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Health-enhancing behaviours of nurses in Poland and their association with shift work and age

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ABSTRACT

Background: Deficiencies in terms of healthy lifestyle may exacerbate the negative characteristics of nursing work, especially those arising from shift work.

Aim: The purpose of the study was to examine the frequency of selected health-enhancing behaviours and abstinence from health-risk behaviours among Polish nurses considering their age and performance of shift work.

Methods: Cross-sectional survey; study conducted among 1107 nurses (female; average age: 43.2 ± 7.23 ; 73% working in shifts) who followed a specialty training programme. The data were collected in March–May 2016. An anonymous questionnaire with a Positive Health Behaviours Scale was used (4 subscales: nutrition, physical activity, relaxation and behaviours related to mental health, preventive behaviours). The impact of the age and shift work on the incidence of health-enhancing behaviours was assessed by linear regression.

Findings: Out of the 29 recommended health-enhancing behaviours only 3 were practised “always or almost always” by more than 50% of the respondents. The mean score in all subscales on a ten scale was 50 per 100. Most of the nurses (65–82%) abstained from health-risk behaviours. Shift work had a statistically significant negative impact in three domains: nutrition ($\beta_{\text{stand.}} = -0.065$), relaxation and behaviours related to mental health ($\beta_{\text{stand.}} = -0.194$) and preventive behaviours ($\beta_{\text{stand.}} = -0.092$).

Conclusions: Deficiencies in terms of a healthy lifestyle (greater in nurses who worked in shifts) influence the health of the nurses, their performance of professional duties and their capacity for modelling of health enhancing behaviours in patients. Health promotion programmes should be introduced at healthcare institutions.

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Problem

The relationship between health-enhancing behaviours and a shift work/age among Polish nurses.

What is already known

- The nursing profession entails many burdens and risks associated with the effects of many factors, including shift work.

- The results of a systematic literature review indicate that nurses are more likely to develop health problems and less likely to lead a healthy lifestyle.
- It was found that shift work has a negative impact on nurses' health and quality of life. It increases the risk obesity, sleeping problems, locomotor disorders, circulation disorders, incidence of accidents and injuries among nurses, and the likelihood of making mistakes in patient care. The profession makes leading a healthy lifestyle—following dietary guidelines, undertaking physical activity, avoiding tobacco and alcohol abuse—more difficult.

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What this paper adds

- Presentation of data concerning the lifestyle of nurses in the context of their age, type of work and actual working conditions, and the economic situation of this profession in Poland.
- Inclusion of five domains of a healthy lifestyle—nutrition, physical activity, relaxation and behaviours related to mental health, preventive behaviours, and abstinence from health risk behaviours—in the research.
- Focus on positive health behaviours as a resource for health; presentation of the Positive Health Behaviours Scale (PHBS)—a simple tool that can be easily used in health-promotion practices in hospitals and outpatient clinics.

1. Introduction

In Poland there are around 285,000 nurses, 98% of whom are women (CSIOZ, 2016). Their average age is 48.4 years and this has been steadily increasing in recent years. There is also a nursing shortage: Poland has 4.8 nurses per 1000 population (NIPiP, 2015), which places the country at the bottom of the OECD (2013) rankings. This impacts on the workload of the majority of nurses. According to the results of a study conducted by OZZPiP (2015), 95% of nurses are not capable of fulfilling all their professional duties within normal working hours, 53% are assigned extra duties (e.g. filing medical records, completing the referral form for diagnostic tests, rewriting medical orders, transporting patients and even cleaning) and one in four nurses was alone on duty in hospital at least once in the last three months. It is not compatible with applicable standards, but forced from deficiencies of the shortage of nursing staff. Many healthcare providers do not introduce employment standards for nurses and do not employ new staff.

Polish nurses have high position (ahead of physicians) in a hierarchy of professions ranked (CBOS, 2013). However, nurses' economic position is low: their average wage accounts for 84% of the national average (Hajec, 2015); their average salary is twice lower than physicians' salaries (OZZPiP, 2015). Nurses feel their salaries are low for the amount of work performed; they protest on that basis, and a number of younger nurses move abroad to work (NIPiP, 2015; Kozek, 2013). Many nurses take on additional jobs within their profession; they work in a number of healthcare centres in a variety of positions (Kozek, 2013), hence their working time is longer and workload and fatigue are greater.

