

Smoking and SF-36 health functioning

Mikko Laaksonen ^{a,*}, Ossi Rahkonen ^a, Pekka Martikainen ^b,
Sakari Karvonen ^c, Eero Lahelma ^a

^a Department of Public Health, P.O. Box 41, FIN-00014 University of Helsinki, Finland

^b Population Research Unit, Department of Sociology, University of Helsinki, Finland

^c STAKES (National Research and Development Centre for Welfare and Health), Finland

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Abstract

Objective. To examine the association between smoking and general health as measured by the Short-Form Health Survey (SF-36) questionnaire.

Methods. Data derived are from three cross-sectional surveys conducted in 2000, 2001 and 2002. Respondents to the postal surveys were middle-aged employees of the City of Helsinki (1799 men and 7171 women, response rate 67%). Smoking status was divided into current heavy and moderate smokers, ex-smokers and never smokers. Health status was measured by the eight SF-36 subscales and the physical and mental component summaries.

Results. On the physical subscales, current smokers reported poorer health than non-smokers on general health and physical functioning in men. On the mental subscales, current smokers had consistently poorer health than non-smokers. However, often only heavy smokers differed from non-smokers. No differences were found between ex-smokers and never smokers on any subscale or the component summaries of the SF-36.

Conclusions. Differences between smoking categories were found on some physical and all mental subscales of the SF-36. The differences were slightly larger among men. As heavy smokers more often report limitations with daily activities as well as loss of well-being, these impairments potentially provide valuable incentives for non-smoking to be used in health education messages and interventions.

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Introduction

The discussion on health effects of smoking has been dominated by the well-known association of smoking with several chronic diseases and subsequent mortality (World Health Organization, 2002; Ezzati and Lopez, 2004). The chronic diseases that smoking is largely responsible for include cardiovascular diseases, lung and other cancers and diseases of the respiratory system. It has been estimated that smokers may lose even up to 10 years of life because of their smoking (Anon, 2002; Doll et al., 2004; Brønnum-Hansen and Juel, 2001). However, smokers are also expected to have shorter lifetime in good health and spend more years with disability than non-smokers (Brønnum-Hansen and Juel, 2001; Nusselder et al.,

2000). Yet, relatively little is known about how smoking affects general health, including functioning and personal well-being. The possible effect of smoking on self-evaluated general health is important for estimating the total health burden of smoking. Functional status and well-being are increasingly important outcome measures in medical care (Guyatt et al., 1993).

The Short-Form Health Survey (SF-36) is one of the most widely used measures of general health. The SF-36 is a broad-spectrum profile measure that consists of eight subscales and component summaries on physical and mental health. The measure basically indicates the self-assessed impact of ill-health and diseases on functioning and well-being. The primary focus is on functioning and the ability to perform daily tasks and activities. Furthermore, the SF-36 measures how people feel physically and emotionally and what they think about their health. As a non-specific measure, the SF-36 has been used in connection with various risk factors, such as hypertension (Bardage and Isacson, 2001) or obesity (Doll et al., 2000; Laaksonen et al., in press).

* Corresponding author. Fax: +358 9 191 27570.

E-mail address: mikko.t.laaksonen@helsinki.fi (M. Laaksonen).

Only few population studies have examined the association between smoking and the SF-36. Furthermore, the results vary greatly. Some studies have found current smokers to report consistently poorer health than non-smokers or ex-smokers (Tillmann and Silcock, 1997; Wilson et al., 1999), while others have found such differences only on some SF-36 subscales (Bellido-Casado et al., 2004; Lyons et al., 1994; Mulder et al., 2001; Olufade et al., 1999). Some studies have found a dose–response relationship between the amount of smoking and one or more subscales (Mulder et al., 2001; Wilson et al., 1999). Most studies are based on very small samples (Bellido-Casado et al., 2004; Lyons et al., 1994; Olufade et al., 1999; Tillmann and Silcock, 1997), and none has examined men and women separately.

The aim of this study was to compare general health as measured by the SF-36 questionnaire between current heavy and moderate smokers, ex-smokers and never smokers among middle-aged employed men and women.

