Indonesia Journal of Learning Education and Counseling
homepage: https://journal.ilininstitute.com/index.php/IJoLEC
Vol 9, No 1, September 2026, pp 63-72
p-ISSN:2460-1497 and e-ISSN: 2477-3840



Workload Analysis of School Operators Across Educational Levels: Implications for Staffing Allocation and Workforce Planning

Sumarlin Mus[1*], Arismunandar[2], Bongani I Nkambule[3], Abdul Saman[4], Ansar[5], Rusmayadi[6]
[1] Education Administration, Universitas Negeri Makassar, Indonesia
Email: sumarlin.mus@unm.ac.id
[2] Education Administration, Universitas Negeri Makassar, Indonesia
Email: arismunandar.unm.ac.id
[3] Education Management, University of South Afrika, South Africa
Email: nkambbi@unisa.ac.za
[4] Guidance and Counseling, Universitas Negeri Makassar, Indonesia
Email: abdulsaman@unm.ac.id
[5] Education Administration, Universitas Negeri Makassar, Indonesia
Email: ansar@unm.ac.id
[6] Early childhood Education Programs, Universitas Negeri Makassar, Indonesia
Email: rusmayadi@unm.ac.id

Article info

Article history:
Received: 04-06-2026
Revised: 22-06-2026
Accepted: 12-08-2026
Publish: 20-09-2026

Keywords:
Workload Analysis;
School Operator;
Effective Working Time;
Staffing Allocation;
Workforce Planning

Abstract

School operators, as educational support personnel, play a vital role in managing data-driven school administration amid increasing digitalization and accountability demands. This study examined whether the workload of school operators at different educational levels exceeded effective working time and identified staffing requirements based on workload analysis. A quantitative workload analysis was conducted in three schools representing elementary, junior high, and senior high schools. Three school operators were purposively selected because each was responsible for core educational data administration. Data were collected through direct observation, administrative documentation, and confirmation with school principals. Annual workload was calculated by multiplying the standard completion time for each task by its annual frequency and comparing the result with the effective working time standard of 75,000 minutes per year. The findings revealed that the elementary school operator had an ABK indicating sufficient capacity. The junior high school operator recorded an ABK suggesting a slight workload excess requiring task redistribution or temporary assistance, while the senior high school operator had an ABK indicating a substantial workload that justifies the assignment of two operators. These findings provide empirical evidence for workload-based staffing policies in school administration and highlight workload disparities across educational levels.

* Corresponding author at: Education Administration, Universitas Negeri Makassar, Kampus IV UNM Sektor Tidung, Jalan Tamalate I, Tidung, Kecamatan Rappocini, Kota Makassar, Sulawesi Selatan 90222 Indonesia.
E-mail address: sumarlin.mus@unm.ac.id
DOI: https://doi.org/10.31960/ijolec.v9i1.3382
© 2026 The Authors. Published by ILIN Institute. This is an open access article under the CC BY NC license (https://creativecommons.org/licenses/by-nc/4.0/).

INTRODUCTION

Digital transformation has changed the administrative work of Indonesian schools. Data-based governance has increased the need for systematic and transparent human resource management in public education institutions (Bashir et al., 2024). School operators no longer perform only routine data entry. They manage student, teacher, curriculum, finance, and reporting data through different education information systems (Janumpally, 2025). In many schools, one operator must handle work that requires technical accuracy, administrative coordination, and timely reporting. This condition makes operator workload a strategic issue in school governance and human resource planning (Ishma et al., 2025).

Workload analysis has become an important approach in human resource management because it connects task volume, task frequency, standard completion time, and available working time (Putri et al., 2025). A balanced workload supports service quality and organizational effectiveness. In contrast, a mismatch between work volume and employee capacity can reduce work performance and increase fatigue (Al-Gburi & Musaheb, 2024). Poorly managed workload can also weaken service effectiveness in public institutions (Rule & Ducot, 2025). This issue is also relevant in educational organizations that need rational workload arrangements (Razalli et al., 2021).

