

# IMPACT OF NURSES' SHIFT WORK ON THEIR NUTRITION ATTITUDES

## WPLYW PRACY ZMIANOWEJ PIELEŃNIAREK NA ICH POSTAWY ŻYWIENIOWE

Małgorzata Nejman<sup>1</sup>, Joanna Gotlib<sup>2</sup>

<sup>1</sup> Nursing

Medical University of Warsaw

<sup>2</sup> Division of Teaching and Outcomes of Education

Medical University of Warsaw, Poland

DOI: <https://doi.org/10.20883/pielpol.2017.1>

### ABSTRACT

**Introduction and aim.** Shift work is one of the key elements determining the development of attitudes towards nutrition. The aim of the study was an attempt to assess the influence of nurses' shift work on their dietary habits.

**Material and methods.** A total of 126 nurses (women: 100% of all) employed in teaching hospitals in Warsaw: group A (87 nurses working in a two-shift system: 12 hours), group B (39 nurses working in a single-shift system: 7.35 hours). The mean age among group A was 36.2 years and among group B it was 37.1 years. The minimum age amounted to 22 years, and the maximum age was 56 years.

A voluntary and anonymous questionnaire study. An original questionnaire and a method for assessing a periodic diet developed by Starzyńska. The original questionnaire comprised 11 closed-ended questions, 11 open-ended questions, and 7 semi-open-ended questions. Statistical analysis: Statsoft STATISTICA 12.5, non-parametric Mann-Whitney U test,  $\alpha < 0.05$ .

**Results.** A detailed analysis of diets of the study group of nurses demonstrated that their everyday diet contained a series of nutrition errors. An increase in regularity of meals would considerably improve the dietary habits of nurses.

#### Conclusions.

1. Diets of nurses from both groups contained a number of nutrition errors and the level of diets can be described as sufficient.
2. The study showed a significant correlation between shift work and regularity and variety of meals. Nurses working in a single-shift system (group B) ate more regularly compared to nurses from group A (a two-shift system).

KEYWORDS: nutrition, shift work, nurses.

### STRESZCZENIE

**Wstęp i cel.** Praca zmianowa jest jednym z głównych czynników warunkujących kształtowanie postaw względem żywienia. Celem pracy była próba oceny wpływu wykonywania pracy zmianowej przez pielęgniarki na ich zwyczaje żywieniowe.

**Materiał i metody.** W badaniach wzięło udział 126 pielęgniarek (100% kobiet) zatrudnionych w szpitalach klinicznych na terenie Warszawy: grupa A (87 pielęgniarek pracujących w systemie dwuzmianowym – 12 godz.), grupa B (39 pielęgniarek pracujących w systemie jednozmianowym – 7,35 godz.). Średnia wieku grupy A wynosiła 36,2 roku, średnia wieku grupy B – 37,1 roku. Wiek minimalny wynosił 22 lata, a wiek maksymalny – 56 lat.

Metodą zastosowaną w badaniu był autorski kwestionariusz ankiety; dokonano również oceny jadłospisu okresowego metodą opracowaną przez Starzyńską. Autorski kwestionariusz składał się z 11 pytań zamkniętych, 11 – otwartych i 7 – półotwartych. Analiza statystyczna: Statsoft STATISTICA 12.5, nieparametryczny test statystyczny U Manna-Whitneya,  $\alpha < 0,05$ .

**Wyniki.** Szczegółowa analiza jadłospisów badanej grupy pielęgniarek wykazała, że codzienny jadłospis zawierał wiele błędów dietetycznych. Czynnikiem, który w zdecydowanym stopniu wpłynąłby na poprawę zwyczajów żywieniowych pielęgniarek, byłoby zwiększenie regularności spożywania posiłków.

