quit smoking was higher than the average intention to quit the current contraceptive method and this brings along many other health benefits, for some women this option is more realistic than for other women. In order to minimize the amount of women that use the combination, some women should be advised to switch to another form of contraception instead of trying to persuade them to quit smoking. General practitioners should be aware of the characteristics of women that often have a high or low intention to quit smoking, and stimulate the women that tend to have a low intention to quit smoking to switch to another contraceptive method.

However, more research is needed in order to obtain more reliable results and to form generalizable guidelines for general practitioners. This future research should include a larger research sample, which is more representative for the entire population. Follow-up studies should be performed in order to observe the strength of the intention-behaviour relation. These results can support general practitioners in the decision whether they should try to persuade women to quit smoking or advise them to switch to another form of contraception. Further suggestions for studies would be to analyze whether giving this personalized advise is more effective than giving all women the same advise.

## 5. Conclusion

Combining smoking with contraceptive methods containing ethinylestradiol increases the risk at several health issues. It is therefore important that women are informed about this risk and are encouraged to either quit with smoking or their contraceptive method. This research indicates that the intention to quit smoking can be predicted by a high perceived vulnerability, high education level and reason for contraceptive use, whereas the intention to quit the currently used contraceptive method can be predicted by a high perceived self-efficacy and a low education level. In order to minimize the number of women that use this combination, general practitioners should examine whether women have the characteristics that can predict a high or low intention to quit smoking. Women with a high education level, a high perceived vulnerability and women who specifically use their contraceptive method in order to control their menstrual cycle should be advised to quit smoking. For women with a low education level and a low perceived vulnerability, who don’t specifically use their contraceptive method for their menstrual cycle control, it might be more effective to advise them to switch to another form of contraception. Further research is needed in order to form guidelines that are generalizable for the entire population.

## 6. References


Beckman, M. G., Hooper, W. C., Critchley, S. E., & Ortel, T. L. (2010). Venous thromboembolism: a public health concern. *American journal of preventive medicine*, *38*(4), S495-S501.

Bonink, J. G. M. (2006). Welke richtlijnen zijn er dat de vrouw in de perimenopauze geen pil meer hoeft te slikken om niet zwanger te worden?. In *Vademecum permanente nascholing huisartsen* (pp. 1253-1254). Bohn Stafleu van Loghum, Houten.

Borrelli, B., Hayes, R. B., Dunsiger, S., & Fava, J. L. (2010). Risk perception and smoking behavior in medically ill smokers: a prospective study. *Addiction*, *105*(6), 1100-1108.

Brand, A., Bruinsma, A., van Groeningen, K., Kalmijn, S., Kardolus, I., Peerden, M., Smeenk, R., de Swart, S., Kurver, M. & Goudswaard, L. (2011). NHG-STANDAARD-Anticonceptie. Huisarts en Wetenschap, 54(12), 652.

Brug, J., Campbell, M., & van Assema, P. (1999). The application and impact of computer-generated personalized nutrition education: a review of the literature. Patient education and counseling, 36(2), 145-156.

Centraal Bureau voor de Statistiek. (2017, mei 31). Vooral hoogopgeleiden roken minder. Retrieved from https://www.cbs.nl/nl-nl/nieuws/2017/22/vooral-hoogopgeleiden-roken-minder

Centraal Bureau voor de Statistiek. (2018, december 20). Gezondheidsenquête/leefstijlmonitor. Retrieved from https://www.volksgezondheidenzorg.info/onderwerp/roken/cijfers-context/huidige-situatie-volwassenen#node-roken-naar-opleiding

Centraal Bureau voor de Statistiek. (2019, maart 19). Leefstijl en (preventief) gezondheidsonderzoek; persoonskenmerken. Retrieved from https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83021NED/table?ts=1522312658353

Chasan-Taber, L., & Stampfer, M. J. (1998). Epidemiology of oral contraceptives and cardiovascular disease. *Annals of internal medicine*, *128*(6), 467-477.

Das, S. K. (2003). Harmful health effects of cigarette smoking. *Molecular and cellular biochemistry*, *253*(1-2), 159-165.

Dieben, T. O., Roumen, F. J., & Apter, D. (2002). Efficacy, cycle control, and user acceptability of a novel combined contraceptive vaginal ring. *Obstetrics & Gynecology*, *100*(3), 585-593.

Egarter, C., Tirri, B. F., Bitzer, J., Kaminskyy, V., Oddens, B. J., Prilepskaya, V., ... & Weyers, S. (2013). Women's perceptions and reasons for choosing the pill, patch, or ring in the CHOICE study: a cross-sectional survey of contraceptive method selection after counseling. *BMC women's health*, *13*(1), 9.

Etter, J. F., Le Houezec, J., & Perneger, T. V. (2003). A self-administered questionnaire to measure dependence on cigarettes: the cigarette dependence scale. *Neuropsychopharmacology*, *28*(2), 359.

Farley, T. M., Meirik, O., Chang, C. L., & Poulter, N. R. (1998). Combined oral contraceptives, smoking, and cardiovascular risk. Journal of Epidemiology & Community Health, 52(12), 775-785.

Goldmann, D. (2003). Het Medisch Handboek. Utrecht: Kosmos – Z & K Uitgevers

Goodman, C. C., & Snyder, T. E. (2007). Screening for cardiovascular disease. *Differential Diagnosis for Physical Therapists: Screening for Referral. 4th ed. St Louis, MO: Saunders/Elsevier*, 274-331.

