

Exposure to cardiovascular risk factors declared by students of nursing – a pilot study

Występowanie czynników ryzyka chorób układu krążenia wśród studentów pielęgniarstwa – doniesienie wstępne

ALEKSANDRA KOŁTUNIUK, JOANNA ROSIŃCZUK

Chair of Nervous System Diseases, Department of Clinical Nursing, Faculty of Health Science, Wrocław Medical University

Wstęp. Choroby układu krążenia (CHUK) są główną przyczyną umieralności osób dorosłych w Polsce. Poprzez wczesną identyfikację i kontrolę czynników ryzyka możliwe jest podjęcie działań zmierzających do ograniczenia ich negatywnego wpływu na zdrowie.

Cel badań. Ustalenie częstości występowania deklarowanych przez respondentów czynników ryzyka CHUK oraz zależności między miejscem zamieszkania a obecnością tych czynników wśród studentów pielęgniarstwa.

Materiał i metody. Badanie zostało przeprowadzone wśród 84 studentów. Dla celów pracy zastosowano metodę sondażu diagnostycznego i technikę ankiety.

Wyniki. Zdecydowana większość respondentów (88,09%) była narażona na występowanie od 1 do 6 czynników ryzyka chorób układu sercowo-naczyniowego. Jednakże u co dziesiątego studenta zdiagnozowano występowanie aż od 7 do 13 czynników. Długotrwała praca w pozycji stojącej lub siedzącej, niewłaściwa dieta, narażenie na zanieczyszczenie powietrza oraz nadwaga to czynniki najczęściej deklarowane przez uczestników badania. Oprócz częstszego występowania niewłaściwych nawyków żywieniowych wśród mieszkańcy wsi, miejsce zamieszkania nie wywiera istotnego wpływu na występowanie czynników ryzyka chorób układu sercowo-naczyniowego wśród badanych osób.

Wnioski. Studenci pielęgniarstwa są predysponowani do rozwoju chorób układu krążenia, gdyż zdecydowana większość z nich jest narażona na działanie wielu czynników ryzyka tychże chorób. Miejsce zamieszkania nie różnicuje deklarowanego występowania czynników ryzyka rozwoju CHUK wśród studentów.

Słowa kluczowe: choroby układu krążenia, czynniki ryzyka, studenci, zapobieganie

Introduction. Cardiovascular diseases (CVDs) are the leading cause of death in the adult population in Poland. Early identification and control of risk factors are vital for the prevention of cardiovascular disorders.

Aim. The analysis of prevalence of cardiovascular risk factors declared by the respondents and the relationship between the place of residence of students of nursing and their exposure to these factors.

Material & Method. The study was conducted among 84 students. The diagnostic questionnaire method and the questionnaire technique were used in the study.

Results. Most of the respondents (88.09%) were exposed from 1 to 6 risk factors of cardiovascular conditions. However, every tenth student was diagnosed with the exposure from 7 up to 13 factors. Long-term work while standing or sitting, poor diet, exposure to air pollution and overweight are the factors most frequently mentioned by the study respondents. Except for a higher prevalence of improper dietary habits among the countryside residents, the place of residence did not significantly influence the incidence of cardiovascular risk factors in the studied population.

Conclusions. The students of nursing are predisposed to the development of circulatory conditions as in a vast majority they are exposed to several cardiovascular risk factors. The place of residence does not differentiate the incidence of development of the mentioned CVD risk factors among the students.

Key words: cardiovascular disease, risk factors, students, prevention

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Adres do korespondencji / Address for correspondence

Aleksandra Kołtuniuk MSc

Chair of Nervous System Diseases, Faculty of Health Science

Wrocław Medical University

ul. Bartla 5, 51-618 Wrocław, Poland

e-mail: ola.koltuniuk@gmail.com

Introduction

Cardiovascular disorders are considered an epidemic of modern civilization and constitute a major health problem both in Poland and worldwide. Although cardiovascular conditions represent the most frequent cause of morbidity and mortality in most

developed countries, a decrease in the number of related deaths was documented in recent years [1, 2].

