ANALYTIC HIERARCHY PROCESS AND KNOWLEDGE-BASED SYSTEM INTEGRATION FOR WEB-BASED ERGONOMICS ASSESSMENT APPROACH IN PRIORITIZING WORKPLACE CRITICAL RISK FACTORS

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Doctor of Philosophy

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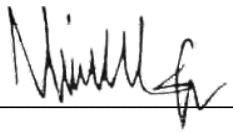

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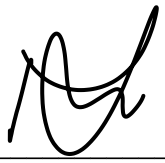

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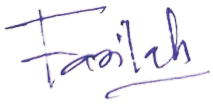

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ABSTRAK

Pelaksanaan penilaian risiko ergonomik di tempat kerja adalah kewajipan undang-undang untuk semua tempat kerja termasuk kilang pembuatan automotif. Keperluan ergonomis yang kompeten untuk mengkaji, merancang, dan menilai sistem kerja manusia sangat kritikal. Oleh itu, menggunakan teknologi sistem berasas pengetahuan (KBS) dalam ergonomik memungkinkan pekerja biasa menggunakan kepakaran pakar ergonomik untuk menyelesaikan pekerjaan mereka dengan tepat dan cekap tanpa bantuan pakar. Tesis ini membentangkan sistem penilaian ergonomi berasaskan web (W-BEAS) untuk menilai dan mengutamakan risiko di tempat kerja automotif. Metodologi kajian di bawah fasa 1 bermula dengan menyiasat faktor risiko ergonomi dominan di tempat kerja. Dalam kajian awal, 97 kuesioner dikumpulkan dari 120 set untuk mengenal pasti prestasi ergonomi tempat kerja, dan permintaan peningkatan di kilang automotif. Di bawah fasa 1, kajian ini dilanjutkan dengan beberapa kaedah: penyiasatan gejala MSD, penilaian tugas pekerjaan, tinjauan kajian mapan, analisis pengetahuan pakar domain, dan pengesahan faktor risiko. Kemudian, kajian ini diteruskan dengan menetapkan kaedah penilaian berdasarkan proses hierarki analitik (AHP) untuk mengutamakan faktor risiko ergonomik yang kritikal. Akhirnya, sistem penilaian ergonomi berasaskan web (W-BEAS) dikembangkan dengan mengintegrasikan teknik AHP, KBS, dan pendekatan berasaskan web untuk menilai elemen bahaya di tempat kerja automotif. W-BEAS dibangunkan menggunakan perisian XAMMP dengan mengintegrasikan KBS, teknik AHP dan pelayan web yang membolehkan pengguna mencapai data menggunakan peranti dengan sambungan internet. Perisian XAMPP Apache adalah timbunan penyelesaian pelayan web lintas platform yang bebas dan sumber terbuka. Hasil kajian awal menunjukkan bahawa sekitar 70% responden memerhatikan bahawa pekerja sering mengadu tentang tugas pekerjaan mereka, dan 60% atau lebih responden memahami keperluan untuk memperbaiki tempat kerja mereka. Proses penyiasatan untuk faktor risiko ergonomik telah menghasilkan 26 faktor risiko dominan yang disimpan sebagai pengkalan data W-BEAS. Kaedah penilaian berasaskan AHP mengenal pasti ergonomik organisasi adalah faktor paling kritikal yang membawa kepada pembangunan WMSD di kilang pembuatan komponen kenderaan. Faktor-faktor sub-risiko yang kritikal, termasuk tahap pendidikan, permintaan fizikal di tempat kerja, tenaga kerja dalam tugas, getaran tangan-tangan dan sokongan pekerjaan rendah. Kaedah penilaian berasaskan AHP telah disahkan oleh penilaian konsistensi (CR <0.1). Kumpulan penilai yang berbeza juga telah menunjukkan nilai keutamaan tempat pertama yang serupa, dan perbezaannya sedikit (<0.05). Oleh itu, kerangka kaedah penilaian berasaskan AHP terbukti praktikal dalam mengutamakan faktor risiko kritikal untuk campur tangan ergonomik di tempat kerja. W-BEAS menerapkan dan menghasilkan hasil bahawa ergonomi organisasi adalah yang paling kritikal dan ergonomi individu adalah faktor risiko yang kurang kritikal. Sementara itu, hasil pengesahan W-BEAS menunjukkan bahawa kedudukan faktor risiko peringkat pertama yang dihasilkan oleh kaedah W-BEAS dan RPN dapat dibandingkan. W-BEAS juga disahkan dengan menunjukkan faktor risiko penekanan yang sama yang dihasilkan oleh kedua-dua kumpulan penilai. Lebih-lebih lagi, kedua-dua pengguna syarikat berpuas hati dengan kandungan dan sistem W-BEAS (p> 0.05). Keupayaan W-BEAS untuk menilai faktor risiko ergonomi tempat kerja diakui, dan pekerja biasa dapat menilai situasi tempat kerja mereka menggunakan laman web. Oleh itu, W-BEAS sangat penting dalam industri automotif yang membolehkan maklumat risiko ergonomi dapat diakses dan dikaji pada peringkat awal reka bentuk produk dan proses.

ABSTRACT

Conducting workplace ergonomics risk assessment is a legal obligation for all workplaces, including automotive manufacturing plant. The needs for a competent ergonomist to study, design, and evaluate human work system is crucial. Thus, utilizing the technology of knowledge-based system (KBS) in ergonomics makes it possible for an ordinary worker to use ergonomic experts' expertise to accomplish their work accurately and efficiently without experts' assistance. This thesis presents a web-based ergonomics assessment system (W-BEAS) to evaluate and prioritize automotive workplace risks. The study's methodology under phase 1 starts with investigating dominant ergonomics risk factors in the workplace. In the preliminary study, 97 questionnaires were collected out of 120 sets to identify workplace ergonomics' performance, and the improvements demand at an automotive production plant. Under phase 1, the study continues with several methods: MSD symptom investigation, job task assessment, established studies review, domain expert knowledge analysis, and risk factors validation. Then, this study continued with establishing the analytical hierarchy process (AHP) based assessment method for prioritizing the critical ergonomic risk factors. Finally, a web-based ergonomics assessment system (W-BEAS) was developed by integrating the AHP technique, KBS, and web-based approach to evaluate automotive workplace hazards elements. The W-BEAS was developed using XAMMP software by integrating a KBS, the AHP technique and a web server that users can access from any device with an internet connection. Apache's XAMPP software is a cross-platform web-server solution stack that is free and open-source. The preliminary study results showed that about 70% of the respondents observed that employees frequently complained about their job task, and 60% or more of the respondents understood a need to improve their workplace. The investigation process for ergonomics risk factors has produced 26 dominant risk factors stored as knowledge-based for W-BEAS databased. The AHP-based evaluation method identified the organizational ergonomics are the most critical factor that leads to WMSD development in the vehicle component manufacturing plant. The critical sub-risk factors, including the level of education, physical demand at work, force exertion in job task, hand-arm vibration and low job support. The AHP-based evaluation method has validated by the consistency judgement ($CR < 0.1$). Different assessor groups also have shown similar first-place prioritization value, and the difference is slightly (< 0.05). Thus, the AHP-based evaluation method framework proved practical in prioritizing critical risk factors for workplace ergonomic intervention. W-BEAS applied and produced results that organisational ergonomics is the most critical and individual ergonomics is the less critical risk factor. Meanwhile, W-BEAS validation results showed that the first-place rank of risk factor produced by the W-BEAS and RPN method is comparable. W-BEAS also validated by showing the same prioritizations risk factors produced by both assessor groups. Moreover, both company users were satisfied with the W-BEAS content and system ($p > 0.05$). The W-BEAS's ability to assess workplace ergonomics risk factors is recognized, and ordinary workers could assess their workplace situations using the website. Therefore, W-BEAS is significant in the automotive industry that allows ergonomics risk information to be accessed and studied at the earliest stages of product and process design.

TABLE OF CONTENT

REFERENCES

Abareshi, F., Yarahmadi, R., Solhi, M., & Farshad, A. A. (2015). Educational intervention for reducing work- related musculoskeletal disorders and promoting productivity. *International Journal OfOccupational Safety and Ergonomics (JOSE), 21*(4), 480–485. https://doi.org/10.1080/10803548.2015.1087729

Abdul Aziz, F., Ghazalli, Z., & Nik Mohamed, N. M. Z. (2019). Participatory Ergonomics Intervention for Exploring Risk Factors Lead to Work-Related Musculoskeletal Disorders Among Automotive Production Workers. *In Proceedings of the International Manufacturing Engineering Conference & The Asia Pacific Conference on Manufacturing Systems*, 278–283. https://doi.org/10.1007/978-981-15-0950-6_43

Abdul Aziz, F., Razali, N., & Jaafar, N. N. (2016). An investigation of low ergonomics risk awareness, among staffs at early product development phase in Malaysia automotive industries. *IOP Conference Series: Materials Science and Engineering*, *114*(1). https://doi.org/10.1088/1757-899X/114/1/012096

Abdullah, N. H., Wahab, E., Shamsuddin, A., Aziati, N., Hamid, A., & Kamaruddin, N. K. (2016). *Workplace Ergonomics and Employees ' Health : A Case Study at Automotive Manufacturer*. 917–923.

Adeyemi, H. O., Adejuyigbe, S. B., Ismaila, S. O., & Adekoya, A. F. (2015). Low back pain assessment application for construction workers. *Journal of Engineering, Design and Technology*, *13*(3), 419–434. https://doi.org/10.1108/JEDT-02-2013-0008

Adhabi, E. A. R., & Anozie, C. B. L. (2017). Literature Review for the Type of Interview in Qualitative Research. *International Journal of Education*, *9*(3), 86. https://doi.org/10.5296/ije.v9i3.11483

Agarski, B., Hadzistevic, M., Budak, I., Moraca, S., & Vukelic, D. (2019). Comparison of approaches to weighting of multiple criteria for selecting equipment to optimize performance and safety. *International Journal of Occupational Safety and Ergonomics*, *25*(2), 228–240. https://doi.org/10.1080/10803548.2017.1341126

Ahlin, J., Osterman, C., Osvalder, A.-L., Hemphälä, H., Glimne, S., Hagg, G. M., Janzon, O., Pettersson, P. J., & Stavervik, M. (2015). Permanent link to this version : Strategies to develop and strengthen human factors and ergonomics knowledge among stakeholders in Sweden. *Proceedings 19th Triennial Congress of the IEA, Melbourne, International Ergonomics Association., August*, 1–7.

Ahmadi, M., Zakerian, S. A., & Salmanzadeh, H. (2017). Prioritizing the ILO/IEA Ergonomic Checkpoints' measures; a study in an assembly and packaging industry. *International Journal of Industrial Ergonomics*, *59*, 54–63.

https://doi.org/10.1016/j.ergon.2017.03.002

Ahmed, I., Shaukat, M. Z., Usman, A., Nawaz, M. M., & Nazir, M. S. (2018). Occupational health and safety issues in the informal economic segment of Pakistan: a survey of construction sites. *International Journal of Occupational Safety and Ergonomics*, *24*(2), 240–250.

Ahram, T. Z., & Karwowski, W. (2012). Ergonomics and quality interventions in woodworking technological processes for lightening the workload. In *Advances in Physical Ergonomics and Safety* (pp. 264–272). CRC Press.

Akladios, M., Gopalakrishnan, B., Bird, A., Carr, M., Garcia, R., McMullin, D., Myers, W. R., Vennetti, V., Zayas, J., Becker, P. E., & McCullom, D. (1998). Development of an Expert System to Help Design for Worker Safety. In B. Gopalakrishnan & S. Murugesan (Eds.), *Intelligent Systems in Design and Manufacturing* (Vol. 3517, Issue November 1998, pp. 240–250). https://doi.org/10.1117/12.326929

Akter, S., Rahman, M. M., Mandal, S., & Nahar, N. (2016). Musculoskeletal symptoms and physical risk factors among automobile mechanics in Dhaka, Bangladesh. *South East Asia Journal of Public Health*, *6*(1), 8–13. https://doi.org/10.3329/seajph.v6i1.30338

Alabdulkarim, S., Nussbaum, M. A., Rashedi, E., Kim, S., Agnew, M., & Gardner, R. (2017). Impact of task design on task performance and injury risk: case study of a simulated drilling task. *Ergonomics*, *60*(6), 851–866. https://doi.org/10.1080/00140139.2016.1217354

Alder, H., Michel, B. A., Marx, C., Tamborrini, G., Langenegger, T., Bruehlmann, P., Steurer, J., & Wildi, L. M. (2014). Computer-based diagnostic expert systems in rheumatology: Where do we stand in 2014? In *International Journal of Rheumatology*. https://doi.org/10.1155/2014/672714

Alimohammadi, I., Kanrash, F. A., Abolghasemi, J., Vosoughi, S., & Chalak, M. H. (2019). Relationship Between Noise Annoyance and Cognitive Performance in Automotive Workers Exposed to Chronic Noise. *Journal of UOEH*, *41*(4), 375–385.

Allahyari, T., Rangi, N. H., Khalkhali, H., & Khosravi, Y. (2014). Occupational cognitive failures and safety performance in the workplace. *International Journal of Occupational Safety and Ergonomics*, *20*(1), 175–180. https://doi.org/10.1080/10803548.2014.11077037

Alsaffar, I., & Ketan, H. (2018). Integration of Lean Six Sigma and Ergonomics: A Proposed Model Combining Mura Waste and a RULA Tool to Examine Assembly Workstations. In *IOP Conference Series: Materials Science and Engineering* (Vol. 433, Issue 1). https://doi.org/10.1088/1757-899X/433/1/012061

Alyahya, F., Algarzaie, K., Alsubeh, Y., & Khounganian, R. (2018). Awareness of ergonomics & work-related musculoskeletal disorders among dental professionals and students in Riyadh, Saudi Arabia. *Journal of Physical Therapy Science*. https://doi.org/10.1589/jpts.30.770

Amir-Heidari, P., Maknoon, R., Taheri, B., & Bazyari, M. (2016). Identification of strategies to reduce accidents and losses in drilling industry by comprehensive HSE risk assessment—A case study in Iranian drilling industry. *Journal of Loss Prevention in the Process Industries*, *44*, 405–413. https://doi.org/10.1016/j.jlp.2016.09.015

Andersen, L. L., Fallentin, N., Ajslev, J. Z. N., Jakobsen, M. D., & Sundstrup, E. (2017). Association between occupational lifting and day-to-day change in low-back pain intensity based on company records and text messages. *Scandinavian Journal of Work, Environment and Health*, *43*(1), 68–74. https://doi.org/10.5271/sjweh.3592

Ani, M. F., Fukumi, M., RahayuKamat, S., Minhat, M., & Husain, K. (2019). Development of driving fatigue strain index using fuzzy logic to analyze risk levels of driving activity. *IEEJ Transactions on Electrical and Electronic Engineering*, *14*(12), 1764–1771. https://doi.org/10.1002/tee.23002

Anita, A. R., Yazdani, A., Hayati, K. S., & Adon, M. Y. (2014). Association between Awkward Posture and Musculoskeletal Disorders (MSD) among Assembly Line Workers in an Automotive Industry. *Malaysian Journal of Medicine and Health Sciences*, *10*(1), 23–28.

Ansari, N. A., Shende, P. N., Sheikh, M. J., & Vaidya, R. D. (2013). Study and Justification of Body Postures of Workers Working In SSI by Using Reba. *International Journal of Engineering and Advanced Technology (IJEAT)*, *2*(3), 505–509.

Aqlan, F.a, Lam, S. S. ., Testani, M. ., & Ramakrishnan, S. . (2013). Ergonomic risk reduction to enhance lean transformation. *IIE Annual Conference and Expo 2013*, 989–997.

Aqlan, Faisal, S.Lam, S., Ramalrishnan, S., & Testani, M. (2014). An Ergonomic Study for 6S Workplace Improvement Faisal. *Proceedings of the 2014 Industrial and Systems Engineering Research Conference.*, 3063. https://doi.org/10.1080/15533174.2011.613886

Arasli, H., Hejraty Namin, B., & Abubakar, A. M. (2018). Workplace incivility as a moderator of the relationships between polychronicity and job outcomes. *International Journal of Contemporary Hospitality Management*, *30*(3), 1245–1272. https://doi.org/10.1108/IJCHM-12-2016-0655

Asadzadeh, S. M., Azadeh, A., Negahban, A., & Sotoudeh, A. (2013). Assessment and improvement of integrated HSE and macroergonomics factors by fuzzy cognitive maps: The case of a large gas refinery. *Journal of Loss Prevention in*

the Process Industries, *26*(6), 1015–1026. https://doi.org/10.1016/j.jlp.2013.03.007

Asensio-Cuesta, S., Bresó, A., Saez, C., & García-Gómez, J. (2019). Robustness and Findings of a Web-Based System for Depression Assessment in a University Work Context. *International Journal of Environmental Research and Public Health*, *16*(4), 644. https://doi.org/10.3390/ijerph16040644

Asfour, S. S., & Genaidy, A. M. (1987). A knowledge-based system for assessment of human physiological abilities in manual lifting tasks. *Computers and Industrial Engineering*, *13*(1–4), 319–322. https://doi.org/10.1016/0360-8352(87)90106-9

Azadeh, A., Fam, I. M., Khoshnoud, M., & Nikafrouz, M. (2008). Design and implementation of a fuzzy expert system for performance assessment of an integrated health, safety, environment (HSE) and ergonomics system: The case of a gas refinery. *Information Sciences*, *178*(22), 4280–4300. https://doi.org/10.1016/j.ins.2008.06.026

Azadeh, A., Gaeini, Z., & Moradi, B. (2014). Optimization of HSE in maintenance activities by integration of continuous improvement cycle and fuzzy multivariate approach: A gas refinery. *Journal of Loss Prevention in the Process Industries*, *32*, 415–427. https://doi.org/10.1016/j.jlp.2014.10.006

Azadeh, A., Jiryaei, Z., & Farmand, A. H. (2012). Performance assessment and optimization of HSE management systems with human error and ambiguity by an integrated fuzzy multivariate approach in a large conventional power plant manufacturer. *Advances in Physical Ergonomics and Safety*, *25*(3), 354–363. https://doi.org/10.1201/b12323

Azadeh, A., Madine, M., Motevali Haghighi, S., & Mirzaei Rad, E. (2014). Continuous performance assessment and improvement of integrated HSE and maintenance systems by multivariate analysis in gas transmission units. *Journal of Loss Prevention in the Process Industries*, *27*(1), 32–41. https://doi.org/10.1016/j.jlp.2013.10.013

Azadeh, Ali, Asadzadeh, S. M., & Tanhaeean, M. (2017). A consensus-based AHP for improved assessment of resilience engineering in maintenance organizations. *Journal of Loss Prevention in the Process Industries*, *47*, 151–160. https://doi.org/10.1016/j.jlp.2017.02.028

Azaini, N. N., & Masngut, N. (2017). Oscillatory flow reactor design for biological process. *JOURNAL OF MECHANICAL ENGINEERING AND SCIENCES*, *11*(2), 2615–2625. https://doi.org/10.15282/jmes.11.2.2017.1.0235

Aziz, F. A., Ghazalli, Z., Mohamed, N. M. Z., & Isfar, A. (2017). Investigation on musculoskeletal discomfort and ergonomics risk factors among production team members at an automotive component assembly plant. *IOP Conference Series: Materials Science and Engineering*, *257*(1), 012040. https://doi.org/10.1088/1757-899X/257/1/012040

Aziz, F. A., Ghazalli, Z., & Mohamed, N. M. Z. N. (2019). Participatory Ergonomics Intervention for Exploring Risk Factors Lead to Work-Related Musculoskeletal Disorders Among Automotive Production Workers. *Proceedings of the International Manufacturing Engineering Conference & The Asia Pacific Conference on Manufacturing Systems*, 278–283.

