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What Are the Predictors of Self-Assessed Health in Lithuanian Health Professionals?

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Key Words: *self-assessed health; self-reported disease; risk factors; health professionals; cross-sectional survey.*

Summary. *Background and Objective. Scientific evidence indicates that patient safety and access to health care is linked to the well-being of health professionals. The self-assessed health status has been widely used as a health measure in different surveys. The aim of this study was to examine and determine the factors related to the self-assessed health status of health professionals.*

Material and Methods. The cross-sectional questionnaire surveys of nurses and physicians were carried out in randomly selected hospitals. A total of 1025 health professionals (739 nurses and 286 physicians) from 3 hospitals of different size located in 1 geographical region of Lithuania participated in the survey. The response rate among the nurses and the physicians was 89.2% and 52.5%, respectively. The overall response rate was 74.7%. The data on self-assessed health, demographic factors, anthropometric data, blood pressure, cholesterol level in blood, personal history of diseases, smoking, and alcohol consumption were gathered with the help of the questionnaire.

Results. About two-thirds (64.1%) of the health professionals reported good or quite good health, and only 1.5% of the respondents reported quite poor or poor health. Multivariate logistic regression analysis revealed that the SAH status of health professionals was dependent on age (odds ratio [OR], 1.03; 95% confidence interval [CI], 1.02–1.05 [Model 1]; OR, 1.04; 95% CI, 1.02–1.06 [Model 2]), diseases (OR, 7.32; 95%, 5.18–10.35), heart diseases (OR, 12.09; 95% CI, 2.9–50.35), hypertension (OR, 2.53; 95% CI, 1.55–4.14), cancer (OR, 6.19; 95% CI, 1.27–30.13), gastrointestinal (OR, 3.54; 95% CI, 1.59–7.86) and musculoskeletal diseases (OR, 3.21; 95% CI, 1.71–6.02), smoking (OR, 2.1; 95% CI, 1.28–3.45 [Model 1]; OR, 2.00; 95% CI, 1.26–3.16 [Model 2]), and occupation (OR, 1.47; 95% CI, 1.04–2.07 [Model 1]; OR, 1.54; 95% CI, 1.11–2.16 [Model 2]).

Conclusions. Diseases are the main predictors of self-assessed health in health professionals. Advancing age and smoking also contribute to poorer self-assessed health.

Introduction

Scientific evidence indicates that patient safety and access to health care is linked to the well-being of health professionals (1). The self-assessed health (SAH) status has been widely used as a measure in different surveys to analyze health trends, determinants, inequalities, and needs for health care resources (2). There is evidence on the validity, reliability, and predictive power of the measure as an independent predictor of a range of health outcomes, such as morbidity, mortality, and use of health services (3–6). The other factors related to the SAH status are gender, age, socioeconomic, occupational, and environmental factors (7–9).

Most of previously conducted studies used for self-assessment of health in the United States and Asian countries were based on samples from the general population, mostly in the elderly (2, 6). Recently, not much reliable information has been published on SAH and its predictors among health professionals (8, 10).

The SAH status and its predictors among health professionals are of interest for several reasons. First, better physicians' health and healthy lifestyle (11, 12) may have an effect on their self-assessment of health. Second, given that the personal lifestyle and health behaviors of health professionals, especially physicians, are an important marker of how the public perceives harmful lifestyle behaviors (13, 14) and that the SAH status reflects the person's lifestyle, it would be valuable for the patients to make healthier lifestyle choices.

Material and Methods

Study Population. Two cross-sectional questionnaire surveys were carried out among health professionals (nurses and physicians) in Lithuanian

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hospitals in September–October 2010 and December 2011. The hospitals were selected using the multistage cluster sampling technique. Lithuania administratively is divided into 5 geographical regions with 5 cities and surrounding smaller towns in which the hospitals are located. Five lists of regional hospitals were created from the national list of hospitals including the information about the size of hospitals (a large-sized hospital [more than 1000 beds] or a medium-sized hospital [500–1000 beds] and a small-sized hospital [fewer than 500 beds]). At least 2 hospitals of different size (large- or medium-sized) and small-sized hospitals were randomly selected from each of 5 geographical regions of Lithuania. Usually 1 large-sized hospital or medium-sized hospital (500–1000 beds) was randomly selected from a large town as a regional center. One small-sized hospital was randomly selected from the group of hospitals located in small towns of the geographical region. The study population comprised 1025 health professionals (739 nurses and 286 physicians) from 3 different size hospitals (large-, medium-, and small-sized) selected from 1 geographical region of Lithuania. The survey in the large- and the small-sized hospital was carried out in 2010, and in the medium-sized hospital, in 2011.

