Mental Workload Analysis of Casemix Officers in the Electronic Medical Record Era Using the NASA-TLX Method

Sri Wahyuningsih Nugraheni[1]*, Nopita Cahyaningrum[1], Azizah Mat Hussin[2]

[1]Medical Record and Health Information, Faculty of Health Sciences, Universitas Duta Bangsa, Indonesia
[2]Malaysia Institute of Chemical & Bioengineering Technology, Universiti Kuala Lumpur, Malaysia
Email: sri_wahyuning@udb.ac.id

ABSTRACT

High workload among casemix officers can lead to burnout syndrome. **Research Objective:** To determine the mental workload of casemix officers in the electronic medical record era using the NASA-TLX method. Methods: This study is a quantitative research with a cross-sectional design. The research sample consisted of 6 casemix officers selected using the total sampling technique. Workload was measured using the adapted workload questionnaire from Nursalam (2017) and the NASA-Task Load Index (NASA-TLX). **Research Results:** (1) The average mental workload score of the 6 casemix officers was 406.17. The highest mental workload was observed in Coder 1 (569), while the lowest mental workload was found in the inpatient claim files PIC (Person In Charge) officer (280). (2) The highest mental workload predominantly felt by workers on the Mental Demand (MD) indicator was reported by the head of the casemix unit and Coder 3. For the Physical Demand (PD) indicator, it was Coder 3. For the Temporal Demand (TD) indicator, it involved the head of the casemix unit, the inpatient claim files PIC officer, the outpatient claim files PIC officer, and Coder 3. For the Performance (P) indicator, it was the inpatient claim files PIC officer and Coder 2. (3) The highest indicator score was found in the Temporal Demand (TD) indicator for Coder 1 (500). (4) The highest Weighted Workload (WWL) score was 1,396, observed in Coder 1. (5) The highest Average Weighted Workload (WWL) score was 93.07, also found in Coder 1. (6) The interpretation of the NASA-TLX scores includes: Very High (Head of Casemix Unit, Outpatient Claim Files PIC Officer, Coder 1), Somewhat High (Inpatient Claim Files PIC Officer), and High (Coder 2 and Coder 3). (7) Based on the NASA-TLX Workload Analysis, the highest workload percentage was on Temporal Demand (TD) at 30.1%.

Keywords : Effort; Frustration Level; Mental Demand; Performance; Physical Demand; Temporal Demand

INTRODUCTION

In Indonesia, the workload analysis for Health Human Resources (HRH) is regulated by the Regulation of the Minister of Administrative and Bureaucratic Reform (Permen PAN RB) Num of 2020 using the Health Workload Analysis (ABK-Kes) method. However, this method remains static and fails to capture fluctuating patient queue dynamics and workflow inefficiencies. HRH planning is a critical element in the healthcare delivery system, as staff adequacy directly impacts service delivery and patient health outcomes, particularly through the ABK-Kes method. The ABK-Kes method is an HRH planning and management tool that enables healthcare managers to determine the precise number of health workers required to deliver quality healthcare services based on actual workload. Workload analysis and its validation are valuable for promoting and guiding the design and implementation of interventions to improve workload quality. Furthermore, a population needs-based approach using ABK-Kes yields more accurate results than conventional methods that assume a static workload. (1) (2) (3) (4)

Significant factors influencing workload include the number of patients per ward, the frequency of medication administration per shift, the number of healthcare workers on duty, and the shift type, including home care. (5) (6) (7) (8) Significant factors influencing healthcare workload analysis methods include workload fatigue and service breakdown. (9) Fast-tracking patient care can significantly improve the performance of healthcare professionals. (10) The most common way to translate the required workload score is by categorizing the healthcare worker ratio. (11) Machine Learning is used to predict workload in the healthcare sector using big data. (12)

Workflow inefficiency causes healthcare professionals to feel burdened not only by patient volume but also by administrative processes and unsynchronized coordination flows. (13) In addition, labor productivity is influenced by modern working methods, including the implementation of Artificial Intelligence (AI), smart technology, and robotic technology. (14) (15) (16) The limitations of the ABK-Kes method include the use of healthcare service performance data from the previous year to predict current staffing needs, the lack of proper consideration for frequent service disruptions, the absence of clear standards for managing sudden patient surges, and the failure to account for on-call workers, weekends, and holidays. (17)

