

HTA-Report | Summary

Effectiveness and cost-effectiveness of behavioural strategies in the prevention of cigarette smoking

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Health political background

For Germany, the mortality attributable to smoking is estimated at 110,000 to 140,000 deaths per year. Tobacco consumption is among the most important single risk factors for many chronic and fatal diseases (e. g. cardiovascular diseases, carcinomas and chronic diseases of respiratory organs). From an economic point of view, the impact of smoking is also substantial. Annual costs attributable to smoking are estimated at 17 to 21 billion euro (nearly seven billion euro for medical treatment). Despite the numerous negative effects of tobacco use, the smoking prevalence in Germany is still high with estimated average smoking rates of 32 % for males and 22 % for females. Compared across different countries, the prevalence of smoking in children and adolescents in Germany is extremely high. To reduce smoking rates within populations different tobacco control measures (e. g. advertising bans, smoking bans, tobacco taxes) have been implemented in the past. Additionally, behavioural strategies have traditionally been used in the primary prevention to prevent the uptake of smoking among youths and adolescents. The present HTA report evaluates the medical effectiveness and cost-effectiveness of these measures.

Scientific background

The hazardous health effects of smoking and second hand smoke are nowadays well known and confirmed in numerous studies. In industrialised countries tobacco smoke is the single most common preventable risk factor for a variety of chronic and often deadly diseases. Because the majority of smokers initiate this habit early in life, behavioural preventive strategies usually tried to prevent the uptake of ever smoking among children and youths. School-based prevention programs were therefore frequently used in the past. However, these programs were often ineffective or the evidence on effectiveness was inconclusive. Because of these disappointing results associated with school-based prevention programs, community strategies and multisectorial prevention strategies have more recently been implemented in many countries. At present it is unclear, however, whether these more comprehensive prevention strategies are associated with increased effectiveness compared to school-based programs alone.

Research questions

The goal of this HTA is to summarise the current literature on behavioural strategies for smoking prevention and to evaluate their medical effectiveness/efficacy and cost-effectiveness as well as the ethical, social and legal implications of smoking prevention programs. In addition, this report aims to compare the effectiveness and efficacy of different intervention components and to evaluate the reliability of results in the German context. The goal of this report is to determine the long-term effectiveness / efficacy

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Within the scope of the



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and cost-effectiveness of behavioural interventions to prevent the uptake of smoking in children and youths. In order to do so, the following research questions will be addressed from a medical standpoint:

- What is the long-term effectiveness/efficacy of behavioural prevention strategies in the primary prevention of smoking among children and youths compared to no intervention?
- What is the long-term effectiveness/efficacy of school and community-based interventions on its own compared to multisectorial or comprehensive interventions in the prevention of smoking among children and youths?
- What is the long-term effectiveness/efficacy of specific behavioural intervention components in the prevention of smoking among children and youths and which intervention components might be associated with superior effectiveness?
- What is the applicability of results to the German context?

Out of health economics perspective, the following questions are of particular importance for the economic efficiency examination:

- Are the behavior-based measures for smoking prevention in adolescents cost-effective?
- What is the cost-effectiveness of behavior-based measures in comparison to each other?
- Which economic or health political consequences arise for the German health care system?

Methods

Relevant publications were identified by means of a structured search of databases accessed through the German Institute of Medical Documentation and Information (DIMDI). In addition a manual search of identified reference lists was conducted. The former included the following electronic resources:

DAHTA; INAHTA (NHS-CRD-HTA); NHSEED; CDAR94 (NHS-CRD-DARE); CDSR93 (Cochrane Library); ME00 (MEDLINE); EM00 (EMBASE); CB85 (AMED); BA90 (BIOSIS Previews); MK77 (MEDIKAT); CCTR93 (Cochrane Library – Central); GA03 (gms); SM 78 (SOMED); CV72 (CAB Abstracts); II78 (ISTPB + ISSHP); ED93 (ETHMED); AZ72 (GLOBAL Health); AR 96 (Deutsches Ärzteblatt); ME0A (Medline Alert); EA08 (Embase Alert); IS90 (SciSearch); CC00 (CCMed); IN73 (Social SciSearch); KR03 (Karger Publisher Database); KL97 (Kluwer Publisher Database); SP97 (Springer Publisher Database); SPPP (Springer Publisher Database PrePrint); TV01 (Thieme Publisher Database).

