

## THE USE OF NURSING WORK INDEX AS A PRACTICE CONDITIONS ASSESSMENT FOR THE ROMANIAN NURSE'S CASE

Oana Păduraru<sup>1,2</sup>, C. S. Păduraru<sup>2,3\*</sup>, Elena Mihaela Cărăușu<sup>1</sup>

1. “Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania

2. “Apollonia” University of Iasi / Faculty of Dental Medicine

3. “Dunarea de Jos” University Galati, Romania / Faculty of Medicine and Pharmacy

\*Corresponding author. E-mail: calinstefanpaduraru@gmail.com

THE USE OF NURSING WORK INDEX AS A PRACTICE CONDITIONS ASSESSMENT FOR THE ROMANIAN NURSE'S CASE (Abstract): The work conditions of nurses have a significant impact on the practice of nursing. Suboptimal working conditions can be attributed to insufficient workplace structure, substandard organization of tasks, inadequate training, and unsuitable staffing policies. **Materials and methods:** This research sought to analyze the factors that influence the work conditions of nurses by employing the practice conditions scale of the Nursing Work Index (NWI). The validation of the NWI was conducted, utilizing nurse-reported job features as the independent variables. A total of 746 nurses from hospitals located in North - East Region of Romania were included in the sample. The Nurse Forecasting (RN4CAST) protocol was implemented for data collection. **Results:** The NWI construct was accounted for by 42.9% through factors such as “Advancement opportunities”, ‘Learning opportunities’, ‘Satisfaction with current job’, ‘Professional status’, and ‘Level of education’. An analysis of the NWI revealed the presence of distinct variables within a five-factor structure. The mean score achieved on the Nursing Work Index was observed to be among the least favorable in comparison to earlier survey findings. **Conclusions:** It is imperative for nurses to be acknowledged as peers within the healthcare sector, thereby requiring empowerment for professional growth and access to career advancement prospects. Furthermore, the significance of inter-professional relationships and equitable participation of nurses in hospital matters cannot be understated. **Keywords:** NURSES WORK CONDITIONS, NURSE WORKFORCE, ASSESSMENT OF THE PRACTICE CONDITIONS, NURSING WORK INDEX.

The Nursing Work Index (NWI) is a widely used tool to evaluate the work conditions of nurses. Developed by Dr. Marlene Kramer and colleagues in the 1980s, it assesses the features of the nursing work conditions that contribute to satisfaction at work and the quality of patient care. The NWI helps in identifying the strengths and weaknesses within the nursing practice

conditions and is instrumental in guiding improvements (1, 2).

Using this tool can be measured the several dimensions of the nursing work conditions, such as nurse participation in hospital operations, nursing fundamentals for high-quality healthcare, and nurse-physician collaboration (3, 4). Implementing the NWI involves surveying nursing

staff using a validated questionnaire. The responses are then analyzed to produce scores for each component, highlighting areas of strength and opportunities for improvement. Hospitals can then develop targeted interventions to address the identified issues.

In addition, studies (3, 4) using the NWI have consistently shown that better work conditions, as indicated by higher NWI scores, are associated with improved nurse satisfaction at work, lower burnout rates, and better patient outcomes. For example, research has demonstrated that hospitals with supportive management, adequate staffing, and good nurse-physician relationships have lower patient mortality rates and higher levels of patient satisfaction. This shows that by focusing on key areas, the NWI provides a comprehensive picture of the factors influencing nurse satisfaction and patient care quality (5, 6, 7).

Referring to applications and benefits, hospitals use the NWI for quality improvement, identifying areas needing improvement and implementing strategies for enhancing the work conditions. Also, the NWI allows for comparison across different units or hospitals, helping to benchmark performance and identify best practices. Not least, the NWI is frequently used in research to study the impact of work conditions on nurse outcomes, such as satisfaction at work, retention, and patient care quality.

