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Determinants of critical care nurses' job satisfaction: A cross-sectional study including cultural validation of Kuopio University Hospital Job Satisfaction Scale

Determinanty satysfakcji z pracy pielęgniarek opieki krytycznej: Badanie przekrojowe obejmujące walidację kulturową Skali Satysfakcji z Pracy Szpitala Uniwersyteckiego w Kuopio

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A – Development of the concept and methodology of the study/Opracowanie koncepcji i metodologii badań; B – Query - a review and analysis of the literature/Kwerenda – przegląd i analiza literatury przedmiotu; C – Submission of the application to the appropriate Bioethics Committee/Złożenie wniosku do właściwej Komisji Biotycznej; D – Collection of research material/Gromadzenie materiału badawczego; E – Analysis of the research material/Analiza materiału badawczego; F – Preparation of draft version of manuscript/Przygotowanie roboczej wersji artykułu; G – Critical analysis of manuscript draft version/Analiza krytyczna roboczej wersji artykułu; H – Statistical analysis of the research material/Analiza statystyczna materiału badawczego; I – Interpretation of the performed statistical analysis/Interpretacja dokonanej analizy statystycznej; K – Technical preparation of manuscript in accordance with the journal regulations/Opracowanie techniczne artykułu zgodne z regulaminem czasopisma; L – Supervision of the research and preparation of the manuscript/Nadzór nad przebiegiem badań i przygotowaniem artykułu

STRESZCZENIE

DETERMINANTY SATYSFAKCJI Z PRACY PIELĘGNIAREK OPIEKI KRYTYCZNEJ: BADANIE PRZEKROJOWE OBEJMUJĄCE WALIDACJĘ KULTUROWĄ SKALI SATYSFAKCJI Z PRACY SZPITALA UNIWERSYTECKIEGO W KUOPIO

Cel pracy. Celem tego badania było zidentyfikowanie czynników determinujących poziom satysfakcji z pracy polskich pielęgniarek pracujących na oddziałach intensywnej terapii oraz sprawdzenie trafności nowej, polskiej wersji narzędzia Kuopio University Hospital Job Satisfaction Scale (KUHJSS).
Materiał i metody. Było to obserwacyjne badanie przekrojowe przeprowadzone online. Próbę pozyskano za pomocą dogodnego doboru 306 pielęgniarek pracujących na oddziałach intensywnej terapii w Polsce. Próba została zrekrutowana między listopadem 2020 a lipcem 2021. Analiza danych obejmowała analizę czynnikową, statystykę opisową i wielokrotną regresję liniową.
Wyniki. Pielęgniarki oceniły swoją satysfakcję z pracy jako umiarkowaną. Osoby, które nie ukończyły studiów magisterskich, nie były freelancerami, lubiły swoją pracę i wyżej oceniały jakość opieki, miały wyższą satysfakcję z wykonywanej pracy. Wyniki wykazały, że KUHJSS dostosowana do populacji polskich pielęgniarek oddziałów intensywnej terapii ma inną strukturę niż oryginalna skala i jest trafnym i wiarygodnym narzędziem do pomiaru satysfakcji z pracy wśród tej populacji.
Wnioski. Wyniki wspierają stwierdzenie, że kulturowo zależne czynniki wpływają na poziom satysfakcji zawodowej. Aby poprawić satysfakcję pielęgniarek z pracy, ważne jest, aby ich wykształcenie odzwierciedlało rzeczywiste zadania i promowało autonomię; rodzaj zatrudnienia chronił pracownika; środowisko pracy promowało podejście zorientowane na osobę i wpływało pozytywnie na to, jak bardzo pielęgniarki lubią swoją pracę; oraz aby jakość opieki pozostawała wysoka.

