



Analysis of Nurses' Workload in a Therapeutic Profile Department

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Abstract

Background. The goal of healthcare institutions is to provide high-quality and safe services to patients. Nursing workload in hospitals is discussed worldwide, as it affects the quality of patient care. Studies show that a low number of nursing staff is associated with a negative impact on patient health.

Aim. To assess the workload of nurses working in the Internal Medicine Department of Hospital X in Lithuania.

Methods. The study was conducted at the Hospital X. Patient case histories were used in the study, including patients who were treated in the Hospital X from 1 January 2023 to 1 August 2023. Seven hundred and eleven nursing histories were included in the study. A quantitative study, data collection and analysis were performed. The workload of nurses in the Internal Medicine Department of the Hospital X is a multifaceted and essential aspect that requires careful consideration.

Results. The average working time of nurses in the entire department, including time spent with the patient, assessed according to the NAS methodology, and performing nursing procedures was 526,099.2 hours (over a 7-month period). It was found that on average, one nurse had to complete 35,073.3 hours' worth of nursing work over a 7-month period. The hours would equate to 48 months if the tasks were performed according to global recommendations for the duration of nursing procedures.

Conclusions. It was found that the workload of nurses is very high. Nurses must perform actions and procedures in less time than they are allocated.

Keywords: Nurses; workload; therapeutic; nursing activities score methodology

1. INTRODUCTION

Nurse workload is defined as the total nursing work that must be performed within a given period of time, or as the time and care that nurses devote directly and indirectly to patient care, the workplace, and professional development (Ivziku et al., 2022). The assessment of nursing workload has been discussed in many scholarly works, especially in recent years, as healthcare providers strive to reduce



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nursing costs and improve the quality of healthcare. Studies show that low nursing staffing levels are associated with negative impacts on patient health (Assaye et al., 2021; Jansson et al., 2018; Sardo et al., 2023; Winter et al., 2021).

Currently, the number of nurses per 1,000 inhabitants in Lithuania is insufficient and does not reach the average of the European Union member states (in 2012, the EU average was eight nurses per 1,000 inhabitants, in Lithuania – seven nurses per 1,000 inhabitants). It is predicted that the shortage of nurses will increase, as the average age of working general practice nurses, who make up the largest share of nursing professionals, currently reaches 45.3 years (Lietuvos Respublikos sveikatos apsaugos ministerija, 2016).

The shortage of nursing staff is a problem that affects the provision of quality services to patients. For this reason, it is necessary to ensure the appropriate number of personnel in order to improve the quality of services provided to patients. According to the World Health Organization report summarised in literature, a global shortage of healthcare workers was estimated at 7.2 million and forecasts project nursing shortages up to 12.9 million by 2035; inadequate policies and workforce workload are frequently cited contributing factors (WHO, based on Tamata & Mohammadnezhad, 2023, p. 1248).

The goal of healthcare institutions is to provide quality and safe services to patients, but this is only possible with adequate workload distribution. Nursing workload in hospitals is discussed worldwide because it affects the quality of patient care. Excessive workload is associated with omission of essential care, missed or delayed care, complications, and higher hospital mortality (Čiarnienė et al., 2019). This problem can only be solved by starting to regulate workload in a scientifically sound manner. However, it is difficult to accurately calculate the optimal nurse–patient ratio because the specific nature of nurses' work is not always visible, and activity analyses do not fully reveal task diversity. Thus, this problem remains relevant and requires more detailed scientific analyses.

2. METHODS

The aim of this study is to assess the workload of nurses working in the Internal Medicine Department of the Hospital X in Lithuania.

2.1. Study design and participants – A quantitative study, data collection and analysis were performed. Study was conducted at the Hospital X. The study used medical histories of patients treated in the Hospital from 1 January 2023 to 1 August 2023.

The Hospital X is a modern health service centre in Northern Lithuania. The main goal of the hospital's activities is to strengthen the health of Lithuanian population, improve the personal health care services provided, including their suitability and accessibility, in order to reduce morbidity and mortality. The institution's areas of activity: to organise and provide personal health care services, which the institution is entitled to provide by its personal health care license. Currently, 791 beds are prepared for patients in various departments, clinics, and centres. About 33,000 patients are treated in the hospital per year. The average length of stay for a patient is six days. All the hospital's consultation clinics and departments are visited by about 333,000 patients per year (information from the Hospital X).

