Nurses' knowledge on the assessment of alcohol consumption and smoking and its effect on blood pressure

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ABSTRACT

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Introduction: Excessive alcohol consumption and smoking increase the risk of hypertension and the incidence of cardiovascular disease. Nurses have a unique opportunity to help patients who smoke and consume alcohol at a risky level, not requiring a specialist, which may contribute to a reduction in blood pressure (BP), as well as providing more health benefits. The aim of the study was to evaluate the knowledge of nurses on how to assess the consumption of alcohol and smoking and their effect on BP.

Material and methods: The study included 1,108 participants (W-1,089, M-19, aged 21-60, 0-37 years of work experience). The study was conducted in 2007-2009 using the diagnostic survey method and achievement tests.

Results: Alcohol assessment methods were correctly indicated by 13.4% of respondents, while the correct interpretation of a standard unit of alcohol was made by 35.8% of respondents. The Fagerström Test was known only to 13.2% of respondents. The effects of alcohol and smoking on BP values were known to most subjects. The youngest participants, nursing graduates, were significantly more likely to have made the correct indication.

Conclusions: Overall, knowledge of how to assess alcohol consumption and smoking allowing minimal intervention to take place in the group of nurses studied was relatively low. Significantly more correct indications were made by the youngest respondents, those who were not married and nursing graduates. It seems reasonable to popularize methods for identifying the risk of hypertension associated with alcohol consumption and cigarette smoking in postgraduate nursing education.

Key words: Smoking, alcohol consumption, arterial hypertension, blood pressure, nurses

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INTRODUCTION

Excessive alcohol consumption and smoking increase the risk of hypertension and the incidence of cardiovascular disease. Numerous studies have documented a dose-dependent association between alcohol consumption and the value of blood pressure (BP) [1, 2], which shows a U-curve, and for some age groups of the population, a J-curve [1, 3, 4]. Particularly dangerous is binge drinking, particularly of hard alcohol. Although there are reports of various effects when reducing the level of alcohol consumption to a moderate level causing a reduction in BP, this effect is observed both in normotensive and hypertensive individuals [1, 3, 5]. Strong exposure to cigarette smoke causes an increase in BP (and total cardiovascular risk) and as a result of smoking BP values are probably still higher due to the short-term effect of each smoked cigarette [1, 2].

Overall, it is concluded that health care staff do not often make their assessments with the use of questionnaire tools, which is often caused by a lack of reliable preparation, and insufficient confidence in their own professional competence in this area and the fear of deterioration in their relationship with the patient [6-11].

Nurses occupy an ideal position in the health care system and have a unique opportunity to help patients who smoke and consume alcohol at a risky level, not requiring a specialist, which may contribute to a reduction in BP, as well as providing more health benefits [5, 12, 13].

The aim of the study was to evaluate the knowledge of Polish nurses on how to assess the consumption of alcohol and smoking and their effect on BP.

MATERIALS AND METHODS

The study was conducted in 2007-2009, among 1,108 participants declaring a current license to practice nursing and who consented to take part in the study. Participation in the study was anonymous.

The study group was predominantly female (1089, i.e. 98.3%). The respondents were dominated by urban residents (n=918; 82.8%). Three-quarters of respondents were married (n=839, 75.7%). The age of the subjects ranged from 21-60 years (x=38.7, SD=7.8), with the largest percentage in the 36-40 years range (323 individuals, 29.1%) and the smallest percentage aged 26-30 years (n=48, 4.3%).

The average length of service as a nurse among subjects was 17.0 years (SD=8.6). The largest group – 294 patients (26.5%) – were those with work experience in a range from 16-20 years.

Approximately every fifth person declared a period of work in the range of 21-25 years (n=212, 19.1%), while 58 (5.2%) respondents had not started professional work yet and 41 people had professional experience of not more than 1 year (3.7%).

Primary health care and outpatient specialist care was represented by approximately one-third of the study participants (n=316; 28.5%), and one in four worked on non-invasive therapy wards (n=274, 24.7%), while approximately one in five worked in hospital wards performing surgical treatment (n=209, 18.9%). 160 respondents provided intervention in life-threatening conditions (14.4%), 59 participants worked in long-term care institutions (5.3%), and there were 32 others (2.9%).

More than three-quarters of respondents (n=865, 78.1%) were divisional nurses (in relation to primary care - family nurse). Seventy nurses were employed in managerial positions (6.3%), 60 (5.4%) worked as coordinating nurses, 5 were specialist nurses (0.4%), 26 were surgical nurses (2.3%) and there were 24 others (2.2%).