The successful implementation of ABK-Kes heavily relies on the availability of accurate, complete, and accessible workload and staffing data. Electronic medical records can be utilized to develop operational approaches for quantifying workload. The results of HRH workload analysis using the ABK-Kes method provide evidence-based recommendations, enabling healthcare organizations to foster a resilient, high-performing workforce dedicated to quality care and the advancement of meaningful, sustainable social change. (18) (19) (20). The ABK-Kes method in health policy administration aims to restructure efforts in addressing physician shortages and distributional imbalances in public healthcare facilities. It provides objective information to align nursing staff numbers with actual care situations in hospitals. (21) (22) (23)

Digital transformation in Indonesia's healthcare sector has accelerated massively, one example being the Electronic Medical Record (EMR). One of the work units most impacted by this digitalization is the casemix team. Thus far, evaluations of healthcare staff workload in hospitals have more frequently focused solely on physical or quantitative dimensions. In reality, psychological aspects, mental stress, and workers' cognitive interaction with digital information systems have an equally significant impact on productivity and occupational safety. Therefore, an in-depth analysis is required that integrates mental workload assessment and cognitive ergonomics evaluation specifically for casemix officers. Based on the background, a Systemic Integration Model is needed that is able to connect the ABK-Kes and NASA-TLX Method Integration.

METHODS

This study is a quantitative research with a cross-sectional design. The research sample consisted of 6 casemix officers selected using the total sampling technique. Workload was measured using the adapted workload questionnaire and the NASA-Task Load Index (NASA-TLX): Mental Demand, Physical Demand, Temporal Demand, Performance, Effort, and Frustration Level. Steps for measuring mental workload indicators using the NASA-TLX method are as follows:

Weighting

Respondents complete a pairwise comparison questionnaire consisting of 15 pairwise comparisons. From this questionnaire, the total number of factors perceived as most influential for each indicator is calculated. This total number of factors serves as the weight for each mental workload indicator.

Table 1. NASA-TLX Questionnaire

KM / KF	KF / KW	KW / TU
KM / KW	KF / P	KW / TF
KM / P	KF / TU	P / TU
KM / TU	KF / TF	P / TF
KM / TF	KW / P	TU / TF

Description:
Mental Demand = MD = KM
Physical Demand = PD = KF
Temporal Demand = TD = KW
Own Performance = P
Effort = EF = TU
Frustration Level = FR = TF

Rating

a. Calculating the Product
   At this stage, the product value is obtained by multiplying the weight and rating provided by the respondent, which yields the product value for each indicator:
   Workload product = weight × rating
b. Calculating the Weighted Workload
   Calculating the WWL by summing up the six indicators for each respondent.
   WWL = Σ product value
c. Calculating the average weighted workload
   Obtained by dividing the total WWL by the overall weight of 15.

$$\text{Score} = \frac{\text{Product value}}{15}$$

d. Score interpretation
   The output of the calculation using the NASA-TLX method is the perceived mental workload level of the respondents based on the following NASA-TLX categories:

Table 2. NASA-TLX Workload Categories

No	Workload Category	Scale
1	Low	0-9
2	Medium	10-29
3	Moderately High	30-49
4	High	50-79
5	Very High	80-100

The detailed stages of the research are illustrated in Figure 1 as follows:

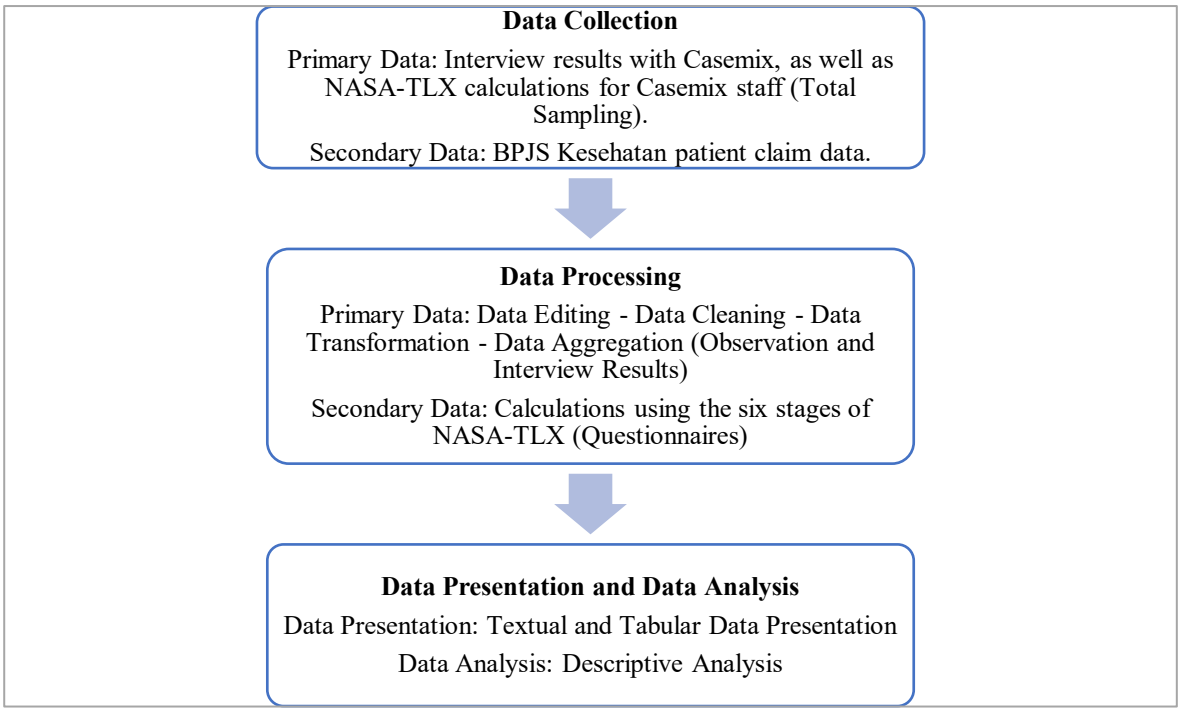

Figure 1. Research Procedure

RESULTS

The characteristics of the research respondents are as follows:

Table 3. Respondent Characteristics

No	Respondent	Position / Job Title	Education	Length of Service
1	R1	Head of Casemix Unit	Bachelor's Degree + Medical Doctor Education	1,5 years
2	R2	Inpatient Claim Files PIC Officer	Diploma 3 in Medical Records	5 years
3	R3	Outpatient Claim Files PIC Officer	Diploma 3 in Medical Records	2 years 8 months
4	R4	Coder 1	Diploma 3 in Medical Records	1 years 3 months
5	R5	Coder 2	Diploma 3 in Medical Records	6 months
6	R6	Coder 3	Diploma 3 in Medical Records	9 months

The Calculation Stages of the NASA-TLX Method consist of six stages, which are:

Rating Scale

The rating scale is used to assess the mental workload level of Medical Record staff with a score of 0–100 across six main dimensions: Mental Demand (MD), Physical Demand (PD), Temporal Demand (TD), Performance (P), Effort (E), and Frustration Level (FL). Data were obtained through questionnaires completed by the six research respondents.

Table 4. Rating Scale

No	Respondent	Position / Job Title	KM	KF	KW	P	U	TF	Total
1	R1	Head of Casemix Unit	100	15	100	75	85	95	**470**
2	R2	Inpatient Claim Files PIC Officer	70	25	70	5	70	40	**280**

No	Respondent	Position / Job Title	KM	KF	KW	P	U	TF	Total
3	R3	Outpatient Claim Files PIC Officer	75	75	90	29	75	90	**434**
4	R4	Coder 1	100	100	100	90	100	79	**569**
5	R5	Coder 2	65	20	60	35	70	40	**290**
6	R6	Coder 3	78	79	85	27	45	80	**394**
		Average							**406.17**

Based on Table 4, it is known that the average mental workload score among the six casemix staff members is 406.17. The highest mental workload score is found in Coder 1 (569), while the lowest mental workload score is found in the Inpatient Claim Files PIC Officer (280).