Badri, A., Nadeau, S., & Gbodossou, A. (2012). Proposal of a risk-factor-based analytical approach for integrating occupational health and safety into project risk evaluation. *Accident Analysis and Prevention*, *48*, 223–234. https://doi.org/10.1016/j.aap.2011.05.009

Bae, Y. H., & Min, K. S. (2016). Associations between work-related musculoskeletal disorders, quality of life, and workplace stress in physical therapists. *Industrial Health*, *54*(4), 347–353. https://doi.org/10.2486/indhealth.2015-0127

Bal, E., Arslan, O., & Tavacioglu, L. (2015). Prioritization of the causal factors of fatigue in seafarers and measurement of fatigue with the application of the Lactate Test. *Safety Science*, *72*, 46–54. https://doi.org/10.1016/j.ssci.2014.08.003

Baldwin, D. G., Manz, P. C., & Williams, M. E. (1995). *Semiconductor Industrial Hygiene Handbook: Monitoring, Ventiliation, Equipment and Ergonomics*. William Andrew.

Banaitiene, N., Banaitis, A., Kaklauskas, A., & Zavadskas, E. K. (2008). Evaluating the life cycle of a building: A multivariant and multiple criteria approach. *Omega*, *36*(3), 429–441. https://doi.org/10.1016/j.omega.2005.10.010

Bao, S. S., Kapellusch, J. M., Merryweather, A. S., Thiese, M. S., Garg, A., Hegmann, K. T., & Silverstein, B. A. (2016a). Relationships between job organisational factors, biomechanical and psychosocial exposures. *Ergonomics*, *59*(2), 179–194. https://doi.org/10.1080/00140139.2015.1065347

Bao, S. S., Kapellusch, J. M., Merryweather, A. S., Thiese, M. S., Garg, A., Hegmann, K. T., & Silverstein, B. A. (2016b). Relationships between job organisational factors, biomechanical and psychosocial exposures. *Ergonomics*, *59*(2), 179–194. https://doi.org/10.1080/00140139.2015.1065347

Barlas, B., & Izci, F. B. (2018). Individual and workplace factors related to fatal occupational accidents among shipyard workers in Turkey. *Safety Science*, *101*, 173–179. https://doi.org/10.1016/j.ssci.2017.09.012

Basak, I. (2019). Estimation of priority weights based on a resampling technique and a ranking method in analytic hierarchy process. *Journal of Multi-Criteria Decision Analysis*, 1–4. https://doi.org/10.1002/mcda.1664

Basha, S. A., & Maiti, J. (2013). Relationships of demographic factors, job risk perception and work injury in a steel plant in India. *Safety Science*, *51*(1), 374–381. https://doi.org/10.1016/j.ssci.2012.08.005

Beck, A. T., Steer, R. A., & Brown, G. K. (2011). *Manual. BDI-II. Inventario de Depresión de Beck-II (Adaptación española: Sanz, J. y Vázquez, C.)*. Madrid: Pearson.

Behzadian, M., Khanmohammadi Otaghsara, S., Yazdani, M., & Ignatius, J. (2012). A state-of the-art survey of TOPSIS applications. *Expert Systems with Applications*, *39*(17), 13051–13069. https://doi.org/10.1016/j.eswa.2012.05.056

Belliappa, C. C., Arun, N., & Rao, R. (2014). Narahari., NS,(2014). A review on ergonomic tools to assess physical risk in garment manufacturing industries. *Proceedings of 4th IRF International Conference, Chennai, 9th March-2014*.

Berrais, A. (1997). Knowledge-based expert systems : user interface implications. *Advances in Engineering Software*, *28*, 31–41.

Bhola, S. S., & Raskar, S. S. (2013). A Comparative Assessment of Employee's Perception towards Motivational Practices of Engineering Industry in Satara. *Indian Stream Research Journal*, *2*(10), 1–9.

Bidassie, B., Barany, J. W., Mccabe, G. P., Duffy, V. G., Witz, S. M., Bidassie, B., Barany, J. W., Mccabe, G. P., & Duffy, V. G. (2016). Occupational and lifestyle risk factors in a wellness programme associated with low back injuries in a Midwest university. *Theoretical Issues in Ergonomics Science*, *17*(3), 239–266. https://doi.org/10.1080/1463922X.2015.1088101

Biswas, G., Bhattacharya, A., & Bhattacharya, R. (2017). Occupational health status of construction workers: A review. *International Journal of Medical Science and Public Health*, *6*(4), 1. https://doi.org/10.5455/ijmsph.2017.0745302112016

Bligard, L. O., & Berlin, C. (2019). ACD 3 as a framework for design of ergonomic workplaces. *Work*, *62*(1), 5–12. https://doi.org/10.3233/WOR-182836

Boatman, L., Chaplan, D., Teran, S., & Welch, L. S. (2015). Creating a climate for ergonomic changes in the construction industry. *American Journal of Industrial Medicine*, *58*(8), 858–869. https://doi.org/10.1002/ajim.22499

Bourassa, D., Gauthier, F., & Abdul-Nour, G. (2016). Equipment failures and their contribution to industrial incidents and accidents in the manufacturing industry. *International Journal of Occupational Safety and Ergonomics*, *22*(1), 131–141. https://doi.org/10.1080/10803548.2015.1116814

Boyce, P. R. (2004). Lighting research for interiors: The beginning of the end or the end of the beginning. *Lighting Research and Technology*. https://doi.org/10.1191/11477153504li118oa

Brandt, M., Madeleine, P., Samani, A., Ajslev, J. Z. N., Jakobsen, M. D., Sundstrup, E., & Andersen, L. L. (2018). Effects of a participatory ergonomics intervention with wearable technical measurements of physical workload in the construction industry: Cluster randomized controlled trial. *Journal of Medical Internet*

Research, *20*(12). https://doi.org/10.2196/10272

Brase, C. H., & Brase, C. P. (2013). *Understanding Basic Statistics* (M. Taylor & J. Campbell (eds.); Sixth). Brooks/Cole Cengage Learning.

Bridger, R. S. (2018). *Introduction to Human Factors and ergonomics*.

Bridger, Robert S., Day, A. J., & Morton, K. (2013). Occupational stress and employee turnover. *Ergonomics*, *56*(11), 1629–1639. https://doi.org/10.1080/00140139.2013.836251

Brito, M. F., Ramos, A. L., Carneiro, P., & Gonçalves, M. A. (2019). A continuous improvement assessment tool, considering lean, safety and ergonomics. *International Journal of Lean Six Sigma*, *11*(5), 893–916. https://doi.org/10.1108/IJLSS-12-2017-0144

Bulduk, E. Ö., Bulduk, S., Süren, T., & Ovali, F. (2014). Assessing exposure to risk factors for work-related musculoskeletal disorders using Quick Exposure Check (QEC) in taxi drivers. *International Journal of Industrial Ergonomics*, *44*(6), 817–820. https://doi.org/10.1016/j.ergon.2014.10.002

Capodaglio, E. M. (2017). Occupational risk and prolonged standing work in apparel sales assistants. *International Journal of Industrial Ergonomics*, *60*, 53–59. https://doi.org/10.1016/j.ergon.2016.11.010

Carrillo-Castrillo, J. A., Guadix, J., Rubio-Romero, J. C., & Onieva, L. (2014). Estimation of the relative risks of musculoskeletal injuries in the Andalusian manufacturing sector. *International Journal of Industrial Ergonomics*, *52*, 69–77. https://doi.org/10.1016/j.ergon.2015.09.001

Carrillo-Castrillo, Jesús A., Onieva, L., & Rubio-Romero, J. C. (2013). Causation of severe and fatal accidents in the manufacturing sector. *International Journal of Occupational Safety and Ergonomics*, *19*(3), 423–434. https://doi.org/10.1080/10803548.2013.11076999

Carrivick, P. J. W., Lee, A. H., Yau, K. K. W., & Stevenson, M. R. (2005). Evaluating the effectiveness of a participatory ergonomics approach in reducing the risk and severity of injuries from manual handling. *Ergonomics*, *48*(8), 907–914. https://doi.org/10.1080/00140130420003276698

Carter, J. L., & Russell, H. L. (1979). Relationship between reading frustration and muscle tension levels in children with reading disabilities. *Am. J. Clin. Biofeedback*, *2*, 60–62.

Cebi, S., Akyuz, E., & Sahin, Y. (2017). Developing web-based decision support system for evaluation occupational risks at shipyards. *Brodogradnja*, *68*(1), 17–30. https://doi.org/10.21278/brod68102

Chan, A. H. S., Kwok, W. Y., & Duffy, V. G. (2004). Using AHP for determining

priority in a safety management system. *Industrial Management and Data Systems*, *104*(5), 430–445. https://doi.org/10.1108/02635570410537516

Chan, M. (2011). Fatigue: The most critical accident risk in oil and gas construction. *Construction Management and Economics*, *29*(4), 341–353. https://doi.org/10.1080/01446193.2010.545993

Chander, D. S., & Cavatorta, M. P. (2018). Multi-directional one-handed strength assessments using AnyBody Modeling Systems. *Applied Ergonomics*, *67*, 225–236. https://doi.org/10.1016/j.apergo.2017.09.015

Chang, Y. H., Yang, H. H., & Hsiao, Y. J. (2016). Human risk factors associated with pilots in runway excursions. *Accident Analysis and Prevention*, *94*, 227–237. https://doi.org/10.1016/j.aap.2016.06.007

Chao, C. J., Chen, M. C., & Yau, Y. J. (2018). Prevention of work-related musculoskeletal disorders in a chemical plant in Taiwan and a comparison of three assessment tools. *Human Factors and Ergonomics In Manufacturing*, *28*(5), 238–249. https://doi.org/10.1002/hfm.20740

Charles, L. E., Ma, C. C., Burchfiel, C. M., & Dong, R. G. (2018). Vibration and Ergonomic Exposures Associated With Musculoskeletal Disorders of the Shoulder and Neck. *Safety and Health at Work*, *9*(2), 125–132. https://doi.org/10.1016/j.shaw.2017.10.003

Chen, J. (1992). Development of vision impaired task and assignment lexicon via an ergonomics and expert system approach. *International Journal of Lndustrial Ergonomics*, *10*, 225–240.

Chen, J. G., Schlegel, R. E., & Peacock, J. B. (1991). A computer-assisted system for physical ergonomics analysis. *Computers and Industrial Engineering*, *20*(2), 261–269. https://doi.org/10.1016/0360-8352(91)90030-A

Chinda, T., Ammarapala, V., & Suanmali, S. (2019). Key factors influencing management decisions concerning safety equipment selection. *International Journal of Occupational Safety and Ergonomics*, *25*(2), 217–227. https://doi.org/10.1080/10803548.2017.1337294

Cho, C., & Egbelu, P. J. (2005). Design of a web-based integrated material handling system for manufacturing applications. *International Journal of Production Research*, *43*(2), 375–403. https://doi.org/10.1080/0020754042000268866

Choobineh, Alireza, Lahmi, M., Khani Jazani, R., Hosseini, M., & Shahnavaz, H. (2004). Musculoskeletal symptoms as related to ergonomic factors in iranian hand- woven carpet industry and general guidelines for workstation design. *International Journal of Occupational Safety and Ergonomics*, *10*(2), 157–168. https://doi.org/10.1080/10803548.2004.11076604

Choobineh, Alireza, Motamedzade, M., Kazemi, M., Moghimbeigi, A., & Heidari

Pahlavian, A. (2011). The impact of ergonomics intervention on psychosocial factors and musculoskeletal symptoms among office workers. *International Journal of Industrial Ergonomics*, *41*(6), 671–676. https://doi.org/10.1016/j.ergon.2011.08.007

Choobineh, AR, Daneshmandi, H., Aghabeigi, M., & Haghayegh, A. (2013). Prevalence of Musculoskeletal Symptoms among Employees of Iranian Petrochemical Industries: October 2009 to December 2012. *International Journal Occupational Environment Medication*, *4*(4), 195–204.

Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). *Workplace Safety : A Meta-Analysis of the Roles of Person and Situation Factors*. *94*(5), 1103–1127. https://doi.org/10.1037/a0016172

Cole, D. C., & Rivilis, I. (2004). Individual factors and musculoskeletal disorders: A framework for their consideration. *Journal of Electromyography and Kinesiology*, *14*(1), 121–127. https://doi.org/10.1016/j.jelekin.2003.09.021

Comper, Maria Luiza C., Costa, L. O. P., & Padula, R. S. (2012). Quick exposure check (QEC): A crosscultural adaptation into Brazilian-Portuguese. *Work*, *41*(SUPPL.1), 2056–2059. https://doi.org/10.3233/WOR-2012-0430-2056

Comper, Maria Luiza Caires, Dennerlein, J. T., Evangelista, G. D. S., Rodrigues Da Silva, P., & Padula, R. S. (2017). Effectiveness of job rotation for preventing work-related musculoskeletal diseases: A cluster randomised controlled trial. *Occupational and Environmental Medicine*, *74*(8), 545–552. https://doi.org/10.1136/oemed-2016-104077

Cothern, C. R. (2019). *Handbook for environmental risk decision making: Values, perceptions, and ethics*. CRC Press.

Craig, B. N., Beier, E., Congleton, J. J., Kerk, C. J., Amendola, A. A., & Gaines, W. G. (2013). Occupational risk factors and back injury. *International Journal of Occupational Safety and Ergonomics*, *19*(3), 335–345. https://doi.org/10.1080/10803548.2013.11076992

Crestani, C. C. (2016). Emotional stress and cardiovascular complications in animal models: a review of the influence of stress type. *Frontiers in Physiology*, *7*, 251.

da Costa, B. R., & Vieira, E. R. (2010). Risk factors for work-related musculoskeletal disorders: a systematic review of recent longitudinal studies. *American Journal of Industrial Medicine*, *53*, 285–323. https://doi.org/10.1002/ajim.20750

Da Costa, B. R., & Vieira, E. R. (2010). Risk factors for work-related musculoskeletal disorders: A systematic review of recent longitudinal studies. *American Journal of Industrial Medicine*, *53*(3), 285–323. https://doi.org/10.1002/ajim.20750

da Silva, M. C., Fassa, A. G., & Kriebel, D. (2006). Musculoskeletal pain in ragpickers in a southern city in Brazil. *American Journal of Industrial Medicine*, *49*(5),

327–336. https://doi.org/10.1002/ajim.20305

Dansie, C., & Bloswick, D. S. (2013). Ergonomic risk assessment based on a Bayesian-optimised expert system Richard Sesek. *International Journal Human Factors Modelling and Simulation*, *4*(1), 23.

Dansie, C., Sesek, R., & Bloswick, D. S. (2013). Ergonomic risk assessment based on a Bayesian-optimised expert system. *International Journal of Human Factors Modelling and Simulation*, *4*(1), 23. https://doi.org/10.1504/ijhfms.2013.055782

Das, D., Kumar, A., & Sharma, M. (2018). A systematic review of work-related musculoskeletal disorders among handicraft workers. *International Journal of Occupational Safety and Ergonomics (JOSE)*, *0*(0), 1–16. https://doi.org/10.1080/10803548.2018.1458487

Das, S. K., & Mukhopadhyay, S. (2014a). Integrating Ergonomics tools in Physical Therapy for Musculoskeletal Risk Assessment and Rehabilitation- A Review. *International Journal of Engineering & Scientific Research*, *2*(October), 136–155.

Das, S. K., & Mukhopadhyay, S. (2014b). Integrating Ergonomics tools in Physical Therapy for Musculoskeletal Risk Assessment and Rehabilitation- A Review. *International Journal of Engineering & Scientific Research*, *2*(10), 136–155.