The questionnaires were distributed among all the physicians and nurses from the small- and medium-sized hospitals and from each department randomly selected from every third clinic in the large-sized hospital. A clinic (Clinic of Cardiology, Nephrology, Surgery, etc.) is a division of a large hospital, and each clinic has from 2 to 4 departments as subdivisions. The questionnaires were administered by the nurse administrator of each department. All potential participants of the study were informed that participation in the survey was voluntary and anonymous. A total of 1372 questionnaires were distributed: 828 questionnaires among nurses and 544 questionnaires among physicians. The questionnaires were returned by 739 nurses (response rate, 89.2%) and 286 physicians (response rate, 52.5%). In total, 1025 questionnaires were collected, with an overall response rate of 74.7%. Six questionnaires filled in by physicians were excluded, because the sociodemographic characteristics were missing; therefore, the data of 1019 participants were used for analysis.

Questionnaires. The questionnaire consisted of 65 questions. By the use of this questionnaire, the data on sociodemographic factors (age, gender, occupation, work type, type of clinic), anthropometric data (height, weight), several health indices (systolic and diastolic blood pressure, cholesterol level in blood), and risk factors (current smoking, alcohol consumption) were gathered. SAH was measured by asking the subjects to rate their present health status on a 5-point scale: good, quite good, average, quite poor, and poor. Information on a personal history of diseases was obtained by asking the question "What diseases do you have?"; the possible answers were "yes," "no," and "If yes, please specify." All the abovementioned questions and questions related to risk factors were formulated in the same way as in the "Health Behaviour Study Among Lithuanian Adult Population" (15). The diseases named by each respondent were coded according to the International Classification of Diseases (10th Revision) and grouped into 8 groups: hypertension, heart diseases, cancer, endocrine, gastrointestinal diseases, musculoskeletal disorders, allergy, and other diseases. Smoking was assessed by asking the question, "Do you smoke cigarettes, cigars, or pipe?"; those who answered "yes, every day" were considered to be current smokers. Alcohol consumption was evaluated by the question, "How often do you drink alcoholic beverages (beer, wine, cider, alcohol cocktails, liqueur, vodka, brandy)?" with 5 possible answers: never, once a month and less, 2–4 times a month, 2–3 times a week, and $\geqslant$4 times a week. Arterial hypertension, elevated cholesterol, and overweight were assessed according to the answers of respondents to the questions: "What is your blood pressure, cholesterol, weight, and height?" Arterial hypertension was defined as a systolic blood pressure of $\geqslant$140 mm Hg and/or a diastolic blood pressure of $\geqslant$90 mm Hg. The cut-off point for the increased cholesterol level in blood was 5 mmol/L. Overweight was defined as the body mass index (BMI) of $\geqslant$25 kg/m^2.

Statistical Analysis. Statistical analysis was performed with the SPSS 17 software program. Data analysis was processed using descriptive and inferential statistical methods, which gave proportions, means, standard deviations (SD), odds ratios (OR), and their 95% confidence intervals (CI). The level of significance was set at 5%. The Student t test was used to calculate the difference between mean values; the z test was used to compare proportions between the groups.

Multivariate logistic regression analysis was performed to assess the relationship between SAH (good=1, quite good=2, average=3, quite poor=4, and poor=5) as a dependent variable and the independent variables, such as gender (female vs. male), age, occupation (physicians vs. nurses), work type (administrative vs. nonadministrative), type of clinic (internal medicine=1, surgical=2, other=3), smoking (yes, every day vs. no), alcohol consumption (<once a month=1, 2 times a month – 3 times a week=2, $\geqslant$4 times a week=3), overweight (yes vs. no), systolic and diastolic blood pressure, any disease (yes vs. no) in Model 1 or specific diseases (yes vs. no) in Model 2. Age and systolic and diastolic

blood pressure were used as continuous variables. The variables "systolic blood pressure" and "diastolic blood pressure" were not taken in Model 2 where the variable "hypertension" was included into analysis.