#### Wnioski.

1. Jadłospis pielęgniarek zarówno z grupy A, jak i z grupy B charakteryzował się wieloma błędami dietetycznymi, a jego poziom można określić jako dostateczny.
2. W badaniach wykazano istotną zależność pomiędzy systemem zmianowym pracy a regularnością i różnorodnością przyjmowanych posiłków. Pielęgniarki pracujące w systemie jednozmianowym (grupa B) odżywiają się bardziej regularnie niż pielęgniarki z grupy A (system dwuzmianowy).

SŁOWA KLUCZOWE: żywienie, praca zmianowa, pielęgniarki.

## Introduction

The nature of the work performed is one of the key determinants establishing the attitude towards eating. Shift work has recently become the main form of employment in the healthcare system. Most nurses employed in inpatient healthcare centres work either in a 12-hour or

7-hour system. Shift work often has a negative impact on a health status and well-being of employees, which is associated with disruption of circadian cycles [1–9].

In addition, shift work is one of the key elements determining the development of attitudes towards nutrition. Healthy eating guarantees productivity at work.

Foods rich in minerals influence effectiveness of work [10–13].

Polish scientific literature includes just a few publications on the nutritional status of medical team members, e.g. nurses. However, studies [5, 9, 11] conducted among Polish nurses showed evidence of dietary irregularities. It is impossible to follow the principles of healthy eating and maintain the proper level of physical activity due to the mode of work typical of this professional group. Not numerous studies performed among nurses demonstrated that this very professional group was particularly exposed to the occurrence of poor eating habits [5, 9, 11]. Most nurses eat irregularly and their diets comprise mostly cold and easy to prepare foods that are poor in minerals [5, 9, 11]. Despite having knowledge of the principles of healthy eating, nurses eat unhealthy foods, blaming the lack of time resulting from overloading with work responsibilities as well as stress for the enhancement of unhealthy eating attitudes.

### Aim of study

The aim of the study was an attempt to assess the influence of nurses' shift work on their dietary habits.

### Material and methods

#### Characteristics of the study group

The study included a total of 126 nurses (women: 100% of all) employed in selected Warsaw teaching hospitals.

The respondents were divided into two sub-groups, broken down by the hour-based system of work: group A comprised 87 nurses working in a two-shift system (12 hours) and group B comprised 39 nurses working in a single-shift system (7.35 hours).

The mean age among group A was 36.2 years and among group B it was 37.1 years. The minimum age of nurses amounted to 22 years, and the maximum age was 56 years. The difference between groups was statistically insignificant ( $p < 0.491$ ). In both groups the largest number of study participants varied between 20–30 and 30–50 years of age.

See **Table 1** for a detailed characteristics of the study group of nurses.

**Table 1.** Characteristics of the study group of nurses

Question	Group A	Group B	p	
BMI	BMI < 18,5	2	5	0,001
	18,5–25	61	22	
	25–30	12	11	
	> 30	12	1	

Place of residence	rural areas	30	2	0.004
	urban areas < 50,000 inhabitants	20	9	0.994
	urban areas > 50,000 inhabitants	37	28	0.002
Marital status	single	33	17	0.552
	married	45	18	0.526
	divorced	8	4	0.856
Monthly income	gross	2432,3 PLN	2115,5 PLN	0.201
	net	1905,2 PLN	1684,5 PLN	0.451
Education level	medical secondary school	4	0	0.067
	medical post-secondary school	15	2	0.178
	bachelor's degree	58	27	0.778
	master's degree	10	10	0.046
	specialisation	4	0	0.178
Job tenure		13.4 years	14 years	0.745
Position at work	charge nurses	77	7	0.001
	dressing nurses	0	4	0.002
	surgery nurses	5	7	0.033
	departmental nurses	0	2	0.035
	nurses of Rother specialisations	6	19	0.001

Group A – nurses working in a two-shift system (12 hours);  
Group B – nurses working in a single-shift system (7.35 hours);  
p – significance level of differences between the groups

Source: author's own analysis

## Study methods

A voluntary and anonymous study was carried out in 2012. A questionnaire developed by the authors and a method for assessing a periodic diet developed by Starzyńska to analyse the quality of foods were used in the study.