Although the incidence and mortality of cardiovascular disorders is still extremely high in Poland as well, a decreasing tendency has been observed in the epidemiological data, and the percentage of cardio-

vascular mortality was reduced to 46% in 2010. Nevertheless, cardiovascular conditions still contribute to nearly every other death in the Polish population [3]. In 2009, the mortality rate of cardiovascular disorders amounted to 446 deaths per 100.000, the most frequent cardiovascular causes being ischemic heart disease (125 deaths per 100.000), followed by stroke (95 per 100.000) and atherosclerosis (87 per 100.000). The mortality was higher in women (irrespective of age) and countryside residents [4].

The term “cardiovascular risk factor” is defined as “an objective feature associated with an increased risk of cardiovascular conditions in the future” [5]. Many classifications of cardiovascular risk factors were proposed in literature [1, 6-9]. According to the possibility of therapeutic intervention, they can be divided into: 1. modifiable, e.g. improper diet, tobacco smoking, lack of physical activity, long-term work in standing or sitting position, arterial hypertension, elevated concentrations of total cholesterol and LDL, decreased concentrations of HDL, diabetes mellitus, inflammatory and prothrombic factors, and 2. non-modifiable, e.g. age, gender, family history of cardiovascular diseases in male relatives <55 years of age and female relatives <65 years), genetic predispositions, history of cardiovascular condition [1].

On the basis of available evidence the cardiovascular risk factors can also be classified as the main (traditional), predisposing, and potential factors [6-8]. Main cardiovascular risk factors include cigarette smoking, hypertension, elevated concentrations of total cholesterol and LDL, decreased concentrations of HDL, diabetes mellitus, male gender, and older age. There is evidence of the role of all these factors in the etiology of cardiovascular conditions [9]. The predisposing factors [8], in turn, i.e. obesity, especially abdominal obesity, sedentary lifestyle and low level of physical activity, familial history of preterm prevalence of cardiovascular conditions, diet, psychosocial, socioeconomic and genetic factors increase the risk indirectly, through a strong causal relationship with the main factors. Finally, there is an array of so-called potential factors, the role of which is a subject of ongoing studies in the etiology of cardiovascular conditions. This group includes environmental factors, among which best understood is the role of air pollutants, i.e., dusts, carbon monoxide, ozone, nitric oxide and sulfur dioxide [10].

Unfortunately, the results of epidemiological studies point to an increasing prevalence of both the main and predisposing risk factors. Therefore, their early identification and control are vital for the prevention of cardiovascular conditions.

Aim

The aim of the study was to analyze the prevalence of cardiovascular risk factors declared by the students

of nursing at a Polish medical university, and to verify potential relationship between the respondents' place of residence and their exposure to these factors.

Methods

The study included 84 (100%) second-year students of the level-two (master's degree) course of nursing from the Wrocław Medical University. As the level-two course lasts for two years, theoretically all the participants should possess sufficient knowledge on the prevention of cardiovascular condition. The study was conducted at a turn of 2013. The participation was voluntary and anonymous. The protocol of the study was approved by the Local Bioethical Committee of the Wrocław Medical University (approval no. KB 422/2012).

The majority of the respondents were women (96.43%), married (75%), city residents (63.1%) with a gross per capita income exceeding 1501 PLN, i.e., ca 350 euro (69.05%). Most of the surveyed students (86.9%) were professionally active. Mean age of the study group was 39.5 years, mean body weight 64.5 kg, mean BMI 24.44 kg/m². None of the respondents declared alcohol abuse (at least 15 g of ethanol in women or 30 g in men, consumed at least five times a week). However, our group included 16% of active smokers, who admitted smoking cigarettes on a daily basis. Only a small fraction of the participants (3.57% of the subjects, all diagnosed with glucose intolerance) declared an elevated level of fasting glucose (above 100 mg%) or hypertension (above 140/90 mm Hg; 4.76% of the subjects, all diagnosed with arterial hypertension). More than three-fourths of the respondents had familial history of cardiovascular conditions.

