

# Opinions regarding the effectiveness of non-pharmacological measures in prevention of cardiovascular disease in the Czech Republic

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## Abstract

**OBJECTIVES:** Cardiovascular diseases are the most common cause of deaths. Cardiovascular mortality is influenced by several factors that can be changed by our behaviour. The goal of this study was to survey the opinions of physicians and nurses on the topic of preventative cardiovascular risk factors.

**METHODS:** The inquiry was carried out using a standardized structured interviewer-respondent interview (face-to-face). The final form of the interview was based on the results of a pre-investigation. The study was anonymous, participation was voluntary, and the actual interview did not contain any controversial ethical questions. To meet these goals, a non-standardized questionnaire for nurses and physicians was developed. The questions evaluated the interest, coping difficulties, and efficiency of multimodal interventions in practice. The study sample included 1000 physicians and 1000 nurses. The results were statistically evaluated.

**RESULTS:** The survey of physician and nurse opinions showed that patients were primarily interested in interventions in the area of nutrition, weight loss, and coping with pharmacotherapy; however, the overall lack of interest in smoking cessation was a surprising result. Physicians and nurses viewed smoking cessation as the most difficult risk factors to influence, followed by nutrition changes, and weight loss. It was noteworthy that more than half of the interviewed physicians and nurses were of the opinion that behavioral interventions were only sometimes or rarely effective.

**CONCLUSION:** The results of our study show that nurses and physicians largely agree on behavioral risk factors and how to influence them. Nurses and physicians in Czech health care generally agree that patients are interested in influencing the above risk factors, being least interested in exercise and smoking cessation. Nurses and physicians also consider smoking reduction and weight loss as particularly difficult risk factors to manage. Results from this study will contribute to the overall goal of preparing and implementing short-term and long-term interventions in preventive cardiology.

## INTRODUCTION

The Czech Republic has one of the higher risk of dying of cardiovascular diseases (CVD) (Rosolová *et al.* 2013; Doležel 2015). Worldwide, 48% of individuals die of CVD (World Health Statistics 2015), with mortality of those over 60 years rising above 35%. The most common cause of death is ischaemic heart disease (IHD). IHD accounts for more than 45% of CVD in men and 37% in women (Gielen *et al.* 2015b).

The incidence of cardiovascular diseases is monitored worldwide and several European countries have reduced CVD mortality over the last twenty years (Gielen *et al.* 2015b). In the Czech Republic (CZ), cardiovascular mortality has been decreasing since the 1990s. Nonetheless, the CZ still ranks higher in CVD mortality than other countries of Southern and Western Europe. Over the past twenty years not only has there been a change in CVD mortality, but there has also been a change in the profile of CVD risk factors (Cífková *et al.* 2010).

Goals set in 2016 established guidelines for managing CVD risk factors (Piepoli *et al.* 2016). As with earlier guidelines, eliminating the use of tobacco (in any form), implementation of regular exercise, maintenance of an appropriate body weight/BMI, stabilized and well controlled blood pressure, and appropriate levels of blood lipids and blood sugar were all stressed as important factors (Doležel and Jarošová 2015; Piepoli *et al.* 2016).

The current trend of preventive cardiology involves an initial estimate of general cardiovascular risk. The estimate is aimed at helping determine the best intervention (i.e., pharmacological or non-pharmacological therapy) to address the observed risk factors (Gielen *et al.* 2015b). By influencing the risk factors, the incidence of new cases of CVD can be reduced. Risk factors can be divided into qualitative or quantitative variables or into influenceable or non-influenceable (i.e., independent) factors (Mendis *et al.* 2011; Rosolová *et al.* 2013). “Independent risk factors for cardiovascular diseases include the following parameters: age, male gender, smoking, hypertension, dyslipidemia (primarily hypercholesterolemia), abdominal-type obesity, diabetes mellitus, and socioeconomic factors” (Rosolová *et al.* 2013, p. 26).

Mendis *et al.* (2011) listed the top 10 risk factors leading to death. The first five positions, include: high blood pressure, smoking, high blood sugar, physical inactivity, followed by overweight and obesity.

