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Smoking Cessation – an Update

Rauchentwöhnung – ein Update

REVIEW

ACCEPTED: November 2017
PUBLISHED ONLINE: December 2017
DOI: 10.5960/dzsm.2017.307

Gohlke H. Smoking cessation – an update. Dtsch Z Sportmed. 2017; 68: 281-286.

1. DEUTSCHE HERZSTIFTUNG E.V., *Frankfurt/Main, Germany*

Summary

› **Tobacco smoking** is the single most important cause for avoidable morbidity and premature deaths in Germany resulting in more than 120.000 deaths per year. Seventy percent of smokers would like to quit but only three percent per year are successful without help.

› **A structured certified curriculum** has been available in Germany since 2008 consisting of an Internet-based learning platform combined with two days of direct group counselling. The support of smoking cessation is -from the national economic point of view - a very cost-effective way of gaining quality adjusted life years but it is not adequately integrated into the management of smoking patients. The duration of smoking history, the number of daily cigarettes smoked, tobacco dependence, the motivation to quit, support by medication as well as the duration and intensity of a smoking cessation intervention are important factors determining the success. Although pharmacological support increases the success of smoking cessation, reimbursement for the medication is prohibited by the social security code (§34 SGB V).

› **In contrast to** worldwide scientific consensus the German legislation defines smoking at any intensity level as "life style". Increasing tobacco taxes would be important to decrease the start of smoking in adolescents who are particularly threatened by tobacco addiction.

› **Thus improvements** are necessary in the education of medical students, continuous medical education of physicians as well as in the legislation to decrease the high death toll of tobacco use in Germany.

KEY WORDS:
Tobacco Dependence, Nicotine Dependence, Tobacco Taxes, Avoidable Morbidity, Premature Deaths

Zusammenfassung

› **Rauchen** ist die wichtigste Ursache für vermeidbare Erkrankungen und vorzeitigen Tod. In Deutschland sind mehr als 120 000 Todesfälle pro Jahr durch das Tabakrauchen bedingt. Siebzig Prozent der Raucher würden gerne den Tabakkonsum beenden, aber nur drei Prozent pro Jahr schaffen es ohne Hilfe.

› **Ein strukturiertes zertifiziertes Curriculum** ist seit 2008 verfügbar mit internetbasierten Lerneinheiten in Kombination mit einer 2-tägigen Beratung in Gruppen. Die ärztliche Unterstützung der Tabakentwöhnung ist eine unter volkswirtschaftlichen Gesichtspunkten höchst kosteneffektive Maßnahme, sie wird aber trotz des starken gesundheitlichen Nutzens nicht ausreichend in das Management des rauchenden Patienten eingebunden. Die Dauer der Raucheranamnese, die Anzahl der täglich gerauchten Zigaretten, eine Nikotinabhängigkeit, die Motivation des Rauchers, eine medikamentöse Unterstützung sowie die Dauer und Intensität der Intervention sind wichtige Faktoren, die den Erfolg der Raucherentwöhnung bestimmen. Obwohl eine medikamentöse Unterstützung den Erfolg der Entwöhnung signifikant unterstützt, ist die Vergütung für Medikamente den Krankenkassen durch §34 SGB V untersagt.

› **Entgegen** weltweiten wissenschaftlichen Erkenntnissen, wird vom Gesetzgeber das Rauchen in jeder Intensität als „Lebensstil" definiert. Eine deutliche Erhöhung der Tabaksteuer wäre eine wirksame Maßnahme, um die Aufnahme des Rauchens bei Jugendlichen zu vermindern, die besonders durch eine Tabakabhängigkeit gefährdet sind.

› **Verbesserungen** sind sowohl bei der Ausbildung der Studenten, der Weiterbildung der Ärzte, der Umsetzung der individuellen Beratung als auch bei der Gesetzgebung notwendig, um den hohen Morbiditäts- und Mortalitätszoll des Tabakkonsums in Deutschland zu senken.