Hansten, P.D., Horn, J.R., Koda-Kimble, M.A., Young, L.Y. In: Drug interactions & updates quarterly, chapter 17. Effects of cigarette smoking on drug actions. Vancouver: Applied Therapeutics Inc.1993: 103-106.

Jick, S. S., Hagberg, K. W., Hernandez, R. K., & Kaye, J. A. (2010). Postmarketing study of ORTHO EVRA® and levonorgestrel oral contraceptives containing hormonal contraceptives with 30 mcg of ethinyl estradiol in relation to nonfatal venous thromboembolism. *Contraception*, *81*(1), 16-21.

Kolacki, C., & Rocco, V. (2012). The combined vaginal contraceptive ring, nuvaring, and cerebral venous sinus thrombosis: a case report and review of the literature. *The Journal of emergency medicine*, *42*(4), 413-416.

Lee, S. Y., Hwang, H., Hawkins, R., & Pingree, S. (2008). Interplay of negative emotion and health self-efficacy on the use of health information and its outcomes. *Communication Research*, *35*(3), 358-381.

Lee, T. S., Kilbreath, S. L., Sullivan, G., Refshauge, K. M., & Beith, J. M. (2007). The development of an arm activity survey for breast cancer survivors using the Protection Motivation Theory. BMC cancer, 7(1), 75.

Mantha, S., Karp, R., Raghavan, V., Terrin, N., Bauer, K. A., & Zwicker, J. I. (2012). Assessing the risk of venous thromboembolic events in women taking progestin-only contraception: a meta-analysis. *Bmj*, *345*, e4944.

Martin, K. A., Douglas, P. S., & Eckler, K. (2018, october 15). Risks and side effects associated with combined estrogen-progestin oral contraceptives. Retrieved from https://www.uptodate.com/contents/risks-and-side-effects-associated-with-combined-estrogen-progestin-oral-contraceptives?topicRef=7398&source=see_link#H1385889034

Monden, C. W. (2002). Beginnen en stoppen met roken: De invloed van opleiding, ouders en partners in een gebeurtenissenanalyse [Smoking initiation and cessation: The influence of education, parents and partners in an event-history analysis].

Moorman, M., & van den Putte, B. (2008). The influence of message framing, intention to quit smoking, and nicotine dependence on the persuasiveness of smoking cessation messages. Addictive behaviors, 33(10), 1267-1275.

Nightingale, A. L., Lawrenson, R. A., Simpson, E. L., Williams, T. J., MacRae, K. D., & Farmer, R. D. T. (2000). The effects of age, body mass index, smoking and general health on the risk of venous thromboembolism in users of combined oral contraceptives. The European Journal of Contraception & Reproductive Health Care, 5(4), 265-274.

Oosterlee, H., Koolman, M., & Meier, J. (2017). Cardiovasculaire risico's verlagen bij pilgebruikende rooksters. Huisarts en wetenschap, 60(12), 642-644.

Petitti, D. B., Wingerd, J., Pellegrin, F., & Ramcharan, S. (1979). Risk of vascular disease in women: smoking, oral contraceptives, noncontraceptive estrogens, and other factors. *Jama*, *242*(11), 1150-1154.
Picavet, C. (2012). Zwangerschap en anticonceptie in Nederland. *Tijdschrift voor Seksuologie*, *36*(2), 121-128.

Poulter, N. R., Chang, C. L., Farley, T. M., Meirik, O., & Marmot, M. G. (1996). Ischaemic stroke and combined oral contraceptives: results of an international multicentre case-control study. WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. Lancet, 348(9026), 498-505.

Poulter, N. R., Meirik, O., Chang, C. L., Farley, T. M. M., Kelaghan, J., Marmot, M. G., ... & Hui, Z. Y. (1997). Acute myocardial infarction and combined oral contraceptives: results of an international multicentre case-control study. Lancet, 349(9060), 1202-1209.

Rijksinstituut voor Volksgezondheid en Milieu. (2018, november 2). Seksuele gezondheid onder volwassenen. Retrieved from https://www.rivm.nl/leefstijlmonitor/cijfers/seksuele-gezondheid/seksuele-gezondheid

Schein, J. R. (1995). Cigarette smoking and clinically significant drug interactions. Annals of Pharmacotherapy, 29(11), 1139-1148.

Schwarzer, R., & Luszczynska, A. (2008). How to overcome health-compromising behaviors: The health action process approach. *European Psychologist*, *13*(2), 141-151.

Severinsen, M. T., Kristensen, S. R., Johnsen, S. P., Dethlefsen, C., Tjønneland, A., & Overvad, K. (2009). Smoking and venous thromboembolism: a Danish follow-up study. *Journal of thrombosis and haemostasis*, *7*(8), 1297-1303.

Toll, B. A., O'malley, S. S., Katulak, N. A., Wu, R., Dubin, J. A., Latimer, A., ... & Salovey, P. (2007). Comparing gain-and loss-framed messages for smoking cessation with sustained-release bupropion: a randomized controlled trial. Psychology of Addictive Behaviors, 21(4), 534.

Twisk, J. (2017). Inleiding in de toegepaste biostatistiek (4e druk). BSL.

Umphrey, L. R. (2004). Message defensiveness, efficacy, and health-related behavioral intentions. *Communication Research Reports*, *21*(4), 329-337.

US Department of Health and Human Services. (2014). The health consequences of smoking—50 years of progress: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 17.