Słowa kluczowe: satysfakcja zawodowa, intensywna terapia, pielęgniarki, warunki pracy

ABSTRACT

DETERMINANTS OF CRITICAL CARE NURSES' JOB SATISFACTION: A CROSS-SECTIONAL STUDY INCLUDING CULTURAL VALIDATION OF KUOPIO UNIVERSITY HOSPITAL JOB SATISFACTION SCALE

Aim. The aim of this study was to identify determinants of Polish critical care nurses' job satisfaction and to verify the validity of Kuopio University Hospital Job Satisfaction Scale (KUHJSS) on sample of Polish critical care nurses.
Material and methods. This is a cross-sectional study using online survey method. A convenience sample of 306 nurses working in ICUs in Poland was recruited between November 2020 and July 2021. Data analysis included factor analyses, descriptive statistics, and multiple linear regression.
Results. Nurses evaluated their job satisfaction as moderate. Those who did not complete a master's degree, were not freelancers, liked their job, and rated the quality of care more highly had higher job satisfaction. The results revealed that KUHJSS adapted to the population of Polish critical care nurses has a different structure from the original scale, and is a valid and reliable tool to measure job satisfaction among this population.
Conclusions. The results support the statement that culturally dependent job characteristics impact job satisfaction levels. To improve nurses' job satisfaction, it is important that their education reflects actual tasks and promotes autonomy; the type of employment protects the employee; the working environment promotes person-centered approach and affects how nurses like their job; and the quality of care remins high.

Key words: job satisfaction, intensive care, critical care nursing, working conditions

INTRODUCTION

Critical care nurses often experience adverse outcomes such as frustration, exhaustion, loss of empathy and compassion fatigue what can lead to rationing care, lower quality of care, and later developing burnout or post traumatic-stress disorder (PTSD) [1]. Maintaining higher job satisfaction among professionals (defined as 'the extent to which nurses are satisfied with their job') particularly those who are highly specialized, is crucial as many of them decide to leave the profession [2]. In fact, lower job satisfaction levels are correlated with increased medication error rates and can negatively impact nurse-patient communication [3, 4]. Moreover, they have been a key factor in nursing turnover in intensive care units (ICUs) with evidence showing that the turnover rate for critical care nurses is higher than in other specialties [2]. Among other consequences, this directly impacts the quality of care and generates additional costs in healthcare [5].

Based on Brief and Aldag [6] theory, employees' perception of their job rather than the job's objective characteristics is a more important determinant of job satisfaction. Extending the body of knowledge on self-assessed job satisfaction of nurses may help understand the actual reasons why nurses leave profession, as not everywhere this issue is well-described and addressed.

Even though the problem of nursing shortage is global, it has been known that job satisfaction is a culturally dependent concept [7]. To gather a better understanding of this issue, it is crucial to research this concept in different cultural settings, especially in times of high nursing migration. This would allow to create a bigger picture and act both globally and locally to address it.

In countries such as Poland, the issue of understaffing in ICUs, which is related to factors such as underfunded health care system, poor working conditions, high mean age of nurses, high number of nurses emigrating abroad, and relatively low number of nursing graduates, is very serious. While job satisfaction levels have been studied among Polish ICU nurses' population [8, 9], the body of knowledge regarding this topic is rather small and there are no studies on specific sociodemographic and job-related factors based on the regression model testing, which would allow to forecast the outcome of job satisfaction levels based on certain criteria. Due to this, combined with unsatisfactory quality of care, relatively low patients' satisfaction [8, 10], and evidence of a high rate of deaths in Polish ICUs compared to other European countries [11], it is important to explore this issue in greater detail.

The aim of this study was to identify determinants of Polish critical care nurses' job satisfaction and to verify the validity of Kuopio University Hospital Job Satisfaction Scale (KUHJSS) on the sample of Polish critical care nurses. The objectives were to: (1) assess the job satisfaction of critical care nurses using newly translated KUHJSS, and to (2) test regression model in order to identify socio-demographic and work-related determinants of critical care nurses' job satisfaction.

MATERIALS AND METHODS

A cross-sectional study design was carried out in this study. The STROBE checklist was followed to ensure proper reporting standards.