SCHLÜSSELWÖRTER:
Tabakentwöhnung, Nikotinabhängigkeit, Tabaksteuer, vermeidbare Erkrankungen, vorzeitige Todesfälle

Introduction

Smoking causes more than one in ten deaths worldwide, and killed in 2015 more than 6 million people with a global loss of nearly 150 million disability-adjusted life-years (15). Germany is the country with second worst tobacco control status in Europe (21) In Germany, each year between 106.000 and more than 120.000 persons die from tobacco induced diseases (28,33) which makes smoking the largest single cause for preventable deaths. This has been acknowledged by the German minister of health (36) even though the social security code (§34 SGB V) – in contrast to international scientific evidence and assessment by the WHO (20) - does not consider tobacco-addiction a disease. According to German law tobacco consumption regardless of intensity is considered as „lifestyle"(45). ›

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Table 1

The main points of the counselling algorithm of this structured intervention can be memorized with the five R's as specified in the table (4).

MAIN POINTS OF THE COUNSELLING ALGORITHM	
Relevance	The physician can explain to the patient the importance of smoking cessation based on his knowledge of his/her individual circumstances (physical status,familial and social circumstances,personal goals, possible health concerns or former smoking cessation attempts) and should relate this to the reason for his/her current office visit.
Risks	Based on the above the physician should name the short and long term risks for the patient and his/her family.
Rewards	The smoker should name advantages and benefits of smoking cessation.
Roadblocks	The realization of the intent to stop smoking mostly fails because of the following anxieties: to be unsuccessful, to gain weight, to enter a depressive mood; the fear of craving or grief about loosing the pleasant feeling associated with smoking may also be important roadblocks.
Repetition	Repetition is important! During each contact the smoker should be asked about his motivation to quit; repetition is helpful to establish a motivation for smoking cessation.

Therefore, the German health insurance system is not allowed to pay for medications supporting smoking cessation and hence is unable to fight the largest single cause of preventable diseases and deaths. Accordingly, it is not surprising that Germany occupies the 34th position in the survey of tobacco control activity in 35 European countries in 2016 (21). The costs of smoking are not only high in terms of increased morbidity and mortality for the German population but also in economic terms. The estimated direct and indirect annual costs of smoking for the economy are about 79 billion Euros whereas the „state income" in form of taxes from tobacco sales amounts to 14 Billion Euros per year(13).

It has been stated that it is difficult to identify any other condition that presents such a mix of lethality, prevalence, and neglect, despite effective and readily available interventions (24). The low utilization of clinical cessation interventions by smokers and physicians alike has partly been attributed to inadequate insurance coverage (29).

The purpose of this update is to sensitise physicians (and also politicians) for the enormous impact of smoking on the health of the population; to emphasize the need for adjustment of the framework requirements for smoking cessation to the current scientific knowledge as well as the need for improvement of primary prevention of smoking.

Need for Smoking Cessation Programs

Smoking cessation is a complex and dynamic process and there is a great need for readily available smoking cessation programs from the individual smoker's point of view. In a US survey 70 percent of smokers said they would like to quit; every year 40% do quit for at least one day (26). Some highly addicted smokers make serious attempts to quit but are able to stop only for a few hours (33). Moreover, the 80% who attempt to quit on their own return to smoking within a month; each year only 3% of smokers quit successfully (5, 26).

Benefit of Smoking Cessation

The benefits of smoking cessation for the health of the individual smoker have been clearly established by randomized and observational studies in healthy persons and in patients with asymptomatic pulmonary disease, stable or unstable angina, after bypass surgery or after myocardial infarction as well as for patients with diabetes (2, 9,10, 11, 22, 27, 31,32,39). For patients after bypass surgery e.g. smoking cessation increases life expectancy by three years compared to persistent smoking - probably more than the effect of bypass surgery (11). Smoking after acute myocardial infarction (AMI) is associated with more angina and worse health related quality of life in all domains, whereas smokers who quit after AMI have similar angina levels and mental health as never smokers. These observations may help encourage patients to stop smoking after AMI (9).