The Nursing Work Index (NWI) is structured around several key components that collectively assess the quality of the nursing work conditions. Each component focuses on different aspects of the work conditions that are crucial for nurse satisfaction and effective patient care. Those key components are: *the involvement of*

*nurses in hospital operations* (3, 6); *nursing fundamentals for high-quality healthcare* (4, 7); *capacity, support, and leadership of nurse managers* (5, 6); *appropriate staffing and resources* (6, 7) and *nurse-physician collaboration* (3, 6).

As additional components can be considered *Flexibility Of work schedule* (this includes the ability to balance work and personal life, which can significantly affect satisfaction at work and performance) and *professional development* (opportunities for further education and career growth are essential for maintaining a motivated and skilled nursing workforce).

#### *Overview of research literature*

As seen above, the Nursing Work Index (NWI) is a widely utilized tool in nursing research to evaluate and enhance the work conditions for nurses. The NWI's application in research studies, highlighting its impact and findings. For example, (8) suggest that NWI can be used to investigate the relationship between nurse staffing levels, nurse burnout, job dissatisfaction, and patient mortality. The study found that better nurse staffing was associated with lower patient mortality, reduced nurse burnout, and higher satisfaction at work. It emphasized the importance of adequate staffing and supportive work conditions in improving patient outcomes. Other researchers (9) used the NWI to examine the association between the nursing work conditions and patient safety outcomes, including the incidence of adverse events. The research highlighted that positive work conditions, as measured by the NWI, were linked to lower rates of adverse events and better overall patient safety. Another relevant study (10) explored the impact of the nursing work conditions on satisfaction at work, stress, and burnout among nurses

using the NWI. It was found that better work conditions significantly reduced stress and burnout, while increasing satisfaction at work among nurses. Also, (11) focused on adapting and validating the NWI for use in different cultural contexts, particularly in non-Western countries. The study confirmed that the NWI is a reliable and valid tool across various cultural settings, making it useful for international research and practice improvements.

Recent studies have continued to explore and validate the Nursing Work Index (NWI), focusing on various aspects of the nursing work conditions and its impact on nurse satisfaction and patient care quality. Thus, (12) aimed to update and revise the NWI to better reflect contemporary nursing practice. The research included a cross-sectional survey of hospital nurses to assess the relevance of the existing items and the addition of new ones. The revised instrument, PES-v2021, included several new items and removed outdated ones. The study confirmed that the revised scale is valid and reliable for assessing current nursing work conditions. (13) re-validated the NWI-Revised (NWI-R) in Finnish hospitals aspiring for Magnet status. It aimed to identify organizational features that influence nurse autonomy and satisfaction at work. The study found that components like nurse management and leadership, staffing and resource adequacy, and nurse-physician collaboration are crucial for a favorable nursing practice condition. The NWI-R demonstrated good internal consistency and validity. (14) evaluated the work conditions of nurses in Slovenian hospitals using the NWI, aiming to understand how job features affect nurses' perceptions of their work conditions. The study found that staffing and resource ade-

quacy, nurse manager ability, and leadership significantly impact the perceived quality of the work conditions. The reliability of the NWI was confirmed, though some subscales showed varying levels of reliability. (15) reviewed the translation and cultural adaptation of the NWI across different countries and languages. It aimed to identify gaps and ensure the tool's applicability in diverse cultural contexts. The research identified translations into 24 languages across 35 countries, highlighting the need for further translation efforts in Africa, Asia, and South America. The study emphasized the importance of robust translation processes to maintain the tool's reliability and validity.

The purpose of our research study is to characterize and investigate the factors that influence nurses' work conditions by using the Nursing Work Index (NWI). The objectives of this research are: to analyze the regional context of nurses' work conditions in public hospitals from North-East Region of Romania using the NWI scale; and to evaluate the impact of factors that can affect nurses' self-evaluation of their work conditions, which managers can utilize to enhance nurses' working circumstances.

## **MATERIALS AND METHODS**

*Design* - To get the data required to investigate areas with limited knowledge or to understand particular aspects better, a cross-sectional study was carried out. To collect the data needed was used the research protocol applied in RN4CAST (16). STROBE checklist was utilized to report the cross-sectional study.