Volksgezondheidenzorg. Rokers vrouwen per GGD-regio. [Internet]. [updated 2018; cited 2018 Nov 28]. Available from: https://www.volksgezondheidenzorg.info/onderwerp/roken/regionaal-internationaal/regionaal#node-rokers-vrouwen-ggd-regio

Witte, K. (1996). Predicting risk behaviors: Development and validation of a diagnostic scale. *Journal of health communication*, *1*(4), 317-342.

Zeko, N. (2008). Minderen met roken: een gedragsdeterminantenonderzoek naar het minderen met roken(Bachelor's thesis, University of Twente).

Zieman, M., Guillebaud, J., Weisberg, E., Shangold, G. A., Fisher, A. C., & Creasy, G. W. (2002). Contraceptive efficacy and cycle control with the Ortho Evra™/Evra™ transdermal system: the analysis of pooled data. *Fertility and sterility*, *77*, 13-18.

# 7. Appendices

## *7.1. Appendix 1: Questionnaire – Dutch version*

Beste deelnemer,

Voordat het onderzoek begint, is het belangrijk dat u op de hoogte bent van de procedure die in dit onderzoek wordt gevolgd. Lees daarom onderstaande tekst zorgvuldig door en aarzel niet om opheldering te vragen over deze tekst, mocht deze niet duidelijk zijn. De onderzoeksleider zal eventuele vragen graag beantwoorden.

**Doel van het onderzoek**
Voorgaand onderzoek heeft uitgewezen dat vrouwen een zeer sterk verhoogd risico lopen op trombose (een bloedstolsel in een bloedvat) wanneer zij roken en ook de anticonceptiepil, Nuvaring of Evra-pleister gebruiken. Het doel van dit onderzoek is om in kaart te brengen om hoeveel vrouwen dit gaat bij onze huisartsenpraktijk en op welke manier dit probleem het beste aangepakt kan worden

**Gang van zaken tijdens het onderzoek**
Dit onderzoek wordt gedaan met behulp van een vragenlijst die bestaat uit 48 meerkeuze vragen. In deze vragenlijst zal naar algemene persoonlijke achtergrondinformatie, eventueel rookgedrag en naar anticonceptiegebruik gevraagd worden. Het invullen van de vragenlijst zal ongeveer 5 minuten duren.

**Vrijwilligheid**
Als u nu besluit af te zien van deelname aan dit onderzoek, zal dit op geen enkele wijze gevolgen voor u hebben. Als u gaandeweg het onderzoek besluit om te stoppen, dan kan dat op elk moment, zonder opgaaf van redenen en zonder dat dit op enige wijze gevolgen voor u heeft. U kunt binnen 7 dagen na het onderzoek verzoeken om uw onderzoeksgegevens te laten verwijderen.

**Uw privacy is gewaarborgd**
Uw persoonsgegevens (over wie u bent) blijven vertrouwelijk en worden niet gedeeld zonder uw uitdrukkelijke toestemming. Uw onderzoeksgegevens worden nader geanalyseerd door de onderzoekers die de data hebben verzameld. Onderzoeksgegevens die worden gepubliceerd in wetenschappelijke tijdschriften zijn anoniem en zijn dus niet tot u te herleiden. Volledig geanonimiseerde onderzoeksgegevens kunnen worden gedeeld met andere onderzoekers.

**Nadere inlichtingen**
Mocht u vragen hebben over dit onderzoek, vooraf of achteraf, dan kunt u zich wenden tot de verantwoordelijke onderzoeker; C.M. van der Heijde (c.m.vanderheijde@uva.nl) Voor eventuele formele klachten over dit onderzoek kunt u zich wenden tot het lid van de Facultaire Commissie Ethiek (FMG) van de Universiteit van Amsterdam, Wery van den Wildenberg (w.p.m.vandenwildenberg@uva.nl).

- ❑ Ik heb bovenstaande informatie gelezen en naar tevredenheid begrepen. Ik verleen mijn medewerking aan dit onderzoek en geef hierbij toestemming om mijn ingevulde gegevens te gebruiken voor onderzoeksdoeleinden.
- ❑ Ik geef geen toestemming en wil niet deelnemen aan dit onderzoek (-> vragenlijst afgelopen)

**Vragenlijst**

*Demografische factoren*

1. Leeftijd:
   …. jaar

2. Heeft u uw jeugd grotendeels in Nederland gewoond?

❑ Ja
❑ Nee

3. Ik beschouw mezelf als: (meerdere opties mogelijk)

❑ Nederlands
❑ Turks
❑ Marrokaans
❑ Surinaams
❑ Antiliaans
❑ Anders, nl ….

4. Wat is de hoogste opleiding die u heeft afgerond?

❑ Basisschool
❑ Middelbare school
❑ Beroepsonderwijs
❑ Hoger beroepsonderwijs
❑ Academische graad
❑ Doctorsgraad

*Rookverslaving*

5. Ik rook:

❑ Nooit (-> vragenlijst afgelopen)
❑ Soms
❑ Regelmatig
❑ Vaak
❑ Heel vaak

U heeft aangegeven dat u (soms of vaker) rookt. We willen u graag wat aanvullende vragen stellen om een goed beeld te krijgen van uw rookgedrag.