Information on the model fitting was as follows: the chi-square value for the likelihood ratio of Model 1 was 253.47 (P<0.001) for the complete version and 285.12 (P<0.001) for the reduced version, which included the variables significant at the 10% level; the figures for Model 2 were 212.05 (P<0.001) and 236.79 (P<0.001), respectively. The results of the complete version are presented for further interpretation because the reduced version did not make substantial changes within the models, with the exception of increased weight in some significant relationships.

Results

Table 1 lists some characteristics of the study population. Women accounted for 93% of the study population, and 99.9% were nurses. There were no age differences between the physicians and the nurses. However, the nurses reported a disease more often as compared with the physicians. The nurses more often had overweight, while the physicians more often drank alcohol at least once a month.

About two-thirds of health professionals rated their health as good or quite good, and only 1.5% of health care professionals rated their health as quite poor or poor (Table 2). About 8% of those who reported good health had a disease, and only 6.5% of the same group of the subjects did not have any risk factor. Almost three-fifths of the subjects who reported average health had a disease, and almost all subjects from the same group had at least one of the risk factors.

Multivariate logistic regression analysis revealed that SAH was dependent mainly on any disease or specific diseases (Table 3). The respondents who reported a disease (Model 1) were more than 7 times as likely to be less healthy. Similarly, the likelihood of being less healthy was significantly greater for the subjects who reported a specific disease (Model 2), with the exception of endocrine and allergic diseases. Higher diastolic blood pressure (Model 1) was also related to worse self-rated health. The current

Table 2. Distribution of Health Measures and Risk Factors in the Study Population

Rating	Self-Assessed Health	Disease (yes/no)	Risk Factor (⩾1/no)
Good	34.4	7.8/92.2	93.5/6.5
Quite good	29.7	23.1/76.9	91.8/8.2
Average	34.4	56.5/43.5	96.5/3.5
Quite poor	1.1	81.9/18.1	100.0/0.0
Poor	0.4	100.0/0.0	100.0/0.0

Values are percentage.

Table 1. Characteristics of the Study Population

Variable	Physicians N=280†	Nurses N=739	Total N=1019
Sociodemographic factors			
Women	210 (75.0)	738 (99.9)	948 (93.0)
Age, years, mean (SD)	43.1 (12.5)	44.2 (9.0)	43.9 (10.1)
Administrative work	19 (6.8)	29 (3.9)	48 (4.7)
Type of clinic			
Internal medicine	113 (43.8)	279 (43.8)	392 (43.8)
Surgical	64 (21.0)	134 (24.8)	198 (22.1)
Other	81 (35.2)	224 (31.4)	305 (34.1)
Disease(s)‡	68 (24.4)	236 (32.6)*	304 (30.3)
Hypertension	28 (10.3)	74 (11.2)	102 (11.0)
Heart	5 (1.8)	9 (1.4)	14 (1.5)
Cancer	4 (1.5)	3 (0.5)	7 (0.8)
Endocrine	5 (1.8)	28 (4.2)	33 (3.5)
Gastrointestinal	5 (1.8)	23 (3.5)	28 (3.0)
Musculoskeletal	13 (4.8)	35 (5.3)	48 (5.2)
Allergy	2 (0.7)	9 (1.4)	11 (1.2)
Other	18 (6.6)	28 (4.2)	46 (5.0)
Risk factors			
Smoking	29 (10.4)	66 (8.9)	95 (9.3)
Use of alcohol (>once a month)	138 (49.5)	217 (29.4)*	355 (34.9)
Arterial hypertension&§	58 (23.0)	163 (24.4)	221 (24.0)
Overweight¶#	126 (47.4)	373 (54.1)*	499 (52.2)
Cholesterolemia >5.0 mmol/L**	57 (68.7)	180 (69.5)	237 (69.3)

Values are number (percentage) unless otherwise stated.
*P<0.05 comparing physicians and nurses. †Of the 286 questionnaires, 6 were not suitable for analysis.
‡At least one of below listed diseases. §Systolic blood pressure ⩾140 mm Hg and/or diastolic blood pressure ⩾90 mm Hg.
&Totally 923 subjects answered to the question. ¶Body mass index ⩾25 kg/m^2. #A total of 961 subjects answered to the question.
**A totally of 345 subjects answered to the question.

