



DAFTAR PUSTAKA

- Afshari, D., & Shirali, G. A., 2019, The effect of heat exposure on physical workload and maximum acceptable work duration (MAWD) in a hot and dry climate, *Urban Climate*, 27(August 2018), 142–148. <https://doi.org/10.1016/j.ulclim.2018.11.008>
- American Psychological Association, 2023, *The American workforce faces compounding pressure: APA's 2021 work and well-being survey results*, American Psychological Association. <https://www.apa.org/pubs/reports/work-well-being>
- Arellano, J. L. H., Perez, J. N. S., Alcaraz, J. L. G., & Macias, A. A. M., 2017, Assessment of Workload, Fatigue, and Musculoskeletal Discomfort Among Computerized Numerical Control Lathe Operators in Mexico, *IIE Transactions on Occupational Ergonomics and Human Factors*, 5(2), 65–81. <https://doi.org/10.1080/24725838.2017.1317301>
- Asmeati, Thamrin, A., Yusriandi, & Paloboran, M., 2022, Analisis Beban Kerja Fisik Terhadap Kelelahan Kerja Dengan Menggunakan Metode Cardiovascular Load Di PT. XYZ, *Jurnal Teknik AMATA*, 3(2), 26–35. <https://doi.org/10.55334/jtam.v3i2.305>
- Astrand, P. ., & Rodalh, K., 1977, *Textbook Of Work Physiology : Physiological Bases Of Exercise*, McGraw-Hill.
- Aull, J. L., Rowe, D. A., Hickner, R. C., Malinauskas, B. M., & Mahar, M. T., 2008, Energy expenditure of obese, overweight, and normal weight females during lifestyle physical activities, *International Journal of Pediatric Obesity*, 3(3), 177–185. <https://doi.org/10.1080/17477160701874844>
- Burton, D. A., Stokes, K., & Hall, G. M., 2004, Physiological effects of exercise, *The Board of Management and Trustees of the British Journal of Anaesthesia*. <https://doi.org/10.1093/bjaceaccp/mkh050>
- Cahyadi, B., Maryanti, A. S., & Timang, G. A., 2020, Measurement of Physiological and Psychological Workloads of Mechanical Department Operator PT. XYZ, *IOP*



Conference Series: Materials Science and Engineering, 847(1).
<https://doi.org/10.1088/1757-899X/847/1/012092>

Charles, R. L., & Nixon, J., 2019, Measuring mental workload using physiological measures: A systematic review, *Applied Ergonomics*, 74(September 2016), 221–232. <https://doi.org/10.1016/j.apergo.2018.08.028>

Chu, B., Marwaha, K., & Ayers, D., 2019, Physiology, Stress Reaction, *StatPearls*.
<http://www.ncbi.nlm.nih.gov/pubmed/31082164>

Crandall, C. G., & Wilson, T. E., 2015, Human cardiovascular responses to passive heat stress, *Comprehensive Physiology*, 5(1), 17–43.
<https://doi.org/10.1002/cphy.c140015>

Fallahi, M., Motamedzade, M., Heidarimoghadam, R., Soltanian, A. R., Farhadian, M., & Miyake, S., 2016, Analysis of the mental workload of city traffic control operators while monitoring traffic density: A field study, *International Journal of Industrial Ergonomics*, 54, 170–177. <https://doi.org/10.1016/j.ergon.2016.06.005>

Ghanavati, F. K., Choobineh, A., Keshavarzi, S., Nasihatkon, A. A., & Roodbandi, A. S. J., 2019, Assessment of mental workload and its association with work ability in control room operators, *Medicina Del Lavoro*, 110(5), 389–397. <https://doi.org/10.23749/mdl.v110i5.8115>

Handoyo, H., & Maharani, D. I., 2021, Workload Identification Using the National Aeronautics and Space Administration Task Load Index (NASA-TLX) Method of Rolling Mill Operators in the Production Department at PT Jaya Pari Steel Surabaya, *Journal of Physics: Conference Series*, 1899(1).
<https://doi.org/10.1088/1742-6596/1899/1/012083>

Haq, F. I. U., Alam, A., Mulk, S. S. U., & Rafiq, F., 2020, The Effect of Stress and Work Overload on Employee's Performance: A Case Study of Public Sector Universities of Khyber Pakhtunkhwa, *European Journal of Business and Management Research*, 5(1), 1–6. <https://doi.org/10.24018/ejbm.2020.5.1.176>

Hart, S. G., 1986, *NASA Task Load Index (TLX) v. 1.0 Paper and Pencil Package* (pp. 1–19).