The original questionnaire comprised 11 closed-ended questions, 11 open-ended questions, and 7 semi-open-ended questions. The questions were divided into two parts. The first part comprised demographics questions concerning socio-demographic features of the respondents. The second part of the questionnaire aimed to assess eating attitudes of nurses working in different shift systems, taking account of factors determining their eating habits. The questions were about daily consumption of products, regularity of eating on a non-working day, a working day, and during a night shift.

## Statistical analysis of the study results

The data obtained during the survey were collected in the Microsoft Excel program (Microsoft Office). Statsoft STATISTICA 12.5 program (licensed to Warsaw Medical University) was used for statistical analysis of the results. Due to the nature of the data (qualitative, non-parametric data without normal distribution,  $p > 0.05$ , analysed with the use of Shapiro-Wilk test), the non-parametric statistical Mann-Whitney U test was used for statistical analysis in the case of comparing the two groups broken down by the system of work of nurses. The significance level was established at  $\alpha < 0.05$ .

## Results

A detailed analysis of diets of the study group of nurses demonstrated that their everyday diet contained a series of nutrition errors. See **Table 2** for the frequency of eating particular meals by the study group of nurses on working and non-working days.

**Table 2.** Analysis of diets of the study group of nurses

Question	Group A	Group B	p
30 points: good diet, no errors	0	1	
21–27 points: sufficient diet, errors can be eliminated	12	8	
Analysis of diets			0.139
12–20 points: diet is merely sufficient, numerous errors	48	22	
<12 points: poor diet, it cannot be improved	27	8	

Frequency of having breakfast on a non-working day	regularly	50	34	0.001
	irregularly	34	4	
	not at all	3	1	
Frequency of having second breakfast on a non-working day	regularly	15	13	0.029
	irregularly	37	10	
	not at all	34	12	
Frequency of having luncheon a non-working day	regularly	43	30	0.004
	irregularly	44	9	
	not at all	0	1	
Frequency of having afternoon snack on a non-working day	regularly	6	9	0.010
	irregularly	26	10	
	not at all	55	20	
Frequency of having dinner on a non-working day	regularly	35	17	0.727
	irregularly	46	12	
	not at all	6	9	
Frequency of having breakfast on a working day	regularly	40	32	0.001
	irregularly	41	5	
	not at all	6	1	
Frequency of having second breakfast on a working day	regularly	9	16	0.001
	irregularly	36	9	
	not at all	41	12	
Frequency of having lunch on a working day	regularly	31	27	0.001
	irregularly	48	10	
	not at all	10	0	
Frequency of having afternoon snack on a working day	regularly	29	8	0.147
	irregularly	32	12	
	not at all	25	17	
Frequency of having dinner on a working day	regularly	34	13	0.541
	irregularly	46	15	
	not at all	8	10	

Group A – nurses working in a two-shift system (12 hours);  
Group B – nurses working in a single-shift system (7.35 hours);  
p – significance level of differences between the groups

Source: author's own analysis

**Table 3** shows a detailed analysis of the regularity of having particular meals by the study group of nurses working in a two-shift system and **Table 4** shows discomfort suffered by nurses on a night shift.

**Table 3.** Analysis of regularity of having particular meals by the study group of nurses working in a two-shift system

Question		Group A
Regularity of having breakfast during the day and night shifts	regularly	47
	irregularly	30
	not at all	6
Regularity of having second breakfast during the day and night shifts	regularly	21
	irregularly	31
	not at all	31
Regularity of having lunch during the day and night shifts	regularly	46
	irregularly	34
	not at all	3
Regularity of having afternoon snack during the day and night shifts	regularly	12
	irregularly	31
	not at all	40
Regularity of having dinner during the day and night shifts	regularly	29
	irregularly	41
	not at all	13
Do you always have a hot meal on your night shift?	yes	15
	no	64

Group A – nurses working in a two-shift system (12 hours)