6. Hoeveel sigaretten/sigaren rookt u gemiddeld per dag?
   …. per dag

7. Kunt u aangeven in welke mate u tabaksverslaafd bent op een schaal van 1 (helemaal niet verslaafd) tot 10 (extreem verslaafd).
   1 ---------- 10

8. Hoeveel minuten na het opstaan steekt u uw eerste sigaret/ sigaar/ pijp op?
   +- .... minuten

❑ Ik rook alleen ‘s avonds
❑ Ik rook alleen in het weekend

9. Voorgoed stoppen met roken is voor mij...
❑ Onmogelijk
❑ Heel moeilijk
❑ Redelijk moeilijk
❑ Redelijk gemakkelijk
❑ Heel gemakkelijk

10. Na een paar uur niet roken voel ik een onweerstaanbare drang om te roken
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

*Anticonceptiepil*

11. De volgende vormen van anticonceptie bevatten de stof ethinylestradiol:

- Nuvaring
- Evra-pleister
- Lovette
- Ethinylestradiol/Levonorgestrel
- Microgynon20
- Microgynon30
- Microgynon50
- Levonorgestrel/Ethinylestradiol
- Stediril30
- Trigynon
- Modicon
- Neocon
- Trinovum
- Mercilon
- Marvelon
- Femodeen
- Minulet
- Trinordiol
- Cilest
- Volina
- Yaz
- Rosal
- Yasmin
- Zoely
- Qlaira
- Daylette

Gebruikt u een van de bovenstaande anticonceptie methodes? Dit kunt u vinden op de verpakking en/of op de strip

❑ Ja
❑ Nee (-> vragenlijst afgelopen)

12. Hoe lang gebruikt u deze anticonceptiepil / ring / pleister al?
…. jaar

13. Wat is de belangrijkste reden waarom u de anticonceptiepil / ring / pleister gebruikt in plaats van een andere vorm van anticonceptie?
❑ Makkelijk in gebruik
❑ Betrouwbaar
❑ Aanbevolen door mijn dokter
❑ Controle over menstruatiecyclus
❑ Als hulpmiddel tegen acne of menstruatiepijn
❑ Anders namelijk ..

14. Het is makkelijk voor mij om te stoppen met de pil / ring / pleister of over te stappen op andere anticonceptie.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

Geef aan in hoeverre u het eens bent met de volgende stellingen.

*Perceived severity*

15. Ik beschouw het combineren van de pil / ring / pleister met roken als een bedreiging voor de gezondheid.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

16. Ik schat in dat de kans op hart- en vaatziekten groot is door het combineren van roken met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

17. Ik schat in dat de kans op een hartaanval groot is door het combineren van roken met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

18. Ik schat in dat de kans op trombose groot is door het combineren van roken met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

19. Ik schat in dat de kans op een beroerte (herseninfarct) groot is door het combineren van roken met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

20. Ik schat in dat de kans op een longembolie groot is door het combineren van roken met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

*Perceived vulnerability*

21. Ik denk dat de kans groot is dat mijn gezondheid er onder lijdt als ik de pil / ring / pleister blijf combineren met roken.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

22. Ik denk dat ik extra gezondheidsrisico's loop doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

23. Ik denk dat de kans groot is dat ik hart- en vaatziekten krijg doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

24. Ik denk dat de kans groot is dat ik een hartaanval krijg doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens

❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

25. Ik denk dat de kans groot is dat ik trombose krijg doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

26. Ik denk dat de kans groot is dat ik een beroerte (herseninfarct) krijg doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

27. Ik denk dat de kans groot is dat ik een longembolie krijg doordat ik roken combineer met de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

28. Ik denk dat ik een hoger risico loop op het krijgen van gezondheidsproblemen dan andere vrouwen van mijn leeftijd omdat ik roken met de pil / ring / pleister combineer.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

*Perceived response efficacy*

29. Ik denk dat ik mijn gezondheidsrisico's kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

30. Ik denk dat ik mijn risico op hart- en vaatziekten kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

31. Ik denk dat ik mijn risico op een hartaanval kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

32. Ik denk dat ik mijn risico op trombose kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

33. Ik denk dat ik mijn risico op een beroerte (herseninfarct) kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

34. Ik denk dat ik mijn risico op een longembolie kan verlagen door te stoppen met de combinatie van roken en de pil / ring / pleister.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

*Perceived self efficacy*

35. Als ik me voorneem te stoppen met de combinatie roken en de pil / ring / pleister, lukt me dat zeker.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

36. Ook al is het lastig voor me om te stoppen met de combinatie roken en de pil / ring / pleister, lukt me dat zeker.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

37. Ook al moet ik moeite doen om mijn leefstijl te veranderen met betrekking tot de combinatie roken en de pil / ring / pleister, ik zet wel door.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

38. Ik ben in staat om te stoppen met de combinatie roken en de pil / ring / pleister.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

*Outcome measures*

39. Op dit moment heb ik de intentie om te stoppen met roken.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

40. Wanneer mij hulp aangeboden zou worden om te stoppen met roken, zou ik deze aanvaarden.

- ❑ Zeer oneens
- ❑ Enigszins oneens
- ❑ Neutraal
- ❑ Enigszins mee eens
- ❑ Zeer mee eens

41. Ik heb de intentie om uit te zoeken hoe ik het stoppen met roken het beste kan aanpakken.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

42. Ik heb de intentie om binnen afzienbare tijd gestopt te zijn met roken.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

43. Ik vind het erg belangrijk om te stoppen met roken.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

44. Op dit moment heb ik de intentie om te stoppen met de pil / ring / pleister.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

45. Ik heb de intentie om uit te zoeken welke andere vormen van anticonceptie dan de pil / ring / pleister voor mij geschikt zouden kunnen zijn.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

46. Ik heb de intentie om een afspraak met mijn huisarts te maken om over te stappen op een andere vorm van anticonceptie dan de pil / ring / pleister.
❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

47. Ik vind het erg belangrijk om te stoppen met de anticonceptiepil / ring / pleister of over te stappen op een andere vorm van anticonceptie.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

48. Ik heb de intentie om op korte termijn gestopt te zijn met de anticonceptiepil / ring / pleister of overgestapt te zijn op een andere vorm van anticonceptie.