The department employs doctors of various fields, general practice nurses, nurse assistants, and auxiliary medical workers. Patients are provided with internal medicine diagnostic and treatment services. The Internal Medicine Department examines and treats patients with respiratory tract and lung diseases, endocrine, rheumatic, blood diseases, and oncological diseases of internal organs. Patients suffering from fever of unknown origin, syndromes of unknown origin, and sepsis are also treated. The department treats patients with acute and chronic diseases. Patients treated in the department undergo all necessary diagnostic tests using the hospital's modern medical equipment. The main objective of the

activity is to provide qualified, high-quality, and timely primary outpatient health care services that meet patients' expectations, including disease prevention, diagnostics, and treatment, and to achieve qualified, timely, and accessible service provision.

2.2. Ethical approval and informed consent – The study was conducted with the permission of the Director of the Hospital X (Ethical Approval No. V-619, 22 August 2023). When planning to collect data, a request was submitted to the Head of the Hospital for permission to conduct the study. The request indicated the topic of research, its title, goal, tasks, and contact details of the researcher and his supervisor. The study was conducted after receiving written permission, in compliance with ethical requirements and ensuring the security of research data.

2.3. Sampling and recruitment procedures – The study included all records of hospital patients who were hospitalised in the therapeutic department of Hospital X during the research period (from 1 January 2023 to 1 August 2023). No personal identifier data were used. In total, 711 nursing histories were obtained.

2.4. Experimental and control conditions – Nursing histories were used for data collection and analysis.

The workload of nurses was assessed using the standardised “Nursing Activities Score” (NAS) and “Nursing Activities Score Analysis” (NASA) principles. The total nursing activity score of an individual patient is the sum of the nursing activity scores of all activities, which ranges from 0 to 177 points. One hundred nursing activity points are equal to the amount of care that one full-time equivalent nurse can provide during one shift or one day. Considering that a nurse is productive at 80 per cent during an 8-hour shift, as described by the author of the nursing activity score, one nursing activity score point corresponds to 3.84 minutes of nursing care per 8-hour shift $((8 \text{ hrs.} * 60 \text{ min})/100)*0.8$.

With this information, it was possible to convert the nursing activity scores into expected nursing time per patient and nursing activity. Next, the time by nursing activity score elements and the total nursing time per patient, based on the nursing activity scores according to the model, were compared with the time from time and movement measurements. The observed time was taken as the time in minutes of all nursing activities performed per patient per shift.

2.5. Statistical analysis – Statistical analysis of the study data was performed using Microsoft Office Excel 2010. The results of statistical data analysis are presented in tables and graphs.

3. RESULTS

During the study, 711 inpatient and nursing histories were analysed. All procedures were counted and entered into a database so that preliminary assessment of the workload of nurses in the department could be completed at a later date. In order to determine how much time nurses spend performing work procedures, based on the NAS methodology, the main procedures performed by nurses in the therapeutic department were identified. Procedures that can be performed by nursing assistants together with nurses are not included, therefore this workload is related only to the activities performed by nurses. Equating procedures by points according to the NAS methodology. The assessment of nurses' workload in minutes based on procedures performed was calculated according to the NAS methodology, where one point is equivalent to 10.6 minutes of procedures performed.

In order to illustrate the number of procedures performed and the time taken by nurses to perform them in the therapeutic department of the Hospital X during the study period, Table 1 was compiled. Analysing the time taken by nurses to perform all procedures, it was determined that nurses performed procedures for 526,099.2 hours over a 7-month period.

Table 1. Number of nursing procedures performed and their conversion into minutes according to the NAS methodology

Procedures	No. of procedures	Procedure equality to minutes
Vital activity monitoring	6,865	72,769.0
Laboratory test collection	20,872	221,243.2
Single drug injection	1,163	12,327.8
Multiple drug infection (>1 time/day)	3,093	32,785.8
Daily dressing change (bedsores, wounds)	609	6,455.4
Drain care (urinary, feeding, etc.)	2	21.2
CVK care	409	4,335.4
PVK care	5,559	58,925.4
Blood component transfusion	1,488	15,772.8
Patient independence*	235	2,491.0
Artificial airway care (endotracheal tube, tracheostomy)	44	466.4
Care of various stomas	198	2,098.8
Supplemental oxygen provision by various methods	1,063	11,267.8
Measurement of urine output	806	8,543.6
Specific interventions, surgical or diagnostic procedures (patient preparation/transport for tests)	336	3,561.6
Enteral nutrition	104	1,102.4
Parenteral nutrition	6	63.6
Medication distribution	3,191	33,824.6
Bladder catheterisation	140	1,484.0
Enema	0	0.0
Pleural punctures (with the assistance of a physician)	11	116.6
Decubitus ulcer care and prevention	2,334	24,740.4
Resuscitation	78	826.8
Recording of electrocardiograms	1,026	10,875.6

According to the data presented in Table 2, one nurse had to perform 35,073.3 hours' worth of nursing work over a 7-month period. This means that the actions of one nurse performed over a 7-month period are equivalent to 48 months' worth of work, according to the recommendations for the duration of nursing procedures.

