European Journal of Clinical and Experimental Medicine

ONLINE FIRST

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Article type: Original Article

Received: 28 March 2026

Accepted: 21 May 2026

Published online: 17 June 2026

eISSN: 2544-1361

Eur J Clin Exp Med

doi:10.15584/ejcem.2026.3.5

Selected determinants of health-related behaviors of nurses – a cross-sectional study

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ABSTRACT

Introduction and aim. Health behaviors include all actions that may affect health status. This research was conducted to assess the level of health-related behaviors among professionally active nurses.

Material and methods. 322 nurses took part in the study. The work used the method of cross-sectional study, the questionnaire technique, and the research tool was the author's Personal Information Form (PIF), and Health Behavior Inventory (HBI).

Results. In the studied group of nurses, the level of the health behavior index was 78.9 points. Rural residents have a slightly worse mental attitude and are slightly more likely to show a low level of health behavior. Nurses with chronic illness present a higher level of health behavior than their healthy colleagues. Age and seniority do not affect the health behavior of the respondents.

Conclusion. The level of health behavior in the studied group of active nurses was moderate. The results obtained indicate the need to undertake targeted preventive and educational activities, especially among groups of nurses with lower health behaviors.

Keywords. health, health behaviors, nurses

Introduction

Nurses constitute the most feminized and numerous professional group in the healthcare system in the world.[1] Their role goes far beyond performing medical procedures and includes educational, preventive and health promotion activities. At the same time, it is a professional group particularly exposed to physical and mental overload. Numerous studies confirm that high workload, time pressure, professional responsibility, staff shortages and stress related to caring for patients in life-threatening conditions significantly affect the health and well-being of nurses.[2-4]

Shift work, including night shifts and irregular work rhythms, is a particularly important risk factor. It disrupts the body's natural circadian rhythm, leading to sleep problems, chronic fatigue, and an increased risk of metabolic and cardiovascular diseases.[3,4] The literature also indicates a link between shift work and an increased risk of obesity, mood disorders and burnout.[5-8] Long-term exposure to occupational stress can further lead to a decrease in the quality of life and deterioration of the over-all health of nursing staff.[2]

Despite the numerous burdens, working with a patient can be a source of professional satisfaction and a sense of meaning in the duties performed.[9,10] However, this satisfaction often co-occurs with a high level of stress, which creates a complex picture of the professional functioning of nurses. In the context of growing staff short-ages and the ageing of the nursing population, the issue of nurses' health and well-being is of particular systemic importance.[1]

A healthy lifestyle and taking appropriate health behaviors are a key element of maintaining good health and a high quality of life.[11,12] Health behaviors are defined as all actions of an individual that affect their health – both in a beneficial way (health-promoting behavior) and in an unfavorable way (anti-health behavior).[13] These range from responses to health-related situations as well as entrenched habits and conscious actions taken to protect it.[14]

The most frequently analyzed health-promoting behaviors includes regular physical activity, rational nutrition, avoidance of psychoactive substances, attention to sleep hygiene and skillful stress management. These behaviors have both short-term (improved well-being, increased energy levels) and long-term (prevention of chronic diseases, prolongation of life).[15] Wellbeing research emphasizes that health status is one of the key components of quality of life and strongly correlates with subjective life satisfaction.[16] Health behaviors affect well-being both directly and indirectly – by improving physical and mental health. People leading a health-promoting lifestyle show a higher level of mental well-being, greater emotional resilience and lower levels of stress.[17] In a holistic approach, health is treated as a multidimensional construct, including physical, mental and social components, the level of which directly affects the overall quality of life.[13,18,19]

In recent years, more and more attention has been paid to the well-being of nursing staff as a factor determining not only the quality of life of nurses themselves, but also the quality of patient care.[10,12] Good

health and high life satisfaction are conducive to greater professional engagement, lower levels of burnout and higher work efficiency.[20] On the other hand, chronic stress, lack of organizational support and work overload significantly increase the risk of burnout and reduced quality of care.[2,21] From a systemic perspective, maintaining a high level of nurses' well-being translates into patient safety, fewer medical errors and higher satisfaction with healthcare.[2,22] At the same time, nurses are expected to act as models of health-promoting behavior, which means that their own health attitudes can influence the credibility and effectiveness of educational activities.[23]

Despite numerous studies on the workload and burnout of nurses, relatively less attention has been paid to the analysis of the level of their health behavior and the factors that determine it. In particular, there is a limited number of studies analyzing the relationship between health behaviors, selected sociodemographic and occupational factors (including shift work) and wellbeing indicators. An in-depth understanding of these relationships can be the basis for the development of targeted sup-port programs, modification of work organization and the implementation of systemic health promotion activities in the nursing community.