Hart, S. G., & Staveland, L. E., 1988, *Development of NASA-TLX (Task Load Index): Results of Empirical and Theoretical Research*. <https://doi.org/10.1007/s10749>



010-0111-6

- Hassan, A. M., Alwan, A. A., & Hamzah, H. K., 2023, Numerical Study of Fan Coil Heat Exchanger with Copper Foam, *International Journal of Fluid Machinery and Systems*, 16(1), 73–88. <https://doi.org/10.5293/ijfms.2023.16.1.073>
- Health and Safety Executive, 2023, *Health and safety at work Summary statistics for Great Britain 2020*. <https://www.hse.gov.uk/statistics/overall/hssh1819.pdf>
- Heaney, J., 2013, Energy: Expenditure, Intake, Lack of, In M. D. Gellman & J. . Turner (Eds.), *Encyclopedia of Behavioral Medicine*, Springer. https://doi.org/10.1007/978-3-030-39903-0_668
- Hennfng, R. A., Sauter, S. L., Salvendy, G., & Krieg, E. F., 1989, Microbreak length, performance, and stress in a data entry task, *Ergonomics*, 32(7), 855–864. <https://doi.org/10.1080/00140138908966848>
- Hermansyah, M. S. A., & Handayani, N. U., 2022, NASA-TLX Assessment of Mental Workload in Manufacturing Industry, *Spektrum Industri*, 20(2), 1–14. <https://doi.org/10.12928/si.v20i2.43>
- Hicks, T. G., & Wierwille, W. W., 1979, Comparison of Five Mental Workload Assessment Procedures in a Moving-Base Driving Simulator, *Human Factors: The Journal of Human Factors and Ergonomics Society*, 21(2), 129–143. <https://doi.org/10.1177/001872087902100201>
- Hosseinabadi, B. M., Khanjani, N., Etemadinezhad, S., Samaei, S. E., Raadabadi, M., & Mostafaee, M., 2019, The associations of workload, individual and organisational factors on nurses' occupational injuries, *Journal of Clinical Nursing*, 28(5–6), 902–911. <https://doi.org/10.1111/jocn.14699>
- Inegbedion, H., Inegbedion, E., Peter, A., & Harry, L., 2020, Heliyon Perception of workload balance and employee job satisfaction in work organisations, *Heliyon*, 6. <https://doi.org/10.1016/j.heliyon.2020.e03160>
- International Ergonomics Association, 2010a, *Ergonomics Guidelines For Occupational Health Practice in Industrially Developing Countries*.
- International Ergonomics Association, 2010b, *Ergonomics Guidelines For Occupational Health Practice In Industrially Developing Countries*.
- International Labour Organization, 2016, Workplace Stress: a collective challenge, In



Workplace Stress: A collective challenge World.

- Ismail, A. R., Jusoh, N., Makhtar, N. K., Zein, R. M., Rahman, I. A., Abdull Wahab, S. F., & Othman, R., 2021, Experimental study on human physiology during repetitive workload simulated under high temperature and high relative humidity, *Journal of Physics: Conference Series*, 1793(1). <https://doi.org/10.1088/1742-6596/1793/1/012077>
- Isnaini, M., Umam, H., Norhiza, F. L., Rizki, M., & Sari, E. K., 2023, *Workload Analysis using NASA-TLX and SWAT METHODS in Shop Floor Company X*, 4662–4669. <https://doi.org/10.46254/ap03.20220788>
- Jafari, M. J., Zaeri, F., Jafari, A. H., Payandeh Najafabadi, A. T., Al-Qaisi, S., & Hassanzadeh-Rangi, N., 2020, Assessment and monitoring of mental workload in subway train operations using physiological, subjective, and performance measures, *Human Factors and Ergonomics In Manufacturing*, 30(3), 165–175. <https://doi.org/10.1002/hfm.20831>
- Kazemi, R., Zamanian, Z., Khalifeh, M., & Hemmatjo, R., 2019, The effects of noise and heat strain on the work ability index (Wai) among rubber factory workers, *Annals of Global Health*, 85(1), 1–6. <https://doi.org/10.5334/aogh.2504>
- Kementerian Dalam Negeri, 2008, *Peraturan Menteri Dalam Negeri Nomor 12 Tahun 2008*.
- Kementerian Kesehatan RI, 2016, *Standar Keselamatan Dan Kesehatan Kerja Perkantoran*.
- Kementerian Ketenagakerjaan RI, 1999, *Nilai Ambang Batas Faktor Fisika Di Tempat Kerja Menteri Tenaga Kerja Republik Indonesia*.
- Keytel, L. R., Goedecke, J. H., Noakes, T. D., Hiiloskorpi, H., Laukkanen, R., van der Merwe, L., & Lambert, E. V., 2005, Prediction of energy expenditure from heart rate monitoring during submaximal exercise, *Journal of Sports Sciences*, 23(3), 289–297. <https://doi.org/10.1080/02640410470001730089>
- Kramer, A. F., 1990, Physiological metrics of mental workload: A review of recent progress, *Multiple-Task Performance*, June, 279–328. <https://doi.org/10.1201/9781003069447-14>
- Kroemer-Elbert, K. E., Kroemer, H. B., & Hoffman, A. D. K., 2017, *How to Design*



for Ease of Use.