The role of school operators is strategic in education governance because the quality of school data affects planning, funding, reporting, and decision-making (Jones et al., 2022). Operators coordinate with principals, teachers, homeroom teachers, treasurers, and external education offices to ensure that institutional data remain accurate and usable. Their tasks include data input, data updating, document verification, report preparation, and synchronization with education information systems (Slavin et al., 2024). This role shows that school operators function as key actors in data-driven school administration. Their workload can become more complex when administrative systems expand across educational levels (Sun et al., 2023). Similar administrative complexity also appears in education settings that require technical and managerial competence (Zhang et al., 2021).

Previous workload studies have produced useful evidence for workforce planning, especially in health services and business organizations. Studies using workload indicators of staffing needs show that a gap between available personnel and actual workload can create staff shortages and reduce service quality (Dimiri et al., 2022a). Similar evidence shows that unequal staffing can weaken service accuracy and organizational performance (Rachman & Yen, 2025). Workload analysis also supports more rational task distribution when organizations use empirical activity data (Alfajri et al., 2024). It also helps estimate personnel needs through the comparison between work volume and available working time (Nguyen et al., 2021). This evidence strengthens the role of workload analysis in workforce policy and planning (Kunjumen et al., 2022).

The research gap lies in three issues. First, existing workload analysis studies rarely examine school operators as a specific occupational group in school administration. Second, previous studies seldom compare operator workload across elementary, junior high, and senior high schools. Third, little empirical evidence explains how differences in administrative complexity across educational levels affect staffing needs. This gap is important because workload analysis studies remain dominant in health and medical education contexts (Rezaei et al., 2021). Research on administrative staff exists, but it has not sufficiently explained the workload of school operators across school levels (Sahdan & Hussain, 2022). Studies on education personnel workload have also remained limited in scope and institutional focus (Sutoyo et al., 2021).

This study addresses the following research question: To what extent does the workload of school operators across elementary, junior high, and senior high school levels align with the available effective working time? Based on this question, the study aims to compare actual annual workload with an effective working time of 75,000 minutes, calculate ABK values, and determine staffing implications across educational levels (Maryadi et al., 2024).

The novelty of this study lies in its application of workload analysis to school operators across three educational levels using effective working time as the benchmark for staffing adequacy. The study contributes theoretically by extending workload analysis to educational support personnel, methodologically by operationalizing annual workload calculation based on task time and frequency, and practically by providing evidence for staffing allocation and workforce planning in school administration.

METHOD

This study used a quantitative workload design with a descriptive analytical approach. The design was positioned as a workload analysis study that combined job analysis, activity identification, and time-based workload calculation. The focus was not to test causal relationships but to measure the alignment between work volume and available working time among school operators (Helshinta et al., 2022).

The study was conducted in Gowa Regency, South Sulawesi, Indonesia. The sample consisted of three schools representing three educational levels: one elementary school, one junior high school, and one senior high school. The units of analysis were three school operators, with one operator representing each educational level. School principals were involved as supporting informants to confirm task distribution and administrative policies. The schools were selected purposively because each school had an active operator, implemented education information systems, and provided administrative documents needed for workload calculation (Sutoyo et al., 2021).

Data were collected through observation, document analysis, and confirmation with school principals. Observation focused on the types of work activities, time required to complete each activity, and frequency of activities within daily, monthly, semester, and annual cycles. The observation sheet recorded task name, task output, standard time, frequency, and total annual time, following workload analysis practices that emphasize activity identification and time measurement (Suhenda et al., 2022). Document analysis examined job descriptions, operator task lists, Dapodik-related documents, BOS and PIP reports, academic administration reports, and school working-hour records to strengthen the accuracy of the observed data (Mawaddah et al., 2023).

Data validity was strengthened through source and method triangulation. Observation results were compared with administrative documents and confirmed by school principals. Activity lists were checked against the actual outputs produced by operators. Time estimates were reviewed by comparing observed task duration, document evidence, and operator work records. This process helped reduce the risk of overestimating or underestimating workload (Mawaddah et al., 2023).

