

Perceived cardiovascular risk and attitude toward lifestyle change

Perceived cardiovascular risk and lifestyle change

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Key messages

- Perceived cardiovascular risk does not influence attitude toward lifestyle change
- Obesity is the key drive for planning to live healthier
- Health consciousness seems to play little role in considering lifestyle change

Abstract

Background

Cardiovascular diseases are prominent cause of death. Lifestyle change is effective in decreasing mortality. Perception of patients' cardiovascular risk by physicians is a drive for following preventive recommendations. Whether the hazard perceived by patients influences their attitude toward lifestyle is uncertain.

Objective

We hypothesized that high perceived risk would be associated with a stronger determination for lifestyle change, while incorrectly optimistic patients would be less motivated.

Methods

Two hundred patients visiting their family physicians were asked to fill out a questionnaire about demographic, clinical and lifestyle characteristics, about their attitude toward lifestyle change and their estimation of their cardiovascular risk. Actual risk was estimated by family physicians based on the national guideline.

Results

Questionnaires were completed by 80.5% (161/200) of patients approached. Patients underestimated their risk ($p < 0.001$), mainly because high/very high risk patients classified themselves into lower risk categories. The majority of patients were planning a lifestyle change, losing weight being the most popular goal. It was the priority even for some normal weight subjects and for smokers, too. Perceived risk played a marginal role as a determinant of lifestyle change. Underestimation of perceived risk had no effect on patients' motivation. Self-rated obesity was the predictor of three out of five means of change (weight loss, diet, physical activity).

Conclusion

Perceived cardiovascular risk and incorrect optimism about this hazard has minimal, if any influence on attitude toward lifestyle change. Patients' motivation seems not to be primarily health related.

Keywords: incorrect optimism, lifestyle change, perceived cardiovascular risk, primary care, weight-loss

Introduction

Cardiovascular diseases account for 38% of total deaths in the European Union [1]. Family practice is the optimal place for primary prevention: patients see physicians as credible sources of health and lifestyle related information [2], and screening belongs to the domain of primary care [3]. Among the huge number of patients who attend primary care, risk factors of cardiovascular mortality are common [4, 5]. Unfortunately, detecting these high-risk patients and starting preventive medications is often not achieved [6].

Several explanations have been proposed for this disappointing finding. Perception of patients' risk by physicians seemed to be an important drive for following preventive recommendations: assignment of risk level correlated with the frequency of lifestyle advice and preventive pharmacotherapy [7]. Unfortunately, doctors underestimate their patients' cardiovascular risk [8], which may hamper the initiation of preventive medications and reaching target levels.

Perceived risk of imminent stroke or myocardial infarction may also be a strong drive for patients to strive for a healthier way of living. Patients – similarly to doctors – often underestimate their risk [9, 10], which could have negative consequences. Decreased participation in screenings, reduced adherence to treatment [11] and conflicts between physician's advised plan of management and patients' expectations [12] have been suggested as explanation.

However, whether patients' perceived risk influences their attitude toward lifestyle change is uncertain. It is also unclear whether incorrect optimism (underestimation of cardiovascular risk) has a deleterious effect on patients' motivation. We intended to explore these possible associations. We hypothesized that high perceived risk would be associated with a stronger determination for lifestyle change, while incorrectly optimistic patients would be less motivated.

Materials and Methods

We enrolled patients from teaching practices attached to the Department of Family Medicine, Semmelweis University. We aimed to include practices of different background: one practice from the capital city, one from a large city, and two practices from smaller towns. Leaders of practices voluntarily agreed to take part in the study. They approached patients aged 40-65 years personally and asked them to participate in the study.

Physicians were required to enroll the first ten consecutive, eligible patients on five working days of a week, in June, 2017.

We developed a self-administered questionnaire that consisted of questions addressing gender, age, education, presence of chronic conditions (hyperlipidemia, diabetes, hypertension, obesity), lifestyle (smoking habits, physical activity, diet), whether they planned lifestyle change, and if yes, then in what respect (weight loss, healthier diet, more physical activity, smoking cessation, less stressful life), and about patients' estimation of their risk for cardiovascular morbidity, mortality (low, average, high, very high).