Das, S. K., Mukhopadhyay, S., & Koilakuntla, M. (2015). Analytic Hierarchy Process to Rate Risk Factors Associated with WMSDs in General Physicians. *Journal of Health Management*, *17*(2), 241–247. https://doi.org/10.1177/0972063415575813

Das, S. K., Patyal, V. S., & Mukhopadhyay, S. (2017). Development and validation of a Re-Modified Work-Style Short Form Questionnaire for assessment of stress in medical practitioners working in Indian hospitals. *Theoretical Issues in Ergonomics Science*, *18*(2), 95–109. https://doi.org/10.1080/1463922X.2016.1154228

David, G C. (2005). Ergonomic methods for assessing exposure to risk factors for work-related musculoskeletal disorders. *Occupational Medicine*, *55*, 190–199. https://doi.org/10.1093/occmed/kqi082

David, Geoffrey C. (2005). Ergonomic methods for assessing exposure to risk factors for work-related musculoskeletal disorders. *Occupational Medicine*, *55*(3), 190–199. https://doi.org/10.1093/occmed/kqi082

Dawal, S. Z. M., & Taha, Z. (2006). The Effect of Job and Environmental Factors on Job Satisfaction in Automotive Industries. *International Journal of Occupational Safety and Ergonomics*, *12*(3), 267–280. https://doi.org/10.1080/10803548.2006.11076687

Dawal, S. Z., & Taha, Z. (2006). The effect of job and environmental factors on job

satisfaction in automotive industries. *International Journal of Occupational Safety and Ergonomics : JOSE.*, *12(3)*(3), 267–280. https://doi.org/10.1080/10803548.2006.11076687

De Cássia Pereira Fernandes, R., Da Silva Pataro, S. M., De Carvalho, R. B., & Burdorf, A. (2016). The concurrence of musculoskeletal pain and associated work-related factors: A cross sectional study. *BMC Public Health*, *16*(1), 1–9. https://doi.org/10.1186/s12889-016-3306-4

de Looze, M. P., Bosch, T., Krause, F., Stadler, K. S., & O'Sullivan, L. W. (2016). Exoskeletons for industrial application and their potential effects on physical work load. *Ergonomics*, *59*(5), 671–681. https://doi.org/10.1080/00140139.2015.1081988

De Luca, A. I., Falcone, G., Stillitano, T., Iofrida, N., Strano, A., & Gulisano, G. (2018). Evaluation of sustainable innovations in olive growing systems: A Life Cycle Sustainability Assessment case study in southern Italy. *Journal of Cleaner Production*, *171*, 1187–1202. https://doi.org/10.1016/j.jclepro.2017.10.119

De Magistris, G., Micaelli, A., Evrard, P., Andriot, C., Savin, J., Gaudez, C., & Marsot, J. (2013). Dynamic control of DHM for ergonomic assessments. *International Journal of Industrial Ergonomics*, *43*(2), 170–180. https://doi.org/10.1016/j.ergon.2013.01.003

Deepak, S., Mathankumar, M., Rameshkumar, R., Jose, J. A., & Rajkumar, J. S. (2014). Ergonomic and Postural Risk Factors among the Assembly Line Workers of a Cosmetics Manufacturing Factory in India. *Human Factors in Organizational Design and Management – XI Nordic Ergonomics Society Annual Conference – 46*, 1027–1031.

Degreve, T. B., & Ayoub, M. M. (1987). A workplace design expert system. *International Journal of Industrial Ergonomics*, *2*, 37–48.

Delice, E. K., & Zegerek, S. (2016). Ranking Occupational Risk Levels of Emergency Departments Using a New Fuzzy MCDM Model: A Case Study In Turkey. *Applied Mathematics & Information Sciences*, *10*(6), 2345–2356. https://doi.org/10.18576/amis/100638

Department of occupational safety and health (DOSH) Malaysia. (2019). *STATISTICS OF EMPLOYMENT DISEASE AND POISONING 2019 (until February)* (Vol. 2019).

Deros, Baba M, Daruis, D. D. I., Ismail, A. R., Sawal, N. A., & Ghani, J. A. (2010). Work-related musculoskeletal disorders among workers' performing manual material handling work in an automotive manufacturing company. *American Journal of Applied Sciences*, *7*(8), 1087.

Deros, Baba Md., Yusoff, A. R. M., Ismail, S. J., & Daruis, D. D. I. (2016). Optimizing

workstation design for standing work system in an electronics assembly work. *Iranian Journal of Public Health*, *45*(1), 17–24.

Deros, Baba Mohd, Rahman, A., Yusoff, M., Ismail, S. J., Darina, D., & Daruis, I. (2016). *Optimizing Workstation Design for Standing Work System in an Electronics Assembly Work*. *45*(1), 17–24.

Desai, H. S., & Bisen, R. S. (2017). Lumbar flexion relaxation phenomenon in the patients with acute and subacute mechanical low back pain and normal subjects. *International Journal of Research in Medical Sciences*, *5*(3), 1011. https://doi.org/10.18203/2320-6012.ijrms20170653

DeShaw, J., & Rahmatalla, S. (2016). Predictive discomfort of supine humans in whole-body vibration and shock environments. *Ergonomics*, *59*(4), 568–581. https://doi.org/10.1080/00140139.2015.1083125

DeVellis, R. F. (2003). Scale Development: Theory and Applications. In *Applied Social Research Methods Series* (Vol. 26).

Dhir, S., Marinov, M. V., & Worsley, D. (2015). Application of the analytic hierarchy process to identify the most suitable manufacturer of rail vehicles for High Speed 2. *Case Studies on Transport Policy*, *3*(4), 431–448. https://doi.org/10.1016/J.CSTP.2015.08.004

Dianat, I., Kord, M., Yahyazade, P., Karimi, M. A., & Stedmon, A. W. (2015). Association of individual and work-related risk factors with musculoskeletal symptoms among Iranian sewing machine operators. *Applied Ergonomics*, *51*, 180–188.

Dickson-Swift, V., Fox, C., Marshall, K., Welch, N., & Willis, J. (2014). What really improves employee health and wellbeing Findings from regional Australian workplaces. *International Journal of Workplace Health Management*, *7*(3), 138–155. https://doi.org/10.1108/IJWHM-10-2012-0026

Donovan, M., Khan, A., & Johnston, V. (2017). The Effect of a Workplace-Based Early Intervention Program on Work-Related Musculoskeletal Compensation Outcomes at a Poultry Meat Processing Plant. *Journal of Occupational Rehabilitation*, *27*(1), 24–34. https://doi.org/10.1007/s10926-016-9628-3

Driessen, M. T., Proper, K. I., Anema, J. R., Knol, D. L., Bongers, P. M., & van der Beek, A. J. (2011). Participatory ergonomics to reduce exposure to psychosocial and physical risk factors for low back pain and neck pain: results of a cluster randomised controlled trial. *Occupational and Environmental Medicine*, *68*(9), 674–681. https://doi.org/10.1136/oem.2010.056739

Duan, Y., Edwards, J. S., & Xu, M. X. (2005). Web-based expert systems: Benefits and challenges. *Information and Management*, *42*(6), 799–811. https://doi.org/10.1016/j.im.2004.08.005

Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., Wilson, J. R., & van der Doelen, B. (2012). A strategy for human factors/ergonomics: developing the discipline and profession. *Ergonomics*, *55*(4), 377–395. https://doi.org/10.1080/00140139.2012.661087

Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of Sexual Behavior*, *41*(6), 1319–1320. https://doi.org/10.1007/s10508-012-0016-6

Eatough, E. M., Way, J. D., & Chang, C. (2012). Understanding the link between psychosocial work stressors and work-related musculoskeletal complaints. *Applied Ergonomics*, *43*(3), 554–563. https://doi.org/10.1016/j.apergo.2011.08.009

Eaves, S., Gyi, D. E., & Gibb, A. G. F. (2016). Building healthy construction workers : Their views on health , wellbeing and better workplace design. *Applied Ergonomics*, *54*, 10–18. https://doi.org/10.1016/j.apergo.2015.11.004

Eijckelhof, B. H. W., Huysmans, M. A., Bruno Garza, J. L., Blatter, B. M., Van Dieën, J. H., Dennerlein, J. T., & Van Der Beek, A. J. (2013). The effects of workplace stressors on muscle activity in the neck-shoulder and forearm muscles during computer work: A systematic review and meta-analysis. *European Journal of Applied Physiology*, *113*(12), 2897–2912. https://doi.org/10.1007/s00421-013-2602-2

Ekpenyong, C. E., Inyang, U. C., & Ekpenyong, C. E. (2014). Associations Between Worker Characteristics , Workplace Factors , and Work-Related Musculoskeletal Disorders : A Cross-Sectional Study of Male Construction Workers in Nigeria. *International Journal of Occupational Safety and Ergonomics*, *20*(3), 447–462. https://doi.org/10.1080/10803548.2014.11077057

Elia, V., Gnoni, M. G., & Lanzilotto, A. (2016). Evaluating the application of augmented reality devices in manufacturing from a process point of view: An AHP based model. *Expert Systems with Applications*, *63*, 187–197. https://doi.org/10.1016/j.eswa.2016.07.006

Esen, H., Hatipoğlu, T., Cihan, A., & Fiğlali, N. (2019). Expert system application for prioritizing preventive actions for shift work: shift expert. *International Journal of Occupational Safety and Ergonomics*, *25*(1), 123–137. https://doi.org/10.1080/10803548.2017.1350392

Falck, A.-C., Ortengren, R., & Hogberg, D. (2010). The Impact of Poor Assembly Ergonomics on Product Quality: A Cost–Benefit Analysis in Car Manufacturing. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *75*(5), 303–306. https://doi.org/10.1002/hfm

Falck, A. C., & Rosenqvist, M. (2012). What are the obstacles and needs of proactive ergonomics measures at early product development stages? - An interview study in five Swedish companies. *International Journal of Industrial Ergonomics*,

42(5), 406–415. https://doi.org/10.1016/j.ergon.2012.05.002

Falck, A. C., & Rosenqvist, M. (2014). A model for calculation of the costs of poor assembly ergonomics (part 1). *International Journal of Industrial Ergonomics*, *44*(1), 140–147. https://doi.org/10.1016/j.ergon.2013.11.013

Faraji, A., & Farahmand, M. R. (2013a). An ergonomic computer mouse for professional designers. *Applied Mechanics and Materials*, *440*, 194–198. https://doi.org/10.4028/www.scientific.net/AMM.440.194

Faraji, A., & Farahmand, M. R. (2013b). An Ergonomic Computer Mouse for Professional Designers. *Applied Mechanics and Materials*, *440*, 194–198. https://doi.org/10.4028/www.scientific.net/AMM.440.194

Farhadi, R., Omidi, L., Balabandi, S., Barzegar, S., Abbasi, A. M., Poornajaf, A. H., & Karchani, M. (2014). Investigation of Musculoskeletal Disorders and its Relevant Factors Using Quick Exposure Check (QEC) Method among Seymareh Hydropower Plant Workers. *Journal of Research and Health*, *4*(2), 714–720. http://jrh.gmu.ac.ir/article-1-372-en.html

Ferguson, S. A., Marras, W. S., Lavender, S. A., Splittstoesser, R. E., & Yang, G. (2014). Are Workers Who Leave a Job Exposed to Similar Physical Demands as Workers Who Develop Clinically Meaningful Declines in Low-Back Function? *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *56(1)*(1), 58–72. https://doi.org/10.1177/0018720813493116

Ferguson, Sue A., Allread, W. G., Burr, D. L., Heaney, C., & Marras, W. S. (2012). Biomechanical, psychosocial and individual risk factors predicting low back functional impairment among furniture distribution employees. *Clinical Biomechanics*, *27*(2), 117–123. https://doi.org/10.1016/j.clinbiomech.2011.09.002

Ferguson, Sue A., Marras, W. S., Gary Allread, W., Knapik, G. G., & Splittstoesser, R. E. (2012). Musculoskeletal disorder risk during automotive assembly: Current vs. seated. *Applied Ergonomics*, *43*(4), 671–678. https://doi.org/10.1016/j.apergo.2011.10.001

Ferguson, Sue A, Marras, W. S., Allread, W. G., Knapik, G. G., & Splittstoesser, R. E. (2012). Musculoskeletal disorder risk during automotive assembly : current vs . seated. *Applied Ergonomics*, *43*(4), 671–678. https://doi.org/10.1016/j.apergo.2011.10.001

Ferguson, Sue A, Marras, W. S., Allread, W. G., Knapik, G. G., Vandlen, K. A., Splittstoesser, R. E., & Yang, G. (2011). Musculoskeletal disorder risk as a function of vehicle rotation angle during assembly tasks. *Applied Ergonomics*, *42*(5), 699–709. https://doi.org/10.1016/j.apergo.2010.11.004

Ferguson, Sue A, Marras, W. S., Lavender, S. A., Splittstoesser, R. E., & Yang, G. (2014). Are workers who leave a job exposed to similar physical demands as

workers who develop clinically meaningful declines in low-back function? *Human Factors*, *56*(1), 58–72. https://doi.org/10.1177/0018720813493116

Ferretti, V., & Montibeller, G. (2016). Key challenges and meta-choices in designing and applying multi-criteria spatial decision support systems. *Decision Support Systems*, *84*, 41–52. https://doi.org/10.1016/j.dss.2016.01.005

Francisco, C., & Edwin, T. (2012). Implementation of an ergonomics program for the welding department inside a car assembly company. *Work*, *41*, 1618–1621. https://doi.org/10.3233/WOR-2012-0361-1618

Freivalds, A. (1987). Comparison of United States (NIOSH Lifting Guidelines) and European (ECSC Force Limits) Recommendations for Manual Work Limits. *American Industrial Hygiene Association Journal*, *48*(8), 698–702. https://doi.org/10.1080/15298668791385444

Fritzsche, L., Wegge, J., Schmauder, M., Kliegel, M., & Schmidt, K.-H. (2014). Good ergonomics and team diversity reduce absenteeism and errors in car manufacturing. *Ergonomics*, *57*(2), 148–161. https://doi.org/10.1080/00140139.2013.875597

Fu, K., Chen, Z., Zhang, Y., & Wee, H. M. (2020). Optimal Production Inventory Decision with Learning and Fatigue Behavioral Effect in Labor Intensive Manufacturing. *Scientia Iranica*, *27*(2), 918–934. https://doi.org/10.24200/sci.2018.50614.1788

Gallagher, S., Schall, M. C., Sesek, R. F., & Huangfu, R. (2018). An Upper Extremity Risk Assessment Tool Based on Material Fatigue Failure Theory: The Distal Upper Extremity Tool (DUET). *Human Factors*, *60*(8), 1146–1162. https://doi.org/10.1177/0018720818789319

Garbie, I. H. (2013). An experimental study on assembly workstation considering ergonomically issues. *Proceedings of the 41st International Conference on Computers & Industrial Engineering*, 275–282.

Garneau, C. J., & Parkinson, M. B. (2016). A survey of anthropometry and physical accommodation in ergonomics curricula. *Ergonomics*, *59*(1), 143–154. https://doi.org/10.1080/00140139.2015.1052853

Genaidy, A. M., Ayoub, M. M., & J.S., D. (1989). A microcomputer-based ergonomic software for the design and evaluation of frequent manual lifting tasks. *Computers and Industrial Engineering*, *16*(3), 455–468.

Genaidy, Ash M., Sequeira, R., Rinder, M. M., & A-Rehim, A. D. (2009). Determinants of business sustainability: An ergonomics perspective. *Ergonomics*, *52*(3), 273–301. https://doi.org/10.1080/00140130802376042

Genova, K., Kirilov, L., Guliashki, V., Staykov, B., & Vatov, D. (2011). A Prototype of a Web-based Decision Support System for Building Models and Solving

Optimization and Decision Making Problems. *International Conference on Computer Systems and Technologies - CompSysTech'11*, 167–172. https://doi.org/10.1145/2023607.2023636

Ghaleb, A. M., Ramadan, M. Z., Badwelan, A., & Aljaloud, K. S. (2019). Effect of ambient oxygen content, safety shoe typeand lifting frequency on subject's MAWL and physiological responses. *International Journal of Environmental Research and Public Health*, *16*(21), 1–18. https://doi.org/10.3390/ijerph16214172

Gilad, I., & Karni, R. (1999). Architecture of an expert system for ergonomics analysis and design. *International Journal of Industrial Ergonomics*, *23*(3), 205–221. https://doi.org/10.1016/S0169-8141(97)00056-5

Gilbert, S., & Kelloway, E. K. (2014). Using single items to measure job stressors. *International Journal of Workplace Health Management*, *7*(3), 186–199. https://doi.org/10.1108/IJWHM-03-2013-0011

Glimskär, B., & Lundberg, S. (2013). Barriers to adoption of ergonomic innovations in the construction industry. *Ergonomics in Design*, *21*(4), 26–30. https://doi.org/10.1177/1064804613488890

Golkar, A., Johansson, E., Kasahara, M., Osika, W., Perski, A., & Savic, I. (2014). The influence of work-related chronic stress on the regulation of emotion and on functional connectivity in the brain. *PLoS One*, *9*(9), e104550.

Golubovich, J., Chang, C., & Eatough, E. M. (2014). Safety climate , hardiness , and musculoskeletal complaints : A mediated moderation model. *Applied Ergonomics*, *45*(3), 757–766. https://doi.org/10.1016/j.apergo.2013.10.008

Gopang, M. A., Nebhwani, M., Khatri, A., & Marri, H. B. (2017). An assessment of occupational health and safety measures and performance of SMEs: An empirical investigation. *Safety Science*, *93*, 127–133. https://doi.org/10.1016/j.ssci.2016.11.024

Gray, J. L., Takata, G. S., Lawlor, M. C., Placencia, G., & Meshkati, N. (2015). Utilization of Participatory Ergonomics and socio-technical models to identify the risk factors of invasive medical technologies in non-clinical environments. *Proceedings of the Human Factors and Ergonomics Society*, *2015-Janua*, 527–530. https://doi.org/10.1177/1541931215591113

Grooten, W. J. A., & Johansson, E. (2018). Observational Methods for Assessing Ergonomic Risks for work-related musculoskeletal disorders. A Scoping Review. *Revista Ciencias de La Salud*, *16*(SPE), 8. https://doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.6840

Grosse, E. H., Glock, C. H., Jaber, M. Y., & Neumann, W. P. (2015). Incorporating human factors in order picking planning models: Framework and research opportunities. *International Journal of Production Research*, *53*(3), 695–717.

https://doi.org/10.1080/00207543.2014.919424

Grove, R. (2000). Internet-based expert systems. *Expert System*, *17*(3), 129–135.