The calculation used the Workload Analysis formula: ABK = Total Annual Time Required to Complete Work / Annual Effective Working Time. Total annual time was obtained by multiplying the standard time for each activity by its annual frequency. This procedure follows workload-based staffing logic that links work volume, time standards, and workforce needs (Nguyen et al., 2021). The annual effective working time was set at 75,000 minutes or 1,250 hours per year, as used in the original calculation basis of this study (Republik Indonesia, 2020). The ABK value was then used to classify whether the available operator capacity was below, equal to, or above the annual workload (Kunjumen et al., 2022).

The ABK value was interpreted as a full-time equivalent indicator. An ABK value below 1.00 indicates that one operator has sufficient annual capacity. An ABK value equal to 1.00 indicates that the workload is aligned with the available annual capacity. An ABK value above 1.00 indicates that workload exceeds the capacity of one full-time operator. For staffing decisions, values slightly above 1.00 may require task redistribution or peak-period assistance, while values that approach or exceed 1.50 indicate the need for an additional full-time operator. This rule allows the analysis to support decision-making rather than only describe workload conditions.

Table 1. Interpretation of Workload Analysis Results

ABK Value	Category	Interpretation
< 1	Low workload	Excess workforce
= 1	Ideal workload	Workforce is appropriate
> 1	High workload	Workforce shortage

Calculations were performed using Microsoft Excel to ensure transparent tabulation of standard time, frequency, annual workload, ABK values, and staffing implications. This tabulation approach supports the accurate conversion of work activities into staffing needs (Prihadi et al., 2021). The analysis followed seven stages: data collection, activity identification, time standardization, frequency calculation, annual workload calculation, ABK calculation, and staffing interpretation. These stages are consistent with workload analysis procedures used to estimate personnel requirements from actual administrative activities (Sulistyowati & Rosa, 2023).

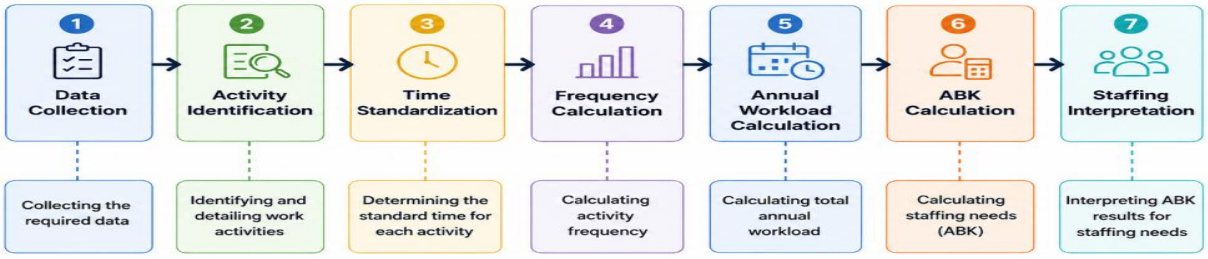


Figure 1. Methodological Flow of Workload Analysis

RESULT AND DISCUSSION

The workload analysis identified differences in the number of work activities, annual time requirements, ABK values, and staffing implications across educational levels. The elementary school operator performed 20 work activities with a total annual workload of 32,330 minutes. The junior high school operator performed 24 work activities with a total annual workload of 84,925 minutes. The senior high school operator performed 27 work activities with a total annual workload of 126,540 minutes. These differences indicate that operator workload increases across educational levels as administrative volume and task complexity increase. This pattern is consistent with workload research showing that task characteristics can shape personnel needs (Chen et al., 2024). It also reflects evidence that workload variability may occur across units within the same organizational system (Zaboli et al., 2024).