Weighting Scale

The weighting scale is used to identify the most dominant dimensions of mental workload by comparing six dimensions: Mental Demand (MD), Physical Demand (PD), Temporal Demand (TD), Performance (P), Effort (E), and Frustration Level (FL). Data were obtained from questionnaires completed by the respondents based on their work experience.

Table 5. Weighting Scale

No	Respondent	Position / Job Title	KM	KF	KW	P	U	TF	Total
1	R1	Head of Casemix Unit	3	0	4	3	1	4	15
2	R2	Inpatient Claim Files PIC Officer	2	0	4	4	3	2	15
3	R3	Outpatient Claim Files PIC Officer	2	0	4	1	3	5	15
4	R4	Coder 1	1	0	5	2	3	4	15
5	R5	Coder 2	1	0	2	4	5	3	15
6	R6	Coder 3	3	2	4	1	1	4	15
		Total	12	2	23	15	16	22	60

Based on Table 5, it is indicated that the most dominant and highest perceived mental workload among workers is in the Mental Demand (MD) indicator, specifically for the head of the casemix unit (R1) and coder 3 (R6). For the Physical Demand (PD) indicator, it is dominant for coder 3 (R6). In the Temporal Demand (TD) indicator, the dominant workload is felt by the head of the casemix unit (R1), the inpatient claim files PIC officer (R2), the outpatient claim files PIC officer (R3), and coder 3 (R6). As for the Performance (P) indicator, it is dominant for the inpatient claim files PIC officer (R2) and coder 2 (R5).

Indicator Scores

Table 6. Indicator Scores

No	Respondent	Position / Job Title	KM	KF	KW	P	U	TF	Total
1	R1	Head of Casemix Unit	300	0	400	225	85	380	1390
2	R2	Inpatient Claim Files PIC Officer	140	0	280	20	210	80	730
3	R3	Outpatient Claim Files PIC Officer	150	0	360	29	225	450	1214
4	R4	Coder 1	100	0	500	180	300	316	1396
5	R5	Coder 2	65	0	120	140	350	120	795
6	R6	Coder 3	234	158	340	27	45	320	1124

Based on Table 6, the highest indicator score was found in the Temporal Demand (TD) indicator for Coder 1 (500).

Weight Work Load (WWL)

Table 7. Weight Work Load (WWL)

No	Respondent	Position / Job Title	Weight Work Load (WWL)
1	R1	Head of Casemix Unit	1390
2	R2	Inpatient Claim Files PIC Officer	730
3	R3	Outpatient Claim Files PIC Officer	1214
4	R4	Coder 1	1396
5	R5	Coder 2	795
6	R6	Coder 3	1124

Based on Table 7, the highest Weighted Workload (WWL) is 1,396, found in Coder 1.

Average Weight Work Load (WWL)

Table 8. Average Weight Work Load (WWL)

No	Respondent	Position / Job Title	Weight Work Load (WWL)/15
1	R1	Head of Casemix Unit	92,67
2	R2	Inpatient Claim Files PIC Officer	48,67
3	R3	Outpatient Claim Files PIC Officer	80,93
4	R4	Coder 1	93,07
5	R5	Coder 2	53
6	R6	Coder 3	74,93

Based on Table 8, the highest Average Weighted Workload (WWL) score was 93.07, found in Coder 1.

NASA-TLX Score Interpretation

Table 9. NASA-TLX Score Interpretation

No	Respondent	Position / Job Title	Weight Work Load (WWL)	Category
1	R1	Head of Casemix Unit	77.67	Very High
2	R2	Inpatient Claim Files PIC Officer	47.33	Moderately High
3	R3	Outpatient Claim Files PIC Officer	79.00	Very High
4	R4	Coder 1	81.07	Very High
5	R5	Coder 2	43.67	High
6	R6	Coder 3	73.13	High

Based on Table 9, the interpretation of the NASA-TLX scores includes: Very High (Head of Casemix Unit, Outpatient Claim Files PIC Officer, Coder 1), Somewhat High (Inpatient Claim Files PIC Officer), and High (Coder 2 and Coder 3).