Source: author's own analysis

**Table 4.** Complaints of the study group of nurses after a night shift

Question	Group A
lack of appetite	17
excessive appetite	18
nausea	8
heartburn	11
constipation	14
abdominal pain	10
headache	45
irritation	48
difficulty concentrating	46
no complaints at all	10

Group A – nurses working in a two-shift system (12 hours)

Source: author's own analysis

**Table 5.** Number of products consumed on a working day

Question	Group A	Group B	p	
	Average number of items/glasses			
Number of products consumed on a working day	fruit	1.3	1.4	0.249
	vegetables	2	2.1	0.535
	bread	2	2.4	0.114
	diary products	1.5	1.8	0.115
	meat	2.1	2.2	0.320
	fish	0.5	0.6	0.759
	hot meal	0.5	1.1	0.037
	fast food meals	0.5	0.6	0.669
	instant meals	0.3	0.4	0.061
	sweets	4	3.4	0.007
	coffee	2.1	2.4	0.960
	tea	3.3	3.4	0.091
	milk	2.2	3.3	0.016
	energy drink	0.3	0.4	0.748
bottled water	4.4	4.5	0.735	
juice	1.2	1.3	0.467	

Group A – nurses working in a two-shift system (12 hours);

Group B – nurses working in a single-shift system (7.35 hours);

p – significance level of differences between the groups

Source: author's own analysis

**Table 6.** Factors influencing diets of the study group of nurses

Question	Group A	Group B	p	
Factors exerting the greatest impact on diets of nurses	work	4.3	3.9	0.042
	stress	4.4	3.7	0.001
	lack of time	4.5	4.0	0.021
	financial resources	3.1	2.8	0.276
	knowledge of healthy diet	3.1	3.4	0.348
	scope of duties	3.8	3.5	0.134
	type of work	4.4	3.8	0.001
	no meal breaks	4.2	3.5	0.005
	poor working time arrangements	3.6	3.1	0.052

Group A – nurses working in a two-shift system (12 hours);

Group B – nurses working in a single-shift system (7.35 hours);

p – significance level of differences between the groups

Source: author's own analysis

**Table 7.** Eating attitudes of the study group of nurses

Question		Group A	Group B	p
Dietary restrictions of nurses	no	63	32	0.047
	yes	23	7	
To what extent do nurses draw attention to what they eat?	strongly yes	7	12	0.566
	rather yes	56	23	
	strongly no	2	0	
	rather no	20	3	
	no opinion	5	2	
Influence of shift work on the change in nurses' eating attitudes	strongly yes	14	1	0.001
	rather yes	45	7	
	strongly no	3	12	
	rather no	21	0	
In your opinion, should the employer provide employees with meals?	strongly yes	36	12	0.021
	rather yes	34	12	
	strongly no	0	0	
	rather no	7	9	
In your opinion, does healthy eating contribute to your health status?	strongly yes	5	7	0.752
	rather yes	60	28	
	strongly no	23	10	
	rather no	0	0	
	rather no	1	0	
	no opinion	3	1	

Group A – nurses working in a two-shift system (12 hours);  
Group B – nurses working in a single-shift system (7.35 hours);  
p – significance level of differences between the groups

Source: author's own analysis

According to the study participants, an increase in regularity of meals would considerably improve the dietary habits of nurses. See **Table 8** for detailed data.

**Table 8.** Factors influencing dietary attitudes of nurses

Question	Group A	Group B	p
Regularity of eating	4.5	4.2	0.099
Eating healthy foods more often	4.1	4	0.986
Eating more fruit and vegetables	4.4	4.1	0.246
Eating more dairy products	3.6	3.2	0.075
Reducing the use of stimulants	3.6	2.8	0.016
Eating hot meals more often	4.1	3.4	0.002
Working in another shift work system	3.9	3.4	0.062

Group A – nurses working in a two-shift system (12 hours);  
Group B – nurses working in a single-shift system (7.35 hours);  
p – significance level of differences between the groups

Source: author's own analysis

## Discussion

In the Polish literature there are not many publications devoted to the nutritional status of nurses. Studies conducted among Polish nurses demonstrated certain errors in their diets as well as in their lifestyles [5, 9, 11]. It is impossible to follow the principles of healthy eating, lead a systematic lifestyle, and maintain the proper level of physical activity due to the mode of work typical of this professional group [14–23].