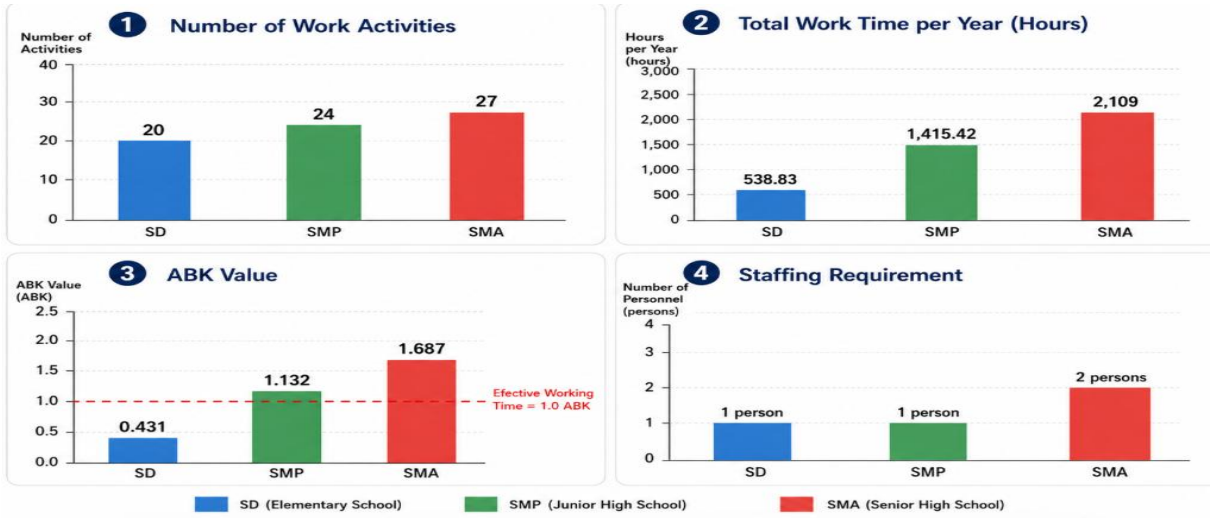


Figure 2. Recapitulation of Workload Analysis Calculation Results

The elementary school operator had an ABK value of 0.431. This value indicates that the workload remained below the annual effective working time capacity. The annual workload used 43.1% of one full-time operator capacity. Thus, one operator was sufficient to manage the observed administrative workload at the elementary school level.

The junior high school operator had an ABK value of 1.132. This value indicates that the workload exceeded the annual capacity of one operator by 13.2%. The result does not automatically justify a full second operator because the excess remains marginal. However, it shows that the operator requires support during peak periods, task redistribution, or simplified workflow procedures to prevent delays in periods of data updating, reporting, and synchronization.

The senior high school operator had an ABK value of 1.687. This value indicates that the workload exceeded the annual capacity of one operator by 68.7%. The staffing implication is different from the junior high school case because the gap is substantial and close to the workload of two full-time operators. Therefore, the senior high school level requires at least two operators or an equivalent redesign of administrative task distribution.

Discussion

The findings show that workload among school operators increases across educational levels. The number of activities rose from 20 at the elementary school level to 27 at the senior high school level. This represents a 35% increase in activity types. More importantly, the increase in total annual time was much larger than the increase in activity count. The senior high school workload was almost four times higher than the elementary school workload. This pattern indicates that workload differences are not caused only by the number of activities but also by the complexity, frequency, and duration of each activity.

The high workload at the senior high school level can be explained by broader academic administration, more complex student records, more varied reporting demands, and stronger coordination needs. Senior high school operators often handle data related to students, teachers, learning groups, academic reporting, graduation administration, program documents, and cross-unit coordination. These tasks require more verification and follow-up than basic data entry. The junior high school level shows a transitional pattern because its workload has exceeded one full-time capacity but not enough to require a full additional operator under the decision rule used in this study.

These findings support human resource management theory, which states that workload results from the interaction between task volume, task complexity, and available working time (Giotopoulos et al., 2024). When task volume remains below available working time, human resources may still have unused capacity. When task volume exceeds available working time, the organization must redesign staffing, distribute work more proportionally, or improve administrative processes. Proportional workload management matters because workload imbalance can affect employee performance and organizational sustainability (Masruddin et al., 2025). The findings extend this logic to educational support personnel by showing that the one-operator model does not produce the same workload consequences across educational levels.