Kroemer, K. H. E., & Grandjean, E., 2009, *Fitting The Task to The Man* (5th editio), Taylor & Francis.

Kroemer, K. H. E., Kroemer, H. J., & Kroemer-Elbert, K. E., 2010, *Engineering Physiology*, Springer Nature. <https://doi.org/10.1007/978-3-642-12883-7>

Lehto, M., & Landry, S. J., 2013, Introduction to Human Factors and Ergonomics, In *Human Factors Engineering and Ergonomics*. <https://doi.org/10.1201/b16191-5>

Lindbohm, M. L., 2013, Physical workload - A risk factor for miscarriage?, *Scandinavian Journal of Work, Environment and Health*, 39(4), 321–323. <https://doi.org/10.5271/sjweh.3369>

Lu, L., Sesek, R. F., Megahed, F. M., & Caviuto, L. A., 2017, A survey of the prevalence of fatigue, its precursors and individual coping mechanisms among U.S. manufacturing workers, *Applied Ergonomics*, 65, 139–151. <https://doi.org/10.1016/j.apergo.2017.06.004>

Ma, Q., Shang, Q., Fu, H., & Chen, F., 2012, Mental workload analysis during the production process: EEG and GSR activity, *Applied Mechanics and Materials*, 220–223(November 2012), 193–197. <https://doi.org/10.4028/www.scientific.net/AMM.220-223.193>

MacLeod, D., 2006, The Ergonomics Kit for General Industry, In *The Ergonomics Kit for General Industry*. <https://doi.org/10.1201/9781420006308>

Mancuso, C. A., Rincon, M., Sayles, W., & Paget, S. A., 2007, Comparison of energy expenditure from lifestyle physical activities between patients with rheumatoid arthritis and healthy controls, *Arthritis Care and Research*, 57(4), 672–678. <https://doi.org/10.1002/art.22689>

Martinez, K. B., Nazarhari, M., & Rouhani, H., 2023, Breaking the Fatigue Cycle: Investigating the Effect of Work-Rest Schedules on Muscle Fatigue in Material Handling Jobs, *Sensors*, 23(24). <https://doi.org/10.3390/s23249670>

Melchior, M., Caspi, A., Milne, B. J., Danese, A., Poulton, R., & Moffitt, T. E., 2007, Work stress precipitates depression and anxiety in young, working women and men, *Psychological Medicine*, 37(8), 1119–1129. <https://doi.org/10.1017/S0033291707000414>



- Meng, X., Lv, Y., Yang, H., & Wang, Y., 2021, The cooling effect of a spray fan in an indoor hot environment, *Indoor and Built Environment*, 30(6), 851–858. <https://doi.org/10.1177/1420326X20914360>
- Mijović, P., Ković, V., Mačužić, I., Todorović, P., Jeremić, B., Milovanović, M., & Gligorijević, I., 2015, Do Micro-Breaks Increase the Attention Level of an Assembly Worker? An ERP Study, *Procedia Manufacturing*, 3(Ahfe), 5074–5080. <https://doi.org/10.1016/j.promfg.2015.07.521>
- Miller, S., 2001, *Workload measures. The University of Iowa. National advanced driving simulator. Document ID: N01-006.*
- O'Donnell, M. P., 2000, Health and productivity management: The concept, impact, and opportunity: Commentary to Goetzel and Ozminkowski, *American Journal of Health Promotion*, 14(4), 215–217. <https://doi.org/10.4278/0890-1171-14.4.215>
- Putri, N. T., Zadry, H. R., Mahata, M. E., Amrina, E., Yuliandra, B., & Humaida, N., 2020, Ergonomics Evaluation of Manual Material Handling Activities in the Section of Feeding Laying Hens at Poultry Farm, *IOP Conference Series: Materials Science and Engineering*, 1003(1). <https://doi.org/10.1088/1757-899X/1003/1/012074>
- Qurthuby, M., 2022, Pengukuran Beban Kerja Mental Job Driver Dan Swamper Team Fuel Menggunakan NASA-TLX, *Jurnal Surya Teknika*, 8(2), 333–338. <https://doi.org/10.37859/jst.v8i2.3283>
- Rajan, D., 2018, *Negative impacts of heavy workload : a comparative study among sanitary workers.* <https://doi.org/10.15406/sij.2018.02.00086>
- Rodahl, K., 1989, The Physiology of Work, In *Journal of the American Medical Association* (Vol. 118, Issue 8), Taylor & Francis. <https://doi.org/10.1001/jama.1942.02830080001001>
- Rusmiati, E., & Harjadi, D., 2021, *Analysis Of The Impact Of Risk And Workload On Employee Performance*, 2021(2), 386–398.
- Santoso, D. A., & Supriyadi, A., 2010, Perhitungan Waktu Baku Dengan Metode Work Sampling Untuk Menentukan Jumlah Tenaga Kerja Optimal, *Prosiding Seminar Nasional Sains Dan Teknologi*.