An analysis of health-related behaviours conducted by Warchot-Stawińska showed that only every fourth nurse working in Warsaw hospitals had a healthy diet [7]. Most of their eating habits depended on the present needs and financial resources. In most cases, nurses ate easy to prepare cold meals. Nevertheless, nurses tried to eat complete products with high nutritional value, which would improve their nutritional status [7].

A study by Sokółowska demonstrated that over half of the nurses participating in the study admitted that shift work negatively influenced their eating attitudes and prevented them from eating on a regular basis [9]. Despite having knowledge of the principles of healthy eating, nurses ate unhealthy foods, blaming the lack of time resulting from overloading with work responsibilities as well as a poor financial situation for the enhance-



ment of unhealthy eating attitudes. The respondents expressed their willingness to improve their eating behaviours by eating healthier foods, eating more regularly, and changing the system of work [9].

An analysis of the quality of meals performed by Bilski showed that the nutrition of nurses was improper [5]. Night shift in particular exerts a negative impact on eating habits of nurses. Nurses' meals comprised products that were difficult to digest, highly calorific and rich in preservatives, but in order to work properly on a night shift it is important to eat a hot and complete meal, which reduces drowsiness and improves performance. The study by Bilski showed that most nurses ate cold meals and drank a lot of coffee instead of eating a hot meal [5].

A study by Brzeźniak performed among 132 nurses working in teaching hospitals in Szczecin demonstrated that, regardless of the job tenure and position, over 50% of nurses found their professional environment stressful due to too many responsibilities and poor organisation of work [8]. Stress in the workplace contributed to nutrition disorders among nurses. 30% of the study nurses complained about periodic eating disorders as well as abdominal pain after a shift [8].

The Polish literature presents only a few studies on the nutritional status and dietary habits of nurses [2, 5, 7, 9, 11, 17, 20]. Studies conducted among Polish nurses demonstrated certain errors in their diets as well as in their lifestyles. It is impossible to follow the principles of healthy eating and maintain the proper level of physical activity due to the mode of work typical of this professional group [2, 5, 7, 9, 11, 17, 20].

An analysis of health-related behaviours conducted by Warchoł-Stawińska showed that only every fourth nurse working in Warsaw hospitals had a healthy diet [7]. Most of their eating habits depended on the present needs and financial resources. Unfortunately, in most cases, nurses ate easy to prepare cold meals. Nevertheless, nurses tried to eat complete products with high nutritional value, which would improve their nutritional status [7].

Similar results were obtained in the present study. The analysis of diets by Starzyńska showed that most nurses made a lot of dietary mistakes and their diets were merely sufficient. A majority of nurses admitted that they did not pay attention to what kind of products and meals they ate. The nurses from group A (12.00 hours) ate their meals less regularly than their colleagues from group B (7.35 hours). Most nurses said that their dietary behaviours depended on the lack of time. Financial resources were not relevant to their choices.

The study by Sokołowska demonstrated that over half of the nurses participating in the study admitted

that shift work negatively influenced their eating attitudes and prevented them from eating on a regular basis [9]. Despite having knowledge of the principles of healthy eating, nurses ate unhealthy foods, blaming the lack of time resulting from overloading with work responsibilities as well as a poor financial situation for the enhancement of unhealthy eating attitudes. The respondents expressed their willingness to improve their eating behaviours by eating more healthy foods, eating more regularly, and changing the system of work [9].