Doctors assigned patients to risk groups according to the recommendation of the Hungarian Cardiovascular Consensus Conference on risk stratification [13] and provided clinical data (BMI, chronic diseases). Details of the recommendation are summarized in Supplementary Table S1. In short, the recommendation classifies patients into four risk groups based on the presence of chronic conditions (such as diabetes, hypertension, hyperlipidemia, chronic kidney disease), end-organ damage, atherosclerotic diseases, lifestyle habits and on SCORE risk points.

Patients not being able to fill out the questionnaire due to mental or vision difficulties were excluded.

Patient-level data was available only to the family physicians of patients. Questionnaires and clinical data sheets were marked by patient code numbers and further analyzed at the Department of Family Medicine by the investigators.

All patients gave informed consent. The study was approved by the ethical committee of Semmelweis University (115/2017).

We performed a post-hoc analysis to check if the power of our study is above the generally accepted 80% value [14]. We used G*Power 3.1.9.2 software [15]. In one tailed analysis, setting alpha to 0.05, and probability level to 0.2, we evaluated the power of our analysis with 161 patients, for the weakest, significant odds ratio (1.755, the effect of healthy eating on physical activity). The result of the power analysis (87.5%) was above the generally accepted 80%.

Statistical analysis was performed with SPSS v22 (SPSS, Chicago, IL, USA). Continuous variables are presented as mean \pm standard deviation (SD), ordinal variables as median and interquartile range. As cardiovascular risk has only four categories (low, medium, high, very high), the median values not necessarily differed, even when there was significant difference between groups. For that reason, means for these ordinal variables are also used to present these differences.

We used Mann Whitney U test to compare continuous and ordinal variables and chi square test for categorical variables. We evaluated the relationship between actual and perceived risk using Wilcoxon test.

Backward logistic regression analysis was used for multivariate analyses. Results are reported as odds ratios and 95% confidence intervals (CI). In the latter analyses dependent variable was different aspects of lifestyle change and independent variables were clinical and demographic parameters of patients', and their perception of chronic conditions. P-values < 0.05 were considered statistically significant.

Results

Questionnaires were completed by 80.5% (161/200) of patients approached. The main reasons for not participating in the study were lack of time (24 patients), not specified (9 patients), feeling apprehensive about estimating the risk of their own serious disease (4) and based on exclusion criteria (unable to read without glasses, 2 patients). Main characteristics of subjects are summarized in Table 1.

Table 1. Clinical and demographic characteristics of 161 patients who completed the perceived risk and lifestyle change questionnaire in 2017

Characteristic	Value
Gender (females/males)	71/90 (44.1% / 55.9%)
Age (years)	51.7 ± 8.3
BMI (kg/m ²)	28.1 ± 5.6
Self-rated obesity/overweight	119 (73.9%)
Hypertension	90 (55.9%)
Hyperlipidemia	86 (53.4%)
Diabetes mellitus [Type 2 / Type 1]	24 [21/3] (14.9% [13.0% / 1.9%])
Smoking (%)	54 (33.6%)

Mean ± SD or number of patients and percentage.

Patients underestimate their cardiovascular risk

Most patients fell into the high risk group (84 subjects, 52.2%), 16 (9.9%) into the very high, 18 (11.2%) into the medium and 43 (26.7%) into the low risk group.