- Siregar, I., Tarigan, I. R., Syahputri, K., Sari, R. M., & Nasution, T., 2018, Analysis of physiological workload approach in packing stations to determine optimal workload, *IOP Conference Series: Materials Science and Engineering*, 420(1). <https://doi.org/10.1088/1757-899X/420/1/012029>
- Sluchak, T. J., 1992, Ergonomics: Origins, focus, and implementation considerations, *AAOHN Journal*, 40(3), 105–112.
- Suryaningrat, I. B., Kuswardhani, N., & Hastuti, N. R., 2021, Optimalisasi Beban Kerja Pada Industri Makanan Menggunakan Metode Workload Analysis (Studi Kasus Pada Ud. Mr-Jember), *Jurnal Ilmiah Rekayasa Pertanian Dan Biosistem*, 9(2), 118–129. <https://doi.org/10.29303/jrp.v9i2.219>
- Tarwaka, & Bakri, S. H. A., 2016, *Ergonomi untuk Keselamatan, Kesehatan Kerja dan Produktivitas*.
- Thielmann, B., Schumann, H., Botscharow, J., & Böckelmann, I., 2022, Subjective perceptions of workload and stress of emergency service personnel depending on work-related behavior and experience patterns, *Notfall Und Rettungsmedizin*, 25, 15–22. <https://doi.org/10.1007/s10049-022-01076-y>
- Ukwadinamor, C., & Oduguwa, A., 2020, Impact of Work Overload and Work Hours on Employees Performance of Selected Manufacturing Industries in Ogun State, *IOSR Journal of Business and Managements and Management*, 22(11), 16–25. <https://doi.org/10.9790/487X-2211011625>
- Valsson, S., & Bharat, A., 2011, Impact of Air Temperature on Relative Humidity - A study, *Architecture - Time Space & People*.
- Wahyuni, D., Budiman, I., Sembiring, M. T., Sitorus, E., & Nasution, H., 2017, The workload analysis in welding workshop To, *Iopscience.Iop.Org*, 8(February 2018), 68–74. <https://doi.org/10.1088/1755-1315/126/1/012095>
- Wickens, C. D., Lee, J., & Becker, S. G., 2004, *An Introduction to Human Factors Engineering Second Edition*, Addison-Wesley Educational Publishers Inc.
- Widiasih, W., & Nuha, H., 2019, Workload Analysis Using Work Sampling and NASA-TLX for Employee of Private University in Surabaya, *Jurnal Ilmiah Teknik Industri*, 18(2), 134–141. <https://doi.org/10.23917/jiti.v18i2.8247>
- Wignjosoebroto, S., 2008, Teknik Analisis Untuk Peningkatan Produktivitas Kerja, In



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PENGUKURAN BEBAN KERJA MENGGUNAKAN PENGUKURAN FISIOLOGIS DAN SUBJEKTIF DI
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PERUSAHAAN

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Surabaya: *Prima Printing*, Penerbit Guna Widya.

- Wilson, T. E., & Crandall, C. G., 2011, Effect of thermal stress on cardiac function, *Exercise and Sport Sciences Reviews*, 39(1), 12–17.
<https://doi.org/10.1097/JES.0b013e318201eed6>
- Wirakusuma, K. W., & Singgih, M. L., 2019, Evaluation Setup Process on Rotogravure Printing Machine in Order to Reduce Setup Time, *IPTEK Journal of Proceedings Series*. <https://doi.org/10.12962/j23546026.y2019i5.6408>
- Zanabazar, A., & Jigjiddorj, S., 2022, Relationships between mental workload, job burnout, and organizational commitment, *SHS Web of Conferences*, 132, 01003.
<https://doi.org/10.1051/shsconf/202213201003>
- Zulfany, A. H., Dewi, R. S., & Partiwi, S. G., 2019, Analyzing Mental Workload of Remote Worker by Using SWAT Methodology (Case Study: Remote Software Engineer), *IOP Conference Series: Materials Science and Engineering*, 598(1), 012008. <https://doi.org/10.1088/1757-899x/598/1/012008>