The cause of cardiovascular diseases is multifactorial; therefore, the prevention and potential therapy of CVD is complex (Artinian *et al.* 2010). In addition to pharmacological treatments, there are also important non-pharmacological methods, most of which address the issues of exercise, eating habits, smoking, and psychosocial factors (Gielen *et al.* 2015b). Non-pharmacological methods require combinations of elements of cognitive-behavioral therapy and elements of motivational interviews (Schwarzer 2008; Albus and Hermann-Lingen 2015).

As stated in the Guidelines of the European Cardiology Society (Piepoli *et al.* 2016), the combination of knowledge and skills of multidisciplinary teams in prevention and in treatment of cardiovascular patients can significantly reduce cardiovascular mortality through its actions (multimodal, behavioral interventions). Such interventions are suggested for high-risk individuals as well as for those with undergoing CVD treatment (Buford 2015).

Multimodal interventions can be implemented by physicians, nurses, physiotherapists, nutritional therapists, and psychologists (Kotseva *et al.* 2015). Interventions can even take place outside of traditional health care facilities, i.e., they can be community based health care or health education (Tóthová *et al.* 2014). Many studies have shown that multimodal individual or group interventions can lead to desirable improvements in cardiovascular health (Kotseva *et al.* 2015). Interventions, whether individual or group, must not discriminate, i.e., they need to be available to individuals in all socioeconomic groups, both sexes, and be sensitive to cultural diversity, and to the extent possible, be individualized with regard to cultural/individual food restrictions, eating habits, and exercise limitations (Šedová *et al.* 2015; Piepoli *et al.* 2016).

Significant studies monitoring the efficacy of the guidelines implemented in cardiological prevention include EUROASPIRE I–IV – European Action on Secondary and Primary Prevention by Intervention to Reduce Events (Kotseva *et al.* 2009, 2010; Prugger *et al.* 2015; Bruthans *et al.* 2016). The Czech Republic was represented in this extensive study by two centers (Prague and Plzeň). The study dealt with the control of risk factors, life style interventions, and medication (Rosolová *et al.* 2013).

The goal of our study consisted in surveying the opinions of physicians and nurses on the topic of influenceable risk factors associated with CVD. This article focuses on presentation of the opinions with respect to interest, difficulty, and efficacy of management of CVD behavioral risk factors in current clinical practice. Nurse and physician opinions were statistically compared. The results will contribute a larger project

as well as help prepare and implement short-term and long-term intervention procedures.

## MATERIALS AND METHODS

The interviews were carried out using a standardized structured interviewer-respondent interview (face-to-face). The final form of the interview was determined based on results of a pre-investigation. The study was anonymous, participation was voluntary, and the actual inquiry did not contain any controversial ethical questions.

Data collection was carried out by 582 professional interviewers from the Institute for the Study of Health and Life Style, throughout the Czech Republic. The structured interview was offered to 1219 physicians and 1190 nurses. Some physicians (219) declined to take part, i.e. 18.0% of all physicians approached. As with physicians, some nurses (190) declined to take part, i.e. 16.0% of all nurses approached. Ultimately 1000 physicians and 1000 nurses were interviewed. The parameters of each group were constructed according to the data from the Institute of Health Care Information and Statistics (Network of Health Care Facilities 2015) from the Ministry of Health of the Czech Republic. The interviewed physicians worked in outpatient departments as general practitioners for adults, cardiologists, and internists. The nurses worked in the same specialties. The gender and age parameters of both groups were derived from the data set of all physicians and nurses of the Czech Republic. The inquiry was carried out in all regions of the Czech Republic through a professional interviewer network.

A non-standardized questionnaire for physicians and nurses was developed to assess opinions during the structured interview. Our goal was to assess opinions toward behavioral risk factors, i.e. *smoking cessation, weight loss, nutrition modification, exercise, stress reduction, and coping with pharmacotherapy*. Our inquiry targeted the opinions of physicians and nurses regarding patient interest in influencing the above stated risk factors, as well as the degree of difficulty in managing the patient risk factors, and identifying those areas where physicians and nurses believed interventions

were successful in reducing CVD risks. The opinions of physicians and nurses were evaluated using the Likert scale.