Methods

Data

Data are derived from women and men employed by the City of Helsinki (Lahelma et al., 2005). In 2000, 2001 and 2002, a self-administered questionnaire was mailed to each employee aged 40, 45, 50, 55 or 60 at the year of the survey. The response rate to the three surveys was 69% among women and 60% among men. The data include 1,799 men and 7,171 women, reflecting the fact that 80% of the employees of the City of Helsinki are women. Younger respondents and manual workers were slightly underrepresented among the respondents.

Measures

Smoking status was divided into four categories on the basis of past and present regular smoking. All respondents were first asked whether they currently smoked cigarettes, cigars or pipe on a regular basis. A follow-up question asking how many daily cigarettes, cigars or pipefuls current smokers on average smoked daily was used to distinguish between moderate and heavy smokers. For men, a cut-off point of 20 cigarettes per day was used but since few women exceeded this amount a cut-off point of 15 cigarettes was used for them. Current non-smokers were further asked whether they had ever smoked regularly. This question was used to divide non-smokers into ex-smokers and never smokers.

The Short-Form Health Survey (SF-36) includes 36 items assessing health status on eight subscales: physical functioning, role limitations due to physical problems, bodily pain, general health perceptions, mental health, role limitations due to emotional problems, social functioning and vitality (Ware et al., 1993). All subscales are scored from 0 to 100, with higher scores indicating better health. Factor analysis has been used to compress these eight subscales into two component summaries indicating physical and mental health (Ware et al., 1994). Each component summary has a mean of 50 and a standard deviation of 10 in the US general population, and higher scores again indicate better health. The four first mentioned subscales are often referred to as physical subscales and the four last mentioned as mental subscales, although vitality, social functioning and general health also correlate with the other component summary. The SF-36 has good construct validity, high internal consistency and high test–retest reliability (Ware et al., 1993, 1994).

Statistical analyses

Means and 95% confidence intervals for the eight SF-36 subscales and the two component summaries were calculated for each smoking category, adjusting for age and occupational class as covariates in ANOVA. Three to five points' difference between the compared groups has been suggested to be clinically important (Samsa et al., 1999). Furthermore, to evaluate the magnitude of the

difference between current smokers and non-smokers on a standard scale, effect sizes were calculated by dividing the difference of the mean scores by the standard deviation for each subscale. Effect size is usually classified as small (0.2–0.4), moderate (0.5–0.7) or large (>0.8) (Olufade et al., 1999). All analyses were conducted separately for women and men using SAS version 8.02.

Results

Among men, 27% and among women 23% were current smokers. Roughly half of them were classified as heavy smokers. One third of men and one fifth of women were ex-smokers, and the rest were never smokers. Women reported slightly poorer health than men on most SF-36 subscales.

Among men, current smokers reported poorer physical functioning and general health than non-smokers (Table 1). All mental subscales except role limitations due to emotional problems showed poorer health among current smokers than non-smokers. Both component summaries also showed poorer health for current smokers. However, splitting by the amount of smoking indicated that often only heavy smokers differed from the non-smokers. There were no differences between ex-smokers and never smokers on any of the subscales or the component summaries. In the effect size comparisons, largest differences were found for physical functioning, general health and general mental health.

Differences between the smoking categories were generally smaller among women than men (Table 1). On the subscales of physical health, only general health showed lower scores for current smokers than non-smokers. All mental subscales and the mental component summary showed poorer health among smokers than non-smokers. However, heavy smokers generally reported poorer health than moderate smokers, and only heavy smokers differed from the non-smokers. No differences were found between ex-smokers and never smokers.

Discussion

We examined the health effects of smoking over and above mortality and specific chronic diseases using the SF-36, a well-regarded research instrument of general health and functioning.

Physical health differences between current smokers and non-smokers were found only on the subscales of general health and physical functioning in men, and the physical component summary showed minimal differences. On the mental subscales, current smokers showed consistently poorer health than non-smokers. Previous studies have found smoking to be associated with major depression and other serious mental disorders (Anda et al., 1990). However, the association of smoking with common mental disorders, i.e. less severe mental problems as measured for example by the SF-36, is less well known. A previous study among primary care patients equally reported a more consistent association of smoking with the SF-36 mental subscales than the physical subscales (Woolf et al., 1999). Overall, differences between the smoking categories were slightly clearer among men than women.

The largest difference was found between heavy smokers and moderate smokers. On most subscales, heavy smokers reported

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