Aim

The aim of this study was to assess the level of health-related behaviors among professionally active nurses and to analyze selected sociodemographic and occupational factors, including the nature of shift work and chronic diseases occurrence. The following research questions were formulated: What is the level of health behavior in the studied group of nurses? Do health behaviors vary depending on selected sociodemographic variables? Is there a relationship between health behavior and occupational factors, including shift work? The novelty of this study lies in the assessment of health-related behaviors and occupational characteristics.

Material and methods

Study design

It was a descriptive cross-sectional study aimed at assessing the level of health behavior of nurses and their relationship with selected sociodemographic and occupational factors.

Participants and settings

The sample was selected using a convenience sampling method. The study involved 322 nurses employed in two hospitals in south-eastern Poland. The inclusion criteria included: age over 18 years, active employment as a nurse, minimum one year's work experience in the nursing profession and voluntary participation in the study. People who do not meet the above criteria are excluded. A total of 322 completed forms were included in the analysis due to missing data, some analyses were conducted on reduced subsamples; therefore, the number of observations varies across tables.

Ethical considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and received approval from the Bioethics Committee at the University of Rzeszow from 09/05/2019 (Resolution No. 30/05/2019). Prior to the commencement of the study, participants were informed about the aims and design of the project and were advised that participation was anonymous and entirely voluntary. They were then asked to provide informed verbal consent to participate. No incentives were offered for participation. Nurses who provided consent were subsequently invited to complete the questionnaire.

Data collections

The questionnaires were distributed in two hospitals in south-eastern Poland between May and June 2019. Respondents received clear instructions on how to complete the survey. After filling out the questionnaires, they were deposited in a special urn located on the premises of the hospital.

Research instruments

Personal Information Form (PIF)

The PIF author's questionnaire included questions on socio-demographic and occupational characteristics, including age, place of residence, length of service, work system, occurrence of chronic diseases.

Health Behavior Inventory (HBI)

The level of health behavior was assessed using the HBI by Zygfryd Juczyński.[24] The questionnaire consists of 24 statements relating to health-promoting behaviors. Respondents determined the frequency of undertaking individual behaviors over the past year, using a five-point Likert scale (1 – almost never, 2 – rarely, 3 – occasionally, 4 – often, 5 – almost always). On the basis of the data obtained, the overall rate of health-related behaviors undertaken by respondents and the level of severity in four categories of health behaviors were calculated: proper eating habits, preventive behaviors, positive mental attitude and health practices. The value of the General Health Behavior Index (GI) ranges from 24 to 120 points, with a higher value indicating a higher level of declared health-promoting behaviors. According to the summary classification of the HBI scale, the results are converted into sten units, on the basis of which three levels of health behavior are distinguished: low (1–4 sten), average (5–6 sten) and high (7–10 sten). The HBI is a standardized tool with established psychometric properties. In the original validation study, the overall internal consistency was good (Cronbach's α=0.85), while the four subscales showed reliability coefficients ranging from 0.60 to 0.65.[24]

Statistical analysis

The statistical analysis was carried out in the Statistica 13.3 (TIBCO Software Inc. Palo Alto, CA, USA) program. Quantitative variables are described using the arithmetic mean (M), standard deviation (SD), median, and range of values. Qualitative variables are presented as numbers (n) and percentages (%). The normality of the distribution of quantitative variables was assessed using the Shapiro-Wilk test. Due to the non-normal distribution of the analyzed variables, the non-parametric Mann-Whitney and Kruskal-Wallis tests were used. The chi-square test of independence was applied for qualitative variables. The level of statistical significance was assumed to be $p<0.05$.