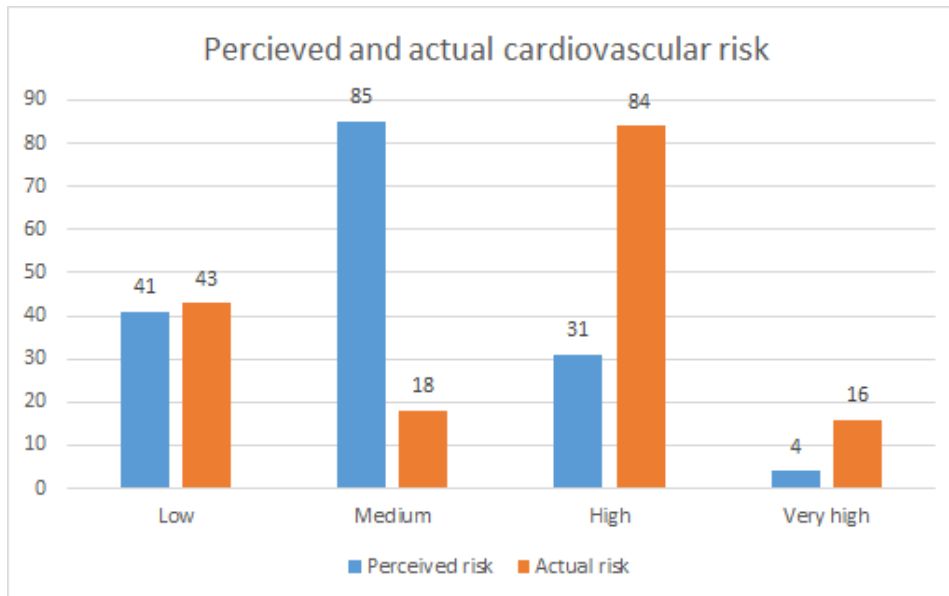


Figure 1. Distribution of cardiovascular risk categories calculated by family physicians versus perceived by the 161 patients who completed the perceived risk and lifestyle change questionnaire in 2017 (number of patients)

Perceived risk was significantly lower compared to actual risk (median risk: 2 (1-2) vs 3 (1-3), mean: 1.99 ± 0.742 vs 2.47 ± 0.992 , Wilcoxon test, $Z = -5.055$, $p < 0.001$), mainly because eighty-three patients (51.6%) from the high and very high risk groups classified themselves into lower risk categories. The number of patients with different perceived and actual risk categories is presented in Figure 1.

We found several patient characteristics associated with being optimistic about cardiovascular risk. In multivariate analysis only age (OR: 1.154, CI 1.096 to 1.215; $p < 0.001$) and obesity (OR: 2.176, CI 1.328 to 3.565; $p = 0.002$) were independent determinants of incorrect optimism (Backward logistic regression, $R^2 = 0.375$, $p < 0.001$, included variables: age, gender, education level, smoking state, hypertension, hyperlipidemia, diabetes, overweight/obesity).

In our sample 32 patients (19.9%) perceived higher risk than their actual one. Compared to subjects not overestimating their hazard, these pessimistic patients were younger (46.8 ± 7 vs 53.0 ± 8.2 years, $p < 0.001$, Mann Whitney U test) suffered less often from hypertension, diabetes or hyperlipidemia (21.9% vs 59.4%, $p < 0.001$; 0% vs 16.0%, $p = 0.003$; 6.3% vs 29.0%, $p < 0.001$; chi square test, respectively).

Perceived cardiovascular risk and readiness for lifestyle change

At the time of filling out the questionnaire, 78.9% of patients was planning lifestyle change. The most popular goal was weight loss (43.1%), followed by avoiding stress (30.6%), increasing physical activity (21.9%) and changing eating habits (19.4%).

Among those who intended to get slimmer 31.9% planned to change eating habits, 29.0% intended to increase physical activity and only 6.8% wanted to do both. Ten women with normal BMI also desired to lose weight.

In bivariate analysis we compared willingness for lifestyle change between patients with lower perceived cardiovascular risk (low and medium categories, as estimated by patients, n = 35) and higher perceived risk (high and very high categories, n = 126). More patients in the higher perceived risk group aimed to live a less stressful life than patients in the lower perceived risk group (50.0% vs 25.8%, p = 0.006, chi square test).

However, there was no difference between the groups in any other means of lifestyle change (all NS, chi square test).

In multivariate analysis, we only investigated subjective parameters, closely related to patients, as the behavior of people is influenced by factors they can comprehend or they are familiar with. Self-rated obesity played an important role in patients' decisions about lifestyle change. It was the only determinant of starting a healthier diet, and it also predicted intended weight loss and increased physical activity. Besides overweight and obesity, female sex was an independent determinant of intended weight loss (Table 2).

Table 2. Significant determinants of lifestyle change among patients who completed the perceived risk and lifestyle change questionnaire in 2017

Dependent variable (Nagelkerke R², model significance) Independent variables	Beta	Odds Ratio	95% CI	p
Weight loss (R² = 0.548, p < 0.001)				
Gender (female)	1.247	3.479	1.41-8.57	0.007
Obesity	2.287	9.846	4.87-19.90	<0.001
Healthy diet (R² = 0.053, p = 0.024)				
Obesity	0.597	1.817	1.05-3.13	0.032
Physical activity (R² = 0.177, p < 0.001)				
Education level	0.680	1.974	1.21-3.23	0.007
Obesity	0.568	1.765	1.02-3.05	0.042
Healthy eating habits	0.563	1.755	1.07-2.88	0.025
Smoking cessation* (R² = 0.116, p = 0.012)				
Eating healthy	-0.853	0.426	0.21-0.89	0.023
Less stressful life (R² = 0.085, p = 0.010)				
Perceived risk	0.612	1.845	1.09-2.92	0.016

Backward logistic regression analysis, included variables: age, gender, education level, smoking state

(variable not included in the calculation of planned smoking cessation), patient reported hypertension, patient

reported hyperlipidemia, patient reported diabetes, patient reported overweight/obesity, patient reported healthy eating habits, patient reported level of physical activity and perceived cardiovascular risk.