The results also align with previous workload studies showing that staffing needs should follow empirical workload rather than fixed administrative assumptions (Aytona et al., 2021). Workload-based studies in different organizational settings show that staff shortages appear when total work volume exceeds available working time (Dimiri et al., 2022b). Workload indicators can guide workforce planning and personnel estimation (Kunjumen et al., 2022). Similar evidence shows that workload-based estimation supports staffing decisions in service organizations (Jing et al., 2022). Workload imbalance can also affect service quality and operational capacity (Yulliswandi et al., 2022). However, this study adds a specific educational contribution because it applies workload analysis to school operators across educational levels, not only to health workers or general administrative employees.

The theoretical contribution of this study is the extension of workload analysis into the field of educational support personnel. The methodological contribution lies in the use of

effective working time as a benchmark to evaluate staffing adequacy across school levels. The practical contribution lies in producing evidence that staffing policies should account for differences in administrative complexity between elementary, junior high, and senior high schools.

The study also offers an intervention-oriented framework. At the elementary school level, schools can maintain one operator while improving task documentation and workflow efficiency. At the junior high school level, schools should provide peak-period support, distribute simple administrative tasks to relevant staff, and develop a calendar-based workload plan. At the senior high school level, schools and local education authorities should consider adding one operator or creating a formal division of tasks between data management, academic reporting, and financial-program documentation.

The policy implication is that school operator allocation should not rely solely on the principal of one school one operator. Local education authorities need workload-based staffing standards that consider educational level, number of administrative systems, data volume, reporting frequency, and school complexity. Workload analysis can provide an empirical basis for more effective human resource policy and personnel allocation (Alfajri et al., 2024). This evidence-based approach can help prevent underutilization at one level and overload at another level. It can also support staffing decisions that reflect actual work volume in educational administration (Firasghani & Rinawati, 2025). Workload analysis further helps organizations understand technical workload when determining personnel needs (Thomas et al., 2024).

The findings should be interpreted carefully. The study did not measure stress, fatigue, or burnout. Therefore, the term overload in this article refers to workload that exceeds effective working time, not psychological pressure. Future studies should combine workload measurement with interviews, surveys, or mixed method designs to examine how workload affects performance, well-being, and data quality among school operators.

CONCLUSION AND SUGGESTION

This study found that the alignment between school operator workload and effective working time differs across educational levels. The elementary school operator worked within annual capacity, the junior high school operator experienced marginal overload, and the senior high school operator experienced substantial overload. These results show that staffing adequacy cannot be determined through a uniform operator allocation pattern. Workload-based staffing is necessary because administrative complexity increases across educational levels.

The main significance of this study lies in its evidence that school operators should be treated as a strategic workforce group in education administration. The study strengthens the use of workload analysis as an objective instrument for educational workforce planning. In practice, schools and local education authorities should maintain one operator at the elementary school level, provide task redistribution or peak-period assistance at the junior high school level, and add an additional operator or redesign administrative task structures at the senior high school level. Future research should involve a larger sample, more school categories, and mixed-method data to produce stronger staffing standards for school data governance.

CRediT authorship contribution statement

Sumarlin Mus: Led the conceptualization of the research, formulation of the objectives, and development of the framework and methodology for analyzing school operators' workloads across educational levels. Coordinated the research activities, developed the research instruments, and led data collection, curation, analysis, and interpretation to determine staffing needs and implications for workforce planning. Prepared the original manuscript draft, developed tables and presentations of the findings, and integrated feedback from all authors. Managed project administration and, as the corresponding author, coordinated communication with the journal and manuscript revisions throughout the publication process.

Arismunandar: Contributed to the development of the conceptual framework and research methodology and provided academic supervision. Reviewed the interpretation of the findings and critically edited the manuscript, particularly regarding the implications for educational personnel management.

Bongani I Nkambule: Contributed to interpreting the findings and developing the discussion on staffing allocation and workforce planning in educational contexts. Critically reviewed and edited the manuscript to strengthen its arguments, clarity, and international relevance.

Abdul Saman: Provided methodological input on instrument development and research implementation. Contributed to interpreting the findings and reviewing and editing the manuscript to strengthen alignment among the research objectives, methods, and conclusions.