Results

Study group characteristics

The study group consisted of 322 nurses. Only women participated in the study. The analysis of sociodemographic characteristics showed that over 40% of respondents were under 30 years of age, and the largest percentage had 1 to 5 years of work experience in the profession. The majority of participants lived in the countryside 57.8%, while 42.2% came from the city. The dominant work system was shift work, i.e. 80.1% of the respondents, while 19.9% worked in a one-shift system. One in five nurses (23%) confirmed a chronic disease (Table 1).

Table 1. Sociodemographic characteristics of respondents (n=322)

Variables		n	%
Age (in years)	<30	130	40.3
	30-49	128	39.7
	>50	61	19.0
Place of residence	city	135	41.9
	village	187	58.1
Seniority (in years)	>5	130	40.3
	5-25	97	30.2
	>25	95	29.5
System of work	shift work	258	80.1
	single-shift work	64	19.9
Chronic disease	yes	74	23.0
	not	248	77.0

Level of health behavior according to HBI

The table below summarizes the distribution of health behavior levels across the four domains assessed using the HBI), as well as the overall index. In the study group, the mean value of the overall HBI was 78.9 points (Me=79), which corresponds to a average level of health behaviors according to the HBI classification (Table 2).

Table 2. Level of health behaviors according to HBI

Level of health-related behaviors	$\bar{x}$	Me	s	c_{25}	c_{75}	min	max
Healthy dietary habits	3.39	3.33	0.68	3.00	3.83	1.50	5.00
Preventive behaviors	3.38	3.50	0.71	2.83	3.83	1.17	4.83
Positive psychological attitude	3.37	3.33	0.68	3.00	3.83	1.17	5.00
Health practices	3.01	3.00	0.64	2.67	3.50	1.00	5.00
HBI	78.9	79	13.2	71	88	35	117

The majority of nurses present a low (44.7%) or average (41.6%) level of health behavior, and only 13.7% a high level (Table 3).

Table 3. Level of health-related behaviors

Level of health-related behaviors	Frequency	Percentage
Low	144	44.7%
Average	134	41.6%
High	44	13.7%

The influence of selected socio-demographic factors on psychometric measures

In the next part, the impact of selected factors – independent variables – related to professional status, but also demographic characteristics and social status – on the level of health behavior was analyzed. The calculations were based on the numerical values of the HBI measures, as well as the classification made on this basis.

Selected socio-demographic factors and the level of health behavior

The analysis did not show statistically significant differences in the level of health behavior depending on the age of the respondents (p>0.05). The values of the medians of the individual components of the HBI and the general index were similar in the analyzed age groups. However, a slight upward trend was observed, consisting in obtaining slightly higher values of the HBI index and selected categories of health behaviors in the oldest group of respondents (>50 years).

The place of residence showed a certain tendency to differentiate the level of health behavior. Respondents living in cities scored slightly higher in terms of positive mental attitude compared to rural residents, with this difference being close to the level of statistical significance (p=0.058). A similar trend was observed for the overall HBI index.

Similarly, the length of service in the profession did not significantly differentiate the level of health behavior (p>0.05). Although the longest-serving people scored slightly higher median in some categories of health behaviors, these differences did not reach the level of statistical significance. There were also no statistically significant differences in the level of health behavior between people working in shifts and in a one-shift system (p>0.05).

A statistically significant relationship was observed in relation to the occurrence of chronic disease. People declaring a chronic disease showed a higher level of proper eating habits compared to respondents without chronic diseases (p=0.015). In addition, slightly higher values of the overall HBI index were recorded in this group, with this difference being close to the level of statistical significance (p=0.077), (Table 4).

Table 4. The influence of selected socio-demographic factors on psychometric measures