❑ Zeer oneens
❑ Enigszins oneens
❑ Neutraal
❑ Enigszins mee eens
❑ Zeer mee eens

**Einde van de vragenlijst**

Dit is het einde van de vragenlijst, hartelijk bedankt voor uw medewerking. Als u opmerkingen heeft over de vragenlijst kunt u die hier achterlaten. Bij verdere op- of aanmerkingen kunt u contact opnemen met de onderzoekster, Nieneke Hofstra (T: +316 50822836 of E: n.hofstra@uva.nl), of de supervisor, Claudia van der Heijde (T: +31 20 525 5306 of E: c.m.vanderheijde@uva.nl).

## *7.2. Appendix 2: Questionnaire – English version*

Dear participant,

Before starting the questionnaire, it is important that you are aware of the procedure that is followed in this research. Therefore, read the text below carefully and do not hesitate to ask for clarification about this text, should it not be clear. The researcher will gladly answer any questions.

**Purpose of this research**
Previous research has shown that women have a very high risk of thrombosis (a blood clot in a blood vessel) when they smoke and also use the contraceptive pill, Nuvaring or Evra patch. The purpose of this research is to get insight in the amount of women in our general practice that use this combination, and how this problem can best be solved.

**Procedure during the investigation**
This research is conducted with the help of a questionnaire that consists of 48 multiple choice questions. In this questionnaire you will be asked for general personal background information, possible smoking behavior and contraceptive use. Completing the questionnaire will take approximately 10 minutes.

**Voluntarily**
If you decide not to participate in this study, this will have no consequences for you. If you decide to stop the questionnaire, you can do so at any time, without giving reasons and without this having any consequences for you. You can request to have your research data deleted within 7 days after the research.

**Your privacy is guaranteed**
Your personal data (about who you are) remain confidential and will not be shared without your explicit permission. Your research data is further analyzed by the researchers who collected the data. Research data published in scientific journals are anonymous and cannot be traced back to you. Fully anonymised research data can be shared with other researchers.

**Further information**
If you have questions about this research, in advance or afterwards, you can contact the responsible researcher; C.M. van der Heijde (cmvanderheijde@uva.nl). For any formal complaints about this research, you can contact Wery van den Wildenberg (wpmvandenwildenberg@uva.nl) of the Faculty Ethics Commision (FMG) of the University of Amsterdam.

- ❑ I have read the above information and have understood it to my satisfaction. I lend my cooperation to this research and hereby consent to the use of my entered data for research purposes.
- ❑ I do not give permission and do not want to participate in this study (-> questionnaire ended)

**Questionnaire**

*Demographic factors*

1. Age
   … years

2. Have you lived most of your childhood in the Netherlands?

❑ Yes
❑ No

3. I consider myself as: (multiple options possible)

❑ Dutch
❑ Turkish
❑ Moroccan
❑ Surinamese
❑ Antillean
❑ Otherwise, namely ..

4. What is the highest level of education that you have completed?

❑ Primary school
❑ High school
❑ Vocational education
❑ Higher professional education
❑ Academic degree
❑ Doctor's degree

*Smoking addiction*

5. I smoke:

❑ Never (-> questionnaire ended)
❑ Sometimes
❑ Regularly
❑ Often
❑ Very often

You have indicated that you smoke (sometimes or more often). We would like to ask you some additional questions to get a clear image of your smoking behavior.

6. On average, how many cigarettes/cigars do you smoke per day?
   … per day

7. Can you indicate to what extent you are addicted to tobacco on a scale from 1 (not at all addicted) to 10 (extremely addicted).
   1 ---------- 10

8. How many minutes after getting up in the morning do you light your first cigarette / cigar / pipe?

- ❑ + - .... minutes
- ❑ I only smoke in the evening
- ❑ I only smoke on weekends

9. Permanently quitting smoking for me is ...
- ❑ Impossible
- ❑ Very difficult
- ❑ Pretty hard
- ❑ Quite easy
- ❑ Very easy

10. After not smoking for a few hours I feel an irresistible urge to smoke
- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

*Contraceptive use*

11. The following forms of contraception contain the substance ethinyl estradiol:

| | | |
|---|---|---|
| - Nuvaring | - Trigynon | Cilest |
| - Evra-pleister | - Modicon | Volina |
| - Lovette | - Neocon | Yaz |
| - Ethinylestradiol/Levonorgestrel | - Trinovum | Rosal |
| - Microgynon20 | - Mercilon | Yasmin |
| - Microgynon30 | - Marvelon | Zoely |
| - Microgynon50 | - Femodeen | Qlaira |
| - Levonorgestrel/Ethinylestradiol | - Minulet | Daylette |
| - Stediril30 | - Trinordiol | |

Do you currently use one of the above contraceptive methods? You can find this on the packaging and / or on the strip.
- ❑ Yes
- ❑ No (-> questionnaire ended)

12. For how many years have you been using this birth control pill / ring / patch?
… years

13. What is the <u>main</u> reason for using the birth control pill / ring / patch instead of another form of birth control?
- ❑ Easy to use
- ❑ Reliable
- ❑ Recommended by my doctor
- ❑ Control over menstrual cycle
- ❑ As an aid against acne or menstrual pain
- ❑ Otherwise, namely ..