*Instrument* - The NWI (2) scale was used. This scale consists of several subscales that assess different aspects of the nursing work conditions. Each subscale

includes specific items that nurses rate based on their experiences.

The first part of the scale contains 8 items that refer to respondent's socio-demographic features and professional membership: gender (0 - Male, 1 - Female), age, education level (1- Vocational health school, 2 - High school studies, 3 - Post-secondary studies, 4 - University studies, 5 - Postgraduate studies or equivalent (e.g., master programs, PhD, or advanced professional training), the department where the respondent works, whether they occupy or not a management position, and the geographic location.

The second part contains 81 items designed to assess the healthcare management dimensions and nursing practice conditions such as the involvement of decision factors; the management of human resources (selection of human resources, training of the nursing staff, the involvement of medical personnel); process management (simplifying administrative procedures for patients' admission in hospital, administrative support and clinical output, clinical outcomes of healthcare); supporting services provided by the hospital; focus on the healthcare services; focus on the employee; evaluation of indicators for hospital performance; system of hospital information; errors, safety, and risk management; the hospital organizational culture; quality management of healthcare and sustained improvement of the healthcare services, governance and social responsibility.

The third part includes 23 items related to factors that can create problems for the nurses' ability to fulfil their professional role. The list of items for each of the selected items of the Nursing Work Index is given in, Appendix.

For the items established for our questionnaire, scales were chosen to reflect the frequency of certain opinions. Thus, for the items in the first section of our questionnaire, we generally used the binomial scale and nominal scale. Since the scale with six or more points is valid and distinctive, a 7 - point Likert scale was used for the items in the second part of the proposed questionnaire (where: 1 - the lowest possible score; 2; 3; 4; . . . .7 - the highest possible score; quality), and a 10-point Likert scale was used for the items in the third part of the questionnaire (where: 1 - creates no problems at all; 2; 3; 4; ....10 - causes the most important problems).

*Sample size, composition and data collection* - Considering the RN4CAST protocol (16), all hospitals units from the North-East Region of Romania were asked to join in the study (N=76). Of these, just 10 hospitals confirmed their participation. Eight regular hospitals and two larger hospitals that provide tertiary care.

All employed nurses at the included hospitals (N=2021) were invited to take part to our study. Nurses who were absent due to illness, pregnancy leave, or holiday were excluded (N = 657). In total, 746 nurses participated to our study. Nurses are defined as those matching the European Union definition of trained and licensed nurses according to Directive 2005/36/EC (17).

The data collection period began in April and will last until June 2023. Each hospital has two weeks to collect data. The research coordinator employed a paper-and-pencil and delivered printed questionnaires. Participants submitted them in a sealed box to the agreed-upon pickup site.

*Ethical considerations* - Permission to conduct the study in hospitals from North-

East Region of Romania was obtained from the Hospitals Medical Ethics Committee (for example, No. 30/E3333, March 31<sup>st</sup>, 2023). All techniques were carried out in line with applicable standards and laws, including the standards for Research Ethics in the Social Sciences and Humanities (18) and the Helsinki Declaration (19). Each hospital approved its involvement by deciding on the ethics committee. Participants received written information about many parts of the study; their rights to participate voluntarily and removal from the study at any time were addressed, as were their privacy and confidentiality rights. Participants also indicated their approval of participating in the study and authorization to utilize national data for professional and scientific objectives.

**Data analysis.** The data underwent examination through the utilization of the statistical software *SPSS version 26*. Various forms of statistical analysis, including univariate and bivariate approaches, were conducted alongside the application of descriptive statistics and multivariate analysis. Due to the quantification of each item on a scale ranging from 1 to 7, the mean composite score for each subscale of NWI, in addition to the overall composite score, was established. The assessment of the reliability of the scales was carried out using Cronbach's alpha coefficient. Furthermore, the construct reliability of the measurable scales was evaluated through the use of Confirmatory Factor Analysis (CFA), and factor analysis. Principal Component Analysis (PCA) and Principal Axis Factor Analysis (PAF) were used to generate the most related structure of the instrument. The minimum threshold for communalities was established at 0.400. Subsequent to the identification of correlations

among factors, the rotation method involving Keiser normalization was implemented. Utilization of Bartlett's test ( $p < 0.05$ ) and KMO test ( $> 0.8$ ) demonstrated adequacy of the sample size (20). A linear regression model was employed, with significance set at the  $p$ -value  $< 0.05$ .