Level of health-related behaviors	**Age [years] – Kruskal-Wallis test**									**p**
	<30			**30–49**			**>50**			
	$\bar{x}$	Me	s	$\bar{x}$	Me	s	$\bar{x}$	Me	s	
Proper dietary habits	3.36	3.33	0.62	3.36	3.50	0.72	3.52	3.67	0.68	0.2413
Preventive behaviors	3.38	3.42	0.61	3.40	3.50	0.79	3.39	3.50	0.70	0.7902
Positive mental attitude	3.38	3.33	0.55	3.31	3.33	0.76	3.47	3.67	0.67	0.3192
Health practices	3.01	3.00	0.55	2.98	3.00	0.72	3.11	3.17	0.64	0.5165
Overall HBI score	78.8	77.0	10.5	78.3	80.0	15.3	80.9	84.0	13.0	0.3366
Level of health-related	**Seniority in profession [years], Kruskal-Wallis test"**									**p**

behaviors	<5			5–24			>25			
	$\bar{x}$	Me	s	$\bar{x}$	Me	s	$\bar{x}$	Me	s	
Proper dietary habits	3.37	3.33	0.62	3.33	3.42	0.74	3.45	3.50	0.66	0.4760
Preventive behaviors	3.41	3.50	0.61	3.39	3.50	0.75	3.38	3.50	0.74	0.9903
Positive mental attitude	3.38	3.33	0.59	3.34	3.33	0.67	3.43	3.50	0.70	0.4674
Health practices	2.99	3.00	0.54	2.97	3.00	0.71	3.10	3.00	0.66	0.4335
Overall HBI score	78.8	77.0	11.1	78.1	80.0	14.1	80.1	81.0	13.5	0.5212

Level of health-related behaviors	Place of residence						p
	City			Village			
	$\bar{x}$	Me	s	$\bar{x}$	Me	s	
Proper dietary habits	3.43	3.50	0.72	3.35	3.33	0.64	0.2605
Preventive behaviors	3.40	3.50	0.73	3.37	3.42	0.71	0.5115
Positive mental attitude	3.44	3.50	0.69	3.32	3.33	0.66	0.0581
Health Practices	3.05	3.00	0.67	2.99	3.00	0.61	0.5933
Overall HBI score	79.9	82.0	14.0	78.2	78.0	12.6	0.1113

Level of health-related behaviors	Work system (Mann-Whitney test)						p
	Shift work			Single-shift work			
	$\bar{x}$	Me	s	$\bar{x}$	Me	s	
Proper dietary habits	3.37	3.33	0.65	3.43	3.33	0.79	0.6767
Preventive behaviors	3.39	3.50	0.72	3.35	3.50	0.68	0.6500
Positive mental attitude	3.34	3.33	0.68	3.48	3.50	0.67	0.1896
Health Practices	2.99	3.00	0.64	3.11	3.00	0.63	0.1198
Overall HBI score	78.5	79.0	13.3	80.2	79.0	12.9	0.3715

Level of health-related behaviors	Presence of chronic disease (Mann-Whitney test)						p
	Yes			No			
	$\bar{x}$	Me	s	$\bar{x}$	Me	s	
Proper dietary habits	3.55	3.67	0.71	3.34	3.33	0.65	0.0154*
Preventive behaviors	3.40	3.50	0.75	3.39	3.50	0.69	0.4749

Positive mental attitude	3.41	3.42	0.71	3.36	3.33	0.66	0.4365
Health Practices	3.08	3.00	0.71	3.00	3.00	0.61	0.3076
Overall HBI score	80.6	81.5	14.9	78.5	79.0	12.4	0.0775

The analysis did not show statistically significant relationships between the level of health behavior and the age of respondents (p=0.1443) or length of service (p=0.2832). In each of the analyzed groups, a low level of health behavior prevailed, although with age there was a tendency toward a lower a lower proportion of respondents presenting low levels of health behavior. A tendency toward a relationship between place of residence and health behaviors was observed; however, the result did not reach statistical significance (p=0.0849). Respondents living in rural areas more often presented a low level of health behavior, while city dwellers more often declared a high level of health-promoting behavior. There was also no significant relationship between the level of health behavior and the work system (p=0.4166). A statistically significant association was noted in the case of chronic disease occurrence (p=0.0240). Respondents with chronic disease were more likely to present a high level of health behaviors and less likely to present a low level of these behaviors compared to respondents without chronic diseases (Table 5).