Almost half of the respondents declared that they had completed a qualification course (512 individuals, 46.2%), including 280 respondents (25.3%) in areas where the programs covered prevention of hypertension, while 232 worked in other areas (20.9%). Only 59 participants (5.3%) declared that they had completed specialist training (at a similar level of the percentage of specialists in Poland, which is 6.0%), of which 24 people (2.2%) were in areas involving the prevention of cardiovascular disease and 35 participants (3.2%) in other areas of nursing. On average, one in three respondents (n=353, 31.9%) declared to have a nursing degree, while 38 respondents (3.4%) have a master's degree in nursing.

The methods applied were diagnostic surveys and achievement tests. The study tool was a custom-made questionnaire, combining elements of a survey and knowledge test. The core section of the questionnaire was a knowledge test comprising 6 questions with cafeteria-style closed checklists (disjunctive questions comprising four items) and 2 dichotomous questions. Test reliability was assessed using Cronbach's alpha coefficient, which attained 0.929, evidencing the adequate reliability of the test questions.

The study obtained the approval of the Independent Ethics Committee for Scientific Research at the Medical University of Gdańsk (NKEBN/177/ 2007).

The questions put to the respondents included issues such as:
1. What tools can nurses use to assess the drinking habits of a patient? The correct answer was screening tools, such as: AUDIT, CAGE and

MAST.

2. What does the term standard unit of alcohol mean? According to WHO and the guidelines of scientific bodies in Poland, it means 10 g of ethanol.
3. What volume of alcohol consumption increases the risk of hypertension? The correct answer here was consumption of more than 2 units for women and 3 units for men (5 days per week).
4. How can a nurse assess a patient's tolerance of nicotine? The correct answer was the Fagerström test.
5. What is the principle used in a brief nursing intervention with a smoker? The correct answer was the 5A principle.
6. What impact on blood pressure does smoking and alcohol consumption have? The correct answer was the pressure effect of these stimulants, which in the case of cigarettes lasts for 15-20 minutes after each smoked cigarette.

The study was conducted in the main centres providing pre- and postgraduate nursing education in Pomerania (northern Poland), including: three higher education institutions and three centres that are able to conduct postgraduate nursing training, after prior approval from college authorities. The study was carried out at the start of a given course to avoid the influence of knowledge acquired during the course (100% participants of the course consented to take part in the study).

It is worth mentioning that in Poland the following types of postgraduate education exist: specialised training (lasting two years and culminating in a state examination for obtaining specialist nursing knowledge and skills in a particular area of nursing), qualification courses (allowing the acquisition of knowledge and skills to provide certain nursing services), specialist courses (aiming to prepare nurses to perform certain professional activities).

For the purpose of this study, an analysis of the syllabi of the above-mentioned types of post-graduate training was carried out in terms of content and learning outcomes covering issues related to the prevention of cardiovascular disorders, including hypertension. The analysis distinguished fields of nursing that raise relevant issues such as family, internal and occupational nursing as well as school medicine.

It was assumed that those who have studied nursing and/or qualification courses and/or specialisations related to the above mentioned issues will display a higher level of knowledge, allowing preventive measures reducing the risk of cardiovascular disease and its clinical consequences to be taken in nursing practice.

The study was preceded by a pilot study conducted in January 2007, in a group of 53 nursing students in the fifth-year of their master's degree in the Department of Nursing, Medical University of Gdańsk. The aim was to construct the final research tool used in the main study.

The statistical analysis of the data used the STATISTICA 8.0. package and the Excel spreadsheet. For the description of quantitative variables, mean values (x) and their standard deviations (SD) were calculated, while for the description of qualitative variables, their frequency in percentages was provided. The hypothesis on the conformity of quantitative variables with normal distribution was checked by means of the W Shapiro-Wilk test. Inter-group differences for qualiative variables were assessed by means of the U Mann-Whitney test. Qualitative variables were presented as percentage values of correct and incorrect answers, hence non-parametric ANOVA (the Kruskal-Wallis test) was used in the analysis. The statistical significance was assumed at $p<0.05$.

The findings presented in this article are part of more extensive studies assessing nurses' preparation for identifying the risk factors of hypertension and its prevention.

RESULTS

Knowledge of screening tools to assess alcohol drinking behavior correctly was declared by only 149 respondents (13.5%), while three times as many participants (n=496, 44.8%) indicated the answer "do not know", and a similar group of 463 respondents (41.8%) gave false indications.

The correct interpretation of standard units of alcohol was made by 397 (35.8%) respondents, while 309 participants (27.9%) said that they did not know this term. The other respondents considered that a standard portion contains more alcohol, including 103 subjects (9.3%) who indicated a level five times greater, and 74 participants (6.7%) ten times the alcohol content per unit.