## RESULTS

### *Study participants*

The population of nursing staff working in hospitals that participated in our study ranged from 48 to 1266. The response rate was 36.91% ( $n = 746$ ), hospital response rates ranged from 20.1 to 67.2%. The lowest and highest number of responses per hospital were 49 and 264, respectively. Respondents included 654 (87.7%) females and 92 (12.3%) males.

The sample included 262 nurses with a professional health school (35.1%), 143 bachelor's degree (19.2%), 131 post-secondaries (17.6%), 193 university studies (25.9%), and 13 postgraduate studies (1.7%). The higher length of respondent's turnover was between 5 and 10 years (38.9%) and more than 10 years (36.1%). Almost all (97%) were employed full time.

### *Explorative results*

The mean levels of satisfaction degree regarding the existing job, career, and work conditions are illustrated in (tab. I, fig.1) of the Appendix These findings provide insight into the self-evaluation outcomes concerning various job aspects. Among these aspects, the least satisfactory was the salary, followed by growth opportunities. An examination of the data revealed no apparent link between gender, educational attainment, and age in the nursing profession and the average value of the five dimensions. Conversely, a notable association was identified between the five dimen-

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sions and job-related attributes. Furthermore, the established dimensions exhibited a significant relationship, as indicated in of

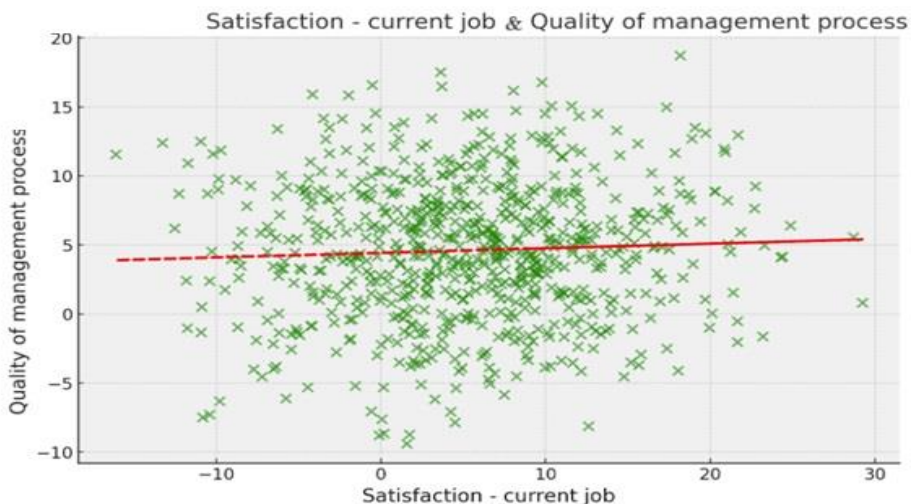
the Appendix. The majority of these relationships fell within the medium range ( $r = 0.300$  to  $0.600$ ).