Smoking cessation does not only improve the health of the individual current smoker but it is also highly cost-effective from the perspective of the society: in the US smoking cessation would not cost but save for the national economy more than 1750 US $ per quality adjusted life year (QALY) (22). In the British Doctors Study smoking cessation at 60, 50, 40 or 30 years of age, gained three, six, nine or ten years of life expectancy respectively (10). Thus a significant amount of money could be spent for smoking cessation and this would still be highly cost-effective for gaining additional QALYs – more than any other preventive strategy (22).

Behavioural Interventions

Changing a lifestyle habit is difficult and behavioural interventions are time consuming; nicotine addiction plays a crucial role for maintaining the smoking habit and impeding smoking cessation (5). However basic aspects of consultation could be improved by increasing awareness of the problem. Although the simple advice of the personal physician to the patient to give up smoking (in relation to his current reason for the office visit) is effective (14, 19, 37) this advice is given only to 50% of smokers; less than 10% of smokers are advised to participate in a smoking cessation course (26). As a consequence of these data, which apply similarly to Germany, medical associations have to implement better educational programs for physicians that focus on prevention and smoking cessation. Also, prevention has to gain more importance in the education of medical students and physicians.

Smoking cessation is of particular importance in patients with vascular disease, where it is reasonable to integrate behavioural interventions for smoking cessation in long-term prevention programs on cardiovascular risk factor control, which could be coordinated by prevention assistants(41, 42).

The efficacy of behavioural interventions for smoking cessation has been reviewed (30). Interventions varied in intensity and duration: in randomized controlled trials classified as minimal clinical intervention the mean duration of sessions varied from 1 to 20min. The mean total duration of sessions using individual counselling varied from 13.5min to 10h, for group counselling from 7.5 to 16 h, and for telephone counselling from 3 to 60min. Intensive interventions, including individual counselling (Odds Ratio[OR] 1.49, 95% CI 1.08-2.07), group counselling (OR 1.76, 95% CI 1.11-2.93), and telephone counselling (OR 1.58, 95% CI 1.15-2.29), all substantially increased smoking abstinence compared with control. The OR for minimal interventions (1.50 ,95%CI 0.84-2.78) suggested that it may be efficacious at promoting smoking abstinence but the results did not reach statistical significance (30).

A structured curriculum entitled "Tobacco Dependence" has been available in Germany since 2008 and is certified by the German Medical Association. This "blended-learning" program,

consisting of an internet-based learning platform combined with two days of direct group counselling, is offered by a number of the medical associations in different German federal states (4) (Table 1).

Support by Medication

Although the intensity and the duration of the behavioural intervention are important the outcome can be improved by medication: three medications which differ in their mechanism of action are in use to support smoking cessation by softening withdrawal symptoms (25):

- Nicotine replacement therapy (NRT) as patch, gum, inhaler or nasal spray replaces directly the nicotine in tobacco products.
- Bupropion mitigates the symptoms of withdrawal whereas
- Varenicline acts as a partial nicotine agonist.

A network meta-analysis of randomized controlled trials on the efficacy and safety of smoking cessation interventions in patients with cardiovascular disease (38) revealed that varenicline (OR: 2.64; 95% (CI] 1.34-5.21) and bupropion (OR: 1.42; 95% CI, 1.01-2.01) were associated with greater abstinence than placebo. The evidence about NRT in this patient population was inconclusive (OR: 1.22; 95% CI, 0.72-2.06). Telephone therapy (OR: 1.47; 95% CI: 1.15-1.88) and individual counselling (OR: 1.64, 95% CI: 1.17-2.28) were both more efficacious than usual care, whereas in-hospital behavioural interventions were not (OR: 1.05; 95% CI, 0.78-1.43).