The alcohol threshold beyond which there is an increase in the likelihood of developing high blood pressure was correctly pointed out by half of the respondents (n=551, 49.7%). Approximately one-third of respondents could not identify this threshold (n=334, 30.1%) and 223 participants (20.1%) indicated higher limits of alcohol consumption.

More than half of respondents did not know the tools assessing the degree of nicotine tolerance (588, 53.1%), while only 146 (13.2%) respondents selected the correct tool, i.e. the Fagerström test. Little known among the respondents was the 5As principle used in brief nursing interventions in cigarette smokers, which was indicated by only one in twelve study participants (n=92, 8.3%). In the opinion of more than half of the respondents (n=607, 54.8%), the

principle in question should be based on the presentation of the benefits of not smoking, and – according to 244 participants (22.0%) – building positive personal motivation, without fear, to quit smoking, which of course is used in the process of health education among smoking patients, but it is a method rather than a principle of intervention. One hundred and twenty-seven respondents (11.5%) expressed the view that the above principle is based on the use of handbooks, pamphlets, and addresses and telephone numbers of anti-smoking advice centres, while 38 respondents (3.4%) openly admitted that they do not know the answer.

The effects of alcohol and smoking cigarettes immediately prior to measuring BP values was known by most subjects (respectively 90.2% and 80.6%), but in another question referring to the duration of the pressure effect after smoking a cigarette one in ten respondents (n=111, 10.0%) found that cigarette smoking does not affect BP values, and one in twelve (n=93, 8.4%) said they did not know. However, the majority of respondents thought that smoking causes an increase in the value of BP, with one in three participants agreeing with the statement that the increase in blood pressure is maintained for 15-30 minutes afterwards (375 patients, 33.8%) and 496 patients (44.8%) felt that the time is shorter and fluctuates within 5-10 minutes after smoking. Thirty-three participants (3.0%) expressed the view that smoking causes a reduction of BP – Table 1.

Table 1. Elements of knowledge assessed among respondents.

Element of knowledge	Correct answer n (%)	Wrong answer n (%)	"Don't know" answer n (%)
AUDIT, MAST Test	149 (13.45)	463 (41.78)	496 (44.77)
Standard unit	397 (35.83)	402 (36.28)	309 (27.89)
Limit of alcohol consumption	551 (49.73)	223 (20.13)	334 (30.14)
Effects of alcohol on BP	1000 (90.25)	72 (6.50)	36 (3.25)
Fagerström test	146 (13.18)	374 (33.75)	588 (53.07)
The "5A's"	92 (8.30)	978 (88.27)	38 (3.43)
Effect of smoking on BP	893 (80.60)	134 (12.09)	81 (7.31)
The duration of the pressure effect of smoking a cigarette	375 (33.84)	640 (57.76)	93 (8.39)
AUDIT - Alcohol Use Disorders Identification Test MAST Test - Michigan Alcoholism Screening BP – blood pressure The 5 A's - Ask, Advise, Assess, Assist, Arrange			

Impact of socio-demographic factors

Significant differences in correct answers occurred between the youngest participants, aged 20-25 (mean correct indication was 0.31 ± 0.16, Kruskal-Wallis test 21.91) and those whose age were in the ranges 36-40 ($x=0.24\pm0.18$, p=0.006), 41-45 ($x=0.22\pm0.17$, p=0.0004), and over 45 ($x=0.25\pm0.19$, p=0.033).

Single participants ($x=0.27\pm0.17$) made significantly more correct indications (p=0.017, U Mann-Whitney test -2.40), as compared to married participants ($x=0.24\pm0.18$), which probably reflects the difference in age of the respondents. There was no effect of gender (p>0.05) and place of residence (p=0.993, U Manna-Whitney test 1.44) on respondents' indications.

Impact of work-related factors

An analysis showed a the occurrence of significant differences between those with no professional work experience ($x=0.33\pm0.17$) and respondents with more than 16 years of work experience ($x=0.24\pm0.18$, p=0.005, Kruskal-Wallis test 20.46), while starting with the group of people with a few months of professional work experience a gradual decrease in the percentage of correct answers was observed, which probably reflects the low level of application of knowledge in everyday nursing practice.

A similar observation was made after taking into account the profile of the health care centres in which research participants were employed. Statistical differences in correct answers were found between individuals with no experience and all the others (p=0.012, Kruskal-Wallis test 16,36) - with the exception of respondents providing long-term/hospice care and those working in emergency medicine, although in this case, the difference reached borderline statistical significance (p=0.051). The assessment of the

impact of respondents' job position confirmed a significantly higher (p=0.0004, Kruskal-Wallis test 24.85) level of knowledge of participants with no experience in comparison with ward nurses (p=0.011), specialist nurses (p=0.017), treatment nurses (p=0.014) and those in management positions (p=0.026), with the exception of nurses coordinating and working in 'other' positions.