**TABLE I,**  
**Examining job features and exploratory analysis between variables**

Variables	N	M (SD)	F1	F2	F3	F4	F5
Satisfaction- current job	746	5.78 (7.715)	0.414**	-0.330**	0.310**	-0.410**	-0.205**
Satisfaction - career	746	4.93 (0.976)	0.428**	-0.460**	0.290*	0.220*	0.396**
<i>Aspects of job</i>							
Flexibility of work schedule	746	4.82 (0.925)	0.361**	-0.342**	0.475**	0.420**	-0.433**
Advancement opportunities	746	5.42 (6.952)	0.512**	0.471**	-0.397**	0.455**	0.402**
Work independence	746	5.74 (4.928)	0.321**	-0.255**	0.425**	0.222*	0.372**
Professional status	746	4.27 (0.826)	0.238**	-0.416**	0.402**	0.426**	0.471**
Salary	746	4.14 (0.957)	0.279**	0.343**	0.225**	-0.309**	0.370**
Learning opportunities	746	4.17 (4.193)	0.514**	-0.272**	0.381**	0.317**	0.417**
Annual leave	746	4.24 (4.361)	0.319**	-0.265**	0.347**	0.319**	0.316**
<i>Factors of NWI</i>							
F1 - Quality of management process	746	4.91 (4.950)	1				
F2 - Challenges of nurse's professional role	746	7.38 (14.279)	0.328	1			
F3 - Nurse manager proficiency in providing support to nurses	746	4.48 (4.255)	0.725	0.517	1		
F4 - Nurses' involvement in hospital management	746	5.32 (5.137)	0.016	0.029	-0.528**	1	
F5 - Nurses' development	746	5.00 (0.666)	0.081	0.371	0.513**	-0.418**	1

Note. N - Number of answers, M - Mean (7-point scale), SD - Standard deviation,

\*\*Correlation is significant at the 0.01 level (2-tailed)



**Fig. 1.** Examining job features and exploratory analysis between variables.

TABLE II.  
The effect of job characteristic on NWI scale and developed factors

Variables	Regression model 1		Regression model 2									
	NWI (all items)		F1		F2		F3		F4		F5	
	<i>(R<sup>2</sup> = 0.429)</i>		<i>(R<sup>2</sup> = 0.414)</i>		<i>(R<sup>2</sup> = 0.218)</i>		<i>(R<sup>2</sup> = 0.358)</i>		<i>(R<sup>2</sup> = 0.328)</i>		<i>(R<sup>2</sup> = 0.371)</i>	
	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p
Satisfaction- current job	0.162	< 0.001	0.056	0.092	-0.193	< 0.001	0.169	< 0.001	0.137	< 0.001	0.159	< 0.001
Satisfaction - career	0.013	0.735	0.030	0.351	0.014	0.788	0.058	0.599	0.041	0.728	0.069	0.361
<i>Aspects of job</i>												
Flexibility of work schedule	0.026	0.076	-0.004	0.904	0.082	0.621	0.103	0.005	0.017	0.539	0.162	0.0729
Advancement opportunities	0.250	< 0.001	0.251	< 0.001	-0.118	< 0.001	0.083	0.021	0.228	< 0.001	0.317	< 0.001
Work independence	0.039	0.074	0.172	0.917	-0.036	0.736	0.116	0.005	0.051	0.949	0.041	0.747
Professional status	0.183	< 0.001	0.059	0.631	-0.055	0.498	0.129	0.661	-0.025	0.318	0.023	0.514
Salary	0.032	0.572	0.000	0.995	-0.041	0.647	0.029	0.701	-0.013	0.428	0.041	0.381
Learning opportunities	0.157	< 0.001	0.297	< 0.001	-0.015	0.042	0.217	< 0.001	0.277	< 0.001	0.339	< 0.001
Annual leave	0.002	0.839	0.002	0.724	0.011	0.429	0.032	0.739	0.133	0.420	0.071	0.821

Note. R<sup>2</sup> = Adjusted R-Squared,  $\beta$  = Standard regression coefficient, p = P-value. F1 - Quality of management process, F2 - Challenges of nurse's professional role, F3 - Nurse manager proficiency in providing support to nurses, F4 - Nurses' involvement in hospital management, F5 - Nurses' development \*\*Correlation is significant at the 0.01 level (2-tailed)