Population wide Measures: Taxes and Advertising

Although counselling the individual patient for smoking cessation is usually the task of the physician, population wide measures for primary prevention of smoking in the population have a greater impact on the health of the population(22). On a smaller scale the physician may also have a task in promoting smoking prevention: she or he as a professional in health matters may be asked in the community about her/his opinion about smoking in the school yard or about billboards for cigarettes in general or even in proximity to public schools or kindergartens. Here the physician may also have a role to inform and influence persons responsible for such decisions in the community.

One important goal of preventing tobacco consumption and tobacco related diseases in the society is to decrease uptake of smoking in children and adolescents. The single most important factor for decreasing smoking in this age group are the costs of cigarettes (35) (Fig. 1).

Accordingly, tax increases would be particularly effective to decrease smoking. Cigarette prices are low at about six Euros per pack in Germany, the Netherlands and Belgium or even below six Euros in Austria, whereas in countries like the United Kingdom, Ireland and Norway prices are above 10€ - countries that score much better on the tobacco control scale than Germany or Austria (21). New York City in August 2017 drastically increased the price for a pack of cigarettes by 24% from 10.50$ to 13.00$ to decrease smoking in the city and its health-related consequences for its citizens (40).

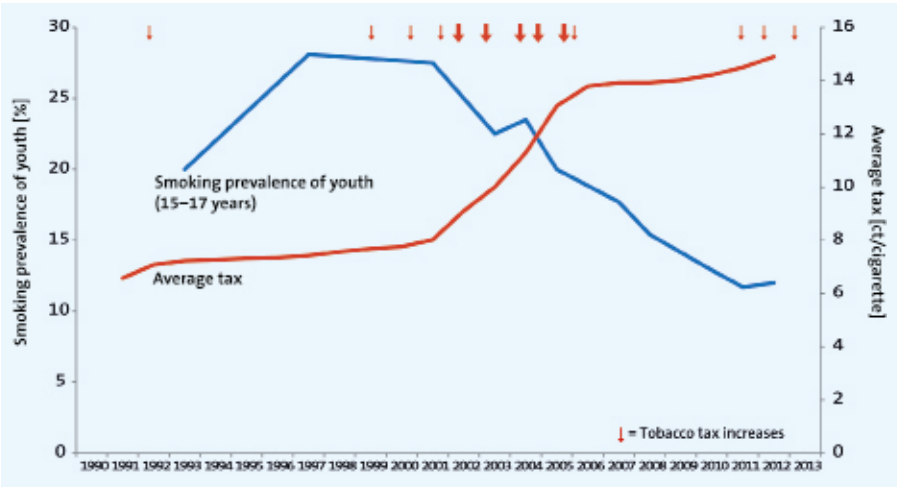

Figure 1

Percentage of smokers among 12-17 year old youths in Germany and average tobacco tax per cigarette; with permission from Ref.35; source: Statistisches Bundesamt 1991-2013; Bundeszentrale für gesundheitliche Aufklärung 2013.

Education and information can help to decrease smoking habits particularly in the young age group(16). This is one point emphasized in the WHO-initiated Framework convention on Tobacco Control (FCTC). The prohibition of public advertising for smoking is a second important aspect of prevention which is demanded in Article 13 in the FCTC(43). Accordingly, all European countries (with the exception of Germany!) have prohibited public advertising for tobacco products.

The earlier smoking is initiated the longer the habit will persist. Tobacco smoke creates major problems in early life and even in the fetus of young mothers. The damage induced by toxins in cigarette smoke during the vulnerable period when the lung is undergoing growth and remodeling has important implications for later life (3).

Newer but still unproven strategies for smoking cessation

Additional non-traditional approaches have been tried in an attempt to improve the effects of behavioural interventions.