Setting and sample

A convenience sampling was used to recruit 306 registered nurses working in ICUs in Poland, between November 2020 and July 2021. The inclusion criteria were being a registered nurse currently working in an adult intensive care unit in Poland. Given the purpose of the study, which required testing regression models, a priori power analysis using a G*Power software was conducted. To detect a small effect size of 0.1 (with a statistical power of 80% and a significance level of 0.05) at least 179 nurses needed to be recruited. For the scale adaptation, a desired sample size of at least 300 was considered necessary to provide a stable factor solution. This decision was supported by a Kaiser-Meyer-Olkin measure of 0.849 and the "rule of five" (five participants per item), confirming that the sample size was well-suited for factor analysis. Finally, given the number of planned predictors in the regression model (n=11), the final number of respondents turned out to be sufficient.

Based on inability to collect data in person at that time, a decision to collect data online (which was shown to be an efficient and cost-effective method in health care studies requiring more than 200-300 participants), was made. A link to the LimeSurvey questionnaire was distributed via e-mail to the members of the Polish Anesthesiology and Intensive Care Nurses Association by the leaders of 16 regional divisions of the organization and was shared on critical care nurses online interest groups.

Data collection tools and methods

The questionnaire consisted of three parts: (I) included information about the study: its aim, anonymous and voluntary nature, research team, possible physical and psychological risk for participants, and an informed consent form; (II) – KUHJSS used with the permission of its author, and (III) multiple choice or open ended or multiple-choice questions regarding sociodemographic and work-related characteristics of the participants.

The KUHJSS was developed by Kvist et al. [12]. It consists of 37 five-point Likert scale items (1 = "fully disagree, 2 = "partly disagree", 3 = "cannot say", 4 = "partly agree, 5 = "fully agree"). The items reflect nurses' perceptions related to different aspects of their job satisfaction, covered by seven subscales: (1) leadership – 7 items, (2) requiring factors of work – 5 items, (3) motivating factors of work – 6 items, (4) working environment – 4 items, (5) working welfare – 4 items, (6) participating in decision-making – 4 items, and (7) sense of community – 4 items. Job satisfaction is assessed by calculating mean values for the whole scale and each scale separately (higher value – higher job satisfaction). For the purpose of this study, values below 2 were considered low, values between 2 and 4 moderate, and values above 4 – high. Cronbach's alpha values for the original subscales range from 0.72 to 0.89, indicating that the instrument is internally consistent and credible [12].

The English KUHJSS version was translated into Polish using a forward-back translation method by two independent expert translators proficient in Polish and English. Next, the researchers accessed congruity between the two translated versions and discussed differences until consensus was met. Then, a panel of three nursing leadership and critical care experts evaluated the translated version to test its face validity and perform a cultural debugging. They evaluated all items as being essential to the job satisfaction concept, supporting content validity of the scale (CVI = 1). No changes to the scale items were made at that stage; however due to country-specific wording, it was decided to add a clear description of a nurse manager concept to the introductory part of the questionnaire. Finally, a total of 10 critical care nurses pilot-tested the translated version and were asked to provide feedback on whether the questionnaire was appropriate, feasible and understandable, and whether the instructions to participants were clear. Because of their positive answers, no changes were made to the questionnaire at that stage.