The prevalence of cardiovascular risk factors among the students was determined by means of the diagnostic questionnaire survey. The prevalence of nicotine exposure was verified with the Fagerström Test for Nicotine Dependence, and body mass index (BMI) was calculated from the self-declared values of body weight and body height.

The results of the survey were processed with the Microsoft Excel 2010 software and subjected to a statistical analysis with the Statistica 10 package (StatSoft, Tulsa, OK, United States). The significance of differences in the distributions of qualitative variables among the countryside and city residents was verified with the chi-square test. The threshold of the statistical significance was set at $p=0.05$.

Results

The analysis of our findings suggested that the vast majority of our students had an increased risk of cardiovascular disorders. Most of the respondents

(88.09%) were exposed from 1 to 6 risk factors of these conditions, including 58.11% of the individuals who revealed as many as 4 to 6 risk factors. Moreover, we identified a fraction of students (10.71%) who were exposed to 7-13 factors. Only one student did not manifest any risk factor and thus was considered as not in danger of circulatory conditions.

Prolonged work in a standing or sitting position was the most frequent cardiovascular risk factor among our participants (95.24%). Work under such conditions is associated with an increase in venous pressure, thus potentially leading to venous insufficiency.

Improper diet (consuming no more than three meals per day), which was the second frequent risk factor of cardiovascular disorders in our group, was documented significantly more often among the countryside residents (67.74% vs. 35.85% in city residents, $p=0.004$). In contrast, the students living in towns declared consuming excessive amounts of salt more frequently than those living in the countryside (26.98% vs. 12.9%) but this difference did not prove statistically significant ($p=0.61$). Every tenth respondent consumed fruit and vegetables with less than two meals daily.

Every fourth participant declared exposure to another cardiovascular risk factor, air pollutants, in a place of residence or at work.

Overweight ($BMI>25$) was the fourth frequent risk factor of cardiovascular conditions, identified in one-third of our participants. It was revealed more often, albeit insignificantly, among the students living in towns than in the countryside residents (37.74% vs. 29.03%, $p=0.42$).

Elevated levels of LDL and total cholesterol were declared by 23.81% and 21.43% of the students, respectively. Elevated concentrations of LDL and total cholesterol were more frequent amongst town residents (28.3% and 26.42%, respectively) than in the students living in the countryside (16.13% and 12.9%, respectively) but the differences in this intergroup did not prove significant in the statistical analysis.

Tobacco smoking was identified as the cardiovascular risk factor in the case of 16.67% of the students, more frequently among the countryside than in the city residents (22.58% vs. 13.21%). However, also this difference did not prove statistically significant ($p=0.26$). Only one of the smokers scored higher than 7 points in the Fagerström Test for Nicotine Dependence.

Although none of our participants admitted to alcohol abuse, nearly 65% declared occasional drinking.

More than one half of the students performed moderate physical exercise for at least 30 minutes at least five times a week. However, we identified 15% of

the respondents characterized by a low level of physical activity, i.e., exposed to moderate 30-minute physical activity no more than once a week, and usually spending their spare time sitting or lying. Although the students living in the countryside declared low level of physical activity more frequently than those who lived in towns (nearly every fifth vs. nearly every tenth), the difference did not prove significant ($p=0.096$).

The detailed data on the prevalence of cardiovascular risk factors among our participants is presented in Table I.