Statistical data processing was carried out by SASD 1.4.12 (Statistical Analysis of Social Data) program. The 1st classification degree and the contingency tables of selected indicators of the 2nd classification degree were processed. The degree of dependence of selected features was determined using the  $\chi^2$ , *t*-test, the independence test, and other testing criteria, as called for by the character of the features.

### *Characteristics of the sample groups*

The physicians ( $n=1000$ ) consisted of general practitioners for adults ( $n=547$ ; 54.7%), internists ( $n=364$ ; 36.4%), and cardiologists ( $n=89$ ; 8.9%). Since there are no data about the gender and age structure of physicians by specialty, the parameters of the group were derived from the data set of all physicians in the Czech Republic. The set of physicians was put together so that its structure corresponded to the structure of the data set from the perspective of regions, genders, ages and branches (general practitioner for adults, internist, cardiologist). Regarding age, 50–59 years ( $n=291$ , 29.1%) was the most common. Regarding gender, 43.2% were male and 56.8% were female physicians (Table 1).

The group of nurses included nurses working in offices of general practitioners for adults, internists, and cardiologists. The group consisted of 1000 nurses. Since there are no data about the age structure of nurse groups by specialty, the parameters of the group were derived from the data set of all nurses in the Czech Republic. The group of nurses was put together so that its structure corresponded to the structure of the basic set from the perspective of regions, ages, and branches (i.e., office of general practitioner for adults, internist, or cardiology outpatient departments). The above stated features were defined as representative features. The study included 547 (54.7%) nurses from general practices, 363 (36.3%) from internal practices, and 90 (9%) from cardiology outpatient departments. Regarding age, 30–39 years ( $n=299$ ; 29.9%) was the most common (Table 1).

## RESULTS

The study was focused on the opinions of professionals (physicians and nurses) regarding the current situation relative to health-education interventions in preventive cardiology. This article presents the opinions of physicians and nurses focused on patient interest, difficulty, and efficacy of influencing CVD behavioral risk factors. Tables 2–4 present the opinions on these issues; neutral opinions were not recorded in the tables since they represented statistically insignificant numbers.

The answers to the question about patient interest in modification of selected risk factors are shown in Table 2. The question sought opinions regarding which areas

**Tab. 1.** Age structure of sample sets.

	PHYSICIANS – N		NURSES – N	
	N	%	N	%
under 29 years	87	8.7	124	12.4
30–39 years	165	16.5	299	29.9
40–49 years	197	8.7	270	27
50–59 years	291	29.1	231	23.1
60–69 years	204	20.4	71	7.1
70 and more years	56	5.6	5	0.5
Total	1000	100.0	1000	100.0

patients were most interested in changing; the answers were chosen from a 4-degree Likert scale (*definitely yes, mostly yes, mostly no, definitely no*). The results from the question suggested that both nurses and physicians believed that their patients were interested in changing CVD behavioral risk factors. A detailed analysis showed that patients were most interested in modifying nutrition and weight loss; nurses observed this interest slightly higher than physicians. Patient interest in exercise (Table 2) produced similar results; 57% of nurses and physicians held the opinion that patients were interested, while the remaining 43% of respondents mostly held the opinion that patients were not interested in exercise interventions.

Statistically significant differences were identified with regard to physician and nurse opinions related to smoking **cessation** ( $p < 0.01$ ). Physicians (540; 54%) were significantly more likely to hold the opinion that patients were interested in smoking cessation (Table 2).

Table 3 presents nurse and physician opinions regarding which of the selected risk factors were most difficult to influence. The evaluation was done using a 5-point Likert scale (*definitely yes, mostly yes, mostly no, definitely no, cannot decide*). The variant *cannot decide* is not shown in the table. The analysis suggests that the physicians and nurses agreed that patients had some

degree of difficulty changing any of discussed risk factors. However, analysis showed that, compared to the other risk factors, smoking and weight loss were considered the most difficult modify.