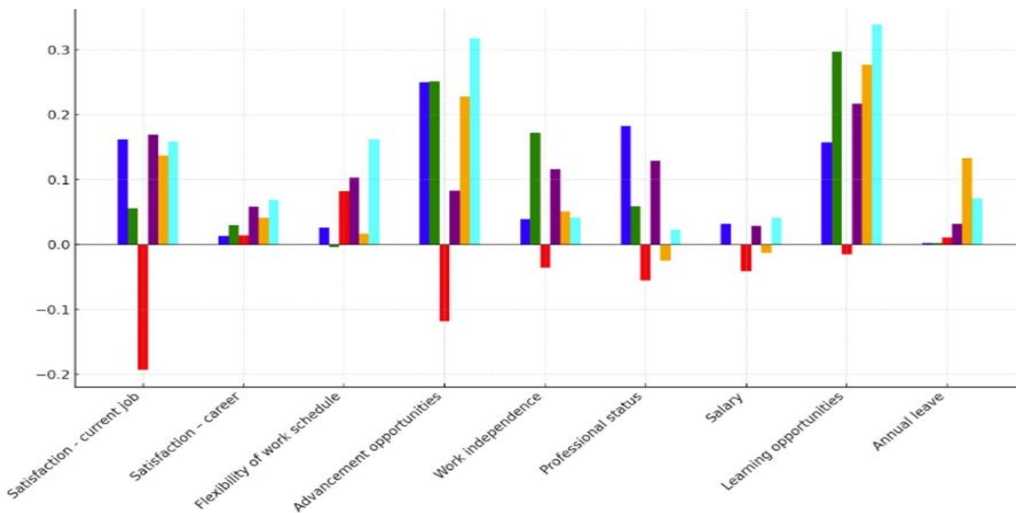


Fig. 2. The effect of job characteristic on NWI scale and developed factors.

Table II and second figure presents findings from two linear regression models. The initial model, Regression Model 1, indicates that 42.9% of the variance in the NWI scale,

encompassing all items, can be accounted for. Noteworthy explanatory factors include ‘Advancement opportunities’, ‘Satisfaction with current job’, ‘Learning opportunities’,

and 'Professional status', with 'Level of education' being a less influential factor. In the subsequent Regression Model, Factor 1 ('Quality of management process') is associated with 41.4% of the variance, primarily explained by beta coefficients of 'Advancement opportunities' and 'Learning opportunities', followed by 'Level of education'. Factor 2 ('Challenges of nurse's professional role') is linked to 21.8% of the variance by beta coefficients such as 'Satisfaction with current job', 'Professional status', 'Advancement opportunities', and 'Learning opportunities'. Factor 3 ('Nurse manager proficiency in providing support to nurses') demonstrates an explained variance of 35.8%, with beta coefficients including 'Learning opportunities', 'Satisfaction with current job', 'Work independence', 'Advancement opportunities', and 'Flexibility of work schedule'. Factor 4 ('Nurses' involvement in hospital management') is connected to 32.8% of the variance, primarily through beta coefficients of 'Satisfaction with current job', 'Advancement opportunities', and 'Learning opportunities'. Lastly, Factor 5 ('Nurses development') is associated with 37.1% of the variance, primarily explained by beta coefficients of 'Satisfaction with current job', 'Advancement opportunities', and 'Learning opportunities'.

## **DISCUSSION**

Prior studies have confirmed that the variables identified in the regression model of our research influence the work conditions of nurses. However, our study delves deeper into these variables by utilizing the NWI scale as a dependent variable. In a literature review by (21), the predictors linked to NWI are summarized, with each study highlighting only two to three significant variables related to self-assessed workplace features and their connection to NWI (such as nurse power, satisfaction at

work, and organizational commitment). Another literature review involving nine studies by (22) revealed that findings regarding nursing workplace features were significant, either through composite scores or subscale scores of NWI. While some associations were significant at one analytical level, they did not hold at another level. Our study aims to showcase the intricate nature of nurse workplace features, providing valuable insights for managers in hospitals from North-East Region of Romania to enhance the work conditions for nurses.

### ***Implications for managers***

Our research delineates the workplace setting of two professional cohorts and elucidates the features of the work conditions that can serve as a valuable resource for managers to enhance the working conditions of nursing staff in North - East Region of Romania. Given the shortage of Bachelor of Science in Nursing (BSN) graduates in Romania, nursing services are delivered by a healthcare team with varying levels of educational background, necessitating vigilant monitoring of the impact of such services. As posited by (8), the substitution of registered Nurses with individuals possessing lower educational credentials heightens the potential risk for patient mortality.