The present study also demonstrated a significant correlation between shift work and eating attitudes. The analysis of eating particular meals showed that nurses ate more regularly and had a larger number of meals on their non-working days. Group B (7.35 hours) had as many as four out of five regular meals per day. The nurses from group A (12.00 hours) believed that their nutritional habits would have changed if it were not for shift work. It is encouraging that nurses were aware of the negative consequences of poor nutrition.

The analysis of the quality of meals performed by Bilski conducted among 241 practising nurses showed that their nutrition was improper [2, 5]. Night shift in particular exerts a negative impact on eating habits of nurses. Their diet at night was limited to cold meals and coffee. Nurses' meals comprised products that were difficult to digest, highly calorific and rich in preservatives. The study by Bilski showed that only 10% of nurses on duty ate a hot meal on a night shift [2, 5].

The present analysis demonstrated that nurses working on a night shift ate a smaller number of meals with lower regularity compared to a day shift. Most respondents ate regularly only breakfast and lunch. Nurses working a 12-hour shift system (group A) ate a significantly lower number of products and their diet was not varied. It is worrying that one of the respondents did not have a hot meal on her night shift.

The study by Brzeźniak performed among 132 nurses working in teaching hospitals in Szczecin demonstrated that, regardless of the job tenure and position, over 50% of nurses found their professional environment stressful due to too many responsibilities and poor organisation of work [8]. Stress in the workplace contributed to nutrition disorders among nurses. 30% of the study nurses complained about periodic eating disorders as well as abdominal pain after a shift [8].

This was also found in the present study. The nutrition of nurses was most affected by the lack of time. Nurses complained about being overloaded with work responsibilities and a lack of meal breaks. However, a majority of nurses from both groups were not convinced of a need that employers should provide them with meals. Nurses preferred to prepare food for themselves

independently. The respondents also complained about headaches as well as irritation after having a night shift.

The study by Ślusarska conducted among 150 practising nurses focused on an analysis of BMI based on measurements of body mass and height. Only 42% of the respondents had a normal BMI value [11].

A significant correlation in a BMI value was found in the present study. The mean BMI value among group A amounted to 24.8 and it was 23.1 among group B, which showed that most nurses were within normal limits. In terms of the value itself, both groups were not diverse, however, a substantially larger number of obese persons were observed in group A.

## Conclusions

1. Diets of nurses from both groups contained a number of nutrition errors and the level of diets can be described as sufficient.
2. The study showed a significant correlation between shift work and regularity and variety of meals. Nurses working in a single-shift system (group B) eat more regularly compared to nurses from group A (a two-shift system).