Low Nicotine Cigarettes

Slowly decreasing the nicotine content of cigarettes could possibly help to overcome nicotine dependence. Participants who were not planning to give up smoking within the next 30 days were randomly assigned to smoke for six weeks either their usual brand of cigarettes or one of six types of investigational cigarettes with lower nicotine content, provided free. During the six-week study, reduced-nicotine cigarettes compared to standard-nicotine cigarettes reduced nicotine exposure, dependence on nicotine and the number of cigarettes smoked as well as craving during abstinence from smoking. However only cigarettes with less than 2.4mg nicotine per gram of tobacco (compared to 15.2mg per gram of tobacco in the usual brand) had this effect: No long-term effects of the exposure to low nicotine cigarettes were reported (12).

Mobile Phone Apps for Adolescents

Young people would rarely consult a physician because of their smoking habit. Young people can be reached more easily by modern information technology. This was attempted by creating a free photoaging mobile phone app ("Smokerface") with which one half of the face of a self-portrait was modified as it ›

would look like after five, ten or 15 years of smoking, compared to normal aging without smoking in the other half of the face (6). More than 400,000 young students in German secondary schools have downloaded the app. The young students received with this app additional information about the effects of smoking and the benefits of not smoking. In a small sample more than 60% of the students perceived the intervention as fun, claimed that the intervention motivated them not to smoke, and stated that they learned new benefits of non-smoking. Less than 15% of students did not think that they had learned new benefits of non-smoking. A randomized study is planned to evaluate the effect of the Smokerface mobile phone app on smoking behaviour in this young age group (7).

E-Cigarettes

The health effects of e-cigarettes have been reviewed recently (17). It is likely that e-cigarettes are less harmful than conventional cigarettes mainly because the vapor contains no combustion-products of tobacco leaves, which have multiple carcinogenic effects (3,32). Of particular concern however appear to be the ultra-fine particles in the e-cigarettes vapor the number and distribution of which are similar to those in tobacco smoke. Frequent low or short-term levels of exposure to fine and ultrafine particles from tobacco smoke or air pollution can contribute to pulmonary and systemic inflammatory processes and increase the risk of cardiovascular and respiratory disease and death (8, 34, 44). E-cigarettes have been promoted as smoking cessation aids, and many individuals who use e-cigarettes believe that they will help them quit smoking conventional cigarettes. The assumption that e-cigarettes will be as effective as or even more effective than pharmaceutical nicotine replacement therapies has also motivated support for e-cigarettes among some public health researchers and policy makers- particularly in England (1). Studies evaluating the use of e-cigarettes for quitting smoking however are small and of limited quality. The most recent Cochrane analysis in 2016 came to the conclusion that the confidence in the smoking cessation results of the evaluated trials is to be rated as 'low' by GRADE standards because of the small number of smoking cessation trials with e-cigarettes, the low event rates and wide confidence intervals around the estimates (18).A second metanalysis came to similar conclusions(23).Taken together, these studies shed some doubt on the hypothesis that e-cigarettes are associated with successful quitting in general population-based samples of smokers (17, 18, 23).

Conclusion

Smoking cessation remains a challenge for the individual smoker, the treating physician and a complex problem for society. The motivation of the smoker, the degree of addiction, the intensity and duration of the behavioural intervention and the support by medication are important factors determining the success of the behavioural intervention. The benefits of smoking cessation are overwhelming for the individual as well as for the society. The unique situation in Germany is that the current law considers nicotine or tobacco addiction still as a form of lifestyle and not as a treatable disease (45) and this against all scientific evidence, against international consensus and despite more than 120,000 tobacco induced deaths in Germany per year. Primary prevention of smoking and smoking cessation particularly of patients with vascular disease need more emphasis in the curriculum of the medical school and in continuing medical education for practicing physicians.

In addition in Germany a better transfer of current scientific knowledge about the health and economic benefits of smoking prevention and smoking cessation from the scientific community to the members of the parliament should become an important component of the strategy to decrease the detrimental consequences of smoking and significantly improve the health of the population.

Conflict of Interest

The authors have no conflict of interest.

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