Tab. 1. Loadings and names of the seven final factors

Items	Factors							Name
	1	2	3	4	5	6	7	
I look after my own personal well-being	0.790							Self-fulfilment
I appreciate my own work	0.778							
I am happy with my current health	0.738							
I feel I am a competent employee	0.670							
I am active in developing myself professionally	0.661							
Combining work and personal life is successful	0.626							
My work is interesting	0.625							
Client feedback motivates me in my work	0.541							
My manager/director provides the staff feedback with an aim to develop work		0.809						Leadership
My manager/director is genuinely interested in the well-being of the staff		0.778						
My manager/director treats the staff fairly and equally		0.774						
My manager/director encourages staff to take part in the planning of our unit's operation		0.770						
My manager/director is interested in work results and outcomes		0.664						
My manager/director informs well about issues concerning my unit		0.523						
I have possibilities to plan my work independently			0.759					Workplace autonomy
My work tasks are suitably challenging			0.751					
I have possibilities to make independent decisions in my work			0.722					
I can apply a wide range of my skills and expertise in my work			0.705					
I trust the expertise of my colleagues			0.611					
New employees are familiarized well in my unit			0.517					
My unit has appropriate work facilities				0.703				Resources distribution
I have a chance to influence decision-making in my unit				0.671				
My unit has appropriate equipment to ensure quality of care				0.609				
The workload is distributed evenly in my unit				0.424				
The flow of information works well in my unit					0.611			Motivating work organization
I do not find my work too stressful					0.607			
There is a good community spirit in my unit					0.566			
My workload is appropriate					0.533			
The upper management of the hospital district appreciates my work					0.531			
My salary is appropriate in relation to the demands of my work					0.424			
There is usually enough staff in my unit						0.715		Comfort of work
My work unit is safe and secure						0.582		
I am satisfied with my working hours						0.580		
My work unit is comfortable						0.468		
I have a chance for career development in the hospital district							0.750	Professional development
I am willing to work in the hospital district also in the future							0.638	
My manager/director enables the continuous professional development of the staff							0.561	
% of variation explained	28.93	10.93	6.89	5.13	4.54	4.21	3.43	
Cronbach's α	0.862	0.863	0.851	0.755	0.765	0.773	0.701	

A confirmatory factor analysis (CFA) was conducted in order to verify the original 7-factor structure of observed variables. Then, exploratory factor analysis (EFA) using principal-axis extraction method with varimax rotation was conducted to assess the construct validity of the newly translated scale. The criteria for factor extraction and item retention included: eigenvalue > 1, factor loadings > 0.4, and the visual analysis of the scree plot. The Bartlett test of sphericity was statistically significant (p<0.001). The CFA analysis revealed that the original 7-factor model did not fit the data ($\chi 2$ = 335.,66; df = 608; $\chi 2/df$ = 5.52; CFI = 0.588; TLI = 0.548; SRMR = 0.114; RMSEA = 0.122, 90%CI 0.118-0.126). The EFA first resulted in 9 factors which explained 70.13% of the total variance (with eigenvalues ranging from 1.097 to 10.705). Further analysis of the factor loadings (in 9-factor structure, two factors only had one item each) resulted in testing also 6- and 7-factor options. Because 6-factor structure consisted of loadings below 0.4, 7-factor structure was found to have the best fit with the studied data. Table 1. presents names, contents, and internal consistency data of the new factors.

Data analysis

IBM Statistics 25.0 and IBM AMOS 24.0 were used to analyze the data. Descriptive statistical analyses were performed to analyze sociodemographic characteristics of participants. Missing data detected (0.1%) were replaced by mean. After detecting outliers in the outcome variable ('job satisfaction'), which accounted for less than 5%, a decision was made to winsorize them. It did not affect the hypothesis testing.

To explore determinants of nurses' job satisfaction, multiple linear regression model was built. The decision to add following predictor variables using forced entry regression method: 'gender', 'highest nursing education', 'postgraduate training', 'years of working experience', 'type of employment', 'working mode', 'do you like your job?', 'estimated care quality', 'working experience in current unit', 'number of patients per shift', and 'number of nurses' was based on a theoretical rationale and previous studies. The decision to exclude the variable 'age' from the model was made because of its high correlation to 'years of working experience'. The assumptions of linearity, normality, independence, and homoscedasticity in the final models were satisfied. A p-value of <0.05 (two-tailed) was considered statistically significant.

Ethical considerations

The study was reviewed and approved in March 2020 by the Medical University of Warsaw Committee on Research Ethics (statement nr AKBE/68/2020). Potential participants were informed about the study aim, and that it was voluntary, anonymous and did not involve any invasive procedures. No physical risk for participants was determined. Potential psychological risk was related to discussion of possibly sensitive topics regarding job satisfaction aspects.