NASA-TLX Workload Analysis

Table 10. NASA-TLX Workload Analysis

No	Indicator	Total	Average	Persentase (%)
1	Mental Demand = MD = KM	989	164.83	14.88
2	Physical Demand = PD = KF	158	26.33	2.38
3	Temporal Demand = TD = KW	2000	333.33	30.1
4	Own Performance = P	621	103.50	9.34
5	Effort = EF = TU	1215	202.50	18.28
6	Frustration Level = FR = TF	1666	277.67	25.02

Based on table 10, based on the NASA-TLX Workload Analysis, the highest workload percentage was on Temporal Demand (TD) at 30.1%.

DISCUSSION

The interpretation of the NASA-TLX scores includes: Very High (Head of Casemix Unit, Outpatient Claim Files PIC Officer, Coder 1), Somewhat High (Inpatient Claim Files PIC Officer), and High (Coder 2 and Coder 3). Based on the NASA-TLX Workload Analysis, the highest workload percentages were on Temporal Demand (TD) at 30.1% and Frustration Level (FR) at 25.02%.

Efforts to minimize cognitive and psychological pressure include increasing the number of staff, as well as arranging appropriate rest breaks and job rotations. Accumulatively, the mental workload falls into the high category, indicating that the hospital management needs to implement corrective measures, one of which is by adding work shifts for the staff. This step is suggested to reduce the task load and minimize the risk of long-term psychological distress experienced by these frontline healthcare workers. To minimize the risk of stress and cognitive overload, recommended improvement strategies include providing additional facilities such as a job rotation policy (rolling job desk) to ensure workload is evenly distributed, as well as organizing regular group meals or staff outings to reduce employee stress levels. (24) (25) (26)

Physical fatigue in specific work units, together with technical barriers associated with the Hospital Management Information System (HMIS), remained significant contributors to both physical and emotional exhaustion among healthcare personnel. Therefore, hospitals should prioritize the evaluation and optimization of system workflows, as well as enhance training programs on integrated Electronic Medical Record (EMR) systems to support staff well-being and improve work efficiency. To mitigate cognitive fatigue and maintain patient safety, hospital management is recommended to implement strategic workforce interventions, including the reorganization of work schedules, the recruitment of additional personnel, and the provision of adequate rest facilities for healthcare staff. Furthermore, to reduce cognitive stress and minimize the risk of occupational fatigue, hospitals should undertake targeted improvements, such as providing additional work resources to facilitate manual tasks and implementing effective rest-break schedules to sustain staff concentration and performance.(27) (28) (29)

To minimize the risk of staff fatigue and maintain the quality of healthcare services, hospital management is encouraged to implement organizational interventions, including work schedule reorganization, increasing the number of personnel assigned to night shifts, and providing more adequate rest facilities. Given the high level of mental workload among healthcare personnel, primarily driven by mental demands, time pressure, and the expectation of consistently high performance, additional strategies should be considered to alleviate mental strain. These include effective time management, job rotation, the promotion of work–life balance, relaxation and mindfulness-based interventions, initiatives to enhance work motivation, and strengthening teamwork. Furthermore, equitable distribution of core responsibilities, the implementation of staff recognition and reward systems, and continuous professional development through ongoing education and training are recommended to improve the competency, capability, and resilience of healthcare professionals while reducing disparities in workload across units. (30) (31) (32)

CONCLUSION

The highest mental workload predominantly experienced by workers on the Mental Demand (MD) indicator was reported by the head of the casemix unit and Coder 3. For the Physical Demand (PD) indicator, it was Coder 3. For the Temporal Demand (TD) indicator, it involved the head of the casemix unit, the inpatient claim files PIC officer, the outpatient claim files PIC officer, and Coder 3. For the Performance (P) indicator, it was the inpatient claim files PIC officer and Coder 2. The interpretation of the NASA-TLX scores includes: Very High (Head of Casemix Unit, Outpatient Claim Files PIC Officer, Coder 1), Moderately High (Inpatient

Claim Files PIC Officer), and High (Coder 2 and Coder 3). Based on the NASA-TLX Workload Analysis, the highest workload percentages were on Temporal Demand (TD) at 30.1% and Frustration Level (FR) at 25.02%.