The nursing profession entails a number of risks for health associated with the impact of biological, chemical, physical, ergonomic, and psychological factors, as well as factors related to work organisation and rhythm (Canadian, 2013; Jordan, Nowrouzi-Kia, Gohar, & Nowrouzi, 2015). Those who work in the nursing profession are at comparatively high risk of suffering a burnout (Adriaenssens, De Gucht, & Maes, 2015; Epp, 2012). The results of a systematic literature review indicate that nurses are more likely than the rest of the population to develop musculoskeletal disorders, breast cancer and tuberculosis, and to be exposed to blood borne pathogens (HIV, hepatitis B virus, hepatitis C virus, hepatitis A virus) (Fronteira & Ferrinho, 2011). The available results of research demonstrate that the level of risk factors among nurses is similar to or higher than in the general population (Schluter, Turner, Huntington, Bain, & McClure, 2011; Tucker, Harris, Pipe, & Stevens, 2010; van Dam, Li, Spiegelman, Franco, & Hu, 2008).

Major risks for nurses' health are related to shift work, including night shifts. Most nurses have to work in shifts. As a result, their bodies' circadian rhythms (the endogenous, roughly 24 h cycle in physiological processes, responding primarily to light and darkness in the environment) become disrupted. In effect, they suffer from sleep pattern disorders, sleep deprivation and poor quality of sleep,

sleepiness during the day and during night shifts. They are more likely to suffer from stress and fatigue and have difficulties balancing their work, family and social life (Caruso, 2014; Stavroula & Aditya, 2010). The results of many studies indicate that shift work can undermine the health and quality of life of nurses (Berger & Hobbs, 2005). It increases the risk of obesity, sleep disorders (including sleep apnoea), circulatory (cardiovascular) disorders and even breast cancer, as well as the incidence of accidents and injuries among nurses and the number of mistakes they make in patient care (Berger & Hobbs, 2005; Buss, 2012; Frost, Kolstad, & Bonde, 2009; Geiger-Brown et al., 2013; Jordan et al., 2015; Schernhammer et al., 2001; Syrocka, Gaworska-Krzemińska, & Barton, 2014).

Shift work makes it more difficult to lead a healthy lifestyle. The most comprehensive of the studies published so far, "The Nurses' Health Study" conducted in the United States on a population of registered nurses aged 30–55, demonstrated that risk factors associated with lifestyle are independent predictors for death in that professional group, and they are related to around 55% of recorded deaths (Sarna et al., 2008; van Dam et al., 2008). The lifestyle adopted by nurses is a key determinant of their health, as well as the quality of their work and patient safety. So far no one has conducted a large study in the Polish context that would assess nurses' attempts at a healthy lifestyle and the subject has not been examined in enough detail. This study is an attempt to fill the gap. Research into the lifestyles of nurses should be a starting point for planning actions in the area of health promotion designed to nurses.

The aim of this study was to analyse the frequency of selected health-enhancing behaviours and abstinence from health-risk behaviours among Polish nurses considering their age and performance of shift work.

2. Methods

2.1. Study design

The study had a cross-sectional design. The applied research tool was an original anonymous questionnaire divided into three sections:

1. Positive Health Behaviours Scale (PHBS) for adults. The scale included 29 statements concerned with selected health-enhancing behaviours in four domains (subscales): I. Nutrition, II. Physical activity, III. Relaxation and behaviours related to mental health, IV. Preventive behaviours (Table 1). The respondents specified the frequency of engaging in specific behaviours on a four-point scale: *always or almost always* (3 points), *often* (2 points), *sometimes* (1 point), *never or almost never* (0 points). The desirable choice was *always or almost always*. PHBS was originally designed and validated among Polish teachers. It had good properties with respect to internal consistency of measurement (Cronbach's alpha = 0.825) and good criterion validity (Woynarowska-Sołdan and Węziak-Białowolska, 2012). Good psychometric characteristics of the scale were confirmed by unpublished preliminary results of PHBS validation among Polish nurses. The results of the psychometric analysis of PHBS for reliability confirmed the high internal consistency of the entire scale (Cronbach's alpha reached 0.844) and specific subscales (0.623–0.761). The scale's criterion validity was validated on the basis of positive results of correlation and trend analysis.
2. Statements about abstinence from selected health-risk behaviours (abuse of alcohol, smoking, passive smoking, abuse of drugs not prescribed by a physician—painkillers, hypnotics and sedatives drugs). The statements have been formulated in such a way as to describe advisable, health-