Table 5. The influence of selected socio-demographic factors on the level of health behaviors*

Level of health-related behaviors	**Variables**			**Total (n#)**
	Age [years] (p=0.1443)			
	<30	**30–49**	**>50**	
Low	66 (50.8%)	56 (43.8%)	20 (32.8%)	142
Average	51 (39.2%)	51 (39.8%)	31 (50.8%)	133
High	13 (10.0%)	21 (16.4%)	10 (16.4%)	44
Total	130	128	61	319
Level of health-related behaviors	**Seniority in profession [years], (p=0.2832)**			Total
	<5	**5–25**	**>25**	
Low	66 (51.6%)	37 (41.1%)	36 (37.9%)	139
Average	49 (38.3%)	40 (44.4%)	44 (46.3%)	133
High	13 (10.2%)	13 (14.4%)	15 (15.8%)	41
Total	128	90	95	313
Level of health-related behaviors	**Place of residence (p=0.0849)**			Total
	City		**Village**	
Low	52 (38.5%)		91 (48.9%)	143
Average	59 (43.7%)		75 (40.3%)	134

High	24 (17.8%)	20 (10.8%)	44
Total	135	186	321
Level of health-related behaviors	**Work system (p=0.4166)**		Total
	Shift work	**Single-shift work**	
Low	117 (45.3%)	27 (42.2%)	144
Average	109 (42.2%)	25 (39.1%)	134
High	32 (12.4%)	12 (18.8%)	44
Total	258	64	322
Level of health-related behaviors	**Presence of chronic disease (p=0.0240*)**		Total
	Yes	**No**	
Low	27 (36.5%)	116 (47.0%)	143
Average	30 (40.5%)	104 (42.1%)	134
High	17 (23.0%)	27 (10.9%)	44
Total	74	247	321

* # – n may vary due to missing responses, p – probability value calculated using the chi-square test of independence

Discussion

The aim of this study was to assess the level of health behavior of professionally active nurses. The results obtained indicate that the average level of health behavior measured by the HBI was 78.9 points, which classifies the surveyed people in the range of moderate to high level of health-promoting habits. This result can be interpreted as, especially in the context of the professional burden characteristic of the nursing profession.[25] At the same time, the structure of the results indicates that the majority of respondents presented a low or average level of health behavior, and only 13.7% reached a high level, which suggests significant space for intervention activities.

A moderate mean level of health-promoting behavior may be related to the specific characteristic of the nursing profession, including a high level of health knowledge, medical education and daily contact with patients. According to the World Health Organization (WHO)[1], nurses are a key professional group in the health care system and play an important role in health promotion. Theoretical and practical knowledge may promote greater awareness of the importance of prevention; however previous studies showed that health awareness does not always translate into consistent implementation of health behaviors in everyday life.[23,26,27]

The results of this study are similar to the observations of Kilar et al.,[28] who obtained an average HBI score of 80.52 points. In that study, the family played a key role in the nurses' value system, along with health and professional work, and the level of health behavior was described as average. The authors also pointed

to the im-portance of educational and environmental factors – higher education correlated with a higher level of health-promoting behaviors. The literature emphasizes that education increases health competences and promotes rational health decisions.[14] Similar findings have been reported in studies conducted among Polish nurses, which indicate that health-related behaviors are associated not only with sociodemographic factors but also with psychological traits and occupational conditions. [29]

In the study by Trojanowska et al. on a group of pediatric nurses, the HBI score was 80.7 points, a higher level of health behavior was presented by older respondents and those with higher professional experience, which is consistent with our results.[30]

International studies conducted in China, Nepal, Qatar, Iran and South Korea also indicate that nurses commonly present low or moderate levels of health-related behaviors, although the results vary depending on the measurement tools and cultural context. However, comparisons between studies should be interpreted cautiously due to the use of different measurement tools and scoring systems.[31-35]

The findings of the present study are consistent with recent research indicating that nurses generally present a moderate level of health-related behaviors, although important deficits remain in specific domains.[36] Moreover, contemporary studies emphasize that nurses' health and well-being are closely associated with their work performance and quality of care, highlighting the importance of supporting this professional group at both individual and organizational levels.[37,38]

The analysis of socio-demographic factors did not reveal any statistically significant relationships between the level of health behavior and age, length of service or the work system. However, there was a noticeable upward trend with age – the percentage of people with low levels of health behavior decreased in older age groups. This phenomenon may be associated with an increase in health maturity, a change in life priorities and greater awareness of the health consequences of incorrect habits.[16,30]