REFERENCES

1. Firasghani MA. Human Resource Needs Assessment in the Health Sector Using Workload Analysis Method : A Literature Case Study. 2025;6(August):114–22.
2. Ahmat A, Jacques J, Millogo S, Mahaman M, Illou A, Maritza T, et al. Workloads and activity standards for integrated health service delivery : insights from 12 countries in the WHO African region. 2022;1–7.
3. Menezes AA De, Leite C, Soares M, Roberto M, Poz D, Pinto ICM. Application of the workload indicators of staffing need method to calculate the size of the medical staff at a maternity hospital in the state of Bahia , Brazil. Hum Resour Health [Internet]. 2022;19(1):1–10. Available from: https://doi.org/10.1186/s12960-021-00660-6
4. Asamani JA, Christmals C Dela, Reitsma GM. Advancing the Population Needs-Based Health Workforce Planning Methodology : A Simulation Tool for Country Application. 2021;
5. Buestan M. Identification of Predictive Nursing Workload Factors : A Six Sigma Approach. 2022;
6. Loso JM, Filipp SL, Gurka MJ, Davis MK. Using Queue Theory and Load- Leveling Principles to Identify a Simple Metric for Resource Planning in a Pediatric Emergency. 2021;
7. Myriam A, Llor S, Javier F, Mikla M. Validation of a Nursing Workload Measurement Scale , Based on the Classification of Nursing Interventions , for Adult Hospitalization Units. 2022;
8. Guevara JAC, Díez NP, Vrotsou K, Machón M, Orruño E, Ecenarro MJO, et al. Factors associated with the workload of health professionals in hospital at home : a systematic review. BMC Health Serv Res [Internet]. 2022;1–13. Available from: https://doi.org/10.1186/s12913-022-08100-4
9. Harper PR, Harper PR. Server behaviours in healthcare queueing systems Server behaviours in healthcare queueing systems. J Oper Res Soc [Internet]. 2019;0(0):1–13. Available from: https://doi.org/10.1080/01605682.2019.1567653
10. Ahsan KB. L Ean Integrated O Ptimisation M Odel Of E Mergency D Epartment. 2021;
11. Hoogendoorn ME, Margadant CC, Brinkman S, Haringman JJ, Jaap J, Keizer NF De. International Journal of Nursing Studies Workload scoring systems in the Intensive Care and their ability to quantify the need for nursing time : A systematic literature review. 2020;101.
12. Piccialli F, Giampaolo F, Salvi A, Cuomo S. Neurocomputing A robust ensemble technique in forecasting workload of local healthcare departments. Neurocomputing [Internet]. 2021;444:69–78. Available from: https://doi.org/10.1016/j.neucom.2020.02.138
13. Thi T, Nguyen H, Phung HT, Thi A, Bui M. Applying the workload indicators of staffing needs method in nursing health workforce planning : evidences from four hospitals in Vietnam. Hum Resour Health [Internet]. 2022;19(1):1–9. Available from: https://doi.org/10.1186/s12960-021-00668-y
14. Management O. Worker Productivity in Operations Management. 2020;
15. Colim A, Morgado R, Carneiro P, Costa N, Faria C, Sousa N, et al. Lean Manufacturing and Ergonomics Integration : Defining Productivity and Wellbeing Indicators in a Human – Robot Workstation. 2021;