Ansar: Contributed to data collection and checked the completeness and consistency of data on school operators' work activities. Reviewed the analytical findings and provided input on the discussion of staffing needs at each educational level.

Rusmayadi: Contributed to data curation and verified the consistency of activity classifications and workload calculations. Reviewed and edited the presentation of the findings and the recommendations for staffing allocation**.**

Declaration of competing interests

The authors declare that they have no financial conflicts of interest or personal relationships that could have influenced this research. The authors conducted the analysis and reported the findings independently and objectively.

Declaration of the use of AI

During the preparation of this manuscript, the authors used Grammarly for proofreading and spell checking and Gemini to assist in visualizing the research findings as graphs. The authors reviewed and verified all suggested revisions and generated graphs to ensure consistency with the research data and take full responsibility for the final content of the publication.

Funding statement

This research was funded by the Non-Tax State Revenue (PNBP) funds of Universitas Negeri Makassar for the year 2026, under LP2M Contract Number 318/DST/UN36.12/TU/2026. The funding supported the implementation of the research and the preparation of the research report.

Acknowledgments

The authors would like to express their sincere gratitude to the Dean of the Faculty of Education, Universitas Negeri Makassar, for the institutional support and encouragement provided throughout the completion of this study. The authors also extend their appreciation to the Head of the Department of Educational Administration, Universitas Negeri Makassar, for academic guidance and support during the research and writing process. Special thanks are addressed to all authors who contributed to the development of the research idea, data analysis, manuscript preparation, and article revision. The collaboration among the authors strengthened the quality, coherence, and academic contribution of this article on workload analysis of school operators across educational levels. This acknowledgment is written in line with the article's focus on school operator workload and staffing allocation in educational administration.

REFERENCES

Alfajri, A., Sutedjo, M. B. D., & Kumala, A. A. (2024). Workload indicator staffing need (WISN) as a method for analyzing clinic health personnel needs in Surakarta. *Media Publikasi Promosi Kesehatan Indonesia*, *7*(7). https://doi.org/10.56338/mppki.v7i7.5292

Al-Gburi, H. A. I., & Musaheb, M. R. (2024). The impact of supportive leadership on work stress: An empirical research in the Ministry of Iraqi Interior. *Journal of Economics and Administrative Sciences*. https://doi.org/10.33095/jeas.v30i140.2400

Aytona, M. G. C., Politico, M. R., McManus, L., Ronquillo, K., & Okech, M. (2021). Determining

staffing standards for primary care services using workload indicators of staffing needs in the Philippines. *Human Resources for Health*, *19*. https://doi.org/10.1186/s12960-021-00670-4

Bashir, M., Zahra, S. N., & Qaisar, Z. (2024). The gig economy and automation: Implications for human resource management in Pakistan. *Inverge Journal of Social Sciences*. https://doi.org/10.47631/ijss.2302

Chen, Y., Chan, C. W., Dong, J., Jackson, E. M., Yip, N. H., & Rossetti, S. C. (2024). Beyond order-based nursing workload: A retrospective cohort study in intensive care units. *Journal of Nursing Scholarship*. https://doi.org/10.1111/jnu.12979

Dimiri, D., Mek, N., Apini, M. T., Ali, T., Pumuye, G. T., Laka, V., Jogo, R., Kari, P., Deki, O., Mollent, O., Luo, D., Maalsen, A., Yapi, K., & Madodo, R. (2022a). Estimating staffing requirements using workload indicators of staffing need at Braun District Hospital in Morobe Province, Papua New Guinea. *Human Resources for Health*, *19*. https://doi.org/10.1186/s12960-021-00677-x

Dimiri, D., Mek, N., Apini, M. T., Ali, T., Pumuye, G. T., Laka, V., Jogo, R., Kari, P., Deki, O., Mollent, O., Luo, D., Maalsen, A., Yapi, K., & Madodo, R. (2022b). Estimating staffing requirements using workload indicators of staffing need at Braun District Hospital in Morobe Province, Papua New Guinea. *Human Resources for Health*, *19*. https://doi.org/10.1186/s12960-021-00677-x