Table I. Prevalence of cardiovascular risk factors among students of nursing, stratified according to place of residence

Risk factor	Countryside		City		p
	n	%	n	%	
Low level of physical activity	7	22.58	5	9.43	0.096
Low birth weight <2500 g	2	6.45	11	20.75	0.090
Dietary content of salt >6g	4	12.90	9	16.98	0.618
Tobacco smoking	7	22.58	7	13.21	0.266
Heart rate >80 beats/min	8	25.81	7	13.21	0.145
Total cholesterol >200 mg%	4	12.90	14	26.42	0.145
LDL >155 mg%	5	16.13	15	28.30	0.206
Marital status – unmarried	5	16.13	16	30.19	0.151
Waist circumference >80 cm in women or >94 cm in men	10	32.26	16	30.19	0.843
BMI >25 kg/m ²	9	29.03	20	37.74	0.418
Exposure to air pollution	13	41.94	21	39.62	0.834
Nutrition: less than three meals per day	21	67.74	19	35.85	0.004
Prolonged work in a standing or sitting position	29	93.55	51	96.23	0.578
Presence of at least 1 cardiovascular risk factor	30	96.77	53	100.0	0.188
Presence of 1-6 cardiovascular risk factors	28	37.83	46	62.16	0.629
Presence of 7-13 cardiovascular risk factors	2	22.23	7	77.77	0.334

Discussion

At present, cardiovascular disorders constitute one of the most important medical and social problems. Their high prevalence, as well as high costs associated with the treatment of primary conditions and their complications, justify undertaking efficient preventive activities. This requires the identification of all potential risk factors and elimination or control of the modifiable ones.

Our study revealed that the prevalence of cardiovascular risk factors among the students of nursing was relatively high, pointing to an increased risk of developing one of the related conditions. Most of the factors identified among our students were modifiable, lifestyle-related risk factors.

Tobacco smoking is one of established risk factors of cardiovascular disorders. The incidence of ischemic heart disease among smokers is nearly twice as high as in non-smokers [1, 11]. The results of studies conducted in other academic centers [12-17] point to a high prevalence of smoking among students, as the percentage of declared smokers ranged between 23.9% and 31.9%. Cigarette smoking was declared by more than 16% of our respondents, more often among the countryside (22.58%) than the city residents (13.21%). Also the studies conducted among the students of other Wrocław universities confirmed that the prevalence of smoking differed depending on the place of residence [15]. A high percentage of smokers (40%) was also documented among professionally active nurses from the Łódź voivodeship (Central Poland) [18]. In contrast, the prevalence of smoking among nurses from Pakistan was very low and equaled 0.6% only [19]. This probably resulted from cultural considerations as Muslim women traditionally do not smoke. Nevertheless, also the percentage of smokers among cardiologic nurses – members of the Preventive Cardiovascular Nurses Association (PCNA) was markedly lower than in our study (3.6%) [20].

Although none of our respondents declared alcohol abuse, nearly 65% admitted to occasional, so-called safe drinking. Similar findings were previously documented among the students of nursing from Warsaw [12] and the students of the Higher Pedagogical School in Olsztyn (Northeastern Poland) [13]. One-third of our respondents declared complete abstinence from alcoholic drinks. Similar prevalence of abstinence was reported by Sulewska et al. [12] and Eszyk et al. [13]. Previous studies of students from other universities revealed that the percentage of abstaining ranged from 11.4% [15] to 47.3% [14]. In contrast, complete abstinence was declared by every fifth PCNA member [20].

Both our findings and the results documented at other universities [12-14, 16, 21-23] confirm improper dietary habits of students. According to literature, students eat irregularly [13, 16, 22], usually only when feeling hungry [12, 22]. Also the daily number of meals [21, 23] and the consumption of fruit and vegetables [13, 14, 23] is too low among students.

We revealed that the percentage of individuals consuming no more than three meals per day was significantly higher among the countryside residents than in the students living in a city. Perhaps, this resulted from a greater number of household duties and lower amount of time left for preparation and consumption of meals among the countryside residents.