Statistical testing of opinions among respondents found significant deviations **in the area of weight loss** ( $p < 0.05$ ); 85.8% of physicians and 83.9% of nurses believed that weight loss was the most difficult issue for patients. Other statistical differences were identified **in the area of smoking cessation** ( $p < 0.001$ ); with 90.9% (900) of physicians and 87.2% (844) of nurses holding the opinion that smoking behavior was the most difficult to modify. Other statistical differences in the opinions of physicians and nurses were recorded **in the area of stress reduction** ( $p < 0.01$ ). Results show that 24% of the interviewed nurses believed that patients had difficulties with stress reduction. Differences in physician and nurse opinions **regarding coping with medication** were also identified as statistically significant ( $p < 0.001$ ).

The question of efficacy of patient interventions is shown in Table 4. A 5-point Likert scale was used to evaluate the question (*always – often – sometimes – rarely – never*). The analysis suggests that most physicians and nurses interviewed believed that interventions (*Multimodal interventions – Modification of nutrition; Weight loss; Smoking; Stress reduction*) were only some-

**Tab. 2.** Patient interest in modification of selected risk factors.

Opinion	PHYSICIANS				NURSES				X <sup>2</sup>
	Positive N	%	Negative N	%	Positive N	%	Negative N	%	
Modification of nutrition	798	79.8	202	20.2	815	81.5	185	18.5	n.s
Weight loss	793	79.3	207	20.7	802	80.2	198	19.8	n.s
Exercise	578	57.8	422	42.2	570	57.0	430	43.0	n.s
Smoking cessation	540	54.0	460	46.0	482	48.2	518	51.8	<b>p &lt; 0.01</b>
Stress reduction	659	65.9	341	34.1	664	66.4	336	33.6	n.s
Coping with pharmacotherapy	669	66.9	331	33.1	685	68.5	315	31.5	n.s

**Tab. 3.** Difficulty of reduction of selected risk factors.

	PHYSICIANS				NURSES				X <sup>2</sup>
	Difficult N	%	Not difficult N	%	Difficult N	%	Not difficult N	%	
Modification of nutrition	770	77.6	222	22.4	735	75.2	243	24.8	n.s
Weight loss	853	85.8	141	14.2	821	83.9	158	16.1	<b>p &lt; 0.05</b>
Exercise	702	71.1	286	28.9	675	69.5	296	30.5	n.s
Smoking cessation	900	90.9	90	9.1	844	87.2	124	12.8	<b>p &lt; 0.001</b>
Stress reduction	757	77.3	222	22.7	724	76.0	229	24.0	<b>p &lt; 0.01</b>
Coping with pharmacotherapy	454	47.6	500	52.4	424	48.1	457	51.9	<b>p &lt; 0.001</b>

times or rarely effective. About half of the physicians and nurses believed that modification of nutrition was either *always* or *often* effective (physicians – 49.6% and nurses – 47.7%). Physicians (63.3%; 618) and nurses (65.6%; 636) believed that attempts to modify stress reduction were *sometimes* or *rarely* effective; while smoking cessation (61.1% physicians and 78% nurses) and exercise (physicians, 60.7%; nurses, 64.4%) were viewed as *sometimes* or *rarely* effective.

Statistically significant differences were identified between physician and nurse opinions on the efficacy of **weight loss interventions** ( $p < 0.05$ ), with 44.2% (438) of the interviewed physicians of the opinion that such interventions were *always* or *often* effective.

Statistically significant differences (61.1% of physicians vs. 78% of nurses) between physician and nurse opinions were also found regarding **smoking cessation** ( $p < 0.001$ ).

Statistically significant differences of opinion were also recorded with regard to **stress reduction** ( $p < 0.05$ ).

Nurses (76%; 724) evaluated the efficiency of the interventions better than Physicians (77.3%; 757).