Table 1
Frequency of health-enhancing behaviours in nurses (% of total surveyed).^a

Behaviours	Always or almost always	Sometimes/never or almost never
I. Nutrition		
1. I have at least 3 meals a day with a regular meal pattern	36.5	24.4
2. I have breakfast at home every morning (more than a glass of milk, tea or other beverage)	45.8	33.3
3. I eat fruit at least once a day	44.4	17.2
4. I eat vegetables at least once a day	38.9	19.7
5. I drink at least 2 glasses of milk, kefir or yoghurt daily	13.2	57.8
6. I limit the intake of animal fats	15.2	37.1
7. I limit the intake of salt	18.9	39.0
8. I limit the amount of consumed sweets	13.7	49.2
9. I avoid snacking between meals (e.g. between a lunch and a light afternoon meal)	9.2	52.8
II. Physical activity		
1. I exercise daily at least 30 min with moderate or vigorous intensity (e.g. jogging, brisk walking, practicing sport, gardening, working on a farm)	10.9	60.1
2. I do strength-building exercise for main muscle groups at least twice a week (e.g. raking leaves, carrying shopping bags (a heavy backpack), climbing stairs, exercise for abdominal muscles)	16.2	50.3
3. I increase physical activity and physical effort in everyday life (e.g. walking instead of driving, taking a bus, climbing stairs instead of using elevators)	18.2	37.1
4. I limit the time spent watching television	15.0	38.9
III. Relaxation and behaviours related to mental health		
1. I get at least 6–7 h of sleep every night	25.7	32.5
2. I go to bed at regular hours	11.1	48.9
3. I spend at least 20–30 min a day resting/relaxing (e.g. chilling out, doing relaxation exercises, doing what I like)	9.6	53.2
4. I cope well with stress	6.8	56.4
5. I am positive about myself and the world	20.6	27.7
6. I ask other people for help in difficult situations (e.g. family, friends)	14.3	45.4
7. I spend time with colleagues/friends at least once a month	23.6	33.8
IV. Preventive behaviours		
1. From September to April I take vitamin D	11.9	74.9
2. I avoid excessive sunbathing (e.g. I use creams with sun protection factor, head cap, I avoid sun exposure between 10 AM and 2 PM)	28.6	29.3
3. I brush my teeth at least twice a day	82.3	3.2
4. I have a dental check-up every 6 months	43.1	19.3
5. I measure blood pressure once a year	60.9	16.7
6. I have a flu vaccine according to recommendations	10.7	82.9
7. I perform a breast self-examination once a month	24.0	42.0
8. I have a smear test at least once every 3 years, as prescribed by a physician	55.2	19.9
9. If I get sick and have a doctor's appointment, I follow doctor's recommendations	49.5	9.1

^a Omitted answer: *often*.

enhancing behaviours. If a given statement was true for the respondent, they marked the box: "I do it".

3. Questions about age and shift work.

2.2. Study setting and participants

The study was conducted on a group of nurses who were preparing for a state specialty exam held in Warsaw by the Centre for Postgraduate Education for Nurses and Midwives, between March and May 2016. Participation in the study was voluntary and anonymous. Results were collected using an auditorium questionnaire, in which respondents were gathered in a single room to complete self-administered questionnaires and the completed questionnaires were subsequently pooled. Data were collected in the whole group with the questionnaire being returned immediately after completion.

The analysis covered data from 1017 nurses (a survey return rate of 40% in relation to the total number of exam takers). The average age of the respondents was 43.2 ± 7.23 years (median: 44, min. 27 and max. 58) and, on average, 19.0 ± 8.04 years in the nursing profession (median: 20, min. 5, max. 37). The sample obtained for the study was representative for the population of nurses during specialisation with respect to the mean age ($t = 0.407$, $df = 3568$, $P = 0.684$). Nearly 50% of the respondents worked in municipal or teaching hospitals, others worked in a variety of out-patient clinics. They had different nursing specialties. A vast majority of the respondents (73%) worked in shifts.