* Only smokers were included in the analysis

Patients planning to increase their activity were more obese, but they were already on a healthier diet, and had higher education.

Smoking cessation was only the third most often-mentioned aim among smokers (20.9%), after losing weight (39.5%) and avoiding stress (27.9%).

Perceived cardiovascular risk only increased the odds of planning to live a less stressful life, and did not influence any other means of lifestyle change.

Patients with incorrect optimism have similar willingness to change

Underestimation of cardiovascular risk by patients did not influence their intention to correct unhealthy behaviors. There was no significant difference in the number of patients planning lifestyle change between incorrectly optimistic subjects and all other patients (Table 3).

Table 3. Comparison of readiness for lifestyle change among incorrectly optimistic and all other patients who completed the perceived risk and lifestyle change questionnaire in 2017

	Patients underestimating their risk (n = 83, 51.6%)	All other patients (n = 78, 48.4%)	p
Any kind of change	65 (78.0%)	63 (80.8%)	0.671
Weight loss	36 (43.9%)	33 (42.3%)	0.839
Healthy diet	16 (19.5%)	15 (19.2%)	0.964
Physical activity	19 (23.2%)	16 (20.5%)	0.684
Tranquility	21 (25.6%)	28 (35.9%)	0.158
Smoking cessation*	20 (23.9%)	14 (17.5%)	0.466

Number and percentage of patients, chi square test.

* Only smokers were included in the analysis.

Discussion

Efforts to reduce the burden of cardiovascular diseases have yielded promising results. In some European countries, cancer has become the primary cause of mortality [1]. Further improvements seems difficult as

patients seem to be unfamiliar with their risk factors, and are often not determined for lifestyle change [16] and physicians tend to start preventive medications later than optimal [6].

Doctors' sense of cardiovascular risk increases their willingness to promote lifestyle change and recommend preventive medications [7]. We hypothesized that the risk perceived by patients will promote their activity for their health in a similar way. To test our hypothesis, we evaluated the effect of patient dependent variables on lifestyle change, including self-assignment to risk categories. Contrary to our expectations, perceived hazard did not influence most aspects of lifestyle change. Higher risk did not seem to motivate patients to lose weight, go on a healthier diet, increase physical activity or quit smoking. Based on our results the notion of changing lifestyle in order to decrease cardiovascular risk does not seem to be important for patients. Lack of motivational effect of perceived risk is rather disappointing, as lifestyle change is a reasonable means of decreasing cardiovascular risk [17-19].

Perceived hazard only determined the strive for a less stressful life. This aspect was very important for patients; it was the second most popular goal: 30.6% of patients mentioned avoiding stress as a planned lifestyle change. Whether the reason behind this popularity was seeking health or just the desire to decrease anxiety cannot be determined based on our data. It is notable though, that anxiety may facilitate participation in lifestyle change programs [20], and thus it might even have beneficial effects.

Obesity was clearly in the focus of our patients. In line with previous findings on the frequency of weight loss attempts [21], by far the most prevalent intended lifestyle change in our sample was improving weight, planned by more than 40% of patients. This popularity seems rational, as 73.9% of our patients rated themselves as obese or overweight. This finding correlates with national data on prevalence of obesity. In Hungary, 60% of women and 65% of men are overweight or obese [22, 23], putting Hungary in fourth place on OECD's worldwide chart [24].

In the EUROPREVIEW study changing eating habit, increasing physical activity and improving body weight were equally important for patients (43.05%, 48.13% and 47.58%, respectively)[25]. In our sample losing weight was more than twice as popular as exercise and diet (43.1% and 21.9%, 19.4%). The presence of self-rated obesity was the determinant of three out of five intended lifestyle changes.

In multivariate analysis – beside perceived overweight or obesity – female gender proved to be an independent determinant of intended weight loss. In general, women are more open for lifestyle change [25], especially for weight loss [21], which could partly explain our finding.