Gu, B., Tan, Q., & Zhao, S. (2019). The association between occupational stress and psychosomatic wellbeing among Chinese nurses: A cross-sectional survey. *Medicine*, *98*(22).

Guimarães, L.B.de M., Ribeiro, J. L. D., & Renner, J. S. (2012). Cost–benefit analysis of a socio-technical intervention in a Brazilian footwear company. *Applied Ergonomics*, *43*(5), 948–957. https://doi.org/10.1016/j.apergo.2012.01.003

Guimarães, Lia Buarque de Macedo, Anzanello, M. J., Ribeiro, J. L. D., & Saurin, T. A. (2015). Participatory ergonomics intervention for improving human and production outcomes of a Brazilian furniture company. *International Journal of Industrial Ergonomics*, *49*, 97–107. https://doi.org/10.1016/j.ergon.2015.02.002

Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, *60*(2), 159–170. https://doi.org/10.1037/h0076546

Hadidi, L. A., & Khater, M. A. (2015). Loss prevention in turnaround maintenance projects by selecting contractors based on safety criteria using the analytic hierarchy process (AHP). *Journal of Loss Prevention in the Process Industries*, *34*, 115–126. https://doi.org/10.1016/j.jlp.2015.01.028

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2010). Multivariate Data Analysis (7th Edition). In *Uppersaddle River, New Jersey: Pearson Education International*. https://doi.org/10.1016/j.ijpharm.2011.02.019

Halder, P., Sarker, E., & Karmaker, C. (2019). AHP based Anthropometric Analysis of University Hall Bed Design in Bangladesh. *Journal of The Institution of Engineers (India): Series C*, *100*(4), 591–599. https://doi.org/10.1007/s40032-018-0474-2

Halim, I., Abdullah, R., & Ismail, A. R. (2012). A Survey on Work-related Musculoskeletal Disorders (WMSDs) among Construction Workers. *Journal of Occupational Safety and Health*, *9*(1), 1–6.

Halim, I., Arep, H., Kamat, S. R., Abdullah, R., Omar, A. R., & Ismail, A. R. (2014). Development of a decision support system for analysis and solutions of prolonged standing in the workplace. *Safety and Health at Work*, *5*(2), 97–105. https://doi.org/10.1016/j.shaw.2014.04.002

Halim, I., & Omar, A. R. (2012). Development of prolonged standing strain index to quantify risk levels of standing jobs. *International Journal of Occupational Safety and Ergonomics*, *18*(1), 85–96. https://doi.org/10.1080/10803548.2012.11076917

Hancock, J. I., Allen, D. G., Bosco, F. A., McDaniel, K. R., & Pierce, C. A. (2013). Meta-Analytic Review of Employee Turnover as a Predictor of Firm Performance. *Journal of Management*, *39*(3), 573–603. https://doi.org/10.1177/0149206311424943

Handoyo, I. T., & Sensuse, D. I. (2017). Knowledge-based Systems in Decision Support Context : A Literature Review. *4th International Conference on New Media Studies Yogyakarta, Indonesia, November 08-10, 2017*, 81–86.

Hanine, M., Boutkhoum, O., Tikniouine, A., & Agouti, T. (2016). A new web-based framework development for fuzzy multi-criteria group decision-making. *SpringerPlus*, *5*(1), 1–18. https://doi.org/10.1186/s40064-016-2198-1

Hanse, J. J., & Forsman, M. (2001). Identification and analysis of unsatisfactory psychosocial work situations: A participatory approach employing video-computer interaction. *Applied Ergonomics*, *32*(1), 23–29. https://doi.org/10.1016/S0003-6870(00)00057-0

Harputlugil, T. · Prins, M. · Tanju Gültekin, A. · Ilker Topçu, Y. (2011). Conceptual Framework for Potential Implementations of Multi Criteria Decision Making (Mcdm) Methods for Design Quality Assessment. *Management and Innovation for a Sustainable Built Environment*, *June*.

Harrald, J. R., Renda-Tanali, I., Shaw, G. L., Rubin, C. B., & Yeletaysi, S. (2004). Review of risk based prioritization/decision making methodologies for dams. *US Army Corps for Engineers, The George Washington University, Institute for Crisis, Disaster, and Risk Management, Washington, DC*, *29*.

Helander, M. (2006). *A guide to human factors and ergonomics* (Second edi). Taylor & Francis Group.

Helander, M. G. (1997). Forty years of IEA: Some reflections on the evolution of ergonomics. *Ergonomics*, *40*(10), 952–961. https://doi.org/10.1080/001401397187531

Helliwell, P. S. (1999). The elbow, forearm, wrist and hand. *Bailliere's Best Practice and Research in Clinical Rheumatology*, *13*(2), 311–328. https://doi.org/10.1053/berh.1999.0022

Hemingway, H., & Marmot, M. (1999). Evidence based cardiology: Psychosocial factors in the aetiology and prognosis of coronary heart disease: systematic review of prospective cohort studies. *BMJ*, *318*(7196), 1460–1467. https://doi.org/10.1136/bmj.318.7196.1460

Henderson, R. D., & Dutta, S. P. (1992). Use of the analytic hierarchy process in ergonomic analysis. *International Journal of Industrial Ergonomics*, *9*(4), 275–282. https://doi.org/10.1016/0169-8141(92)90061-4

Henry, L. J., Jafarzadeh Esfehani, A., Ramli, A., Ishak, I., Justine, M., & Mohan, V.

(2015). Patterns of Work-Related Musculoskeletal Disorders Among Workers in Palm Plantation Occupation. *Asia Pacific Journal of Public Health*, *27*(2), NP1785–NP1792. https://doi.org/10.1177/1010539513475657

Hermawati, S., Lawson, G., D'Cruz, M., Arlt, F., Apold, J., Andersson, L., Lövgren, M. G., & Malmsköld, L. (2015). Understanding the complex needs of automotive training at final assembly lines. *Applied Ergonomics*, *46*(September 2015), 144–157. https://doi.org/10.1016/j.apergo.2014.07.014

Hill, R. (1998). What sample size is "enough" in internet survey research. *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*, *6*(3–4), 1–12.

Hisamune, S., & Kogi, K. (2015). *Effects of the Work Improvement on Board (WIB) program for improving safety and health of seamen*. *August*, 1–8. https://doi.org/10.5603/IMH.2015.0030

Ho, W., & Ma, X. (2018). The state-of-the-art integrations and applications of the analytic hierarchy process. *European Journal of Operational Research*, *267*(2), 399–414. https://doi.org/10.1016/j.ejor.2017.09.007

Hodacova, L., Sustova, Z., Cermakova, E., Kapitan, M., & Smejkalova, J. (2015). Self-reported risk factors related to the most frequent musculoskeletal complaints among Czech dentists. *Industrial Health*, *53*(1), 48–55. https://doi.org/10.2486/indhealth.2013-0141

Hoffmeister, K., Gibbons, A., Schwatka, N., & Rosecrance, J. (2015). Ergonomics Climate Assessment : A measure of operational performance and employee well-being. *Applied Ergonomics*, *50*, 160–169. https://doi.org/10.1016/j.apergo.2015.03.011

Hossain, M. D., Aftab, A., Al Imam, M. H., Mahmud, I., Chowdhury, I. A., Kabir, R. I., & Sarker, M. (2018). Prevalence of work related musculoskeletal disorders (WMSDs) and ergonomic risk assessment among readymade garment workers of Bangladesh: A cross sectional study. *PLOS ONE*, *13*(7), e0200122. https://doi.org/10.1371/journal.pone.0200122

Hsiao, S. W., & Ko, Y. C. (2013). A study on bicycle appearance preference by using FCE and FAHP. *International Journal of Industrial Ergonomics*, *43*(4), 264–273. https://doi.org/10.1016/j.ergon.2013.04.003

Huang, H. (2009). Designing a knowledge-based system for strategic planning : A balanced scorecard perspective. *Expert Systems With Applications*, *36*(1), 209–218. https://doi.org/10.1016/j.eswa.2007.09.046

Huang, I. B., Keisler, J., & Linkov, I. (2011). Multi-criteria decision analysis in environmental sciences: Ten years of applications and trends. *Science of the Total Environment*, *409*(19), 3578–3594. https://doi.org/10.1016/j.scitotenv.2011.06.022

Hussain, A., Case, K., Marshall, R., & Summerskill, S. (2016). Using Ergonomic Risk Assessment Methods for Designing Inclusive Work Practices: A Case Study. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *26*(3), 337–355. https://doi.org/10.1002/hfm.20650

Hutting, N., Engels, J. A., Staal, J. B., Heerkens, Y. F., & Nijhuis-Van Der Sanden, M. W. G. (2015). Development of a self-management intervention for employees with complaints of the arm, neck and/or shoulder (CANS): A focus group study with experts. *Journal of Occupational Medicine and Toxicology*, *10*(1), 1–16. https://doi.org/10.1186/s12995-015-0051-z

Idoro, G. I. (2008). Health and safety management efforts as correlates of performance in the Nigerian construction industry. *Journal of Civil Engineering and Management*. https://doi.org/10.3846/1392-3730.2008.14.27

International Ergonomics Association. (2010). *Ergonomics Guidelines For Occupational Health Practice In Industrially Developing Countries*.

International Ergonomics Association. (2020). *What is ergonomics?* WebPage. https://iea.cc/what-is-ergonomics/

Ishizaka, A., & Labib, A. (2011). Review of the main developments in the analytic hierarchy process. *Expert Systems with Applications*, *38*(11), 14336–14345. https://doi.org/10.1016/j.eswa.2011.04.143

Ismail, A. R., Md Deros, B., Mohd Yusuf, M. Y., Mohd Haniff, M. H., & Halim, I. (2012). Modelling and Optimization Approach of Quantitative Environmental Ergonomics in Malaysian Automotive Industry. *Journal of Occupational Safety and Health*, *9*(1), 1–6.

Ivarsson, A., & Eek, F. (2015). The relationship between physical workload and quality within line-based assembly. *Ergonomics*, *0139*(November), 1–11. https://doi.org/10.1080/00140139.2015.1105303

Ivarsson, A., & Eek, F. (2016). The relationship between physical workload and quality within line-based assembly. *Ergonomics*, *59*(7), 913–923. https://doi.org/10.1080/00140139.2015.1105303

Jacob, A., Joseph, J., & Rengaraj, M. (2014). Study of the Influence of Safety Factors by Performing Factor Analysis. *International Journal of Engineering Trends and Technology*, *9*(6), 272–276.

Jadhav, A. S., & Sonar, R. M. (2011). The Journal of Systems and Software Framework for evaluation and selection of the software packages : A hybrid knowledge based system approach. *The Journal of Systems & Software*, *84*(8), 1394–1407. https://doi.org/10.1016/j.jss.2011.03.034

Jain, P., Pasman, H. J., Waldram, S., Pistikopoulos, E. N., & Mannan, M. S. (2018). Process Resilience Analysis Framework (PRAF): A systems approach for

improved risk and safety management. *Journal of Loss Prevention in the Process Industries*, *53*, 61–73. https://doi.org/10.1016/j.jlp.2017.08.006

Jain, R., Meena, M. L., Dangayach, G. S., & Bhardwaj, A. K. (2018). Risk factors for musculoskeletal disorders in manual harvesting farmers of Rajasthan. *Industrial Health*, *56*(3), 241–248. https://doi.org/10.2486/indhealth.2016-0084

Janetzke, H., & Ertel, M. (2017). Psychosocial risk management in more and less favourable workplace conditions. *International Journal of Workplace Health Management*, *10*(4), 300–317. https://doi.org/10.1108/IJWHM-09-2016-0063

Jozi, S. A., Saffarian, S., Shafiee, M., & Majd, N. M. (2015). Safety, Health, and Environmental Risk Assessment of a Gas Power Plant: A Case Study from Southern Iran. *Human and Ecological Risk Assessment: An International Journal*, *21*(6), 1479–1495. https://doi.org/10.1080/10807039.2014.957114

JR, A. B., Amalia, W., & Suryani, E. (2015). Design of Working Tools Based on Quick Exposure Check Method to Reduce the Risk of Work Related Musculoskeletal Disorders AYU BIDIAWATI JR repetitive movements continuously . According to United States Public Work Statistic Bureau , accident caused by Rep. *European Academic Research*, *III*(4), 5134–5146.

Jun, D., O'Leary, S., McPhail, S. M., & Johnston, V. (2019). Job strain and psychological distress in office workers: The role of coping. *Work*, *64*(1), 55–65.

Jung, H. S., & Jung, H. S. (2001). Establishment of overall workload assessment technique for various tasks and workplaces. *International Journal of Industrial Ergonomics*, *28*(6), 341–353. https://doi.org/10.1016/S0169-8141(01)00040-3

Jung, K., Kwon, O., & You, H. (2009). Development of a digital human model generation method for ergonomic design in virtual environment. *International Journal of Industrial Ergonomics*, *39*(5), 744–748. https://doi.org/10.1016/j.ergon.2009.04.001

Junkes-cunha, M., Cardozo, G., Boos, C. F., & Azevedo, F. De. (2014). Implementation of expert systems to support the functional evaluation of stand-to-sit activity. *BioMedical Engineering OnLine*, *13*(98), 1–12.

Kabuka, M., Genaidy, A. M., & Asfourt, S. S. (1988). A knowledge-based system for the design of manual materials handling. *Applied Ergonomics 1988*, *19*(2), 147–155.

Kadefors, R., Engstriim, T., & Petzil, J. (1996). Ergonomics in parallelized car assembly : a case study , with reference also to productivity aspects. *Applied Ergonomics*, *27*(2), 101–110.

Kadiri, Z. O., Nden, T., Avre, G. K., Oladipo, T. O., Edom, A., Samuel, P. O., & Ananso, G. N. (2014). Causes and effects of accidents on construction sites (a

case study of some selected construction firms in Abuja FCT Nigeria). *IOSR Journal of Mechanical and Civil Engineering*, *11*(5), 66–72.

Kaklauskas, A., Zavadskas, E. K., Pruskus, V., Vlasenko, A., Bartkiene, L., Paliskiene, R., Zemeckyte, L., Gerstein, V., Dzemyda, G., & Tamulevicius, G. (2011). Recommended biometric stress management system. *Expert Systems with Applications*, *38*(11), 14011–14025. https://doi.org/10.1016/j.eswa.2011.04.209

Kalantari, R., Arghami, S., Ahmadi, E., Garosi, E., & Farahani, A. Z. (2016). Relationship between workload and low back pain in assembly line workers Article Info. *Journal of Kermanshah University of Medical Science*, *20*(1), 26–29.

Kale, P. N., & Vyavahare, R. T. (2016). Ergonomic Analysis Tools: A Review. *International Journal of Current Engineering and Technology*, *6*(4), 1271–1280.

Kaljun, J., & Dolšak, B. (2012). Ergonomic design knowledge built in the intelligent decision support system. *International Journal of Industrial Ergonomics*, *42*(1), 162–171. https://doi.org/10.1016/j.ergon.2011.11.009

Kara, Y., Atasagun, Y., Gökçen, H., Hezer, S., & Demirel, N. (2014). An integrated model to incorporate ergonomics and resource restrictions into assembly line balancing. *International Journal of Computer Integrated Manufacturing*, *27*(11), 997–1007. https://doi.org/10.1080/0951192X.2013.874575

Karahalios, H., Yang, Z. L., Williams, V., & Wang, J. (2011). A proposed System of Hierarchical Scorecards to assess the implementation of maritime regulations. *Safety Science*, *49*(3), 450–462. https://doi.org/10.1016/j.ssci.2010.11.001

Karsh, B.-T. (2006). Theories of work-related musculoskeletal disorders: Implications for ergonomic interventions. *Theoretical Issues in Ergonomics Science*, *7*(1), 71–88. https://doi.org/10.1080/14639220512331335160

Karwowski, W., Mulholland, N. O., Ward, T. L., Jagannathan, V., & Kirchner, R. L. (1986). LIFTAN: An experimental expert system for analysis of manual lifting tasks. *Ergonomics*, *29*(10), 1213–1234. https://doi.org/10.1080/00140138608967236

Karwowski, W, Mulholland, N. O., Ward, T. L., Jagannathan, V., & Kirchner JR, R. L. (1986). LIFTAN : An experimental expert system for analysis of manual lifting tasks. *Ergonomics*, *29*(10), 1213–1234. https://doi.org/10.1080/00140138608967236

Karwowski, Waldemar, Mital, A., Palenque, L. E., & Ward, T. L. (1987). Development of a microcomputer-based expert system for the analysis of manual materials handling tasks in industrial settings. *International Journal of Industrial Ergonomics*, *2*(1), 49–59. https://doi.org/10.1016/0169-8141(87)90007-2

Katsakiori, P., Manatakis, E., Goutsos, S., & Athanassiou, G. (2008). Factors attributed to fatal occupational accidents in a period of 5 years preceding the athens 2004 olympic games. *International Journal of Occupational Safety and Ergonomics*, *14*(3), 285–292. https://doi.org/10.1080/10803548.2008.11076766

Katz, J. D. (2017). Control of the Environment in the Operating Room. *Anesthesia & Analgesia*, *125*(4), 1214–1218.