The obtained figures confirm a higher need for staff than calculated based on bed occupancy indicators. In summary, it can be stated that the workload of nurses is very high, and the number of hours that can be spent with patients is very low.

Table 2. Number of nursing procedures performed in minutes and their equating to one nurse according to the NAS methodology

Procedures	Procedure time in total (minutes)	Procedure time for 1 nurse (minutes)
Vital activity monitoring	72,769.0	4,851.3
Laboratory test collection	221,243.2	14,749.5
Single drug injection	12,327.8	821.9
Multiple drug injection (>1 time/day)	32,785.8	2,185.7
Daily dressing change (bedsores, wounds)	6,455.4	430.4
Drain care (urinary, feeding, etc.)	21.2	1.4
CVK care	4,335.4	289.0
PVK care	58,925.4	3,928.4
Blood component transfusion	15,772.8	1,051.5
Patient independence*	2,491.0	166.1
Artificial airway care (endotracheal tube, tracheostomy)	466.4	31.1
Care of various stomas	2,098.8	139.9
Supplemental oxygen provision by various methods	11,267.8	751.2
Measurement of urine output	8,543.6	569.6
Specific interventions, surgical or diagnostic procedures (patient preparation/transport for tests)	3,561.6	237.4
Enteral nutrition	1,102.4	73.5
Parenteral nutrition	63.6	4.2
Medication distribution	33,824.6	2,255.0
Bladder catheterisation	1,484.0	98.9
Enema	0.0	0.0
Pleural punctures (with the assistance of a physician)	116.6	7.8
Decubitus ulcer care and prevention	24,740.4	1,649.4
Resuscitation	826.8	55.1
Recording of electrocardiograms	10,875.6	725.0

4. DISCUSSION

This study's findings demonstrate a substantial nursing workload in the therapeutic department of the Hospital X, quantified as 526,099.2 hours of nursing procedures over a 7-month period, equivalent to 35,073.3 hours' worth of work per nurse for the same period (i.e. approximately 48 months of work per nurse based on global procedure-time recommendations). Such magnitudes indicate a severe mismatch between required nursing time and available staffing resources.

The findings of this study reveal a staggering disparity between clinical requirements and human capacity, with the workload of a single nurse over seven months equating to four years of recommended labour time. This 'time-deficit' confirms that nurses are operating in a state of constant 'care compression', where procedures are likely performed at speeds that may compromise safety protocols. Furthermore, the inability of current NAS methodologies to account for simultaneous tasking in a busy

therapeutic profile department suggests that the actual burden may be even higher. This necessitates a shift in management logic: staffing should not be calculated by bed occupancy, but by the mathematical reality of procedural time demands identified in this research.

High aggregated nursing time requirements per patient are consistent with prior reports linking heavy task volumes and time pressure to increased risk of missed care and adverse outcomes (Assaye et al., 2021; Čiarnienė et al., 2019).

The distribution of procedure types shows that routine yet time-consuming activities, laboratory test collection and vital sign monitoring, comprised a large share of total nursing time, mirroring other studies where everyday surveillance and monitoring exert major workload demands (Ferramosca et al., 2023; Ivziku et al., 2022). When routine monitoring and frequent medication-related tasks accumulate across many patients and shifts, nursing capacity to respond to complex, unpredictable needs (e.g. resuscitation, airway management) becomes constrained, raising patient safety concerns (Jansson et al., 2018; Sardo et al., 2023).

Night shifts in the department were reported to have higher patient loads and possibly increased acuity. This pattern aligns with literature showing that lower staffing or higher acuity during night shift hours correlates with worse patient outcomes and more missed or delayed interventions (Assaye et al., 2021; Winter et al., 2021). The present data suggest that temporal staffing mismatches (insufficient night staffing relative to acuity) may be an important contributor to overall workload stress and quality compromise.