Table 2. Impact of completed forms of education on the study participants' answers

	Valid	Minimum	Maximum	Median	Test-value	P-value
Qualifying course [2]						
No course	596	0.00	0.71	0.29	0.02	0.988
Including BP-related issues	280	0.00	0.71	0.29		
Other	232	0.00	0.71	0.29		
Specialization training [2]						
No course	1049	0.00	0.71	0.29	2.25	0.325
Including BP-related issues	24	0.00	0.71	0.29		
Other	35	0.00	0.57	0.14		
Bachelor's degree studies [1]						
No	755	0.00	0.71	0.14	5.31	p<0.001
Yes	353	0.00	0.71	0.29		
Master's degree studies [1]						
No	1070	0.00	0.71	0.29	-0.74	0.461
Yes	38	0.00	0.71	0.29		
[1] U Mann-Whitney test, [2] Kruskal-Wallis test						

Impact of education factors (Table 2)

Significant differences in correct answers were found only between respondents who had completed undergraduate degrees in nursing, compared with those who had not (p<0.001). However, this effect was not observed in relation to the qualification courses, specialisation courses and graduate nursing degrees completed by respondents.

DISCUSSION

There is growing evidence that nurses should make greater use of screening and brief interventions aimed at identifying and reducing the above-mentioned risk factors, including the assessment of alcohol consumption and smoking [5, 14,15]. The use of questionnaire screening tools, which include AUDIT, is recommended by the WHO, MAST Test and its abbreviated version, the CAGE, recommended by Canadian nurses [5], facilitate the qualification of patients to a specific group (e.g., hazardous drinking) [5,16].

The Fagerström test is recommended by US, Canadian, Australian and Polish societies to assess the nicotine status [5,15, 16-18].

In the current study, the average of correct answers to all questions was 40.6%. Approximately,

half of the participants did not know the Fagerström test nor any tool assessing the amount of alcohol consumption. Thus, the overall knowledge of how to assess alcohol consumption and smoking allowing minimal intervention to take place in the studied group is relatively low. These results, however, are similar or even better than those reported in previous studies performed in Poland and other countries [19].

In the assessment of alcohol consumption, the concept of a standard alcohol unit is used, which – depending on the country – contains from 8 g to 14 g of pure ethyl alcohol [20]. The correct interpretation of "standard unit" was made by 36% of study participants, on a similar level as nurses in Australia [21], and three times more as compared to nurses and doctors from New Zealand [12].

It was found that almost half of the respondents made the correct indications for the suggested limits of moderate alcohol consumption, which is similar to English general practice nurses surveyed by Owens [22], and slightly better than Australian nurses [21] and nurses from New Zealand [12].

The next step in nursing conduct is the implementation of minimal intervention, based on Prochaska's and DiClemente's transtheoretical model [23]. Brief intervention, based on the 5As principle [24,25], however, was known only to one

in twelve respondents. After analysing a small percentage of the correct answers of participants, as well as the significantly higher (but also modest) level of knowledge of young, often not-yet working respondents, it is worth signalling the potential determinants of the situation.

It was not until the late 1990s that the transformation process of the nursing education system in Poland and the adjustment to international guidelines and standards started. At the same time, the availability increased of textbooks aimed at nurses, which contained a wider range of health education and health promotion issues and the use of physical examination in nursing.

Limitations of the study

It should be emphasised that this study was conducted in a group of nurses that take an interest in their own professional development and undertake a variety of forms of post-graduate training. Potentially, it should be assumed that the knowledge deficit of nurses as a whole is likely to be higher, which of course requires further study.

Implications for practice

More extensive popularization of the knowledge about the issues in question among nurses and nursing students is recommended, because an increase in the knowledge and awareness of professional Polish nurses can contribute to the creation of optimal conditions for their application in practice, and in turn can improve the effectiveness of patient interventions in the Polish health care system.

CONCLUSIONS

1. Overall, knowledge of how to assess alcohol consumption and smoking allowing minimal intervention to take place in the group of nurses studied was low.
2. Significantly more correct indications were made by the youngest respondents, those who were not married and nursing graduates.
3. It seems reasonable to popularise methods for identifying the risk of hypertension associated with alcohol consumption and cigarette smoking in postgraduate nursing education.

Conflicts of interest
The authors have declared no conflicts of interest.

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