14. It is easy for me to stop using the pill / ring / patch or switch to another birth control method.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

Indicate to what extent you agree with the following statements.

*Perceived severity*

15. I consider combining smoking with the birth control pill / ring / patch as a health threat.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

16. I believe the risk at cardiovascular diseases is high when smoking is combined with the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

17. I believe the risk at a heart attack is high when smoking is combined with the birth control pill / ring / patch..

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

18. I believe the risk at thrombosis is high when smoking is combined with the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

19. I believe the risk at a stroke is high when smoking is combined with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

20. I believe the risk at pulmonary embolism is high when smoking is combined with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

*Perceived vulnerability*

21. I think there is a good chance that my health will suffer if I continue to combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

22. I think I have additional health risks because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

23. I think there is a good chance that I will get cardiovascular disease because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

24. I think there is a good chance that I will get a heart attack because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral

- ❑ Slightly agree
- ❑ Strongly agree

25. I think there is a good chance that I will get thrombosis because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

26. I think there is a good chance that I will get a stroke disease because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

27. I think there is a good chance that I will get pulmonary embolism because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

28. I think I have a higher risk of getting health problems than other women of my age because I combine smoking with the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

*Perceived response efficacy*

29. I think I can reduce my health risks by quitting with the combination of smoking and the birth control pill / ring / patch.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

30. I think I can lower my risk of cardiovascular disease by quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

31. I think I can lower my risk of a heart attack by quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

32. I think I can lower my risk of thrombosis by quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

33. I think I can lower my risk of a stroke by quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

34. I think I can lower my risk of pulmonary embolism by quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

*Perceived self efficacy*

35. If I intend to stop with the combination of smoking and the birth control pill / ring / patch, I will certainly succeed.

❑ Strongly disagree
❑ Slightly disagree

❑ Neutral
❑ Slightly agree
❑ Strongly agree

36. Even when it is difficult for me to stop with the combination of smoking and the birth control pill / ring / patch, I will certainly succeed.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

37. Even though I have to make an effort to change my lifestyle with regard to the combination of smoking and the birth control pill / ring / patch, I will push through.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

38. I am capable of quitting the combination of smoking and the birth control pill / ring / patch.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

*Outcome measures*

39. At the moment I intend to quit smoking.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

40. If help would be offered to me to quit smoking, I would accept it.

❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

41. I intend to find out what the best way to quit smoking could be for me.

❑ Strongly disagree

❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

42. I have the intention to have quit smoking in the near future.
❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

43. I think it is very important to quit smoking.
❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

44. At the moment I intend to stop using the birth control pill / ring / patch.
❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

45. I intend to find out what other forms of birth control could be good alternatives for me, instead of using the pill / ring / patch.
❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

46. I intend to make an appointment with my doctor to switch to a different form of birth control than the pill / ring / patch.
❑ Strongly disagree
❑ Slightly disagree
❑ Neutral
❑ Slightly agree
❑ Strongly agree

47. I think it is very important to stop using the birth control pill / ring / patch, or switch to another form of birth control.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

48. I have the intention to have stopped using the birth control pill / ring / patch in the near future, or to have switched to another form of birth control.

- ❑ Strongly disagree
- ❑ Slightly disagree
- ❑ Neutral
- ❑ Slightly agree
- ❑ Strongly agree

**End of the questionnaire**

This is the end of the questionnaire, thank you very much for your cooperation. If you have comments about the questionnaire, you can leave them here. For further comments or remarks you can contact the researcher, Nieneke Hofstra (T: +316 50822836 or E: n.hofstra@uva.nl), or the supervisor, Claudia van der Heijde (T: +31 20 525 5306 or E: cmvanderheijde@uva.nl).

## *7.3. Appendix 3: Message end of questionnaire*

Research has shown that the best way of persuading smokers to quit smoking is dependent of their nicotine dependence and of their own intention to quit smoking (Moorman & Van der Putte, 2008). People with a high nicotine dependence and a high intention to quit smoking can more effectively be persuaded using a loss framed message. Loss framed messaging emphasizes on the costs of smoking, by using a negative approach. To persuade smokers with a low nicotine dependence or a low intention to quit smoking, it is best to use a gain-framed approach. This type of message framing emphasizes on the benefits of quitting smoking, rather than on the costs of continuing smoking like in the loss framed approach (Toll et al., 2007). It is expected that these people with low nicotine dependence and low quitting intentions are less likely to see their behavior as a risk and see the risk factors as irrelevant to them, which makes loss framed messaging less effective (Moorman & Van der Putte, 2008). Within this research, women who indicated to have a high intention to quit smoking ('*slightly agree'* or '*strongly agree'*) were displayed a loss framed message at the end of the questionnaire. Women who indicated to have a low intention to quit smoking ('*strongly disagree'*, '*slightly disagree'* or '*neutral*') were displayed a gain framed message at the end of the questionnaire.