The present report includes German and English literature published between August 2001 and August 2006. The search parameters can be found in the appendix. The target population was youth aged up to 18. The methodological quality of included studies was assessed using the criteria recommended by the “Scottish Intercollegiate Guidelines Network (SIGN) Grading Review Group”.

The documentation of methodical quality of the economic studies took place in consideration of the checklists to evaluate the methodical quality of health economic procedures and the German Scientific Working Group Technology Assessment for Health Care.

Results

Medical results

Among 3,580 publications, the selection process identified 47 publications reporting the results of 37 medical studies meeting the pre-specified inclusion criteria. These included 21 studies rated with good and high methodological quality. School-based programs were investigated in 14 studies, while community and multisectorial strategies were each investigated in eleven studies. In addition, one meta-analysis was identified, evaluating school-based and multisectorial prevention programs. Among 37 included medical studies, only 16 reported smoking uptake as the outcome parameter, while the remaining studies reported overall smoking rates or alternative outcomes. Duration of follow-up varied between twelve and 120 months. Although overall effectiveness of prevention programs showed considerable heterogeneity, there was evidence for the long-term effectiveness of behavioural smoking prevention programs. However, the reduction in smoking rates was only moderate. Especially community and multisectorial interventions reported reductions in smoking rates, while school-based programs on its own did not provide conclusive evidence for intervention effectiveness. None of the included studies investigated the sustainability of intervention effects until adulthood and only few studies evaluated single intervention components in regards to their effectiveness. Only one study from Germany fulfilled the methodological requirements and was included in this report.

Economic results

Only three economic studies were identified, focussing on school-based interventions. Study results suggested a trend towards positive cost-effectiveness of school-based behavioural interventions. The available evidence is not sufficient, however, to draw reliable conclusions in regards to the cost-effectiveness of school-based interventions. No further conclusions regarding alternative behavioural interventions can be made.

Discussion

Discussion of medical aspects

Behavioural preventive strategies were effective to delay or decrease uptake of smoking behaviour among children and youths. The effect size, however, was only moderate. While there was considerable heterogeneity in study quality, follow-up duration and reported effect sizes, the overall quality of included studies was satisfactory. Similar to previous research, there was no conclusive evidence for the long-term effectiveness of school-based interventions. Community and multisectorial interventions, however, provided more conclusive evidence for intervention effectiveness. Because none of the methodologically reliable studies investigated intervention effects specifically until the onset of adulthood, conclusions regarding the sustainability of intervention effects are limited. Similarly, due to a lack of studies investigating single intervention components, reliable conclusions in regards to the effectiveness of specific components were limited. On the other hand, there is evidence, that findings from international studies can be adapted and used in Germany despite the fact that only one study from Germany fulfilled the inclusion criteria. Furthermore, the effectiveness in Germany seems to be comparable as long as intervention strategies are adapted appropriately.

Discussion of economic aspects

Overall, study results were variable, depending on the investigated school-based interventions and defined modelling scenario. The cost-effectiveness predominantly fell below international cost-effectiveness values and health benefits were mainly observed in the long-term. Therefore, studies mainly adopted a long-term perspective to evaluate smoking prevention strategies.

All identified economic studies focused on school-based interventions. The available evidence and broadness of publications was therefore not sufficient to compare single behavioural prevention strategies. Due to the lack of evidence regarding behavioural interventions, no explicit economic as well as health political consequences for the German health care system can be derived.

Discussion of ethical, social and legal aspects

No relevant publications dealing with ethical, social or legal aspect of the topic could be identified in the course of this HTA-report.

Conclusions/Recommendations

Behavioural preventive strategies can be effective in the prevention of smoking uptake and reduction of smoking rates among children and youths. It seems advisable though, to incorporate community strategies in addition to school-based strategies in order to improve the intervention effectiveness. Based on presented findings, it was not possible to provide sufficiently strong evidence for specific intervention components. Considering transferability to the German context, it can be concluded that results of this report have to be considered best available evidence for the development of future prevention programs in Germany, as long as methodologically reliable studies of current prevention programs are unavailable. In view of the moderate reductions in smoking uptake and smoking rates identified in this report, the additional implementation of population wide and environmental strategies seems essential to achieve meaningful and sustainable reductions in smoking prevalence. In addition, further research in form of cost-effectiveness and cost studies is needed. The availability of epidemiological and clinical studies from Germany, comprising high evidence and significant results, would enable the construction of health economical models. Thus, the prediction of economic as well as health political consequences for the German health care system would be possible.