Table 3. Multivariate Logistic Regression Analysis of Factors Associated With Self-Assessed Health Among Lithuanian Health Professionals

Variable	Model 1		Model 2	
	OR	95% CI	OR	95% CI
Sociodemographic factors				
Female gender	1.57	0.85–2.9	1.44	0.8–2.58
Age	1.03	1.02–1.05	1.04	1.02–1.06
Nurse	1.47	1.04–2.07	1.54	1.11–2.16
Nonadministrative work	0.85	0.46–1.56	0.72	0.4–1.29
Surgical clinic	0.93	0.65–1.35	1.04	0.73–1.49
Other clinics	1.33	0.96–1.83	1.3	0.95–1.79
Health measures				
Disease(s)*	7.32	5.18–10.35	NA	NA
Hypertension	NA	NA	2.53	1.55–4.14
Heart	NA	NA	12.09	2.9–50.35
Cancer	NA	NA	6.19	1.27–30.13
Endocrine	NA	NA	1.97	0.91–4.29
Gastrointestinal	NA	NA	3.54	1.59–7.86
Musculoskeletal	NA	NA	3.21	1.71–6.02
Allergic	NA	NA	3.24	0.78–13.56
Other	NA	NA	5.94	3.19–11.08
Systolic blood pressure	0.99	0.98–1.01	NA	NA
Diastolic blood pressure	1.02	1.0–1.04	NA	NA
Risk factors				
Smoking	2.1	1.28–3.45	2.0	1.26–3.16
Alcohol use (2 times a month – 3 times a week)	0.9	0.66–1.21	0.87	0.65–1.16
Alcohol use (⩾4 times a week)	0.89	0.22–3.58	0.92	0.24–3.51
Overweight**	0.99	0.73–1.36	1.14	0.84–1.53

OR, odds ratio; CI, confidence intervals; NA, not applicable.
*Absent vs. present. **Body mass index ⩾25 kg/m^2.

smokers had a 2-fold higher likelihood to be less healthy. Advancing age and being a nurse were also associated with poorer SAH.

Discussion

The study demonstrated that 64.1% of health professionals rated their health as good or quite good, and only 1.5% of respondents rated their health as quite poor or poor. In the Lithuanian population, these percentages were 50% and 6.6% (15). There were some discrepancies in the SAH-rating scales that varied from "excellent-good-average-not so good-poor" to "good-quite good-average-quite poor-poor" among the studies. Nevertheless, the data from 2 highest categories were similar to the findings in health professionals reported by other authors (16), while poorer self-rated health (2 lowest categories) was reported by a smaller proportion of the respondents as compared with other studies (8, 16).

The data showed that the strongest predictor of the SAH status in health professionals was disease(s), i.e., prevalent diseases made health professionals feel unhealthy. The respondents who reported a disease had 7-fold greater odds to be less healthy. Specific diseases, heart diseases, and cancer in particular, substantially increased the risk of lower self-assessment of health. The remaining diseases, including hypertension, gastrointestinal and musculoskeletal diseases, increased the risk from 3 to 4 times. Garcia et al. (8) also showed that health professionals with musculoskeletal symptoms had almost 3 times greater odds to report being less healthy. Musculoskeletal, gastrointestinal, stress and exhaustion symptoms and sleeping problems were associated with worse physical health of nurses (10). The studies in the elderly population also reported a higher risk to be less healthy to the subjects who reported hypertension, heart disease, cancer, and diabetes (2, 17). In a random sample of Danish employees, the risk of having poor SAH was also substantially (by 5 times) higher for those with a disease, injury, or illness (7).

In this study, age remained associated with the outcome, even after adjustment for any disease (Model 1) or specific diseases (Model 2) as well as some sociodemographic and risk factors. There is evidence that the self-assessment of health deteriorates with advancing age (16, 17). Other authors also reported similar findings (7, 8), although the data were not consistent (18, 2). When assessing their health, people use their own previous health status or the health status of their peers as a reference, which makes the concept of age rather complex (19).

Our study showed that current smoking was associated with a higher likelihood to be less healthy. Smoking, an undisputed mortality risk factor, was associated with poor health ratings in the general population (7, 17, 19, 20). There was a difference of borderline significance in smoking between nurses who reported very good-good health and poor-very poor health (P=0.052) (10). However, some authors could not confirm the association (8, 18, 21). An independent association between smoking and SAH can be explained by some health problems experienced by smokers. On the other hand, smoking subjects may perceive their health to be worse than good due to being aware of harmful tobacco smoke effects on health. The association was also found among former smokers, suggesting that the effects of smoking on SAH may be long-lasting (20).