Physical activity was a unique category. This was the only group where higher education was an independent predictor, and where lifestyle change seemed achievable. Obesity and already being on a healthy diet were the other two determinants of planning to move more vigorously. The positive relationship

between these three factors (obesity, diet and exercise) is a reasonable way to live a healthier life. Such a relationship seems evident, when weight loss is planned. However, in our sample less than one third of those intending to lose weight planned to start a healthy diet or exercise more, and only 6.8% wanted to do both.

The unrealistically high number of patients who wanted to change (78.9%), the outstanding popularity of losing weight without exercise or diet, the lack of association between most aspects of lifestyle change and perceived cardiovascular risk questions the seriousness of patients' motivations and whether it was inspired by the strive for health. Moreover, women wanted to lose weight more often than men, even though – in line with the literature [26] – they had less risk factors: they were leaner and self-rated obesity was scarcer among them, they had less chronic conditions and smoked in smaller number. Similarly to an earlier report [21] even some normal weight women wanted lose weight, which decision was definitely not motivated by the aim of reducing risk. The same was true for smokers: they wanted to improve their body weight although quitting would be much more beneficial for them [27].

The pronounced role of decreasing body weight without the intention of decreasing cardiovascular risk or aiming at the greatest health benefit requires explanation. Complying with social expectations might be the underlying motivation for the determination to improve body weight. Patients experience strong social pressure, which might lead to unrealistic weight loss expectations [28]. The media often portrays thinness as the true form of beauty [29], therefore the ideal body is seen as a lean figure, with a BMI of 19 kg/m² [30]. Misinterpreting cardiovascular risk may have negative consequences. Underestimation of hazard by doctors has been reported [8], and it may play a role in delayed and suboptimal preventive therapy. Similarly to previous reports conducted in primary care [9, 10] we found that patients underestimate their risk. Weiden reported that certain risk factors (smoking, obesity, and hypertension) are associated with greater number of patients assigning themselves to high risk group. Contrary to their results, we found that patients with hypertension, diabetes, obesity, smoking and advanced age all seemed to underestimate their hazard. In multivariate analysis obesity (increasing with age) and advanced age itself were independent predictors of incorrect optimism. However, in our study those who underestimated their hazard did not show less determination for lifestyle change, probably because perceived risk hardly played any role as a motivational factor.

On the other hand, a relatively large number of patients (19.9%) overestimated their cardiovascular risk. These patients seemed to underestimate the protective effect of younger age and the lack of chronic diseases. The perception of inadequate high risk by patients could lead to over-medicalization, a serious

problem of contemporary medicine. However, we did not investigate whether these patients received more advice, diagnostic tests or treatment.

The role of family physician is vital. Huge number of patients visit their primary care provider with risk factors and chronic diseases [4, 5]. The evaluation and treatment of these patient gives us the opportunity to correct their perceived risk. We must clarify that lifestyle change decreases their risk, it is not just an issue of aesthetics. Most patients want to discuss these topics with their primary care provider [31], and two third would like to receive support from their doctors [26], although only a quarter get it [32].

Hungary has the highest number of patient-doctor encounters [33], thus family physicians are overladen. Unfortunately, there are no financial incentives to encourage giving lifestyle advice. The suboptimal activity of primary care providers underlines the importance of patients' views on lifestyle change.

This study has some limitations. The cross-sectional design of the study did not allow us to find out how many patients actually started lifestyle change, and how effective it was. Surveys based on self-report may raise doubt about accuracy and the degree of readiness for change was not investigated. Relatively low number of patients were enrolled in this study. However, patients were recruited from different types of practices, and their characteristics were comparable to that of family medicine practice visitors, in terms of proportion of smokers [34] or patients with chronic conditions [35, 36]. It is also unlikely that teaching practices would be less efficient in patient education about lifestyle change, so we do not expect that patients in other practices would have more positive attitude about lifestyle change.

Conclusion

Perceived cardiovascular risk and incorrect optimism about this hazard has minimal, if any influence on attitude toward lifestyle change. Planning to lose weight is an important notion for patients. However, health consciousness seems to play little role in considering lifestyle change.

Disclosures

The study was approved by the ethical committee of Semmelweis University (115/2017).

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The authors declare that there is no conflict of interest regarding the publication of this paper.

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