RESULTS

A total of 306 nurses took part in this study. All details on sociodemographic characteristics of study participants are summarized in Table 2. The mean score for the whole KUHJSS scale was moderate – 3.32 (range 1-5, SD=0.61). The mean scores of the factors ranged: the highest for 'Self-fulfilment': 3.67 (SD=0.78) and the lowest for 'Motivating-work organization': 2.74 (SD=0.80). Detailed data for all factors are presented in Table 3. Based on measured predictors in the final multiple regression model, nurses evaluate their job satisfaction higher when they: did not complete master degree (B=-0.145, p=0.009), are employed under a regular job contract (not as freelancers) (B=0.167, p=0.020), like their job (B=0.356, <0.001), and evaluate the overall care quality higher (B=0.138, p<0.001) (Tab. 4).

Tab. 2. Characteristics of study participants (n=306)

Age in years, mean ± SD (range)	36 ± 9 (22-60)
Gender (n=302)	
Female, n (%)	246 (80%)
Male, n (%)	60 (20%)
Highest nursing education	
Medical high school diploma, n (%)	13 (5%)
Bachelor of Science in Nursing, n (%)	146 (47%)
Master of Science in Nursing, n (%)	147 (48%)
Postgraduate anesthesia and ICU nursing training	254 (83%)
Anesthesia and ICU Nursing qualification course (3-months), n (%)	11 (4%)
Anesthesia and ICU Nursing Specialty, n (%)	41 (13%)
Years of working experience in nursing, mean ± SD (range)	13 ± 9 (0-36)
Years of working experience in current ICU, mean ± SD (range)	8 ± 6 (0-36)
Type of employment	
Regular job contract, n (%)	250 (81%)
Contract of mandate or freelancing contract, n (%)	56 (19%)
Working mode	
8-hour morning shifts, n (%)	19 (6%)
12-hour day or night shifts, n (%)	287 (94%)
Do you like your job?	
Yes, n (%)	276 (90%)
No, n (%)	30 (10%)
Number of patients per shift, mean ± SD (range)	2 ± 1 (0-13)
Number of nurses employed by your ICU, mean ± SD (range)	28 ± 13 (3-180)
Estimated quality of nursing care in your ICU, mean ± SD (range)*	6 ± 2 (2-9)

*On a scale from 0 (worst possible care) to 10 (best possible care)

Tab. 3. Mean scores for different aspects of job satisfaction

Factor	Range	Mean Score ± SD
Self-fulfilment	1.75-5.00	3.67 ± 0.79
Leadership	1.71-5.00	3.60 ± 0.78
Workplace autonomy	2.00-5.00	3.60 ± 0.81
Resources distribution	1.00-5.00	2.94 ± 0.97
Motivating work organization	1.17-5.00	2.74 ± 0.80
Comfort of Work	1.00-5.00	3.12 ± 0.96
Professional organization	1.00-5.00	3.17 ± 0.90
Total score	1.00-5.00	3.32 ± 0.61

Tab. 4. Final linear model of predictors of job satisfaction mean score (Multiple Linear Regression analysis, n=306)

Outcome:	Job Satisfaction	
Predictors:	B (CI 95%)	p-value
Gender (0: male, 1: female)	-0.038 (-0.174, 0.097)	0.580
Years of working experience	-0.002 (-0.010, 0.007)	0.721
Years of working experience in current unit	-0.007 (-0.019, 0.005)	0.270
Highest nursing education (0: MHS diploma/BSN diploma, 1: MSN diploma)	-0.145 (-0.254, -0.036)	0.009
Post-graduate training anesthesia and ICU (0: no, 1: yes)	-0.118 (-0.272, 0.036)	0.113
Working mode (0: morning shift, 1: 12-hour day/night shifts)	-0.120 (-0.345, 0.104)	0.292
Type of employment (0: freelancing, 1: job contract)	0.167 (0.027, 0.307)	0.020
Number of patients per shift	-0.019 (-0.063, 0.026)	0.408
Number of nurses employed at the unit	-0.001 (-0.005, 0.003)	0.603
Do you like your job? (0: no, 1: yes)	0.356 (0.164, 0.549)	<0.001
Estimated care quality (0-10)	0.138 (0.098, 0.179)	<0.001
Model statistics:	Constant B = 2.050 (1.663, 2.437), F(11)=20.56, p<0.001, R2=0.43	