Kayis, B., & Charoenchai, N. (2004). Development of a knowledge-based system for nonpowered hand tools (TOOL EXPERT): Part I - The scientific basis. *Human Factors and Ergonomics In Manufacturing*, *14*(3), 257–268. https://doi.org/10.1002/hfm.10065

Kekale, T., Phusavat, K., Rassameethes, B., & Klomjit, P. (2010). Web-based expert system prototype: Applications for workplace improvement. *International Journal of Innovation and Learning*, *8*(1), 78–89. https://doi.org/10.1504/IJIL.2010.034015

Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, *15*(3), 261–266. https://doi.org/10.1093/intqhc/mzg031

Khan, M., & Pope-Ford, R. (2015a). Improving and Modifying the Design of Workstations within a Manufacturing Environment. *Procedia Manufacturing*, *3*(Ahfe), 4927–4934. https://doi.org/10.1016/j.promfg.2015.07.631

Khan, M., & Pope-Ford, R. (2015b). Improving and Modifying the Design of Workstations within a Manufacturing Environment. *Procedia Manufacturing*, *3*(Ahfe), 4927–4934. https://doi.org/10.1016/j.promfg.2015.07.631

Khandan, M., Koohpaei, A. R., Nili, M., & Farjami, Y. (2017). Occupational musculoskeletal disorders management using Fuzzy TOPSIS Assessment of Repetitive Tasks (ART). *Work*, *56*(2), 267–276. https://doi.org/10.3233/WOR-172491

Khandan, Mohammad, & Koohpaei, A. (2016). Assessment and analysis of ergonomics conditions based on TOPSIS in a manufacturing company. *Iran Occupational Health Journal*, *13*(5), 98–108.

Khandan, Mohammad, Nili, M., Koohpaei, A., & Mosaferchi, S. (2016). Integrating the ergonomics techniques with multi criteria decision making as a new approach for risk management: An assessment of repetitive tasks-entropy case study. *Journal of Research in Health Sciences*, *16*(2), 85–89. https://doi.org/10.34172/jrhs162372

Kiker, G. A., Bridges, T. S., Varghese, A., Seager, T. P., & Linkov, I. (2005). Application of Multicriteria Decision Analysis in Environmental Decision Making. *Integrated Environmental Assessment and Management*, *1*(2), 95. https://doi.org/10.1897/IEAM_2004a-015.1

Kim BS, S. E., Chun, J., & Hong, J. (2013). Ergonomic Interventions as a Treatment and Preventative Tool for Work-Related Musculoskeletal Disorders. *International Journal of Caring Sciences*, *6*(3), 339–348. https://tcsedsystem.idm.oclc.org/login?url=https://search.proquest.com/docview/1445366640?accountid=34120%0Ahttp://dg9xu7us4b.search.serialssolutions.com/directLink?&atitle=Ergonomic+Interventions+as+a+Treatment+and+Preventative+Tool+for+Work-Related+Musc

Kim, H., Kim, S.-J., Moon, S.-H., Jung, D.-Y., Lamichhane, D. K., & Lee, B.-J. (2015). Psychosocial factors and psychological well-being: a study from a nationally representative sample of Korean workers. *Industrial Health*, *54*(3), 237–245. https://doi.org/10.1016/S0140-6736(00)87703-X

Kim, S. E. (2013). Ergonomic Interventions as a Treatment and Preventative Tool for Work-Related Musculoskeletal Disorders. *International Journal of Caring Sciences*, *6*(3), 339–348.

Klippert, J., Gudehus, T., & Zick, J. (2012). A software-based method for ergonomic posture assessment in automotive preproduction planning: Concordance and difference in using software and personal observation for assessments. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *22*(2), 156–175. https://doi.org/10.1002/hfm.20370

Koehoorn, M., Ostry, A., Hossain, S., & Village, J. (2011). Injury risk associated with physical demands and school environment characteristics among a cohort of custodial workers. *Ergonomics*, *54*(8), 767–775. https://doi.org/10.1080/00140139.2011.592603

Kogi, K. (2012). Practical ways to facilitate ergonomics improvements in occupational health practice. *Human Factors*, *54*(6), 890–900. https://doi.org/10.1177/0018720812456204

Koppelaar, E., Knibbe, J. J., Miedema, H. S., & Burdorf, A. (2013). The influence of individual and organisational factors on nurses' behaviour to use lifting devices in healthcare. *Applied Ergonomics*, *44*(4), 532–537. https://doi.org/10.1016/j.apergo.2012.11.005

Kortum, E., Leka, S., & Cox, T. (2011). Perceptions of Psychosocial Hazards , Work-related Stress and Workplace Priority Risks in Developing Countries. *Journal of Occupational Health*, *53*, 144–155.

Koukoulaki, T. (2014). The impact of lean production on musculoskeletal and psychosocial risks: An examination of sociotechnical trends over 20 years. *Applied Ergonomics*, *45*(2 Part A), 198–212. https://doi.org/10.1016/j.apergo.2013.07.018

Kralikova, R., & Wessely, E. (2016). Lighting quality, productivity and human health. *INTERNATIONAL SYMPOSIUM ON INTELLIGENT MANUFACTURING AND AUTOMATION*, *27*, 59–65.

Kramer, D., Bigelow, P., Vi, P., Garritano, E., Carlan, N., & Wells, R. (2009). Spreading good ideas: A case study of the adoption of an innovation in the construction sector. *Applied Ergonomics*, *40*(5), 826–832. https://doi.org/10.1016/j.apergo.2008.09.006

Krantz, G., Forsman, M., & Lundberg, U. (2004). Consistency in physiological stress responses and electromyographic activity during induced stress exposure in women and men. *Integrative Physiological & Behavioral Science*, *39*(2), 105–118.

Krokstad, S., Johnsen, R., & Westin, S. (2002). Social determinants of disability pension: a 10-year follow-up of 62 000 people in a Norwegian county population. *International Journal of Epidemiology*, *31*(6), 1183–1191. https://doi.org/10.1093/ije/31.6.1183

Kulak, O. (2005). A decision support system for fuzzy multi-attribute selection of material handling equipments. *Expert Systems with Applications*, *29*, 310–319. https://doi.org/10.1016/j.eswa.2005.04.004

Kumar, G. S., & Das, A. (2012). Analysis and ergonomic improvement of working postures in cast house work station using JACK modelling. *International Journal of Human Factors Modelling and Simulation*, *3*(1), 16. https://doi.org/10.1504/IJHFMS.2012.050060

Kumar, M. W., Sahu, M., Baburao, G., Suresh, M., & Vijay, S. J. (2019). Enhancement of working postures of industrial workers through sit-stand assembly workstation. *International Journal of Scientific and Technology Research*, *8*(11), 3275–3279.

Kumar, R., Chaikumarn, M., & Lundberg, J. (2005). Participatory Ergonomics and an Evaluation of a Low-Cost Improvement Effect on Cleaners' Working Posture. *International Journal of Occupational Safety and Ergonomics*, *11*(2), 203–210. https://doi.org/10.1080/10803548.2005.11076639

Kumar, Sandeep, & Mishra, R. B. (2010). Web-based expert systems and services. *The Knowledge Engineering Review*, *25*(2), 167–198. https://doi.org/10.1017/S0269888910000020

Kumar, Shailendra. (2016). Assessment and selection of psychological attributes: design team perspectives. *Journal of Engineering, Design and Technology*, *14*(4), 874–896. https://doi.org/10.1108/JEDT-03-2015-0010

Kuo, C. F., & Chu, C. H. (2005). An online ergonomic evaluator for 3D product design. In *Computers in Industry* (Vol. 56, Issue 5, pp. 479–492). https://doi.org/10.1016/j.compind.2005.02.002

Kuorinka, I. (1997). Tools and means of implementing participatory ergonomics. *International Journal of Industrial Ergonomics*, *19*(4), 267–270. https://doi.org/10.1016/S0169-8141(96)00035-2

Labbafinejad, Y., Imanizade, Z., & Danesh, H. (2016). Ergonomic Risk Factors and Their Association with Lower Back and Neck Pain among Pharmaceutical Employees in Iran. *Workplace Health and Safety*, *64*(12), 586–595. https://doi.org/10.1177/2165079916655807

Laing, A. C., Cole, D. C., Theberge, N., Wells, R. P., Kerr, M. S., & Frazer, M. B. (2007). Effectiveness of a participatory ergonomics intervention in improving communication and psychosocial exposures. *Ergonomics*, *50*(7), 1092–1109. https://doi.org/10.1080/00140130701308708

Laing, Andrew C., Frazer, M. B., Cole, D. C., Kerr, M. S., Wells, R. P., & Norman, R. W. (2005). Study of the effectiveness of a participatory ergonomics intervention in reducing worker pain severity through physical exposure pathways. *Ergonomics*, *48*(2), 150–170. https://doi.org/10.1080/00140130512331325727

Lang, M., & Fitzgerald, B. (2007). Web-based systems design: A study of contemporary practices and an explanatory framework based on "method-in-action." *Requirements Engineering*, *12*(4), 203–220. https://doi.org/10.1007/s00766-007-0052-2

Laring, J., Falk, K. J., Kadefors, R., & Örtengren, R. (1996). Computer aided workplace design: An approach to create a tool for the production engineer. *International Journal of Industrial Ergonomics*, *17*(4), 323–330. https://doi.org/10.1016/0169-8141(95)00063-1

Larsen, A. K., Holtermann, A., Mortensen, O. S., Punnett, L., Rod, M. H., & Jørgensen, M. B. (2015). Organizing workplace health literacy to reduce musculoskeletal pain and consequences. *BMC Nursing*, *14*(1), 46. https://doi.org/10.1186/s12912-015-0096-4

Lavender, S. a, & Marras, W. S. (1994). The use of turnover rate as a passive surveillance indicator for potential low back disorders. *Ergonomics*, *37(6)*(6), 971–978. https://doi.org/10.1080/00140139408963710

Lawson, G., Salanitri, D., & Waterfield, B. (2016). Future directions for the development of virtual reality within an automotive manufacturer. *Applied Ergonomics*, *53*, 323–330. https://doi.org/10.1016/j.apergo.2015.06.024

Lay, A. M., Saunders, R., Lifshen, M., Breslin, F. C., LaMontagne, A. D., Tompa, E., & Smith, P. M. (2017). The relationship between occupational health and safety vulnerability and workplace injury. *Safety Science*, *94*, 85–93. https://doi.org/10.1016/j.ssci.2016.12.021

Lee J. Cronbach. (1951). Coefficient alpha and the internal structure of tests*. *Psychometrika*, *16(3)*(3), 297–334.

Lehto, M. R., & Cook, B. T. (2012). Occupational Health and Safety Management. *Handbook of Human Factors and Ergonomics: Fourth Edition*, *14*, 699–733. https://doi.org/10.1002/9781118131350.ch25

Leo Kumar, S. P. (2017). State of The Art-Intense Review on Artificial Intelligence Systems Application in Process Planning and Manufacturing. *Engineering Applications of Artificial Intelligence*, *65*, 294–329. https://doi.org/10.1016/j.engappai.2017.08.005

Leu, G., & Abbass, H. (2016). A multi-disciplinary review of knowledge acquisition methods: From human to autonomous eliciting agents. *Knowledge-Based Systems*, *105*, 1–22. https://doi.org/10.1016/j.knosys.2016.02.012

Leung, M., Chan, I. Y. S., & Cooper, C. L. (2015). Theories of Stress. In *Stress Management in the Construction Industry*. https://doi.org/10.1002/9781118456361.ch2

Li, J., & Zhou, Y. F. (2015). Occupational hazards control of hazardous substances in clean room of semiconductor manufacturing plant using CFD analysis. *Toxicology and Industrial Health*, *31*(2), 123–139. https://doi.org/10.1177/0748233712469996

Liang, Q., Leung, M., & Cooper, C. (2018). Focus group study to explore critical factors for managing stress of construction workers. *Journal of Construction Engineering and Management*, *144*(5), 4018023.

Lin, L., Drury, C. G., & Kim, S. W. (2001). Ergonomics and quality in paced assembly lines. *Human Factors and Ergonomics In Manufacturing*, *11*(4), 377–382. https://doi.org/10.1002/hfm.1020

Lin, R. T., & Chan, C. C. (2007). Effectiveness of workstation design on reducing musculoskeletal risk factors and symptoms among semiconductor fabrication room workers. *International Journal of Industrial Ergonomics*, *37*(1), 35–42. https://doi.org/10.1016/j.ergon.2006.09.015

Lind, C. M., Forsman, M., & Rose, L. M. (2019). Development and evaluation of RAMP I – a practitioner's tool for screening of musculoskeletal disorder risk factors in manual handling. *International Journal of Occupational Safety and Ergonomics*, *25*(2), 165–180. https://doi.org/10.1080/10803548.2017.1364458

Liu, L., Chen, S. G., Tang, S. C., Wang, S., He, L. H., Guo, Z. H., Li, J. Y., Yu, S. F., & Wang, Z. X. (2015). How Work Organization Affects the Prevalence of WMSDs : *Biomedical and Environmental Sciences*, *28*(9), 627–633. https://doi.org/10.3967/bes2015.088

Llndegård, A., Wahlström, J., Hagberg, M., Hansson, G.-Å., Jonsson, P., & Tornqvist, E. W. (2003). The impact of working technique on physical loads—an exposure profile among newspaper editors. *Ergonomics*, *46*(6), 598–615. https://doi.org/10.1080/0014013031000071360

Longacre, M. L., Valdmanis, V. G., Handorf, E. A., & Fang, C. Y. (2017). Work impact and emotional stress among informal caregivers for older adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *72*(3), 522–

531.

Loo. (2012). Ergonomics Issues in Malaysia. *Journal of Social Sciences*, *8*(1), 61–65. https://doi.org/10.3844/jssp.2012.61.65

Loo, H. S., Saad, N. H., Redza, M. R. M., Rahman, R. A., Rashid, A. A., & Isa, H. M. (2013). Ergonomics Intervention in Assembling Air Handler Panels. *Applied Mechanics and Materials*, *393*(OCTOBER 2013), 15–20. https://doi.org/10.4028/www.scientific.net/AMM.393.15

Lopes Nunes, I. (2007). Knowledge Acquisition for the Development of an Upper-Body Work-Related Musculoskeletal Disorders Analysis Tool. *Human Factors and Ergonomics in Manufacturing*, *17*(2), 149–162. https://doi.org/10.1002/hfm.20070

Lowe, B. D., Dempsey, P. G., & Jones, E. M. (2019). Ergonomics assessment methods used by ergonomics professionals. *Applied Ergonomics*, *81*(July), 102882. https://doi.org/10.1016/j.apergo.2019.102882

Lu, Lin, Sesek, R. F., Megahed, F. M., & Cavuoto, 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

Lu, Liu, Song Gen, C., Shi Chuan, T., Sheng, W., Li Hua, H., Ze Hua, G., Jing Yun, L., Shan Fa, Y., & Zhong Xu, W. (2015). How Work Organization Affects the Prevalence of WMSDs : A Case-control Study. *Biomed Environ Sci*, *28*(9), 627–633. https://doi.org/10.3967/bes2015.088

Lu, Luo, Lin, H. Y., Lu, C. Q., & Siu, O. L. (2015). The moderating role of intrinsic work value orientation on the dual-process of job demands and resources among Chinese employees. *International Journal of Workplace Health Management*, *8*(2), 78–91. https://doi.org/10.1108/IJWHM-11-2013-0045

Lucas, R. A. I., Epstein, Y., & Kjellstrom, T. (2014). Excessive occupational heat exposure: a significant ergonomic challenge and health risk for current and future workers. *Extreme Physiology & Medicine*, *3*(14), 1–8. https://doi.org/10.1186/2046-7648-3-14

M. Noor, M. H. H., & Raja Ghazilla, R. A. (2018). Physical ergonomics awareness in an offshore processing platform among Malaysian oil and gas workers. *International Journal of Occupational Safety and Ergonomics*, *0*(0), 1–17. https://doi.org/10.1080/10803548.2018.1480341

Maakip, I., Keegel, T., & Oakman, J. (2016). *Prevalence and predictors for musculoskeletal discomfort in Malaysian office workers : Investigating explanatory factors for a developing country*. *53*, 252–257.

MacDonald, L. A., Karasek, R. A., Punnett, L., & Scharf, T. (2001). Covariation

between workplace physical and psychosocial stressors: evidence and implications for occupational health research and prevention. *Ergonomics*, *44*(7), 696–718. https://doi.org/10.1080/00140130119943

Macdonald, W., & Oakman, J. (2015). Requirements for more effective prevention of work-related musculoskeletal disorders. *BMC Musculoskeletal Disorders*, *16*(1), 1–9. https://doi.org/10.1186/s12891-015-0750-8

Macedo Guimarães, L. B. de, Anzanello, M. J., Ribeiro, J. L. D., & Saurin, T. A. (2015). Participatory ergonomics intervention for improving human and production outcomes of a Brazilian furniture company. *International Journal of Industrial Ergonomics*, *49*, 97–107.

Macleod, J. (2003). Psychosocial factors and public health: a suitable case for treatment? *Journal of Epidemiology & Community Health*, *57*(8), 565–570. https://doi.org/10.1136/jech.57.8.565

Mafini, C., & Pooe, D. R. I. (2013). The relationship between employee satisfaction and organisational performance: Evidence from a South African government department. *SA Journal of Industrial Psychology*, *39*(1), 1–9. https://doi.org/10.4102/sajip.v39i1.1090

Mahmud, N., Kenny, D. T., Md Zein, R., & Hassan, S. N. (2015). The effects of office ergonomic training on musculoskeletal complaints, sickness absence, and psychological well-being: a cluster randomized control trial. *Asia-Pacific Journal of Public Health*, *27*(2), NP1652-68. https://doi.org/10.1177/1010539511419199

Maia, L. C., Alves, A. C., & Leão, C. P. (2012). Design of a Lean Methodology for an ergonomic and sustainable work environment in Textile and Garment Industry. *ASME 2012 International Mechanical Engineering Congress and Exposition*, 1843–1852.