2.3. Statistical methods

Each of the 29 statements and four subscales of PHBS was assigned descriptive statistics parameters. Particular subscales of PHBS contain different numbers of statements. This is why, for the purpose of unification the scores in particular subscales, the results were normalised to a ten scores (score range of 0–100 with a mean of 50 and SD equal to 10). The normalisation of the scores allowed for a comparison between particular subscales and in relation to the age and shift work.

For the purpose of estimating potential differences between two age groups (≤ 44 years vs 45 years and more) and groups of nurses who worked or did not work in shifts, parametric (Student's *t*-test) and nonparametric (Pearson's chi-squared test) statistics were applied. Cohen's *d* was used to an effect size used to indicate the standardised difference between two means. For the purpose of correct interference in the latter of the nonparametric tests (chi-squared test), the Cochran's rule was verified (Sharpe, 2015).

Regression analysis was used to evaluate the impact of age and shift work on the incidence of health-enhancing behaviours (model I) and abstinence from health-risk behaviours (model II). In model I (multiple linear regression) a dependant variable was the results obtained by the respondents in the four subscales of PHBS. In model II (logistic regression) a dichotomous dependant variable was the fact of abstaining from health-risk behaviours in four aspects: abuse of alcohol, smoking tobacco, passive smoking, and abuse of drugs not prescribed by a physician. The accuracy of each of the regression models was tested according to guide-

Table 2
Results in subscales split by age groups and the fact of performing shift work (normalised values, ten scores—score range for each subscale: 0–100).

Subscale	Age group		t	P ^a	d ^b
	≤44 years $\bar{X} \pm SD$	45 years and more $\bar{X} \pm SD$			
I. Nutrition	49.80 ± 10.33	50.25 ± 9.58	−0.727	NS	0.045
II. Physical activity	50.75 ± 10.28	50.06 ± 9.67	1.101	NS	0.069
III. Relaxation and behaviours related to mental health	50.07 ± 10.30	49.98 ± 9.81	0.144	NS	0.009
IV. Preventive behaviours	49.32 ± 9.90	50.69 ± 10.12	−2.167	0.030	0.137

Subscale	Shift work		t	P ^a	d ^b
	Yes $\bar{X} \pm SD$	No $\bar{X} \pm SD$			
I. Nutrition	49.53 ± 10.04	51.20 ± 9.70	2.367	0.018	0.169
II. Physical activity	50.15 ± 9.86	50.85 ± 10.28	0.982	NS	0.069
III. Relaxation and behaviours related to mental health	48.89 ± 10.11	53.13 ± 9.53	6.024	0.000	0.431
IV. Preventive behaviours	49.33 ± 9.83	51.62 ± 10.45	3.233	0.001	0.226

\bar{X} —mean, SD—standard deviation, NS—statistically insignificant.

^a Student's *t*-test.

^b Cohen's *d* effect size (standardised difference between two means).

lines specified by Aiken et al. (1991) and Hosmer and Lemeshow (2013). In each regression equation the analysed predictors were assigned standardised regression coefficients ($\beta_{\text{stand.}}$) for multiple linear regression and odds ratio (OR) for logistic regression. Coefficient $\beta_{\text{stand.}}$ assumes values from -1 to 1 , where values near 0 represent a very weak correlation between predictors (age and shift work) and the dependent variable (the result in individual subscales of PHBS). OR stands for a chance (probability) that health-risk behaviours will not be displayed depending on age and shift work. When $OR \approx 1$, there is no correlation; when $OR < 1$, the likelihood that health-risk behaviours will not be displayed decreases and when $OR > 1$, the likelihood increases. *P*-values < 0.05 were considered to be statistically significant. All of the statistical analyses were performed using STATISTICA 12.5 (StatSoft®, Inc.) under the Medical University of Warsaw licence.

3. Results

3.1. The frequency of health-enhancing behaviours among nurses

The frequency of health-enhancing behaviours among nurses was unsatisfactory in all four analysed domains (Table 1). Only three out of 29 behaviours were adopted with desirable frequency (*always* or *almost always*) by more than a half of the respondents. This applied to brushing teeth (82.3%), blood pressure measurement (60.9%) and performance of a smear test (55.2%). The other behaviours were adopted *always* or *almost always* by less than a half of the nurses (6.8–49.5%). The lowest numbers of respondents *always* or *almost always* engaged in the following behaviours:

- Nutrition: avoiding snacking between meals (9.2%), drinking at least 2 glasses of milk, kefir or yoghurt daily (13.2%) and limiting the amount of consumed sweets (13.7%),
- Physical activity: exercising for at least 30 min with moderate or vigorous intensity (10.9%) and limiting the time spent watching television (15%),
- Relaxation and behaviours related to mental health: coping well with stress (6.8%) and spending at least 20–30 min a day resting/relaxing (9.6%),
- Preventive behaviours: having a flu vaccine according to recommendations (10.7%) and taking vitamin D between September and April (11.9%).