The data showed that the SAH status of health professionals was associated with occupation. There was a greater proportion of sick nurses who had 1.5 times greater odds to be less healthy as compared with physicians. Since the higher risk of being less healthy was found after adjustment for the diseases, sociodemographic and risk factors, it could be explained by certain workplace issues, which were found to be stressful by nurses: workload (22, 23), low job control, high job demands, low supportive work relationships (22), and patients' unrelieved suffering and deaths (22, 24).

In this study, gender and some specific work characteristics, such as administrative work or type of clinic, were not associated with the outcome. Similar findings showing an association between outcome and gender among older adults have been reported by Smith and Goldman (2). It has also been found that women had higher odds to be less healthy (7, 18, 25). Some authors concluded that populations in which men predominated tended to exhibit a lower prevalence of poor SAH (25). Nevertheless, Garcia et al. (8) found the opposite, i.e., that male physicians were more prone to reporting a poor SAH status.

High serum cholesterol and blood pressure are known to be the common risk factors for cardiovascular diseases, which were most prevalent within our study group. No significant association between the SAH status and the increased cholesterol level was found in our study (data not shown), and due to the low number of the subjects who answered to the question about the cholesterol level in blood, the variable was not included in the multivariate regression analysis. Other authors reported an association between SAH and cholesterol (17, 26).

Our data showed a significant association between SAH and diastolic blood pressure although an association with systolic blood pressure was not significant. Some authors reported strong relationships between SAH and blood pressure (17, 26). However, the data in the literature are inconsistent (21).

Despite a high prevalence of overweight in the study population (52%), we did not find it to be related to the SAH as in the study by Froom et al. (17). Some authors reported a relationship between the poor SAH status and obesity (8, 10). Others found that both obesity and underweight contributed to poor SAH in young adults aged 18–34 years (20). Since health professionals in our study were quite young (mean age, 43.9 years; SD, 10.1), a possible explanation for our finding is that among younger adults, the health risks linked to overweight are experienced as a lack of physical activity rather than specific health problems.

While alcohol consumption is known to have many adverse effects, our data did not show an association between alcohol consumption and the SAH. The similar patterns of association have also been found in earlier studies (18, 20). This finding could be due to a low number of heavy drinkers (4.4% of the subjects consumed alcohol 2–3 times a week and more often) and, possibly, due to the thinking that alcohol was a measure to improve a certain health-related outcome. Some authors found a J-shaped association between alcohol intake and the subjective suboptimal (average-quite poor-very poor) SAH status and concluded that a moderate alcohol intake was related to the self-perception of good health (27).

This study is one of a limited number of surveys that reported on the SAH status in health professionals and provided information on the main predictors of the SAH status among health professionals. Nevertheless, the study has some limitations. One of them is that there were missing values of different independent variables, especially the cholesterol level in blood, which was not included into multivariate regression analysis in order to avoid the reduced number of the subjects. Moreover, the study lacks detailed information on occupational risk factors and work conditions that affect health and its self-assessment (23, 28). However, we had quite a good response rate and an accepted health measurement scale, which according to most studies is one of the main tools in the health assessment (18).

Some findings obtained in the study were different from those published by other authors. Many factors could explain the differences in the subjective self-assessment of health found in different studies. First, health status was rated from "excellent-good-average-not so good-poor" to "good-quite good-average-quite poor-poor" according to the different scales employed in the studies, taking "an average" as a category to the better or poorer assessment of health. Second, the number and variety of independent variables included in the multivariate analyses proposed by different authors due to different objectives differed among the studies. Third, the differences in the study population structure, related to gender, age, income, and education can also change an association between a factor and the outcome.

Conclusions

Our study has shown that the health profile of health professionals is not good: despite the fact that about two-thirds of health professionals reported good or quite good health, the major risk factors for noncommunicable diseases such as hypertension and overweight are highly prevalent among physicians and nurses. The diseases are the main predictors of self-assessed health status in health professionals. Age and smoking are also related to self-assessed health. The last finding may have a negative impact on health professionals' ability to promote health among their patients and population. However, it might be used in targeted health education and health promotion as an additional argument for interventions, such as smoking cessation, both in health professionals and general population.

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Statement of Conflict of Interest

The authors state no conflict of interest.

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