The primary discovery in our research highlights that the satisfaction levels regarding wages, annual leave, and career selection do not impact the self-evaluation of the work conditions by nursing staff. According to (23), wages play a role in nurse outcomes, but the work conditions and staffing are even more significant. Our regression analysis, along with its components, indicates that opportunities for career advancement and further education are vital for survey participants, reflecting a response to obstacles in their career progression. These two factors largely accounted for the NWI scale and its respec-



tive dimensions. Subsequently, satisfaction at work elucidated two out of the three dimensions of the work conditions. (24) discovered a close relationship between satisfaction at work among hospital nurses and various factors such as the work conditions, empowerment culture, organizational commitment, professional commitment, job-induced stress, patient satisfaction, and patient-nurse ratios. Alongside the established predictors (career development opportunities and Learning opportunities), our study identifies satisfaction at work as a significant predictor influencing the work conditions of nurses.

The cultivation of collegial relationships may cultivate positive atmospheres that enhance nurse satisfaction (25). Enhancing the relationship between nurses and physicians, as well as nurses and leaders, can enhance equal engagement and the professional development of nurses in hospital administration. A similar impact was noted on the managerial skills of nurses, leadership qualities, and the support they receive. The interaction between nurses and physicians and the behavior exhibited towards nurses by physicians are critical, shaping the professional standing of nurses, providing educational prospects, and nurturing the evolution of nursing as a vocation and field, which are also deemed essential predictors in our study and others (22, 26, 27, 28, 29).

It is evident that nursing administration across various levels of healthcare facilities needs to establish a supportive condition for professional practice in order to ensure workforce stability and deliver optimal care, a notion previously acknowledged in prior studies utilizing the NWI scale (30). Enhancing the work conditions for nurses is imperative, encompassing the promotion of continuous education, advanced degrees, professional growth, and fostering a sense of camaraderie among peers (31). The crea-

tion of an ideal work setting for nurses stands as a critical responsibility for both managers and leaders. According to (28), implementing interventions aimed at enhancing the work conditions proves to be an effective strategy in enhancing satisfaction at work. Retention of nurses in their positions is encouraged through three pivotal elements: proficient leadership, opportunities for empowerment, and avenues for professional advancement (27). Equally significant is the imperative for national healthcare policies to regard nurses as equivalent healthcare professionals, recognizing nursing as both a profession and a field of science.

We acknowledge that nursing practice conditions are intricate and contextually dependent; certain aspects of the work conditions may have more pronounced impacts across different levels of analysis and contextual settings (25). Nurturing nurse empowerment, fostering engagement, and cultivating positive interpersonal relationships within the workplace are fundamental for fostering a favorable work condition and ensuring high-quality patient care (26).

## CONCLUSIONS

The study suggests a decreased level of self-assessment regarding the work conditions. Some attributes of the work setting have been pinpointed as potential enhancements that hold significant value for nursing administration, hospital governance, and policymakers involved in the enhancement of nursing personnel in North-East Region of Romania. A pivotal discovery from our analysis pertains to the two factors that displayed the most substantial impact in enhancing the nursing work conditions: opportunities for career advancement and educational prospects. Emphasis should be placed on acknowledging nurses as peers within the healthcare

domain who necessitate empowerment for professional growth and access to career progression pathways. The establishment of inter-professional relationships and equitable participation of nurses in hospital operations are paramount. It is imperative for national healthcare policies to regard nurses as equivalent healthcare professionals and to recognize nursing as both a vocation and a scholarly discipline. Further longitudinal and interventional research endeavors are imperative for a more comprehensive comprehension of the working conditions of nurses.

### **CONFLICT OF INTEREST AND FUNDING**

The authors declare that there is no conflict of interest, and they received no specific funding regarding this scientific research.

### **INSTITUTIONAL REVIEW BOARD STATEMENT**

The study was conducted in accordance with the Ethics Committee of “Grigore T. Popa” University of Medicine and Pharmacy Iasi (No. 128/24.11.2021) for studies involving humans.

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