3.2. Health-enhancing behaviours of nurses in relation to their age and shift work

The mean scores in all subscales were comparable and totaled between 49.97–50.38 from a maximum of 100. The analysis of mean scores obtained by the nurses split by age (≤ 44 years vs 45 years and more) indicated that there were statistically significant differences only in terms of physical activity, which was undertaken with greater frequency by older nurses. The mean scores of nurses who did not work in shifts were significantly higher in all subscales, except for that of physical activity (Table 2).

Based on the results of linear regression analysis it was found that shift work has a significant negative impact on the majority of health-enhancing behaviours of nurses in relation to scores in subscale I (nutrition), III (relaxation and behaviours related to mental health) and IV (preventive behaviours). The most significant negative impact of shift work was found in subscale III ($\beta_{\text{stand.}} = -0.94$), followed by subscales I and IV ($\beta_{\text{stand.}} = -0.065$ and -0.092 respectively). The linear regression analysis revealed negative impact of age only in the area of subscale II (physical activity – $\beta_{\text{stand.}} = -0.065$). However, in the cases of the impact of shift work on the scores in the subscale I, and of age on the scores in the subscale II, the observed effect sizes were small (Table 3).

3.3. Abstinence from health-risk behaviours in relation to age and shift work

A majority of nurses (70–82%) did not abuse alcohol, did not smoke, nor abuse drugs not prescribed by a physician; a slightly smaller number (65%) did not avoid passive smoking. No statistically significant differences relative to the age and shift work were identified in this respect (Table 4).

Based on the results of logistic regression analysis it was found that neither of the variables—age and shift work—had a significant impact on nurses' abstinence from health-risk behaviours such as abuse of alcohol, smoking tobacco, passive smoking and abuse of drugs not prescribed by a physician (Table 5).

4. Discussion

4.1. Overview

This paper presents the results of a research study on health-enhancing behaviours of nurses in Poland. The study covered a large group of nurses—women ($N = 1017$) aged on average

Table 3
Results of linear regression analysis in terms of the impact of age and shift work on health-enhancing behaviours of nurses.

Subscale	Variable	$\beta_{\text{stand.}}$	–95% CI	+95% CI	t-Statistic	P
I. Nutrition	Intercept	–	–		37.0015	<0.0001
	Age	0.029	–0.033	0.092	0.9177	NS
	Shift work					
	0 = NO 1 = YES	–0.065	–0.128	–0.003	–2.0451	0.0411
II. Physical activity	Intercept	–	–		56.3074	<0.0001
	Age	–0.065	–0.127	–0.002	–2.0224	0.0434
	Shift work					
	0 = NO 1 = YES	–0.038	–0.101	0.025	–1.1956	NS
III. Relaxation and behaviours related to mental health	Intercept	–	–		57.8572	<0.0001
	Age	–0.032	–0.094	0.030	–1.0242	NS
	Shift work					
	0 = NO 1 = YES	–0.194	–0.255	–0.132	–6.1544	<0.0001
IV. Preventive behaviours	Intercept	–	–		32.9591	<0.0001
	Age	0.060	–0.003	0.122	1.8765	NS
	Shift work					
	0 = NO 1 = YES	–0.092	–0.154	–0.030	–2.8918	0.0039

$\beta_{\text{stand.}}$ —standardised regression coefficient, 95%CI—95% confidence interval for $\beta_{\text{stand.}}$. NS—statistically insignificant.

Table 4
Abstinence from health-risk behaviours relative to age and shift work among nurses (%).

Behaviour	Total	Age Group			Shift work		
		44 years	45 years and more	P^a	Yes	No	P^a
I do not abuse alcohol	81.5	82.4	81.1	NS	81.0	82.9	NS
I do not smoke	70.9	72.8	69.3	NS	70.5	72.0	NS
I avoid passive smoking	64.6	64.9	64.7	NS	63.7	67.3	NS
I do not abuse drugs not prescribed by physicians	78.8	80.7	77.3	NS	78.8	79.3	NS

NS—statistically insignificant.