An interesting result is the relationship between the occurrence of chronic disease and the level of health behavior. Nurses with chronic diseases showed a significantly higher level of proper eating habits and were more likely to achieve a high level of health behavior. This can be interpreted as the result of increased motivation to check health and greater internalization of medical recommendations. The literature indicates that the experience of the disease can be a strong stimulus to lifestyle modification.[15]

However, it remains worrying that despite high health knowledge, only a small percentage of nurses achieve a high level of health behavior. Numerous studies emphasize the impact of occupational stress, work overload, shift work and the risk of burnout on the deterioration of the well-being and quality of life of nursing staff.[2,20,21] Previous research also suggests that work-family conflict and sleep disturbances may negatively affect mental health among nursing personnel, further limiting engagement in health-promoting behaviors.[39] In turn, participation in preventive programs and effective coping with occupational stress may support healthier behaviors among nurses.[40]

Long-term stress can lead to sleep disorders, reduced physical activity and incorrect eating habits.[3,4,8] As a consequence, there is a discrepancy between the role of the nurse as a health promoter and her own health behavior.[23]

The results of this study fit into the broader context of research on the well-being and quality of life of healthcare workers.[10,12] According to the approach to health as a multidimensional construct, encompassing physical, mental and social components,[13] health behaviors are important, but are not the only determinant of well-being. Organizational factors, social support, and workplace culture can strengthen or weaken individual health resources.[17,18]

In summary, the study indicates that nurses predominantly present low or moderate levels of health-related behaviors despite their professional knowledge and health awareness. The findings suggest a potential role of occupational and organizational factors in shaping these behaviors; however, the descriptive nature of the study does not allow causal interpretation or identification of independent predictors. These results highlight the importance of targeted workplace health promotion and further research using multivariate approaches however, the findings should be interpreted in light of several limitations of the study. The study is limited by the use of univariate analyses without controlling for potential confounding variables. In addition, the use of a convenience sampling method and inclusion of participants from only two hospitals may limit the representativeness of the sample and restrict the generalizability of the findings to the broader population of nurses.

The data on health behaviors are based solely on respondents' declarations and have not been otherwise verified, which may introduce self-report bias. Moreover, the study did not control for psychosocial factors that may influence health behaviors, such as perceived stress, social support or other contextual determinants. Workload was not directly measured, and the study did not include information on lifestyle behaviors outside the workplace, which may also have influenced the observed results. In addition, other potentially relevant factors, such as quality of life, were not assessed. Another limitation is that effect sizes and confidence intervals were not reported, which may limit the interpretation of the magnitude and precision of the observed associations.

Despite these limitations, the results provide valuable insights into the level of health behavior among nurses and the demographic and health factors associated with their health-promoting practices.

Conclusion

Professionally active nurses demonstrate low or average level of health behaviors. No statistically significant associations were observed between the level of health-related behaviors and age, professional experience, and work system. A tendency toward an association between place of residence and health-related behaviors was observed. Nurses with chronic disease was associated with healthier eating habits and a higher overall Health Behavior Index score. These findings highlight the need for targeted health

promotion initiatives aimed at nurses, including both educational and organizational interventions to supporting healthy lifestyles and well-being.

Acknowledgments

The authors would like to thank all participants who took part in the study.

Declarations

Funding

This research received no external funding.

Author contributions

Conceptualization, A.N. and M.N.; Methodology, A.N., Ka.K. and M.N.; Software, A.N., Ka.K. and M.N.; Validation, A.N., Ka.K., and M.N.; Formal analysis, A.N., and M.N.; Investigation, A.N., Ka.K., and M.N.; Resources, A.N., Ka.K., Kr.K. and M.N.; Data curation, A.N., and M.N.; Writing - Original Draft Preparation, A.N., Ka.K., Kr.K. and M.N.; Writing – Review & Editing, A.N., and M.N.; Visualization, A.N., Ka.K., Kr.K. and M.N.; Supervision, A.N., and M.N.; Project Administration, A.N., and M.N.; Funding Acquisition, M.N.

Conflicts of interest

The authors declare no conflicts of interest.

Data availability

The data presented in this study are available on request from the corresponding author.

Ethics approval

This study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Bioethics Committee at the University of Rzeszow from 09/05/2019 (Resolution No. 30/05/2019).

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