Firasghani, M. A., & Rinawati, R. (2025). Human resource needs assessment in the health sector using workload analysis method: A literature case study. *International Journal Administration, Business & Organization*. https://doi.org/10.61242/ijabo.25.490

Giotopoulos, K. C., Michalopoulos, D., Vonitsanos, G., Papadopoulos, D., Giannoukou, I., & Sioutas, S. (2024). Dynamic workload management system in the public sector. *Information*, *15*(6), 335. https://doi.org/10.3390/info15060335

Helshinta, N., Pangaribuan, D., & Ginting, C. (2022). Analysis of health personnel needs (paramedic) in handling COVID-19 based on workload using the WISN method at Hospital Royal Prima Medan. *International Journal of Research and Review*. https://doi.org/10.52403/ijrr.20220259

Ishma, Y. F., Myrna, R., & Susanti, E. (2025). Evaluation of bureaucratic simplification performance: Institutional, human resources, and administrative practices analysis in achieving good governance in Indonesia. *Journal La Sociale*. https://doi.org/10.37899/journal-la-sociale.v6i1.1030

Janumpally, R. K. (2025). The role of natural language processing in graduate medical education: A scoping review. *Cureus*, *17*. https://doi.org/10.7759/cureus.58506

Jones, R. L., Juve, A. M., Hasan, R., Shuford, A., & Carney, P. (2022). Leveraging existing education innovations to establish a community of practice to promote medical education scholar development. *Medical Education Online*, *27*. https://doi.org/10.1080/10872981.2022.2133587

Kunjumen, T., Okech, M., Diallo, K., McQuide, P., Zapata, T., & Campbell, J. (2022). Global experiences in health workforce policy, planning and management using the workload indicators of staffing need (WISN) method, and way forward. *Human Resources for Health*, *19*.

https://doi.org/10.1186/s12960-021-00652-6

Maryadi, R., Shalahuddin, A., Daud, I., & Rosnani, T. (2024). The effect of human resource planning on the performance of police members. *Jurnal Ilmiah Manajemen Kesatuan*. https://doi.org/10.37641/jimkes.v12i4.2730

Masruddin, N. P. D., Saharuddin, S., & Hasbi, A. R. (2025). The effect of work discipline and workload on employee performance. *Golden Ratio of Human Resource Management*. https://doi.org/10.52970/grhrm.v6i1.1581

Mawaddah, N., Prastya, A., & Bogohanto, B. (2023). Factor analysis in the implementation of early warning system documentation in psychiatric hospitals. *The Indonesian Journal of Occupational Safety and Health*. https://doi.org/10.20473/ijosh.v12i2.2023.219-226

Nguyen, T. T. H., Phung, H. T., & Bui, A. T. M. (2021). Applying the workload indicators of staffing needs method in nursing health workforce planning: Evidences from four hospitals in Vietnam. *Human Resources for Health*, *19*. https://doi.org/10.1186/s12960-021-00647-3

Peraturan Menteri Pendayagunaan Aparatur Negara Dan Reformasi Birokrasi Republik Indonesia Nomor 1 Tahun 2020 Tentang Pedoman Analisis Jabatan Dan Analisis Beban Kerja (2020). https://peraturan.bpk.go.id/Details/143660/permen-pan-rb-no-1-tahun-2020

Prihadi, M. D., Danarahmanto, P. A., & Pratami, J. F. (2021). Analysis of the workload of inpatient medical record data update staff using workload indicator of staffing need method to support work effectiveness in hospital in Bandung. *Journal of Business Studies and Management Review*, *5*(1). https://doi.org/10.22437/jbsmr.v5i1.14671

Putri, I. F., Fitriani, R. A., & Hardjowikarto, D. (2025). Enhancing employee performance through organization culture, workload, and job engagement. *Journal Research of Social Science, Economics, and Management*. https://doi.org/10.59141/jrssem.v5i1.912