### *7.3.1 Dutch version*

**Loss framed message**

Aan de hand van de antwoorden die u heeft ingevuld in deze vragenlijst blijkt dat u rookt en de anticonceptiepil/ring/pleister gebruikt. U heeft waarschijnlijk al eerder gehoord dat roken veel consequenties kan hebben voor uw gezondheid, maar wist u ook dat roken combineren met de pil/ring/pleister nog veel grotere risico's geeft op bepaalde aandoeningen? De schadelijke gevolgen van roken kunnen door de pil/ring/pleister versterkt worden, met alle gevolgen van dien. Door tegelijkertijd te roken en de pil/ring/pleister te gebruiken vergroot u uw kans op verschillende hart- en vaatziekten, zoals een hartaanval, trombose, een beroerte en een longembolie aanzienlijk. Hart- en vaatziekten zijn verantwoordelijk voor bijna 30% van de totale sterfte in Nederland. Als u rookt én de pil/ring/pleister gebruikt, heeft u een grotere kans op het krijgen van hart- en vaatziekten dan vrouwen die enkel roken of enkel de pil/ring/pleister gebruiken.

Aangezien roken veel meer gezondheidsrisico's met zich meebrengt, is stoppen met roken de verstandigste optie. Stoppen met roken hoeft u niet alleen te doen, met begeleiding is stoppen met roken makkelijker. Er zijn allerlei verschillende soorten begeleiding waar u uit kunt kiezen: een coach, een groepstraining of telefonische coaching. Ook hulpmiddelen zoals nicotinevervangers kunnen echt helpen. Met de combinatie van begeleiding en hulpmiddelen is de kans het grootst dat

het u lukt. Voor advies kunt u een afspraak maken met uw huisarts op https://www.huisartsenamsterdam.nl/. Daarnaast zijn er verschillende gratis online hulpmiddelen die u kunnen ondersteunen in het stoppen met roken, een voorbeeld hiervan is de zelfhulp van Jellinek, deze kunt u vinden op http://www.zelfhulptabak.nl/Portal. Voor telefonische- en persoonlijke begeleidingsprogramma's kunt u kijken op https://www.medipro.nl/, deze begeleiding wordt vergoed door de verzekering.

Mocht u absoluut niet willen stoppen met roken, dan raden wij u aan om te stoppen met de anticonceptiepil die u nu gebruikt. U zult dan de gezondheidsrisico's van het roken behouden, maar deze niet meer verergeren door het gebruik van uw anticonceptiepil. Er zijn anticonceptiepillen geen extra gezondheidsrisico's geven in combinatie met roken. Daarnaast zijn er andere vormen van anticonceptie die voor u geschikt zouden kunnen zijn, zoals een mirena spiraal of de prikpil. Voor advies kunt u een afspraak maken bij uw huisarts op https://www.huisartsenamsterdam.nl/.

**Gain framed message**

Aan de hand van de antwoorden die u heeft ingevuld in deze vragenlijst blijkt dat u rookt en de anticonceptiepil slikt. U heeft waarschijnlijk al eerder gehoord dat stoppen met roken veel voordelen voor uw gezondheid zal opleveren, maar wist u ook dat stoppen met de combinatie van roken en de pil al helemaal belangrijk is? De schadelijke gevolgen van roken kunnen door de anticonceptiepil versterkt worden, met alle gevolgen van dien. Door te stoppen met de combinatie roken en de anticonceptiepil verkleind u uw risico op verschillende hart- en vaatziekten, zoals een hartaanval, trombose, een beroerte en een longembolie aanzienlijk. Als u stopt met de combinatie van roken en de pil slikken, dan heeft u een kleinere kans op hart- en vaatziekten dan vrouwen die deze combinatie wel blijven gebruiken.

Aangezien stoppen met roken veel meer voordelen voor uw gezondheid met zich meebrengt, is dit de verstandigste optie. Stoppen met roken hoeft u niet alleen te doen, met begeleiding is stoppen met roken makkelijker. Er zijn allerlei verschillende soorten begeleiding waar u uit kunt kiezen: een coach, een groepstraining of telefonische coaching. Ook hulpmiddelen zoals nicotinevervangers kunnen echt helpen. Met de combinatie van begeleiding en hulpmiddelen is de kans het grootst dat het u lukt. Voor advies kunt u een afspraak maken met uw huisarts op https://www.huisartsenamsterdam.nl/. Daarnaast zijn er verschillende gratis online hulpmiddelen die u kunnen ondersteunen in het stoppen met roken, een voorbeeld hiervan is de zelfhulp van Jellinek, deze kunt u vinden op http://www.zelfhulptabak.nl/Portal. Voor telefonische- en persoonlijke begeleidingsprogramma's kunt u kijken op https://www.medipro.nl/, deze begeleiding wordt vergoed door de verzekering.

Mocht u absoluut niet willen stoppen met roken, dan raden wij u aan om te stoppen met de anticonceptiepil die u nu gebruikt. U zult dan de gezondheidsrisico's van het roken behouden, maar deze niet meer verergeren door het gebruik van uw anticonceptiepil. Er zijn anticonceptiepillen geen extra gezondheidsrisico's geven in combinatie met roken. Daarnaast zijn er andere vormen van anticonceptie die voor u geschikt zouden kunnen zijn, zoals een mirena spiraal of de prikpil. Voor advies kunt u een afspraak maken bij uw huisarts op https://www.huisartsenamsterdam.nl/.