## DISCUSSION

To assess the level of health-education interventions on cardiovascular diseases, we focused on the opinions of physicians and nurses, relative to patient interest in the intervention, as well as on the difficulty of achieving a particular goal (i.e., easy or very difficult) and on the effectiveness of the intervention in achieving a particular goal (i.e., usually successful vs. usually unsuccessful). To make the assessment, we used the following behavioral risk factors: modification of nutrition, weight loss, exercise, smoking cessation, stress reduction, and coping with pharmacotherapy.

Smoking was the most significant influenceable CVD risk factor. One out of every five deaths is attributed to smoking (Eriksen *et al.* 2015). In addition to being involved in cardiovascular and cerebrovascular mortality, it is the most frequent cause of death among patients with a cancer diagnosis (Pisinger and Tonstad 2015).

The conclusions of several significant studies (MONICA, post-MONICA, EUROASPIRE I–IV) revealed unsatisfactory results regarding prevention of influenceable CVD risk factors in many countries (Cífková *et al.* 2010; Rosolová *et al.* 2013; Kotseva *et al.* 2015; Bruthans *et al.* 2016). In particular, smoking cessation is one of the most important and most economical measures for prevention of CVD (Pisinger and Tonstad 2015). The MONICA study (1982, 1985 and 1997–98) showed that the proportion of smokers in the Czech Republic has dropped only slightly (from 28% to 26%). Surprisingly, results showed a higher proportion of female smokers over the age of 45; while other age groups showed a modest downward trend. The post-MONICA study (2009), reported 31.9% of males were regular smokers and 23.3% of females were regular smokers (Cífková *et al.* 2010). Percentagewise, men smoke more than women, with the highest proportion of smokers in the 15–24 years (28.2%) category, while other categories show a slight downward trend (Rosolová *et al.* 2013). The EUROASPIRE study (I–IV) concluded that secondary prevention programs have almost no impact on the number of smokers. The decrease between the first and the third study was from 20.3% to 18.2% (Rosolová *et al.* 2013).

Oddly, our study found that smoking cessation ranked low relative to perceived patient interest (physicians,  $n=540$  and nurses,  $n=482$ ). The difference in opinion between nurses and physicians was identified as significant ( $p < 0.01$ ; Table 2). Other results show that both physicians (90%) and nurses (87%) were of the opinion that smoking was difficult to influence ( $p < 0.001$ ; Table 3). Both nurses and physicians evaluated anti-smoking interventions as ineffective in most cases. We can safely assume that both physicians and nurses are aware of the importance of such interventions, but are equally despondent about the potential success of interventions. Kotseva *et al.* (2015), in their EUROASPIRE IV study, carried out a retrospective analysis of hospital documentation of patients ( $n=7998$ ) after a cardiovascular stroke ( $\geq 6$  months after the stroke). The results showed that 16% of patients

**Tab. 4.** Efficacy of reduction of selected risk factors.

Opinion	PHYSICIANS				NURSES				X <sup>2</sup>
	Always – Often N	%	Sometimes – Rarely N	%	Always – Often N	%	Sometimes – Rarely N	%	
Modification of nutrition	493	49.6	501	50.4	475	47.7	520	52.3	n.s
Weight loss	438	44.2	553	55.8	402	40.3	595	59.7	<b>p &lt; 0.05</b>
Exercise	389	39.3	602	60.7	351	35.6	634	64.4	
Smoking cessation	379	38.9	595	61.1	595	22.0	343	78.0	<b>p &lt; 0.001</b>
Stress reduction	359	36.7	618	63.3	333	34.4	636	65.6	<b>p &lt; 0.05</b>
Coping with pharmacotherapy	426	43.6	550	56.4	391	40.4	578	59.6	n.s

continued to smoke regularly. The conclusions of the EUROASPIRE III study pointed out significant relationships between smoking cessation, patient age, and attendance rates for rehabilitation programs in the area. As might be expected, negative relationships are found with respect to serious depressive syndromes and chronic tobacco addiction (Prugger *et al.* 2015).