16. Roy D, Spiliotopoulou E, Vries J De. Restaurant analytics : Emerging practice and research opportunities. 2022;(July):3687–709.
17. Dessie G, Kebede Y. Human Factors in Healthcare Workload Indicators of Staffing Need (WISN) method for health workforce planning at health facility : A scoping review. Hum Factors Healthc [Internet]. 2024;6(June):100078. Available from: https://doi.org/10.1016/j.hfh.2024.100078
18. Namaganda GN, Whitright A, Maniple EB. Lessons learned from implementation of the Workload Indicator of Staffing Need (WISN) methodology: an international Delphi study of expert users. Hum Resour Health [Internet]. 2022;19(1):1–10. Available from: https://doi.org/10.1186/s12960-021-00675-z
19. Browne-farrell G. Walden University. 2025;
20. Fishbein D, Nambiar S, Mckenzie K, Mayorga M, Carolina N, Carolina N, et al. Objective measures of workload in healthcare : a narrative review. 2020;33(1):1–17.
21. Ahmed S, Dabbagh A, Sulaiman HM, Abdulkarim NA. Workload assessment of medical doctors at primary health care centers in the Duhok governorate. Hum Resour Health [Internet]. 2022;19(1):1–8. Available from: https://doi.org/10.1186/s12960-021-00664-2
22. Kunjumen T, Okech M, Diallo K, Mcquide P, Zapata T, Campbell J. Global experiences in health workforce policy , planning and management using the Workload Indicators of Staffing Need (WISN) method , and way forward. Hum Resour Health [Internet]. 2022;19(1):1–4. Available from: https://doi.org/10.1186/s12960-021-00695-9
23. Fuensanta M, Gil H, Mikla M, Myriam A, Llor S, Javier F, et al. International Journal of Nursing Sciences Multicenter application of a nursing workload measurement scale in adult hospitalization units n Valc a. 2022;9.
24. Krisnaningsih E, Dwiyatno S, Arlani T, Jubaedi AD, Cahyadi D. Beban Kerja Psikologis dan Fisik dengan NASA-TLX dan Cardiovascular Load (CVL). 2023;6(1):1–13.
25. Dahlan M, Nengsih S. Beban Kerja Psikologis Perawat Pasien Covid-19 : Metode NASA-TLX Covid-19 Patient Nurse Psychological Workload : The NASA-TLX Method. 2022;13.
26. Anwar AA, Yuamita F. Pengukuran Beban Kerja Fisik dan Mental Pada Pekerja Menggunakan Metode Cardiovascular Load (CVL) dan NASA-TLX. 2024;03(2):87–94.
27. Febrilian CL, Rizqulloh L, Widyaningrum BN, Studi P, Medis R, Polbitrada K, et al. Analisis Beban Kerja Pada Unit Rekam Medis di Rumah Sakit Roemani Muhammadiyah Kota Semarang Tahun 2025 Menggunakan Metode NASA-TLX Workload Analysis Medical Record Unit at Roemani Muhammadiyah Hospital Semarang 2025 Using the NASA-TLX Method. 2025;6(2):70–9.
28. Rusli MW. Pengukuran Beban Kognitif Perawat IGD di Rumah Sakit Melalui Pendekatan NASA-TLX dan RSME. 2025;02(07):665–73.
29. Pratiwi M, Putri M, Suryadi A. Workload Analysis Using Cardiovascular Load and NASA-TLX Method of Emergency Room Health Workers (Case Study : Rumah Sakit Tingkat III Brawijaya) Analisis Beban Kerja Dengan Metode Cardiovascular Load dan NASA-TLX pada Tenaga Kesehatan Ruang IGD (Studi Kasus : Rumah Sakit Tingkat III Brawijaya). 2022;15(1):116–23.
30. Feditasari ED, Sholihah Q. Penilaian Beban Kerja Tenaga Kesehatan Pada Masa COVID-19 Menggunakan Metode NASA-TLX. 2025;02(08):810–21.
31. Andrea H, Industri DT, Brawijaya U, Darurat IG. Evaluasi Beban Kerja Mental Karyawan Puskesmas Jagir Surabaya Berdasarkan Metode NASA-TLX. 2025;02(11):1157–67.
32. Prawatya YE, Wijayanto D, Uslianti S, Rahmahwati R, Citra RW. Evaluasi Beban Kerja Mental dan Tingkat Kelelahan Perawat Terhadap Shift Kerja di Rumah Sakit XYZ dengan Metode NASA-TLX dan Bourdon Wiersma. 2023;406–15.