### *7.3.2. English version*

**Loss framed message**

Based on the answers you have entered in this questionnaire, it appears that you currently smoke and use the contraceptive pill/ring/patch. You have probably heard before that smoking can have many negative consequences for your health, but did you also know that combining smoking with the pill/ring/patch gives even greater risks at certain diseases? The harmful effects of smoking can be enhanced by the contraceptive pill/ring/patch, increasing your health risks. By smoking and using the pill/ring/patch at the same time you considerably increase your chance of various cardiovascular diseases, such as a heart attack, thrombosis, a stroke and pulmonary embolism. Cardiovascular diseases are responsible for almost 30% of the total mortality in the Netherlands. If you smoke and use the pill/ring/patch, you have a greater chance of getting cardiovascular diseases than women who only smoke or only use the pill/ring/patch.

Since smoking contributes to many more negative health consequences, quitting smoking is the best option. You do not have to quit smoking by yourself, quitting is easier with guidance. There are multiple different kinds of guidance that you can choose from: a coach, group training or telephone coaching. Products such as nicotine replacements can also really help. By combining guidance with nicotine replacements, you are most likely to succeed. For advice you can make an appointment with your doctor at https://www.huisartsenamsterdam.nl/. In addition, there are several free online tools that can support you in quitting smoking, an example is the self-help tool by Jellinek, which you can find at http://www.zelfhulptabak.nl/Portal. For telephone- and personal guidance programs you can take a look at https://www.medipro.nl/, these guidance programs are reimbursed by insurance companies.

If you absolutely do not want to quit smoking, we recommend you to stop using the birth control pill/ring/patch that you are currently using. You will then retain the health risks of smoking, but will no longer aggravate these with the use of your pill/ring/patch. There are contraceptive pills that do not cause additional health risks in combination with smoking. In addition, there are other contraceptives that may be suitable for you, such as an hormonal- or copper intrauterine device

(IUD), birth control implant or the Depo Provera injection. For advice you can make an appointment with your doctor at https://www.huisartsenamsterdam.nl/.

**Gain framed message**

Based on the answers you have entered in this questionnaire, it appears that you currently smoke and use the contraceptive pill/ring/patch. You have probably heard before that quitting smoking can will bring you many health benefits, but did you also know that quitting the combination of smoking and the pill/ring/patch is even more important? The harmful effects of smoking can be enhanced by the contraceptive pill/ring/patch, increasing your health risks. Quitting the combination of smoking and the pill/ring/patch significantly reduces your risk of various cardiovascular diseases, such as a heart attack, thrombosis, a stroke and pulmonary embolism. If you stop combining smoking and the pill/ring/patch, you have a lower risk of cardiovascular diseases than women who continue to use this combination.

Since smoking contributes to many more negative health consequences, quitting smoking is the best option. You do not have to quit smoking by yourself, quitting is easier with guidance. There are multiple different kinds of guidance that you can choose from: a coach, group training or telephone coaching. Products such as nicotine replacements can also really help. By combining guidance with nicotine replacements, you are most likely to succeed. For advice you can make an appointment with your doctor at https://www.huisartsenamsterdam.nl/. In addition, there are several free online tools that can support you in quitting smoking, an example is the self-help tool by Jellinek, which you can find at http://www.zelfhulptabak.nl/Portal. For telephone- and personal guidance programs you can take a look at https://www.medipro.nl/, these guidance programs are reimbursed by insurance companies.

If you absolutely do not want to quit smoking, we recommend you to stop using the birth control pill/ring/patch that you are currently using. You will then retain the health risks of smoking, but will no longer aggravate these with the use of your pill/ring/patch. There are contraceptive pills that do not cause additional health risks in combination with smoking. In addition, there are other contraceptives that may be suitable for you, such as an hormonal- or copper intrauterine device (IUD), birth control implant or the Depo Provera injection. For advice you can make an appointment with your doctor at https://www.huisartsenamsterdam.nl/.

# 8. Reflection

Voor mijn gevoel heb ik tijdens deze stage periode goed kunnen ervaren hoe het is om wetenschapper te zijn, dit vond ik vooraf erg belangrijk omdat er veel mogelijkheden zijn vanuit mijn studie om in het onderzoek terecht te komen. In de afgelopen drie maanden heb ik ontzettend veel geleerd over het doen van wetenschappelijk onderzoek. Ik heb de laaste jaren voor verschillende vakken zowel individueel als met groepsgenoten een kleinschalig onderzoek moeten doen. Hierbij was echter meestal sprake van een literatuurstudie of een onderzoek waarbij de benodigde data al beschikbaar was. Nu ik zelf data heb moeten verzamelen door middel van een vragenlijst, ben ik erachter gekomen hoeveel werk er gaat zitten in alle processen die hieraan vooraf gaan. Zo heb ik geleerd hoe belangrijk het is om elke keuze die je maakt te kunnen onderbouwen met wetenschappelijke literatuur. Waarom is dit onderzoek belangrijk, waarom zijn bepaalde vragen belangrijk om te stellen, wat voor advies krijgen mensen te zien aan het einde van hun vragenlijst, etc. Daarnaast heb ik geleerd om vooruit te denken. Zo was het belangrijk om van tevoren te bedenken welke analyses ik wilde doen, welke data ik hier voor nodig had en op welke manier ik deze data wilde meten. Dit alles om te voorkomen dat ik wanneer ik alle vragenlijsten binnen had gekregen, ik erachter zou komen dat het helemaal niet mogelijk bleek te zijn om bepaalde resultaten te verkrijgen. Ik vond het erg leerzaam en leuk om zelf verbanden aan te kunnen tonen in mijn eigen verzamelde dataset, dit gaf erg veel voldoening. Ik kijk met een positieve blik terug op deze stageperiode, en ik kijk uit naar wanneer ik de stageperiodes tijdens de master die ik ga doen.