B, unstandardised coefficients; BSN, Bachelor of Science in Nursing; CI, confidence interval; F, ANOVA F-ratio; ICU, intensive care unit; MHS, medical high school; MSN, Master of Science in Nursing; R2, Nagelkerke R square

DISCUSSION

This is the first study which tested regression model in order to determine which sociodemographic and work-related factors affect Polish critical care nurses' job satisfaction, and which verified the validity of newly translated KUHJSS, used for the first time in a Polish critical care setting. The analysis revealed that the scale used on this population has a different structure from the original scale and confirmed its high internal reliability. While some of the factors remined relatively close to the original version (factors 1, 2 and 5), other ones were a mix of original factors (factors 3, 4, 6 and 7). This result is similar to the result obtained in a study adapting KUHJSS in Greece [13]. Despite the above differences, the analysis in this study demonstrated that new factors are theoretically sound and represent a new structure of a job satisfaction concept for a critical care nurses' setting. Understanding that there might be differences in factor loadings due to the country context is important, and it suggests that the meaning of certain components within the same concept can vary across culturally diverse populations. This supports the theory stating that national culture moderates different job characteristics which impact job satisfaction [7]. It is therefore important to acknowledge those differences and respect them when developing strategies to improve nurses' job satisfaction levels.

Our study revealed that job satisfaction of Polish critical care nurses is moderate. This result aligns with the findings of Dillig-Ruiz et al. review where they reported an average job satisfaction rate of 61% among critical care nurses, and with more recent studies that document job satisfaction levels among Polish critical care nurses [2, 8, 9]. It is, however, lower than the results obtained in the studies on a general nursing population using the same scale in Finland [3], Norway [14] and USA [15], what can be partly explained by the more person-centered working culture in those countries. Given the importance of having a satisfying job together with negative consequence of low job satisfaction, average level among nurses is unsatisfactory and different strategies need to be mapped out to address it. Based on the results of meta-analysis verifying how different interventions are successful in improving nurses' job satisfaction, spiritual intelligence training and Professional Identity Development Program could be helpful to achieve that [16].

In this study, the highest job satisfaction was observed in the self-fulfillment area, and the lowest job satisfaction in the areas of motivating work organization and resources distribution. Based on those results, nurses evaluate the best the areas which influence them personally, while those factors which nurses have no full direct impact on (availability of equipment or flow of information) are evaluated as the worst. It can be explained by the fact that Polish health care is underfunded what is partly responsible for the poor working conditions, outdated management style, lack of innovations, etc. [17]. Despite general average job satisfaction, nurses still seem to find personal aspects of their job satisfying. The above results add to the body of knowledge suggesting a rather negative state of work organization of critical care nurses in Poland, specific to former communist countries [18]. Given constantly growing job strain [19] together with high mean age of Polish nurses, and aging general population, those issues should be urgently addressed.

This study revealed that nurses who like their job more, have higher job satisfaction, which is logically sound and supports validity and reliability of the results. In fact, job satisfaction has been defined as "the degree people like their jobs" [20]. It is important to assure a friendly work environment as factors such as toxic management and moral harassment can lower ICU nurses' job satisfaction [21]. Focusing on improving management style to reflect transformative leadership principles [22] (rather than transactional leadership which is still common in Poland) could be one way to do it. Niskala et al. in their meta-analysis on interventions improving nurses' job satisfaction suggested that improving organizational strategies could be helpful [16]. Moreover, working on increasing nurses' resilience, could help to decrease emotional exhaustion, increase work engagement, and help to cope with workplace challenges. What is alarming, Cicolini et al. gave similar recommendations already a decade ago, therefore, there is a need to better understand why their execution in countries such as Poland is challenging [23].