^a Pearson's chi-squared test.

Table 5
Results of logistic regression analysis in terms of the impact of age and shift work on abstinence from health-risk behaviours among nurses.

Risk behaviours	Variable	OR	–95% CI	+95% CI	Wald statistic	P
I do not abuse alcohol	Intercept	–	–		17.813	<0.0001
	Age	1.000	1.000	1.001	0.902	NS
	Shift work					
	0 = NO 1 = YES	0.925	0.639	1.339	0.173	NS
I do not smoke	Intercept	–	–		25.012	<0.0001
	Age	1.000	0.999	1.000	3.283	NS
	Shift work					
	0 = NO 1 = YES	0.899	0.658	1.230	0.441	NS
I avoid second-hand smoke	Intercept	–	–		7.363	0.007
	Age	1.000	1.000	1.000	0.030	NS
	Shift work					
	0 = NO 1 = YES	0.855	0.634	1.152	1.061	NS
I do not abuse drugs not prescribed by physicians	Intercept	–	–		25.187	<0.0001
	Age	1.000	1.000	1.000	0.444	NS
	Shift work					
	0 = NO 1 = YES	0.965	0.682	1.365	0.041	NS

OR—odds ratio, 95%CI—95% confidence interval for odds ratio, NS—statistically insignificant.

43.2 ± 7.23 years; this means that their average age was less than that of the entire population of nurses in Poland (48.4 years). The nurses were preparing for an exam in different nursing specialties, had a lot of experience and had worked in the nursing profession for a number of years (on average 19.0 ± 8.04 years). A majority (73%) of the analysed nurses worked in shifts.

The data on health-enhancing behaviours of nurses were collected by means of an original PHBS instrument whose psychometric properties had been found satisfactory. The scale is divided into four domains (subscales) of health-enhancing behaviours (nutrition, physical activity, relaxation and behaviours related to mental health, preventive behaviours). The scale covers 29

behaviours in form of positive statements which comply with recommended guidelines or current knowledge. It was assumed that the said behaviours should be practised in everyday life *always* or *almost always*. The scale was supplemented with four statements on avoiding health-risk behaviours (abuse of alcohol, smoking, passive smoking, abuse of drugs not prescribed by a physician). The authors assumed that the behaviours are in line with a healthy lifestyle and that those who practise them on an everyday basis take good care of their health.

4.2. Key results

The results of the survey, carried out in the group of Polish female nurses with considerable professional experience who were increasing their qualifications on specialty training programmes, showed that the behaviours of the majority of nurses deviate significantly from a healthy lifestyle. Out of the 29 behaviours only three were exhibited with desirable frequency (*always* or *almost always*) by more than a half of the nurses. The remaining 26 behaviours were exhibited *always* or *almost always* by less than a half of the nurses, including nine behaviours which were exhibited by less than 15% of the respondents. The percentages of nurses who coped well with stress (6.8%), avoided snacking between meals (9.2%), and spent at last 20–30 min a day resting (9.6%) were the lowest. On a ten scale, a mean score in all four subscales was around 50 points from a maximum of 100, i.e. only half of the maximum score. That is evidence of a general deficiency in positive health behaviours among nurses. A majority of the nurses did not engage in any health-risk behaviours but nearly one third smoked tobacco and were exposed to passive smoking, and one in five nurses abused alcohol and drugs not prescribed by a physician.