Major, M., & Vézina, N. (2015). Analysis of worker strategies: A comprehensive understanding for the prevention of work related musculoskeletal disorders. *International Journal of Industrial Ergonomics*, *48*, 149–157. https://doi.org/10.1016/j.ergon.2015.05.003

Mansor, N., Zakaria, N. H., & Abdullah, Z. (2011). Understanding Common Dimensions of Workplace Accident in Malaysia. *Business and Management Review*, *1*(6), 22–23. https://doi.org/10.1017/CBO9781107415324.004

Mansour, M. (2016). Quantifying the intangible costs related to non-ergonomic work conditions and work injuries based on the stress level among employees. *Safety Science*, *82*, 283–288. https://doi.org/10.1016/j.ssci.2015.09.007

Manuele, F. A. (2003). *On the practice of safety*. John Wiley & Sons.

Marcatto, F., Colautti, L., Larese Filon, F., Luis, O., Di Blas, L., Cavallero, C., &

Ferrante, D. (2016). Work-related stress risk factors and health outcomes in public sector employees. *Safety Science*, *89*, 274–278. https://doi.org/10.1016/j.ssci.2016.07.003

Mardani, A., Jusoh, A., Nor, K. M. D., Khalifah, Z., Zakwan, N., & Valipour, A. (2015). Multiple criteria decision-making techniques and their applications - A review of the literature from 2000 to 2014. *Economic Research-Ekonomska Istrazivanja*, *28*(1), 516–571. https://doi.org/10.1080/1331677X.2015.1075139

Martimo, K. P., Shiri, R., Miranda, H., Ketola, R., Varonen, H., & Viikari-Juntura, E. (2010). Effectiveness of an ergonomic intervention on the productivity of workers with upper-extremity disorders - A randomized controlled trial. *Scandinavian Journal of Work, Environment and Health*, *36*(1), 25–33. https://doi.org/10.5271/sjweh.2880

Masi, D., Cagno, E., & Micheli, G. J. L. (2014). Developing, implementing and evaluating OSH interventions in SMEs: A pilot, exploratory study. *International Journal of Occupational Safety and Ergonomics*, *20*(3), 385–405. https://doi.org/10.1080/10803548.2014.11077059

Matsudaira, K., Kawaguchi, M., Isomura, T., Inuzuka, K., Koga, T., Miyoshi, K., & Konishi, H. (2015). Assessment of psychosocial risk factors for the development of non-specific chronic disabling low back pain in Japanese workers—findings from the Japan epidemiological research of occupationrelated back pain (JOB) study. *Industrial Health*, *53*(4), 368–377. https://doi.org/10.2486/indhealth.2014-0260

Mavis, I. A., Anita Binti, A. R., & Tamrin, S. B. H. J. M. (2015). Occupational hazards and work environment management among OSH certified and uncertified automotive parts manufacturing industry workers. *Middle East Journal of Scientific Research*, *23*(2), 160–164. https://doi.org/10.5829/idosi.mejsr.2015.23.02.926

McCauley-Bush, P. (2011). *Ergonomics: foundational principles, applications, and technologies*. CRC Press.

McMullin, D. L., Akladios, M., Gopalakrishnan, B., Myers, W. R., & Becker, P. E. (2000). Development, validation, and limiations of an expert system for safety and health concerns in technology development. *Proceedings of the XIVth Triennial Congress of the International Ergonomics Association and 44th Annual Meeting of the Human Factors and Ergonomics Association, "Ergonomics for the New Millennium,"* 306–309. https://doi.org/10.1177/154193120004402706

Mean, V., Abdullah, N. S., Md Dawal, S. Z., Aoyama, H., & Sothea, K. (2013). Investigation on Musculoskeletal Symptoms and Ergonomic Risk Factors at Metal Stamping Industry. *Advanced Engineering Forum*, *10*, 293–299. https://doi.org/10.4028/www.scientific.net/aef.10.293

Meepradit, P. (2016). The Prevalence and Risk Factors of Musculoskeletal Disorders among Burmese Migrant Labor in Thailand. *Archives of Current Research International*, *3*(2), 1–7. https://doi.org/10.9734/acri/2016/23830

Meinert, M., König, M., & Jaschinski, W. (2013). Web-based office ergonomics intervention on work-related complaints : a field study. In *Ergonomics* (Vol. 56, Issue 11, pp. 1658–1668). Taylor & Francis. https://doi.org/10.1080/00140139.2013.835872

Melemez, K. (2015). Risk factor analysis of fatal forest harvesting accidents: A case study in Turkey. *Safety Science*, *79*, 369–378. https://doi.org/10.1016/j.ssci.2015.07.004

Memon, M. A., Ting, H., Ramayah, T., Chuah, F., & Cheah, J.-H. (2017). A Review of the Methodological Misconceptions and Guidelines Related To the Application of Structural Equation Modeling: a Malaysian Scenario. *Journal of Applied Structural Equation Modeling*, *1*(August), i–xiii. https://doi.org/10.47263/jasem.1(1)01

Mengoni, M., Matteucci, M., & Raponi, D. (2017a). *A multipath methodology to link ergonomics , safety and efficiency in factories*. *11*(June), 1311–1318. https://doi.org/10.1016/j.promfg.2017.07.259

Mengoni, M., Matteucci, M., & Raponi, D. (2017b). A multipath methodology to link ergonomics , safety and efficiency in factories. *27th International Conference on Flexible Automation and Intelligent Manufacturing, FAIM2017, 27-30 June 2017*, *11*, 1311–1318. https://doi.org/10.1016/j.promfg.2017.07.259

Mgbemena, C. E., Oyekan, J., Hutabarat, W., Xu, Y., & Tiwari, A. (2018). Design and implementation of ergonomic risk assessment feedback system for improved work posture assessment. *Theoretical Issues in Ergonomics Science*, *19*(4), 431–455. https://doi.org/10.1080/1463922X.2017.1381196

Michalos, G., Makris, S., & Chryssolouris, G. (2013). The effect of job rotation during assembly on the quality of final product. *CIRP Journal of Manufacturing Science and Technology*, *6*(3), 187–197. https://doi.org/10.1016/j.cirpj.2013.03.001

Moallem, M. Ben, Derbel, C., Ammar, M. H., Béji, N., & Dhouib, D. (2018). Risk prioritization using the analytic hierarchy process (ahp) in Tunisian Healthcare Department: real case study. *Multiple Criteria Decision Making*, *13*, 9–28. https://doi.org/10.22367/mcdm.2018.13.01

Moghaddasi, Y., Mirmohammadi, S., Ahmad, A., Etemadi Nejad, S., & Yazdani, J. (2014). Health–risk assessment of workers exposed to flour dust: A cross–sectional study of random samples of bakeries workers. *Atmospheric Pollution Research*, *5*(1), 113–118. https://doi.org/10.5094/APR.2014.014

Mohammadi, H., Motamedzade, M., Faghih, M. A., Bayat, H., Mohraz, M. H., &

Musavi, S. (2013). Manual material handling assessment among workers of Iranian casting workshops. *International Journal of Occupational Safety and Ergonomics*, *19*(4), 675–681. https://doi.org/10.1080/10803548.2013.11077021

Mohammadi Motlagh, H. A., Minaei Bidgoli, B., & Parvizi Fard, A. A. (2018). Design and implementation of a web-based fuzzy expert system for diagnosing depressive disorder. *Applied Intelligence*, *48*(5, SI), 1302–1313. https://doi.org/10.1007/s10489-017-1068-z

Mohd Yusuff, R., Baba, Z., Siti, S. Z., & Tan, E. (2016). Malaysian ergonomics standards-its development, awareness and implementation- A review article. In *Iranian Journal of Public Health* (Vol. 45, pp. 1–8).

Montano, D., Hoven, H., & Siegrist, J. (2014). Effects of organisational-level interventions at work on employees' health: a systematic review. *BMC Public Health*, *14*(1), 135. https://doi.org/10.1186/1471-2458-14-135

Mościcka-teske, A., Sadłowska-wrzesińska, J., Butlewski, M., Misztal, A., & Jacukowicz, A. (2016). *Stressful work characteristics , health indicators and work behavior : the case of machine operators*. *3548*(July). https://doi.org/10.1080/10803548.2016.1197577

Mościcka-Teske, A., Sadłowska-Wrzesińska, J., Butlewski, M., Misztal, A., & Jacukowicz, A. (2017). Stressful work characteristics, health indicators and work behavior: the case of machine operators. *International Journal of Occupational Safety and Ergonomics*, *23*(4), 510–518. https://doi.org/10.1080/10803548.2016.1197577

Mossa, G., Boenzi, F., Digiesi, S., Mummolo, G., & Romano, V. A. (2016a). Productivity and ergonomic risk in human based production systems: A job-rotation scheduling model. *International Journal of Production Economics*, *171*, 471–477. https://doi.org/10.1016/j.ijpe.2015.06.017

Mossa, G., Boenzi, F., Digiesi, S., Mummolo, G., & Romano, V. A. (2016b). Productivity and ergonomic risk in human based production systems: A job-rotation scheduling model. *International Journal of Production Economics*, *171*, 471–477. https://doi.org/10.1016/j.ijpe.2015.06.017

Motamedzade, M., Faghih, M. A., Golmohammadi, R., Faradmal, J., & Mohammadi, H. (2013). Effects of physical and personal risk factors on sick leave due to musculoskeletal disorders. *International Journal of Occupational Safety and Ergonomics*, *19*(4), 513–521. https://doi.org/10.1080/10803548.2013.11077012

Moussavi, S. E., Zare, M., Mahdjoub, M., & Grunder, O. (2019). Balancing high operator's workload through a new job rotation approach: Application to an automotive assembly line. *International Journal of Industrial Ergonomics*, *71*, 136–144. https://doi.org/10.1016/j.ergon.2019.03.003

Moynihan, G. P., Fonseca, D. J., Merritt, T. W., & Ray, P. S. (1995). An object-

oriented system for ergonomic risk assessment. *Expert Systems*, *12*(2), 149–156. https://doi.org/10.1111/j.1468-0394.1995.tb00047.x

Mustafa, S. A., Kamaruddin, S., Othman, Z., & Mokhtar, M. (2009). The effect of ergonomics applications in work system on mental health of visual display terminal workers. *European Journal of Scientific Research*, *31*(3), 341–354.

Mustafa, S. A., Kamarudin, S., Othman, Z., & Mokhtar, M. (2009). The Effect of Ergonomics Applications in Work System on Mental Health of Visual Display Terminal Workers. *European Journal of Scientific Research*, *31*(3), 341–354.

Nagamachi, M. (1995). Requisites and practices of participatory ergonomics. *International Journal of Industrial Ergonomics*, *15*(5), 371–377. https://doi.org/10.1016/0169-8141(94)00082-E

National Institute for Occupational Safety and Health. (1997). Low back musculoskeletal disorders: Evidence for work-relatedness. In *Musculoskeletal disorders and workplace factors: a critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back.* NIOSH Cincinnati, Ohio.

Negm, A., MacDermid, J., Sinden, K. E., & MacIntyre, N. J. (2016). Prevalence and Distribution of Musculoskeletal Disorders in Firefighters are Influenced by Age and Tenure. *Archives of Physical Medicine and Rehabilitation*, *97*(10), e52. https://doi.org/10.1016/j.apmr.2016.08.157

Neumann, W. P., & Dul, J. (2010). Human factors: Spanning the gap between OM and HRM. *International Journal of Operations and Production Management*, *30*(9), 923–950. https://doi.org/10.1108/01443571011075056

Neupane, S., Nygård, C. H., & Oakman, J. (2016). Work-related determinants of multi-site musculoskeletal pain among employees in the health care sector. *Work*, *54*(3), 689–697. https://doi.org/10.3233/WOR-162320

Nilashi, M., Zakaria, R., Ibrahim, O., Zaimi, M., Majid, A., Mohamad, R., Waseem, M., Izieadiana, N., Abidin, Z., Rina, S., & Aminu, D. (2015). Knowledge-Based Systems A knowledge-based expert system for assessing the performance level of green buildings. *Knowledge-Based Systems Journal*, *86*, 194–209.

Nimbarte, A. D., Chowdhury, S. K., & David Cartwright, E. (2013). Empirical evaluation of neck muscle fatigue generated by healthcare related exertions. *Safety Science*, *57*, 100–107. https://doi.org/10.1016/j.ssci.2013.01.019

Nunes, I., & Marques, M. (2012). Applications of Fuzzy Logic in Risk Assessment - The RA_X Case. *Fuzzy Inference System - Theory and Applications, June 1989*, 21–40. https://doi.org/10.1016/j.fss.2004.10.018

Nunes, Isabel L. (2009). FAST ERGO-X - A tool for ergonomic auditing and work-related musculoskeletal disorders prevention. *Work*, *34*(2), 133–148.

Nunes, Isabel L, & McCauley Bush, P. (2012). Work-Related Musculoskeletal Disorders Assessment and Prevention. In *Ergonomics - A Systems Approach* (pp. 1–30). https://doi.org/10.5772/37229

Nunes, Isabel Lopes. (2007). Knowledge Acquisition for the Development of an Upper-Body Work-Related Musculoskeletal Disorders Analysis Tool. *Human Factors and Ergonomics in Manufacturing*, *17*(2), 149–162. https://doi.org/10.1002/hfm

Nur, N. M., Dawal, S. Z., & Dahari, M. (2014). The Prevalence of Work Related Musculoskeletal Disorders Among Workers Performing Industrial Repetitive Tasks in the Automotive Manufacturing Companies. *Proceedings of the 2014 International Conference on Industrial Engineering and Operations Management Bali, Indonesia.*, 1–8.

Nyakwara, S., Shiundu, J., George, P., & Gongera, E. (2014). *Evaluation of Employee welfare Facilities as an Intervention strategy of Industrial Unrest on Organization Performance : Case of Mumias Sugar Company*. *6*(29), 209–219.

Oakman, J., & Chan, S. (2015). Risk management: Where should we target strategies to reduce work-related musculoskeletal disorders? *Safety Science*, *73*, 99–105. https://doi.org/10.1016/j.ssci.2014.11.026

Occhipinti, E., & Colombini, D. (2016). A toolkit for the analysis of biomechanical overload and prevention of WMSDs: Criteria, procedures and tool selection in a step-by-step approach. *International Journal of Industrial Ergonomics*, *52*, 18–28. https://doi.org/10.1016/j.ergon.2015.08.001

Occhipinti, E, & Colombini, D. (2016). A toolkit for the analysis of biomechanical overload and prevention of WMSDs: Criteria, procedures and tool selection in a step-by-step approach. *International Journal of Industrial Ergonomics*, *52*, 18–28. https://doi.org/10.1016/j.ergon.2015.08.001

Occhipinti, Enrico, & Colombini, D. (2012). IEA/WHO toolkit for WMSDs prevention: criteria and practical tools for a step by step approach. *Work*, *41*, 3937–3944. https://doi.org/10.3233/WOR-2012-0690-3937

Oldham, G. R., & Fried, Y. (2016). Job design research and theory: Past, present and future. *Organizational Behavior and Human Decision Processes*, *136*, 20–35. https://doi.org/10.1016/j.obhdp.2016.05.002

Onawumi, A. S., Dunmade, I. S., Ajayi, O. O., Adebiyi, K. A., & Omotosho, A. . (2016). Investigation of work related health hazards prevalent among metal fabrication workers in nigeria. *European Journal of Engineering and Technology*, *4*(4), 1–10.

Onawumi, A. S., S., D. I., Ajayi, O. O., Adebiyi, K. A., & A.O, O. (2016). Investigation of work related health hazards prevalent among metal fabrication workers in nigeria. *European Journal of Engineering and Technology*, *4*(4), 1–10.

Oranye, N. O., Wallis, B., Ahmad, N., & Aguilar, Z. (2017a). Workers' experience with work-related musculoskeletal disorder and worker's perception of organisational policies and practices"Maintaining employment and improving health: A qualitative exploration of a job retention programme for employees with mental h. *International Journal of Workplace Health Management International Journal of Workplace Health Management International Journal of Workplace Health Management Iss International Journal of Workplace Health Management*, *10*(1), 69–83.

Oranye, N. O., Wallis, B., Ahmad, N., & Aguilar, Z. (2017b). Workers' experience with work-related musculoskeletal disorder and worker's perception of organisational policies and practices. *International Journal of Workplace Health Management*, *10*(1), 69–83. https://doi.org/10.1108/IJWHM-03-2016-0015

Organization, W. H. (1985). *Identification and control of work-related diseases: report of a WHO expert committee [meeting held in Geneva from 28 November to 2 December 1983]*. World Health Organization.

Organization, W. H. (2010). *Healthy workplaces: a model for action: for employers, workers, policy-makers and practitioners*. World Health Organization. whqlibdoc. who.int/publications/2010/9789241599313 eng.pdf

Orr, G. B., & Elyea, L. L. (2006). The participatory ergonomics at the US postal service. *42nd Annual Human Factors and Ergonomics Society of Australia Conference 2006, HFESA 2006*, *May*, 10–16.