Another risk factor included dietary measures based on the so-called well-balanced diet. Well-balanced diets consist of optimal amounts of basic macronutrients (fats, carbohydrates, and proteins) as well as optimal amounts of micronutrients. It is well established that total intake of fats, both saturated and unsaturated, as well as alcohol consumption are significant CVD risk factors (Dallongeville *et al.* 2015). This risk factor also needs and deserves significant patient education as it relates to CVD prevention. An optimal dietary regime is also closely related to education and understanding with regard to optimal exercise (European Heart Network 2011).

Both physicians ( $n=798$ ; 79.8%) and nurses ( $n=815$ ; 81.5%) were of the opinion that patient interest in nutrition modification was high (Table 2). However, they expressed similar pessimism with regard to the difficulty of implementing nutrition modification ( $n=770$ ; 77.6% – Table 3) and the potential for weight loss (85.8%). As Riccardi and Masulli (2015) stated, obesity is closely related to CVD. The efficacy of weight loss interventions were evaluated at similar levels by physicians and nurses (Table 4). Results from the international EUROASPIRE III study show that weight loss and eating habits interventions are often omitted in clinical practice. Kotseva *et al.* (2015) stated that more than 1/3 of patients remained obese (BMI  $\geq 30$  kg/m<sup>2</sup>) after intervention, with 55% having central-type obesity (as assessed according to waist girth). As Tóthová *et al.* (2015) stated, cultural differences must be considered in weight loss interventions.

Educating patients on the value and importance of exercise is an integral part of any multimodal intervention. At least 30 minutes of aerobic exercise should be a regular daily activity for high-risk patients (Gielen *et al.* 2015a). Our results (Tab. 2–4) showed that more than half of physicians and nurses agree that patients are interested in changing their exercise habits (Table 2). Although, both physicians and the nurses (almost 70%) share the opinion that such changes are difficult to achieve for most patients, and evaluated the efficacy of exercise-related interventions as low, with little success in practice. The EUROASPIRE III study came to similar conclusions, showing retrospectively that only 60% patients with CVD successfully changed their exercise habits (Kotseva *et al.* 2009).

Efficient CVD therapy also includes coping with pharmacotherapy and stress management (Vrijens *et al.* 2008). Coping with therapeutic processes associated with chronic CVD is not easy. This has been confirmed by a number of studies, explaining it, in part, by the fact that chronic diseases are often asymptomatic (Vrijens

*et al.* 2008). As Rosolová *et al.* (2013) stated, younger patients have worse compliance, compared to older individuals. Furthermore, it has been observed that pharmacological compliance decreases over time. Our study showed that physicians and nurses were, more or less, equally divided on this issue (with just under 50% nurses and physicians saying it was difficult and just over 50% saying that it was not difficult; Table 3).

The ability of patients to cope with CVD treatment is also related to their mental condition. Mental disorders like depression and anxiety also constitute risk factors for CVD and can be disruptive to the treatment process (Rosolová *et al.* 2013). The results of our analysis showed that both the physicians and the nurses were of the opinion that stress reduction in CVD patients was difficult to achieve (Table 3) and efficacy of stress reduction was complicated (Table 4); on the other hand, both physicians and nurses were of the opinion that patients were interested in influencing stress related to CVD treatment (Table 2).

## CONCLUSION

The results of our study are, by and large, positive. They show that nurses and physicians tend to share similar opinions with regard to CVD behavioral risk factors and how to manage with them. Nurses and physicians in Czech health care perceive patients to be generally interested in trying to influence the CVD risk factors that affect them. However, nurses and physicians also recognize that interest in exercise and smoking cessation are disappointingly low. They consider smoking reduction and weight loss to be particularly difficult risk factors to manage. It was noteworthy that more than half of the interviewed physicians and nurses ranked behavioral interventions as either *sometimes* or *rarely* effective.

We are thus left with the question: Which multimodal interventions are most effective? For example, should interventions be individual, community based, or hospital based or some combination (Kotseva *et al.* 2015). The results of this study will contribute to a larger project regarding proactive education directed at preventing CVD in the Czech Republic.

The results form a foundation for setting short-term and long-term non-pharmacological interventions in primary and secondary care of patients with high CVD risk factors and for CVD patients now under treatment.

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