Low level of physical activity represents one of important cardiovascular risk factors. According to Barengo et al. [24], a sedentary lifestyle, i.e., minimal

level of physical activity, both at work and in spare time, is associated with a significant increase in the prevalence of cardiovascular conditions and the all-cause mortality among men and women. Unfortunately, every seventh student taking part in our study spent at least 30 minutes on physical activity less often than once a week. Similar situation was previously documented among the life science students from other universities in Wrocław [15]. An even higher percentage of physically inactive students (20.6%) was observed at the Medical University in Warsaw [12]. Also every third student from the Medical University of Silesia self-assessed the level of their physical activity as insufficient [14], and every fourth respondent participating in the study by Eszyk et al. [13] declared their infrequent involvement in physical exercise. Although the students living in towns have more opportunities for active leisure and physical activity than the countryside residents, these two groups did not differ significantly in terms of the level of physical activity. Unfortunately, also professionally active nurses taking part in our study were not involved in regular physical exercise. In contrast, the percentage of regularly exercising cardiologic nurses from the United States exceeds 40% [20], and an even higher figure (60%) was reported from Pakistan [19].

Individuals with improper dietary habits and low levels of physical activity have an increased risk of developing overweight (BMI > 25), an important risk factor of cardiovascular conditions [25]. We documented overweight in every third of our students. Similar results were reported by Wójtowicz-Chomicz et al. [26]. In contrast, a markedly lower prevalence of overweight, 6% [21], 7.7% [15], and 9.7% [12], was reported from other academic centers in Poland. Most likely such a high percentage of overweight individuals revealed in our study was associated with a relatively old age of the respondents. According to Fair et al. [20], BMI > 25 is observed in a half of cardiologic nurses.

Although our respondents studied a medical discipline and should be aware of potential negative consequences of certain behaviors, e.g. improper diet or cigarette smoking, they did not eliminate them from their lifestyle, thus putting themselves at risk of cardiovascular conditions.

Conclusions

In conclusion, our study revealed that the students of nursing were predisposed to circulatory conditions, as their majority were exposed to several cardiovascular risk factors. The profile of cardiovascular risk factors was not influenced by the students' place of residence.