Otto, A., & Battaïa, O. (2017). Reducing physical ergonomic risks at assembly lines by line balancing and job rotation: A survey. *Computers and Industrial Engineering*, *111*, 467–480. https://doi.org/10.1016/j.cie.2017.04.011

Padma, T., & Balasubramanie, P. (2007). Analytic hierarchy process to assess occupational risk for shoulder and neck pain. *Applied Mathematics and Computation*, *193*(2), 321–324. https://doi.org/10.1016/j.amc.2007.03.060

Padma, T., & Balasubramanie, P. (2009a). Knowledge based decision support system to assist work-related risk analysis in musculoskeletal disorder. *Knowledge-Based Systems*, *22*(1), 72–78. https://doi.org/10.1016/j.knosys.2008.07.001

Padma, T., & Balasubramanie, P. (2009b). Knowledge based decision support system to assist work-related risk analysis in musculoskeletal disorder. *Knowledge-Based Systems*, *22*(1), 72–78. https://doi.org/10.1016/j.knosys.2008.07.001

Padma, T., & Balasubramanie, P. (2011a). A fuzzy analytic hierarchy processing decision support system to analyze occupational menace forecasting the spawning of shoulder and neck pain. *Expert Systems with Applications*, *38*(12), 15303–15309. https://doi.org/10.1016/j.eswa.2011.06.037

Padma, T., & Balasubramanie, P. (2011b). Domain experts ' knowledge-based intelligent decision support system in occupational shoulder and neck pain

therapy. *Applied Soft Computing Journal*, *11*(2), 1762–1769. https://doi.org/10.1016/j.asoc.2010.05.019

Paez, O. R., & Genaidy, A. M. (2017). Financial assessment of health and safety programmes in the workplace. *Theoretical Issues in Ergonomics Science*, *18*(3), 241–265. https://doi.org/10.1080/1463922X.2016.1207210

Pallant, J. (2011). *SPSS Survival Manual* (4th Editio). Allen & Unwin.

Pan, C., & Jiangping, Z. (2012). Comprehensive Evaluation on Occupational Hazards for Steel Rolling Workshops with the Interactive Effects of Multiple Hazards. *Procedia Engineering*, *43*, 143–149. https://doi.org/10.1016/j.proeng.2012.08.025

Parimalam, P., Kamalamma, N., & Ganguli, A. (2006). Ergonomic interventions to improve work environment in garment manufacturing units. *Indian Journal of Occupational and Environmental Medicine*, *10*(2), 74. https://doi.org/10.4103/0019-5278.27304

Parry, S. P., Coenen, P., Shrestha, N., O'Sullivan, P. B., Maher, C. G., & Straker, L. M. (2019). Workplace interventions for increasing standing or walking for decreasing musculoskeletal symptoms in sedentary workers. In *Cochrane Database of Systematic Reviews* (Vol. 2019, Issue 11). https://doi.org/10.1002/14651858.CD012487.pub2

Pavić, Z., & Novoselac, V. (2013). Notes on TOPSIS method. *International Journal of Research in Engineering and Science*, *1*(2), 5–12.

Pavlovic-veselinovic, S., Hedge, A., & Veselinovic, M. (2016). An ergonomic expert system for risk assessment of work-related musculo-skeletal disorders. *International Journal of Industrial Ergonomics*, *53*, 130–139. https://doi.org/10.1016/j.ergon.2015.11.008

Pavlovic-Veselinovic, S., Hedge, A., & Veselinovic, M. (2016). An ergonomic expert system for risk assessment of work-related musculo-skeletal disorders. *International Journal of Industrial Ergonomics*, *53*, 130–139. https://doi.org/10.1016/j.ergon.2015.11.008

Pecchia, L., Bath, P. A., Pendleton, N., & Bracale, M. (2011). Analytic Hierarchy Process (AHP) for Examining Healthcare Professionals' Assessments of Risk Factors. *Methods of Information in Medicine*, *50*(05), 435–444. https://doi.org/10.3414/ME10-01-0028

Pejčić, N., Petrović, V., Marković, D., Miličić, B., Dimitrijević, I. I., Perunović, N., & Čakić, S. (2017). Assessment of risk factors and preventive measures and their relations to work-related musculoskeletal pain among dentists. *Work*, *57*(4), 573–593. https://doi.org/10.3233/WOR-172588

Peppoloni, L., Filippeschi, A., Ruffaldi, E., & Avizzano, C. A. (2016). (WMSDs issue

) A novel wearable system for the online assessment of risk for biomechanical load in repetitive efforts *. *International Journal of Industrial Ergonomics*, *52*, 1–11. https://doi.org/10.1016/j.ergon.2015.07.002

Pereira, M., Silva, D., Gonc, F., & Mandagara, H. (2016). *Difficulties in Quantifying Financial Losses that Could Be Reduced by Ergonomic Solutions Difficulties in Quantifying Financial Losses that Could Be Reduced by Ergonomic Solutions*. *JULY 2014*. https://doi.org/10.1002/hfm.20393

Pérez, E., Rodríguez, Y., Salazar, M. C., & Trujillo, M. A. (2021). Improving Working Conditions Using the Ergonomic Checkpoints Tool: Application in a Colombian Meat Processing Plant. *IISE Transactions on Occupational Ergonomics and Human Factors*, *0*(0), 1–6. https://doi.org/10.1080/24725838.2021.1962622

Perez, G. M. (2019). ERGONOMICS. In *Handbook of Occupational Safety and Health* (pp. 49–87). John Wiley & Sons, Inc. https://doi.org/10.1002/9781119581482.ch3

Perry, M. A., Mulligan, H., & Smith, C. (2017). How do professional caregivers perceive their health and well-being? *International Journal of Workplace Health Management*, *10*(6), 434–449. https://doi.org/10.1108/IJWHM-05-2017-0029

Pessina, D., & Bonalume, V. (2010). A predictive model for the vibration risk evaluation in agricultural machinery use. *XVIIth World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)*, 1–6.

Petruni, A., Giagloglou, E., Douglas, E., Geng, J., Chiara, M., & Demichela, M. (2017). Applying Analytic Hierarchy Process (AHP) to choose a human factors technique : Choosing the suitable Human Reliability Analysis technique for the automotive industry. *Safety Science*. https://doi.org/10.1016/j.ssci.2017.05.007

Petruni, A., Giagloglou, E., Douglas, E., Geng, J., Leva, M. C., & Demichela, M. (2019a). Applying Analytic Hierarchy Process (AHP) to choose a human factors technique: Choosing the suitable Human Reliability Analysis technique for the automotive industry. *Safety Science*, *119*, 229–239. https://doi.org/10.1016/j.ssci.2017.05.007

Petruni, A., Giagloglou, E., Douglas, E., Geng, J., Leva, M. C., & Demichela, M. (2019b). Applying Analytic Hierarchy Process (AHP) to choose a human factors technique: Choosing the suitable Human Reliability Analysis technique for the automotive industry. *Safety Science*, *119*, 229–239. https://doi.org/10.1016/j.ssci.2017.05.007

Piranveyseh, P., Motamedzade, M., Osatuke, K., Mohammadfam, I., Moghimbeigi, A., Soltanzadeh, A., & Mohammadi, H. (2016). Association between psychosocial, organizational and personal factors and prevalence of musculoskeletal disorders in office workers. *International Journal of Occupational Safety and Ergonomics*, *22*(2), 267–273. https://doi.org/10.1080/10803548.2015.1135568

Pulat, B. M. (1992). *Fundamentals of Industrial Ergonomics* (C. L. Atkins (ed.)). Prentice Hall Incorporation.

Punnett, L., Warren, N., Henning, R., Nobrega, S., & Cherniack, M. (2013). Participatory ergonomics as a model for integrated programs to prevent chronic disease. *Journal of Occupational and Environmental Medicine*, *55*(12 SUPPL.). https://doi.org/10.1097/JOM.0000000000000040

Qattawi, A., Mayyas, A., Abdelhamid, M., & Omar, M. A. (2013). Incorporating quality function deployment and analytical hierarchy process in a knowledge-based system for automotive production line design. *International Journal of Computer Integrated Manufacturing*, *26*(9), 839–856. https://doi.org/10.1080/0951192X.2013.799780

Qiu, B., Zhou, J., Zheng, Z., & Shen, H. (2017). Should Tractors' Ergonomic Evaluation Index System in Different Life Cycle Stage be Different? A Delphi Survey Conducted in China. *International Conference on Applied Human Factors and Ergonomics*, 145–156.

Quansah, R. (2005). Harmful postures and musculoskeletal symptoms among sanitation workers of a fish processing factory in ghana: A preliminary investigation. *International Journal of Occupational Safety and Ergonomics*, *11*(2), 171–180. https://doi.org/10.1080/10803548.2005.11076636

Qureshi, M. I., Iftikhar, M., Abbas, S. G., Hassan, U., Khan, K., & Zaman, K. (2013). Relationship between job stress, workload, environment and employees turnover intentions: What we know, what should we know. *World Applied Sciences Journal*, *23*(6), 764–770. https://doi.org/10.5829/idosi.wasj.2013.23.06.313

Qutubuddin, S. M., Hebbal, S. S., & Kumar, A. C. . (2012). Computer Assisted System for Enhancing the Application of Ergonomics in Manufacturing Systems. *International Journal of Ergonomics*, *2*(1), 1–11.

Radjiyev, A., Qiu, H., Xiong, S., & Nam, K. (2015). Ergonomics and sustainable development in the past two decades (1992–2011): Research trends and how ergonomics can contribute to sustainable development. *Applied Ergonomics*, *46*, 67–75. https://doi.org/10.1016/j.apergo.2014.07.006

Rafeemanesh, E., Kashani, F. O., Parvaneh, R., & Ahmadi, F. (2017a). A survey on low back pain risk factors in steel industry workers in 2015. *Asian Spine Journal*, *11*(1), 44–49. https://doi.org/10.4184/asj.2017.11.1.44

Rafeemanesh, E., Kashani, F. O., Parvaneh, R., & Ahmadi, F. (2017b). A survey on low back pain risk factors in steel industry workers in 2015. *Asian Spine Journal*, *11*(1), 44–49. https://doi.org/10.4184/asj.2017.11.1.44

Raghunathan, R., & R, S. (2016). Review of Recent Developments in Ergonomic Design and Digital Human Models. *Industrial Engineering & Management*, *5*(2). https://doi.org/10.4172/2169-0316.1000186

Rahmani, A., Khadem, M., Madreseh, E., Aghaei, H. A., Raei, M., & Karchani, M. (2013). Descriptive study of occupational accidents and their causes among electricity distribution company workers at an eight-year period in Iran. *Safety and Health at Work*, *4*(3), 160–165. https://doi.org/10.1016/j.shaw.2013.07.005

Rajakarunakaran, S., Maniram Kumar, A., & Arumuga Prabhu, V. (2015). Applications of fuzzy faulty tree analysis and expert elicitation for evaluation of risks in LPG refuelling station. *Journal of Loss Prevention in the Process Industries*, *33*, 109–123. https://doi.org/10.1016/j.jlp.2014.11.016

Rajarajan, M., & Vetrivel, M. M. (2015). A study on the labour welfare measures and social security towards Sipcot Industries in Cuddalore district of Tamil Nadu. *Asia Pacific Journal of Research Vol: I. Issue XXXII*.

Raviv, G., Shapira, A., & Fishbain, B. (2017). AHP-based analysis of the risk potential of safety incidents: Case study of cranes in the construction industry. *Safety Science*, *91*, 298–309. https://doi.org/10.1016/j.ssci.2016.08.027

Rehman, A.-U., Ullah, M. I., & Abrar-Ul-Haq, M. (2015). The Influence of Individual Characteristics on Organization Performance and Job Satisfaction. *International Journal of Scientific and Research Publications*, *5*(1), 1–6. www.ijsrp.org

Reinhold, K., Tint, P., Tuulik, V., & Saarik, S. (2008). Innovations at Workplace: Improvement of Ergonomics. *Inzinerine Ekonomika-Engineering Economics*, *5*(5), 85–94.

Reyes-Martínez, R. M., Maldonado-Macías, A., & Prado-León, L. R. (2012). Human factors identification and classification related to accidents'causality on hand injuries in the manufacturing industry. *Work*, *41*(SUPPL.1), 3155–3163. https://doi.org/10.3233/WOR-2012-0577-3155

Richardson, M., Maspero, M., Golightly, D., Sheffield, D., Staples, V., & Lumber, R. (2017). Nature: a new paradigm for well-being and ergonomics. *Ergonomics*, *60*(2), 292–305. https://doi.org/10.1080/00140139.2016.1157213

Rivero, L. C., Rodríguez, R. G., Pérez, M. D. R., Mar, C., & Juárez, Z. (2015). Fuzzy Logic and RULA Method for Assessing the Risk of Working. *Procedia Manufacturing*, *3*(Ahfe), 4816–4822. https://doi.org/10.1016/j.promfg.2015.07.591

Robertson, M. M., & Courtney, T. K. (2004). A systems analysis approach to solving office work system health and performance problems. *Theoretical Issues in Ergonomics Science*, *5*(3), 181–197. https://doi.org/10.1080/1463922021000032320

Roquelaure, Y., Bodin, J., Ha, C., le Manac'h, A. P., Descatha, A., Chastang, J. F., Leclerc, A., Goldberg, M., & Imbernon, E. (2011). Personal, biomechanical, and psychosocial risk factors for rotator cuff syndrome in a working population. *Scandinavian Journal of Work, Environment and Health*, *37*(6), 502–511.

https://doi.org/10.5271/sjweh.3179

Rosecrance, J. C., & Cook, T. M. (2000). The use of participatory action research and ergonomics in the prevention of work-related musculoskeletal disorders in the newspaper industry. *Applied Occupational and Environmental Hygiene*, *15*(3), 255–262. https://doi.org/10.1080/104732200301575

Rossi, D., Bertoloni, E., Fenaroli, M., Marciano, F., & Alberti, M. (2013). A multi-criteria ergonomic and performance methodology for evaluating alternatives in "manuable" material handling. *International Journal of Industrial Ergonomics*, *43*(4), 314–327. https://doi.org/10.1016/j.ergon.2013.04.009

Rossi, D., Marciano, F., & Cabassa, P. (2019). A multi-criteria methodology for evaluating alternative ultrasound devices. *Ergonomics*, *62*(10), 1301–1312. https://doi.org/10.1080/00140139.2019.1647349

Rost, K. A., & Alvero, A. M. (2020). Participatory approaches to workplace safety management: bridging the gap between behavioral safety and participatory ergonomics. *International Journal of Occupational Safety and Ergonomics*, *26*(1), 194–203. https://doi.org/10.1080/10803548.2018.1438221

Rothmore, P., Aylward, P., & Karnon, J. (2015). The implementation of ergonomics advice and the stage of change approach. *Applied Ergonomics*, *51*, 370–376. https://doi.org/10.1016/j.apergo.2015.06.013

Russo, R. D. F. S. M., & Camanho, R. (2015). Criteria in AHP: A systematic review of literature. *Procedia Computer Science*, *55*(Itqm), 1123–1132. https://doi.org/10.1016/j.procs.2015.07.081

Rwamamara, R. A., Lagerqvist, O., Olofsson, T., Johansson, B. M., & Algirdas Kaminskas, K. (2010). Evidence-based prevention of work-related musculoskeletal injuries in construction industry. *Journal of Civil Engineering and Management*, *16*(4), 499–509. https://doi.org/10.3846/jcem.2010.56

S.M, Q., Hebbal, S. ., & Kumar, A. C. . (2013). An ergonomic study of work re lated musculoskeletal disorder risks in Indian Saw Mills. *Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, *7*(5), 7–13.

Saarikoski, H., Barton, D. N., Mustajoki, J., H., K., Gomez-Baggethun, E., & Langemeyer, J. (2015). Multi-criteria decision analysis (MCDA) in ecosystem service valuation. *OpenNESS Ecosystem Service Reference Book*, *1*(17), 1–5.

Saaty, R. W. (1987). The analytic hierarchy process-what it is and how it is used. *Mathematical Modelling*, *9*(3–5), 161–176. https://doi.org/10.1016/0270-0255(87)90473-8

Saaty, T. L. (1977). A scaling method for priorities in hierarchical structures. *Journal of Mathematical Psychology*, *15*(3), 234–281. https://doi.org/10.1016/0022-2496(77)90033-5

Saaty, T. L. (1980). The Analytic Hierarchy Process. *Decision Analysis*, 1–17.

Saaty, T. L. (1990). How to make a decision: The analytic hierarchy process. *European Journal of Operational Research*, *48*(1), 9–26. https://doi.org/10.1016/0377-2217(90)90057-I

Saaty, T. L. (1994). How to Make a Decision: The Analytic Hierarchy Process. *Interfaces*, *24*(6), 19–43. https://doi.org/10.1287/inte.24.6.19

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, *1*(1), 83. https://doi.org/10.1504/IJSSCI.2008.017590

Sachdeva, A., Gupta, B. ., & Anand, S. (2011). Minimizing Musculoskeletal Disorders in Lathe Machine Workers. *International Journal of Ergonomics*, *1*(2), 20–28.

Sain, M. K., & Meena, M. L. (2016). Occupational Health and Ergonomic intervention in Indian small scale industries: A review. *International Journal of Recent Advances in Mechanical Engineering*, *5*(1), 13–24. https://doi.org/10.14810/ijmech.2016.5102

Sajja, P. S., & Akerkar, R. (2010). Knowledge-Based Systems for Development. In *Advanced Knowledge Based Systems: Model, Applications & Research* (Vol. 1, pp. 1–11).