Interestingly, the results suggested that nurses with medical high school diploma or BSN diploma seem to be

more satisfied with their jobs than nurses with MSN what opposes the existing evidence. Generally, higher education gives more opportunity for professional development what may improve job satisfaction. Dilig-Rruiz et al., however, in their review revealed that education did not correlate with job satisfaction at all [2]. The reason for such result in this study might be that even though MSN in Poland provides nurses with new competences, in does not affect their everyday practice. In reality, Polish bedside nurses with MSN often do not have different job responsibilities than nurses with BSN, which is a result of relatively recent change of nurses' education system (from medical high school diploma education only to dual higher education system offering BSN and MSN). Given many opportunities for professional growth, it is crucial to change the outdated system so that newly obtained competences can be utilized in practice, especially due to the fact that higher job autonomy, which comes with more credentials, has been associated with better job satisfaction in nurses [2]. Serafin et al. [24] in their study, which revealed a negative correlation between self-esteem and acquired competences of Polish nurses, suggested that a competence-based management could also be helpful to overcome this issue.

Another predictor of higher job satisfaction in this study was type of employment. Nurses with regular job contracts reported higher job satisfaction than freelancers, which contrasts with the findings of Dilig-Ruiz et al., who concluded that nurses with greater work flexibility tend to have higher job satisfaction [2]. In Poland freelance contracts do not include all the social benefits as regular contract provides (i.e. sick leave, holidays, legal support, etc.). Moreover, due to a significant legal loophole, freelance nurses are allowed to take 24-hour shifts (forbidden on a regular job contract), leading them to work up to 300-400h/month in more than one place. This increases their job strain and negatively affects the work-life balance, which has been found to be positively correlated with higher job satisfaction in nursing [25]. Strategies aiming at regulating the law of employment should be planned to protect the freelance employees from a legal loophole allowing them to overwork.

According to this study, nurses who evaluate the overall quality of the care more positively report higher job satisfaction. It supports existing evidence where high quality of care is corelated with the better patient outcomes, what improves satisfaction as it confirms the positive impact of nurse's work on their patients [26].

Finally, our study revealed that individual factors such as gender and years of working experience, are not correlated with job satisfaction what is in line with conclusions drawn by Dilig-Ruiz et al. [2]. Interestingly, the number of patients per shift and the number of nurses working in the unit were not significant predictors of job satisfaction. This opposes results of other studies, in which higher job demands and work overload were found to increase stress, emotional/physical exhaustion, and burnout [2]. The lack of variability in number of ICU patients (in Poland determined by law) might determine why this was not a significant factor in studied model.

Limitations

The convenience online sampling technique, combined with relatively small sample size used in this study and the inclusion of nurses from the Polish Anesthesiology and Intensive Care Nurses Association, could negatively impact the representativeness of the sample and the generalizability of the results. This is evidenced by the difference in mean age of our sample – 36 years, versus the mean age of Polish nurses in general, which is 54 years [27]). Using this sampling method, it was also impossible to verify the response rate and therefore estimate the response bias. What is more, there is evidence suggesting to better use the 'rule of 10' instead the 'rule of 5' participants per item (in this study it was eight) when calculating the desired sample size for factor analysis [28]. Moreover, the results using the 'quality-of-care' variable should be interpreted with caution, as it represents nurses' subjective interpretation of quality rather than an objective measure of care quality itself. Finally, the final model explained only 43% of the variation in job satisfaction variable around its mean, indicating that there are additional factors affecting this variable beyond those tested in this study. Given the complex nature of the outcome variable in tested model, many more cofounding variables could potentially impact the tested relationships, what should be verified in the future studies.

CONCLUSIONS

This study supports the evidence that job satisfaction levels among Polish critical care nurses are impacted by a variety of culturally dependent determinants and are generally moderate. Given the importance of high job satisfaction in addressing current staffing issues in ICUs, the improvement strategies should focus on modernizing outdated work systems still in use. These strategies should ensure that: nurses' education aligns with actual nursing tasks and fosters autonomy; the type of employment protects the employee's rights; the working environment promotes friendly person-centered approach and enhances nurses' job satisfaction; and the quality of care remains high. The factors used in tested regression models should be verified for accuracy in a larger-scale study (also including other nursing specialties) and explored in more detail using a qualitative design in the future research.

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