Rachman, M. D., & Yen, P.-Y. (2025). The influence of nurse staffing and workload on medication administration errors: A scoping review. *Journal of Advanced Nursing*. https://doi.org/10.1111/jan.15963

Razalli, A. R., Kamaruddin, K., Tek, O. E., Teck, W. K., & Daud, N. A. M. (2021). Evaluating teaching workload of academic staff for optimum and effective use of expertise resources. *International Journal of Academic Research in Business and Social Sciences*, *11*. https://doi.org/10.6007/IJARBSS/v11-i9/10974

Rezaei, H., Haghdoost, A. A., Javar, H. A., Dehnavieh, R., Aramesh, S., Dehgani, N., & Tahmasbi Sisakht, M. (2021). The effect of coronavirus (COVID-19) pandemic on medical sciences education in Iran. *Journal of Education and Health Promotion*, *10*. https://doi.org/10.4103/jehp.jehp_817_20

Rule, H., & Ducot, L. (2025). Impact of deloading teachers from ancillary services and their performance. *Psychology and Education: A Multidisciplinary Journal*. https://doi.org/10.5281/zenodo.11025476

Sahdan, M. N., & Hussain, S. (2022). Workload analysis of administrative staff in faculties and academic centers: A case study in Universiti Malaysia Pahang. *International Journal of Industrial Management*. https://doi.org/10.15282/ijim.15.1.2022.8998

Slavin, S., Yaghmour, N. A., Baez-Martinez, A., O'Donovan, C., Panda, M., Carpenter, P., Burt, C., & McLeod, K. K. (2024). Program and

institutional coordinator well-being: Results from a national survey. *Academic Medicine*, *100*, 572–577. https://doi.org/10.1097/ACM.0000000000005955

Suhenda, A., Sukawan, A., & Muslihah, Y. (2022). Perencanaan kebutuhan tenaga rekam medis dengan metode analisis beban kerja kesehatan di Puskesmas Cihideung Kota Tasikmalaya tahun 2021. *Indonesian of Health Information Management Journal (INOHIM)*. https://doi.org/10.47007/inohim.v10i1.390

Sulistyowati, D., & Rosa, E. (2023). Workload analysis of registration personnel and medical records: Approach method workload indicators of staffing need. *Jurnal Aisyah: Jurnal Ilmu Kesehatan*, *8*(1). https://doi.org/10.30604/jika.v8is1.1537

Sun, L., Chen, D., & Xu, J. (2023). Changes in workload of Chinese university undergraduate teaching from the perspective of education quality management. *International Journal of Metrology and Quality Engineering*. https://doi.org/10.1051/ijmqe/2023012

Sutoyo, S., Syari'udin, A., Siswanti, Y., & Yulianti, R. (2021). Workload analysis in determining the needs analysis of the number of education personnel at XYZ University Yogyakarta. *RSF Conference Series: Business, Management and Social Sciences*. https://doi.org/10.31098/bmss.v1i3.322

Thomas, S., Belurkar, S., Bari, T., & Patil, A. (2024). Unveiling efficiency: A research inquiry into technical staff utilization in South Indian clinical laboratory using workload indicators staffing need (WISN) analysis. *F1000Research*. https://doi.org/10.12688/f1000research.152755.1

Yulliswandi, D., Megawati, M., & Nuraini, N. (2022). Nursing personnel needs analysis using the workload indicator staffing needs (WISN) method in installation emergency Datu Beru Hospital Central Aceh. *Journal La Medihealtico*. https://doi.org/10.37899/journallamedihealtico.v3i4.689

Zaboli, A., Brigo, F., Brigiari, G., & Turcato, G. (2024). Exploring the variability in triage nursing workload: Insights from a multicentre observational study. *Journal of Advanced Nursing*. https://doi.org/10.1111/jan.16627

Zhang, X., Li, C., Yue, C., Jiang, X., Cao, J., & ten Cate, O. (2021). Why clinical training in China should improve: A cross-sectional study of MD graduates. *BMC Medical Education*, *21*. https://doi.org/10.1186/s12909-021-02560-3