Beyond quantitative measures, qualitative burdens, such as emotional labour, continuous adaptation, multitasking and cognitive load, emerged from the study and are well documented as drivers of fatigue, reduced situational awareness, and diminished care quality (Čiarnienė et al., 2019; van den Oetelaar et al., 2021). High volumes of routine tasks combined with emotional and cognitive demands increase the likelihood of omissions and errors even when nurse–patient ratios appear adequate (Ivziku et al., 2022; van den Oetelaar et al., 2021).

The local workforce context in Lithuania exacerbates these pressures: a nurse density below the EU average and an ageing nursing workforce limit surge capacity and succession potential (Lietuvos Respublikos sveikatos apsaugos ministerija, 2016; Rypicz et al., 2020). Globally, workforce shortages and policy shortcomings have been identified as key contributors to nursing deficits, projecting increasing gaps in needed personnel, trends that echo the staffing shortfalls highlighted by the current workload calculations (Tamata & Mohammadnezhad, 2023; WHO, based on Tamata & Mohammadnezhad, 2023, p. 1248).

Implications for staffing and organisation are multifield. First, reliance solely on bed-based or nominal nurse–patient ratios likely underestimates required staffing when high-frequency monitoring and procedural loads are present; activity-based workload measures such as NAS provide actionable estimates to align staffing with real task demands (Ivziku et al., 2022; Ferramosca et al., 2023). Second, redistributing tasks, delegating eligible tasks to nursing assistants or support staff, and optimising workflows for laboratory sampling and medication rounds could reduce registered nurse time spent on routine tasks and reserve registered nurse capacity for complex clinical decision-making (Ferramosca et al., 2023; Sardo et al., 2023). Third, targeted adjustments to night staffing and resources should be considered where acuity and workload are demonstrably higher (Assaye et al., 2021; Jansson et al., 2018).

Finally, workforce and policy interventions are necessary to address the structural drivers of high workload. Investment in recruitment, retention, and training of younger nurses, alongside policy measures to improve staffing standards and workforce planning, would mitigate long-term shortages and improve care quality (Rypicz et al., 2020; Tamata & Mohammadnezhad, 2023). Regular use of validated workload tools (e.g. NAS) for staffing decisions and continuous monitoring of workload-related

outcomes (missed care, complications, mortality) can help institutions translate activity data into safer staffing models (Ivziku et al., 2022; van den Oetelaar et al., 2021).

In summary, the quantitative burden observed in this study, substantiated by NAS-based time estimates, combined with the documented qualitative demands, supports the conclusion that current staffing and work organisation in the therapeutic department are insufficient to meet patient care needs safely. Addressing these issues requires activity-based staffing adjustments, task redistribution, targeted resource allocation for high-acuity periods, and strategic workforce policies to sustainably reduce excessive nursing workload and its adverse consequences (Čiarnienė et al., 2019; Ferramosca et al., 2023; Tamata & Mohammadnezhad, 2023).

Nursing activities are complex when several actions are taking place simultaneously and there are practical limitations to their assessment. Therefore, a new assessment method needs to be developed that can effectively measure nursing time based on a comprehensive approach.

Limitations of this study. The research was conducted at a single institution (Hospital X) in Lithuania. Because the results are based on the specific infrastructure, staffing models, and patient demographics of one hospital, the findings may not be generalisable to other hospitals or healthcare systems with different resources. The study relied on the analysis of 711 existing nursing and medical histories. Retrospective studies are limited by the quality and accuracy of the original documentation. If nurses failed to document certain procedures or interventions due to the very high workload identified in the study, the actual workload may be even higher than reported. The study uses the Nursing Activities Score (NAS) to convert procedures into minutes. However, as the authors note in the conclusions, assessing nursing activities is complex when multiple tasks occur simultaneously (multitasking). The NAS methodology may not fully capture the 'invisible' work of nursing, such as emotional support, clinical reasoning, or interruptions, which are difficult to quantify through medical history reviews.

5. CONCLUSIONS AND PERSPECTIVES

1. When analysing the research data, it was found that the workload of nurses in the Internal Medicine Department of Hospital X in Lithuania is very high. Nurses have to perform actions and procedures in a shorter time than the time allotted to them. The average working time of nurses of the entire department spent with patients performing nursing procedures, as assessed according to the NAS methodology, is 526,099.2 hours (over a 7-month period).

2. When assessing the time allocated to procedures and workload per nurse, it was found that, on average, one nurse performs 35,073.3 hours' worth of work on the patients and delivering procedures over a 7-month period. This would take 48 months if the tasks were performed according to the global recommendations for the duration of nursing procedures. Therefore, not only is the workload per nurse very high, but also the shortage of nursing staff is evident.

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