Piśmiennictwo / References

1. Perk J, De Backer G, Gohlke H, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). *Eur Heart J* 2012, 33: 1635-1701.
2. Fact Sheet The Top Ten Causes Of Death. WHO, Geneva 2008.
3. Trwanie życia w 2011 r. GUS, Warszawa 2012.
4. Rocznik Demograficzny 2011. GUS, Warszawa 2011.
5. Smith SC, Jackson R, Pearson TA, et al. Principles for national and regional guidelines on cardiovascular disease prevention: a scientific statement from the World Heart and Stroke Forum. *Circ* 2004, 109: 3112-3121.
6. Terrados N, Valcarcel G, Venta R. New cardiovascular risk factors and physical activity. *Apunts Med Esport* 2010, 45: 201-208.
7. O'Donnell CJ, Elosua R. Cardiovascular risk factors. Insights from Framingham Heart Study. *Rev Esp Cardiol* 2008, 61: 299-310.
8. Grundy S, Pasternak R, Greenland P, et al. Assessment of cardiovascular risk by use of multiple-risk-factor assessment equations: a statement for healthcare professionals from the American Heart Association and the American College of Cardiology. *J Am Coll Cardiol* 1999, 34: 1348-1359.
9. Greenland P, Knoll MD, Stamler J, et al. Major risk factors as antecedents of fatal and nonfatal coronary heart disease events. *JAMA* 2003, 290: 891-897.
10. Cascio WE, Hazucha MJ, Bromberg PA, et al. Cardiovascular Effects of Air Pollutants. [in:] *Netter's Cardiology*. Runge MS, Ohman ME (eds). Elsevier Saunders Philadelphia 2004: 627-632.
11. Mukamal KJ. The effects of smoking and drinking on cardiovascular disease and risk factors. *Alcohol Res Health* 2006, 29: 199-202.
12. Sulewska M, Jach J, Musioł M i wsp. Czynniki ryzyka choroby niedokrwiennej serca u studentów I roku Pielęgniarstwa Akademii Medycznej w Warszawie. *Med Rodz* 2007, 3: 66-69.
13. Eszyk J, Ordys D. Analiza stylu życia studentów wybranych uczelni w Polsce. [w:] *Problemy terapeutyczno-pielęgnacyjne: od poczęcia do starości*. Krajewska-Kułak E, Szczepański M, Łukaszuk C, Lewko J (red). Tom II. Wyd Akademia Medyczna w Białymstoku, Białystok 2007: 349-357.
14. Banaszak-Żak B, Mizia-Stec K, Gąsior Z i wsp. Czynniki ryzyka chorób układu krążenia w populacji młodych dorosłych osób – studentów Śląskiej Akademii Medycznej. [w:] *Problemy terapeutyczno-pielęgnacyjne: od poczęcia do starości*. Krajewska-Kułak E, Szczepański M, Łukaszuk C, Lewko J (red). Tom I. Wyd Akademia Medyczna w Białymstoku, Białystok 2007: 322-330.
15. Poręba R, Gać P, Zawadzki M i wsp. Styl życia i czynniki ryzyka chorób układu krążenia wśród studentów uczelni Wrocławia. *Pol Arch Med Wewn* 2008, 118(3): 1-9.
16. Krzych Ł, Kowalska M, Zejda JE. Styl życia młodych osób dorosłych z podwyższonymi wartościami ciśnienia tętniczego. *Nadciśnienie Tętnicze* 2006, 10(6): 524-531.
17. Binkowska-Bury M, Chmiel-Połeć Z, Marć M i wsp. Rozpowszechnienie palenia tytoniu wśród studentów uczelni rzeszowskich. *Prz Lek* 2007, 64(10): 791-794.
18. Adamek R, Stoczyńska J, Maksymiuk T i wsp. Rozpowszechnienie palenia tytoniu wśród pielęgniarek a świadomość szkodliwości nałogu. *Prz Lek* 2012, 69(10): 969-972.
19. Khan S, Hafizullah M, Gul A, et al. Frequency of coronary heart disease risk factors among nurses. *J Postgrad Med Inst* 2012, 26: 377-385.
20. Fair JM, Gulanick M, Braun LT. Cardiovascular risk factors and lifestyle habits among preventive cardiovascular nurses. *J Cardiovasc Nurs* 2009, 24: 277-286.
21. Cislak P, Błaszczuk R, Ciota M i wsp. Realizacja wiedzy dotyczącej promocji zdrowia w życiu codziennym studentów AM Lublin na przykładzie odżywiania. *Ann UMCS Sect D* 2005, 60(suppl. XVI, 59): 266-271.
22. Lisicki T. Higiena żywienia studentów I roku szkół wyższych w Trójmieście. *Zdr Publ* 2004, 114(1): 71-74.
23. Chrzan R. Analiza nawyków żywieniowych studentów Akademii Medycznej we Wrocławiu. *Fam Med Prim Care Rev* 2011, 13(3): 417-420.
24. Barengo NC, Hu G, Lakka TA, et al. Low physical activity as a predictor for total and cardiovascular disease mortality in middle-aged men and women in Finland. *Eur Heart J* 2004, 25: 2204-2211.
25. Lavie CJ, Milani RV, Ventura HO. Obesity and cardiovascular disease: risk factor, paradox, and impact of weight loss. *J Am Coll Cardiol* 2009, 53: 1925-1932.
26. Wójtowicz-Chomicz K, Borzęcki A. Czy wśród studentów Uniwersytetu Medycznego w Lublinie występuje zjawisko otyłości? *Fam Med Prim Care Rev* 2011, 13(2): 251-253.