## References

1. Zużewicz K, Kwarecki K, Waterhouse J. Skutki fizjologiczne pracy zmianowej i nocnej. Warszawa: CIOP; 2001.
2. Bilski B (red.). Higiena pracy dla pielęgniarek. Wybrane zagadnienia. Poznań: Wyd. Nauk. Akademii Medycznej; 2004.
3. Głowacka M, Majchrowska A. Badanie satysfakcji zawodowej kadr pielęgniarskich. Cele i praktyczne metody zastosowania. *Piel Pol*. 2008; 1(27): 50–54.
4. Sygit E. Długoletni staż zawodowy pielęgniarek – droga ku wypaleniu zawodowemu. *Rocz Pomor Akad Med*. 2009; 55(2): 83–89.
5. Bilski B. Wpływ pracy zmianowej na sposób odżywiania się i patologię przewodu pokarmowego wśród pielęgniarek – wyniki badania pilotażowego. *Med Pracy*. 2006; 57(1): 15–19.
6. Zynarska M, Bernard D, Maksymiuk et al. Specific elements of nurse work overload. *Fam Med Prim Care Rev*. 2008; 10(4): 1351–1355.
7. Warchoń-Stawińska E, Włoch K. Zachowania zdrowotne pielęgniarek. *Zdr Publ*. 2003; 113(1/2): 156–159.
8. Brzeźniak H, Rotter I, Żużak-Bączowska K et al. Ocena wpływu wybranych czynników stresogennych na funkcjonowanie zawodowe pielęgniarek w zależności od wieku i stażu pracy. *Zdr Publ*. 2011; 121(1): 43–46.
9. Sokołowska B, Samoszuk T, Piaszczyk D. Styl życia a odżywianie pielęgniarek jako jeden z wyznaczników programów promocji zdrowia. *Ann Univ Mariae Curie-Skłodowska*. 2003; 58 (Suppl. 12) 231: 152–156.
10. Gotlib J, Rebandel H. Wstępna ocena postrzegania postaw prozdrowotnych personelu medycznego oraz własnych zachowań zdrowotnych w opiniach studentów Warszawskiego Uniwersytetu Medycznego. *Piel XXI w*. 2009; 3 (28): 37–42.
11. Ślusarska B, Nowicki G, Piasecka H. Zmiany sposobu żywienia, poziomu aktywności fizycznej oraz wskaźników BMI, WHR zależne od wieku wśród osób pracujących. *Piel XXI w*. 2009; 3: 5–10.
12. Gulbicka B, Kwasek M. Wpływ dochodów na spożycie żywności w gospodarstwach domowych. Warszawa: IERiGŻ; 2001.
13. Waśkiewicz A, Sygnowska E, Szcześniewska D. Wpływ poziomu wykształcenia na żywienie wybranych grup ludności w 10-letnim okresie obserwacji – badanie Poł-MONICA Warszawa. *Żyw Człow Metab*. 2000; 27, 3: 219.
14. Indulski JA, Makowiec-Dąbrowska T, Starzyński Z. Wpływ pracy nocnej na stan zdrowia. *Med Pracy*. 1989; 11, 3: 153–161.
15. Gawęł G. Psychologiczne obciążenie pielęgniarek pracą zmianową. Badanie porównawcze systemu 8- i 12-godzinowego. *Piel Potoż*. 1991; 9–10: 146–156.
16. Makowiec-Dąbrowska T. Społeczne aspekty podejmowania przez kobiety w Polsce pracy zmianowej w nocy. *Ergonomia PAN*. 1991; 14(1): 131–135.
17. Kuriata E, Felińczak A, Grzebieluch J et al. Specyfika pracy pielęgniarskiej w szpitalu – warunki pracy i aktualne wyzwania. *Piel Zdr Publ*. 2011; 1(2): 163–167.
18. Marcinkowski JT (red.). Higiena, profilaktyka i organizacja w zawodach medycznych. Warszawa: PZWL; 2003.
19. Ogiński A, Kuleta J, Pietsch E et al. Całodobowe obciążenie kobiet zatrudnionych w pracy wielozmianowej. *Ergonomia PAN*. 1991; 14(1): 123–129.
20. Kułagowska E. Kondycja zdrowotna personelu pielęgniarskiego sal operacyjnych. *Zdr Publ*. 2007; 117(1): 40–43.
21. Kicia M, Iwanowicz-Palusz G. Praca zawodowa pielęgniarki i potożnej źródłem stresu. *Piel XXI w*. 2006; 1–2: 41–43.
22. Wysokiński M, Wrońska I, Ślusarz R et al. Ocena satysfakcji z życia aktywnych zawodowo pielęgniarek regionu kujawsko-pomorskiego. *Piel XXI w*. 2009; 4(29): 53–56.
23. Grossvald B. Shift work and negative work-to-family-spillover. *J Sociol Soc Welfare*. 2003; 30: 31–56.

The manuscript accepted for editing: 10.04.2016

The manuscript accepted for publication: 25.05.2016

Funding Sources: This study was not supported.

Conflict of interest: The authors have no conflict of interest to declare.

### Address for correspondence:

Joanna Gotlib

Żwirki i Wigury 61

02-091 Warsaw, Poland

phone: +48 22 5720 490, fax: 22 5720 491

e-mail: joanna.gotlib@wum.edu.pl

Division of Teaching and Outcomes of Education

Medical University of Warsaw