The results of the survey among nurses may be comparable with data for teachers who took part in a study based on a similar PHBS in Poland. On a ten scale, the nurses obtained lower scores than teachers. The teachers obtained 60 points in the nutrition subscale and 65 points in the relaxation and behaviours related to mental health subscale (Wojnarowska-Soldan & Tabak, 2013). Comparison of the results of this study with results obtained by other authors is difficult due to the application of different tools and different forms of questions about health-enhancing behaviours. However, a number of research studies conducted in other countries revealed many mistakes in nurses' diet, including: excessive consumption of sweets and fast food snacks, excessive calories from fat, low intake of fruit and vegetables, irregular timing of eating and low physical activity (Bushnel, Colombi, Caruso, & Tak, 2010; Faugier, Lancaster, Pickles, & Dobson, 2001; Heath et al., 2012; Lowden, Moreno, Holmbäck, & Lennernäs, & Tucker, 2010; Tucker et al., 2010; Zapka, Lemon, Magner, & Hale, 2009). Sleep deprivation, tobacco smoking and abuse of alcohol by nurses were all common occurrences (Bushnel et al., 2010). Similar deficiencies in health-enhancing behaviours and risk behaviours were identified in English pre-registration nurses (Blake, Malik, Mo, & Pisano, 2011). A health-compromising lifestyle is one of the main causes of the high incidence of excess weight and obesity among nurses (Bushnel et al., 2010; Buss, 2012; Jordan et al., 2015; Miller, Alpert, & Cross, 2008; Tucker et al., 2010; Wong, Wong, Wong, & Lee, 2010). A comparison of data available in the existing literature with the results of the authors' original research indicates that the number of deficiencies in health-enhancing behaviours is higher among Polish nurses than nurses in other countries. This might be due to the insufficient number of nurses per head of population in Poland, which is a cause of increased workloads and low economic status within the group.

Differences in health-enhancing behaviours of the analysed nurses relative to their age were insignificant and applied only to behaviours associated with physical activity, which was slightly

higher among older nurses (45 years or more). Since many nurses, particularly those with longer job tenure, develop musculoskeletal disorders, physical activity may be one of the means to deal with these complaints (Mynarski et al., 2014). However, this hypothesis needs to be verified. It is likely that the older nurses are less encumbered by work at home and childcare and have more time for activities related to physical activity. It was found that shift work had a statistically significant negative impact in three subscales: nutrition ($\beta_{\text{stand.}} = -0.065$) and preventive behaviours ($\beta_{\text{stand.}} = -0.092$) – small effect size; relaxation and behaviours related to mental health ($\beta_{\text{stand.}} = -0.194$) – medium effect size. The findings are confirmed in a number of other studies of the effects of shift work on the health-enhancing behaviours of nurses. Out of the 143 work-related situations among Swedish nurses working night shifts, 50 had a positive impact on healthy diet and exercise habits and 93 had a negative impact (Persson & Martensson, 2008). The nurses who worked in shifts were found to have problems sticking to a healthy diet, abnormal eating behaviour, low physical activity and were more likely to engage in health-risk behaviours such as smoking tobacco and abuse of alcohol (Bushnel et al., 2010; Frost et al., 2009; Heath et al., 2012; Lowden et al., 2010; Wong et al., 2009).

4.3. Limitations of the study

A limitation of the study is that the cross-sectional data and the choice of a sample included only nurses who had decided to increase their professional qualifications. It may be assumed that the nurses who were taking actions to advance their career had better than average self-efficacy. Conversely, the extra work associated with preparations for the specialty exam might have had a negative effect on health behaviours among the nurses. The research should be extended to other groups of nurses.

4.4. Implications for practice

The research revealed a number of deficiencies associated with a healthy lifestyle among nurses. No one has previously conducted a similar study on such a large group of nurses in Poland. The results may prove useful to people and organisations that supervise nursing work in hospitals and clinics, and are in charge of nursing education. Learning about the lifestyles of nurses should be a starting point for planning intervention programmes concerned with health promotion. Similar programmes are described or advocated by other authors (e.g. Chan & Perry, 2012; Nejat & Abedi, 2015; Persson & Martensson, 2006; Witkoski & Dickson, 2010; Zapka et al., 2009). Action on nurses' health promotion should be undertaken as a part of the Health Promoting Hospitals programme (Groene, 2005; Whitehead, 2004, 2005).

5. Conclusions

More than half of the analysed nurses were found to have a number of deficiencies in all analysed aspects of healthy lifestyle (nutrition, physical activity, relaxation and behaviours related to mental health, preventive behaviours). The deficiencies in health-enhancing behaviours were greater among nurses who did shift work. Around 19–30% of nurses engaged in health-risk behaviours. This state of affairs may undermine the health of the nurses, their performance of professional duties, patient safety, their capacity for therapeutic and health education of patients, and their ability to model health-enhancing behaviours for patients. It is advisable that health promotion programmes be introduced at institutions that employ nurses, specifically in hospitals, and that the aspects

of health highlighted in this study be included as an element of professional nurse education.

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