Saniuk, A. (2015). Universal access in Human-Computer Interaction. Access to the Human Environment and Culture. In M. Antona & C. Stephanidis (Eds.), *Springer International Publishing* (Vol. 9178, Issue August 2015). Springer International Publishing. https://doi.org/10.1007/978-3-319-20687-5

Sanjog, J., Patel, T., Chowdhury, A., & Karmakar, S. (2015). Musculoskeletal ailments in Indian injection-molded plastic furniture manufacturing shop-floor: Mediating role of work shift duration. *International Journal of Industrial Ergonomics*, *48*, 89–98. https://doi.org/10.1016/j.ergon.2015.04.004

Sanjog, J., Patel, T., & Karmakar, S. (2019). Occupational ergonomics research and applied contextual design implementation for an industrial shop-floor workstation. *International Journal of Industrial Ergonomics*, *72*, 188–198. https://doi.org/10.1016/j.ergon.2019.05.009

Sanjog, J., Patnaik, B., Patel, T., & Karmakar, S. (2016). Context-specific design interventions in blending workstation: An ergonomics perspective. *Journal of Industrial and Production Engineering*, *33*(1), 32–50. https://doi.org/10.1080/21681015.2015.1099057

Sasikumar, V., & Binoosh, S. champakkadayil A. basheer. (2020). A model for predicting the risk of musculoskeletal disorders among computer professionals. *International Journal of Occupational Safety and Ergonomics*, *26*(2), 384–396. https://doi.org/10.1080/10803548.2018.1480583

Savino, M. M., Battini, D., & Riccio, C. (2017). Visual management and artificial intelligence integrated in a new fuzzy-based full body postural assessment. *Computers and Industrial Engineering*, *111*, 596–608. https://doi.org/10.1016/j.cie.2017.06.011

Savino, M., Mazza, A., & Battini, D. (2016). New easy to use postural assessment method through visual management. *International Journal of Industrial Ergonomics*, *53*, 48–58. https://doi.org/10.1016/j.ergon.2015.09.014

Saxena, S. (2015). *Ergonomics at Workplace : A Human Resource Initiative to Increase Wellness*. *VII*(1), 79–82.

Scott, J., Brown, S. A., Benjamin, P., & Jr, J. F. N. (2015). User acceptance of knowledge-based system recommendations : Explanations , arguments , and fi t. *Decision Support Systems*, *72*, 1–10. https://doi.org/10.1016/j.dss.2015.02.005

Scott, P., Kogi, K., & McPhee, B. (2010). *Ergonomics Guidelines for occupational health practice in industrially developing countries*.

Sedighi, A., & Nussbaum, M. A. (2017). Temporal changes in motor variability during prolonged lifting/lowering and the influence of work experience. *Journal of Electromyography and Kinesiology*, *37*(March), 61–67. https://doi.org/10.1016/j.jelekin.2017.09.001

Seker, S., & Zavadskas, E. (2017). Application of Fuzzy DEMATEL Method for Analyzing Occupational Risks on Construction Sites. *Sustainability*, *9*(11), 1–19. https://doi.org/10.3390/su9112083

Seri, R. K., Nurulhuda, A., & Rohana, A. (2013). Vibration of Power Hand Tool and Discomfort Experience among Malaysian Industrial Workers. *Advanced Engineering Forum*, *10*, 313–317. https://doi.org/10.4028/www.scientific.net/AEF.10.313

Shamsudin, M. Z., Vijaykumar, V., & Md Daud, M. Y. (2017). Work-related Musculoskeletal Disorders (WMSDs) among Industrial Packaging Workers in Malaysia. *Malaysian Journal of Human Factors and Ergonomics*, *2*(1), 17–24.

Shariat, A., Tamrin, S. B. M., Arumugam, M., Danaee, M., & Ramasamy, R. (2016). Prevalence Rate of Musculoskeletal Discomforts Based on Severity Level Among Office Workers. *Acta Medica Bulgarica*, *43*(1), 54–63. https://doi.org/10.1515/amb-2016-0007

Shavarani, S. M., & Korhan, O. (2015). Expert System Assessment of Work-Related Musculoskeletal Disorders for Video Display Terminal Users. *Aplied Research Quality Life*, *10*, 205–216. https://doi.org/10.1007/s11482-014-9307-5

Shih, B.-Y., Chen, C.-Y., & Chen, Z.-S. (2006). Performing Ergonomics Analyses through Virtual Interactive Design: Validity and Reliability Assessment. *Human Factors and Ergonomics in Manufacturing*, *16*(1), 61–81.

https://doi.org/10.1002/hfm

Shin, W., & Park, M. (2017). Ergonomic interventions for prevention of work-related musculoskeletal disorders in a small manufacturing assembly line. In *International Journal of Occupational Safety and Ergonomics* (pp. 1–13). https://doi.org/10.1080/10803548.2017.1373487

Shin, W., & Park, M. (2019). Ergonomic interventions for prevention of work-related musculoskeletal disorders in a small manufacturing assembly line. *International Journal of Occupational Safety and Ergonomics*, *25*(1), 110–122. https://doi.org/10.1080/10803548.2017.1373487

Shinde, G. V., & Jadhav, V. S. (2012). Ergonomic analysis of an assembly workstation to identify time consuming and fatigue causing factors using application of motion study. *International Journal of Innovative Research in Science, Engineering and Technology*, *4*(5), 220–227. https://doi.org/10.15680/IJIRSET.2015.0405125

Shiri, R., Heliövaara, M., Ahola, K., Kaila-Kangas, L., Haukka, E., Kausto, J., Saastamoinen, P., Leino-Arjas, P., & Lallukka, T. (2018). A screening tool for the risk of disability retirement due to musculoskeletal disorders. *Scandinavian Journal of Work, Environment & Health*, *44*(1), 37–46. https://doi.org/10.5271/sjweh.3684

Shoaf, C., Genaidy, A., Haartz, J., Karwowski, W., Shell, R., Hancock, P. A., & Huston, R. (2000). An adaptive control model for assessment of work-related musculoskeletal hazards and risks. *Theoretical Issues in Ergonomics Science*, *1*(1), 34–61. https://doi.org/10.1080/146392200308462

Silva, C., Barros, C., Cunha, L., Carnide, F., & Santos, M. (2014). Prevalence of back pain problems in relation to occupational group. *International Journal of Industrial Ergonomics*, *52*, 52–58. https://doi.org/10.1016/j.ergon.2015.08.005

Silva, S., Alçada-almeida, L., & Dias, L. C. (2014). Development of a Web-based Multi-criteria Spatial Decision Support System for the assessment of environmental sustainability of dairy farms. *COMPUTERS AND ELECTRONICS IN AGRICULTURE*, *108*, 46–57. https://doi.org/10.1016/j.compag.2014.06.009

Simões, R. R., & Figueiredo, V. G. C. (2012). The overload at work and outside of work: the case of woman operators of blistering. *Work*, *41*, 698–702. https://doi.org/10.3233/WOR-2012-0228-698

Singh, B., Singh, A., & Yadav, R. C. (2014). Reluctant Workforce may Derail the Adoption of Advance Manufacturing Technology in Micro, Small and Medium Enterprises of India. *Global Journal of Enterprise Information System*, *6*(2), 12. https://doi.org/10.15595/gjeis/2014/v6i2/51842

Singh, J. K., & Jain, M. (2013). A study of employees' job satisfaction and its impact

on their performance. *Journal of Indian Research*, *1*(4), 105–111. https://doi.org/10.1021/acs.jmedchem.7b01826

Sirisawasd, S., Taptagaporn, S., Boonshuyar, C., & Earde, P. (2018). Interventions commonly used to prevent work-related musculoskeletal disorders among healthcare workers. *Journal of Health Research*, *32*(5), 371–383. https://doi.org/10.1108/JHR-08-2018-044

So, R. H. Y., & Lam, S. T. (2014). Factors affecting the appreciation generated through applying human factors/ergonomics (HFE) principles to systems of work. *Applied Ergonomics*, *45*(1), 99–109. https://doi.org/10.1016/j.apergo.2013.04.019

Sobhani, A., Wahab, M. I. M., & Jaber, M. Y. (2019). The effect of working environment aspects on a vendor–buyer inventory model. *International Journal of Production Economics*, *208*, 171–183. https://doi.org/10.1016/j.ijpe.2018.11.017

Sobhani, A., Wahab, M. I. M., & Neumann, W. P. (2015). Investigating work-related ill health effects in optimizing the performance of manufacturing systems. *European Journal of Operational Research*, *241*, 708–718.

Sohail, M. U., & Kashif, A. R. (2016). Effect of Ergonomical Factors on the Employees. *International Journal of Advanced Engineering, Management and Science (IJAEMS)*, *2*(6).

Soriano, A., Kozusznik, M. W., & Peiró, J. M. (2018). From office environmental stressors to work performance: the role of work patterns. *International Journal of Environmental Research and Public Health*, *15*(8). https://doi.org/10.3390/ijerph15081633

Sout, N. M., Ismail, A. R., & Mansor, M. A. (2015). Perception Study On Ergonomics Practices In Malaysian Quarry And Mining Industry. *International Journal of Current Research and Academic Review*, *12*(June), 197–202.

St-Arnaud, L., Briand, C., & Corbière, M. (2014). *Supporting a return to work after an absence for a mental health problem: Design, implementation, and evaluation of an integrated practices program*. Institut de recherche Robert-Sauvé en santé et en sécurité du travail.

Starovoytova, D. (2017). Hazards and Risks at Rotary Screen Printing (Part 2 / 6): Analysis of Machine-operators' Posture via Rapid-Upper-Limb-Assessment (RULA). *Industrial Engineering Letters*, *7*(5), 42–63.

Stock, S. R., Nicolakakis, N., Vézina, N., Vézina, M., Gilbert, L., Turcot, A., Sultan-Taïeb, H., Sinden, K., Denis, M. A., Delga, C., & Beaucage, C. (2018). Are work organization interventions effective in preventing or reducing work-related musculoskeletal disorders? A systematic review of the literature. *Scandinavian Journal of Work, Environment and Health*, *44*(2), 113–133.

https://doi.org/10.5271/sjweh.3696

Subramaniam, S., & Murugesan, S. (2015). Investigation of work-related musculoskeletal disorders among male kitchen workers in South India. *International Journal of Occupational Safety and Ergonomics*, *21*(4), 524–531. https://doi.org/10.1080/10803548.2015.1096063

Suhr, D. (2009). Guidelines for Reliability , Confirmatory and Exploratory Factor Analysis. *Conference Proceedings of Westerns Users of SAS SOFTWARE;2009 Sept 1-3, September 1-3*, 1–15.

Sultan-Taïeb, H., Parent-Lamarche, A., Gaillard, A., Stock, S., Nicolakakis, N., Hong, Q. N., Vezina, M., Coulibaly, Y., Vézina, N., & Berthelette, D. (2017a). Economic evaluations of ergonomic interventions preventing work-related musculoskeletal disorders: a systematic review of organizational-level interventions. *BMC Public Health*, *17*(1), 935. https://doi.org/10.1186/s12889-017-4935-y

Sultan-Taïeb, H., Parent-Lamarche, A., Gaillard, A., Stock, S., Nicolakakis, N., Hong, Q. N., Vezina, M., Coulibaly, Y., Vézina, N., & Berthelette, D. (2017b). Economic evaluations of ergonomic interventions preventing work-related musculoskeletal disorders: a systematic review of organizational-level interventions. *BMC Public Health*, *17*(1), 935. https://doi.org/10.1186/s12889-017-4935-y

Sundin, A., Christmansson, M., & Larsson, M. (2004). A different perspective in participatory ergonomics in product development improves assembly work in the automotive industry. *International Journal of Industrial Ergonomics*, *33*(1), 1–14. https://doi.org/10.1016/j.ergon.2003.06.001

Sung, C. Y. Y., Ho, K. K. F., Lam, R. M. W., Lee, A. H. Y., & Chan, C. C. H. (2003). Physical and psychosocial factors in display screen equipment assessment. *Hong Kong Journal of Occupational Therapy*, *13*(1), 2–10. https://doi.org/10.1016/S1569-1861(09)70017-8

Suzuki, A., Sato, T., Sakasegawa, D., Sawada, H., & Goto, M. (2007). Adhesion properties of swollen hydrogels evaluated by a point-contact method. *Journal of Applied Polymer Science*, *105*(6), 3728–3738. https://doi.org/10.1016/j.apergo.2009.12.016

Swanson, N. G., & Sauter, S. L. (2006). A multivariate evaluation of an office ergonomic intervention using longitudinal data. *Theoretical Issues in Ergonomics Science*, *7*(1), 3–17.

Sylla, N., Bonnet, V., Colledani, F., & Fraisse, P. (2014). Ergonomic contribution of ABLE exoskeleton in automotive industry. *International Journal of Industrial Ergonomics*, *44*(4), 475–481. https://doi.org/10.1016/j.ergon.2014.03.008

Syuaib, M. F. (2015). Ergonomic of the manual Harvesting tasks of oil-palm plantation

in Indonesia based on anthropometric, postures and work motions analyses. *International Agricultural Engineering Journal*, *17*(3), 248–262.

Tamrin, S. B. M., Mohamed, M. S. S., & Guan, N. Y. (2017). KD1-4 Challenges in Establishing the Professional Ergonomist Certification Scheme in Malaysia. *The Japanese Journal of ErgonomicsThe Japanese Journal of Ergonomics*, *53*(Supplement1), S42–S47. https://doi.org/10.5100/jje.53.s42

Threeton, M. D., Kwon, K., Fleck, J. A., Ketchem, R. B., & Farzam, L. (2019). An investigation of instructional practices which promote occupational safety and health. *International Journal of Occupational Safety and Ergonomics*, *0*(0), 1–28. https://doi.org/10.1080/10803548.2019.1659000

Thun, J.-H., Lehr, C. B., & Bierwirth, M. (2011). Feel free to feel comfortable—An empirical analysis of ergonomics in the German automotive industry. *International Journal of Production Economics*, *133*(2), 551–561. https://doi.org/10.1016/j.ijpe.2010.12.017

Thwala, W. D., Ajagbe, M. A., Enegbuma, W. I., Bilau, A. A., & Long, C. S. (2012). *Sudanese Small and Medium Sized Construction Firms : An Empirical Survey of Job Turnover*. *2*(8), 7414–7420.

Toledo, R., Engler, A., & Ahumada, V. (2011). Evaluation of Risk Factors in Agriculture: An Application of the Analytical Hierarchical Process (AHP) Methodology. *Chilean Journal of Agricultural Research*, *71*(1), 114–121. https://doi.org/10.4067/S0718-58392011000100014

Tompa, E., Dolinschi, R., & Laing, A. (2009). An economic evaluation of a participatory ergonomics process in an auto parts manufacturer. *Journal of Safety Research*, *40*(1), 41–47. https://doi.org/10.1016/j.jsr.2008.12.003

Tompa, E., Dolinschi, R., & Natale, J. (2013). *Economic evaluation of a participatory ergonomics intervention in a textile plant*. *44*, 480–487.

Tong, D. Y. K., Rasiah, D., Tong, X. F., & Lai, K. P. (2015). Leadership empowerment behaviour on safety officer and safety teamwork in manufacturing industry. *Safety Science*, *72*, 190–198. https://doi.org/10.1016/j.ssci.2014.09.009

Vaidya, O. S., & Kumar, S. (2006). Analytic hierarchy process: An overview of applications. *European Journal of Operational Research*, *169*(1), 1–29. https://doi.org/10.1016/j.ejor.2004.04.028

Valentin, C. Di, Emrich, A., Werth, D., & Loos, P. (2015). User-Centric Workflow Ergonomics in Industrial Environments: Concept and Architecture of an Assistance System. *2015 International Conference on Computational Science and Computational Intelligence (CSCI)*, 754–759. https://doi.org/10.1109/CSCI.2015.116

van der Beek, A. J., Erik Mathiassen, S., Windhorst, J., & Burdorf, A. (2005). An

evaluation of methods assessing the physical demands of manual lifting in scaffolding. *Applied Ergonomics*, *36*(2), 213–222. https://doi.org/10.1016/j.apergo.2004.10.012

van Eerd, D., Cole, D., Irvin, E., Mahood, Q., Keown, K., Theberge, N., Village, J., St. Vincent, M., & Cullen, K. (2010). Process and implementation of participatory ergonomic interventions: A systematic review. *Ergonomics*, *53*(10), 1153–1166. https://doi.org/10.1080/00140139.2010.513452

Van Eerd, D., King, T., Keown, K., Slack, T., Cole, D. C., Irvin, E., Amick, B. C., & Bigelow, P. (2016). Dissemination and use of a participatory ergonomics guide for workplaces. *Ergonomics*, *59*(6), 851–858. https://doi.org/10.1080/00140139.2015.1088073

Van, L., Chaiear, N., Sumananont, C., & Kannarath, C. (2016). Prevalence of musculoskeletal symptoms among garment workers in Kandal province, Cambodia. *Journal of Occupational Health*, *58*(1), 107–117. https://doi.org/10.1539/joh.15-0100-fs

Vandergrift, J. L., Gold, J. E., Hanlon, A., & Punnett, L. (2012). Physical and psychosocial ergonomic risk factors for low back pain in automobile manufacturing workers. *Occupational and Environmental Medicine*, *69*(1), 29–34. https://doi.org/10.1136/oem.2010.061770

Vandyck, E., & Fianu, D. A. G. (2012). The work practices and ergonomic problems experienced by garment workers in Ghana. *International Journal of Consumer Studies*, *36*(4), 486–491. https://doi.org/10.1111/j.1470-6431.2011.01066.x

Veitch, J. A. (2001). Psychological processes influencing lighting quality. *Journal of the Illuminating Engineering Society*. https://doi.org/10.1080/00994480.2001.10748341

Vieira, E. R., Buckeridge Serra, M. V. G., Brentini de Almeida, L., Vieira Villela, W., Domingos Scalon, J., & Veiga Quemelo, P. R. (2015). Symptoms and risks for musculoskeletal disorders among male and female footwear industry workers. *International Journal of Industrial Ergonomics*, *48*, 110–116. https://doi.org/10.1016/j.ergon.2015.05.001

Vieira, L., Balbinotti, G., Varasquin, A., & Gontijo, L. (2012). Ergonomics and Kaizen as strategies for competitiveness: A theoretical and practical in an automotive industry. *Work*, *41*(SUPPL.1), 1756–1762. https://doi.org/10.3233/WOR-2012-0381-1756

Village, J., Koehoorn, M., Hossain, S., & Ostry, A. (2009). Quantifying tasks, ergonomic exposures and injury rates among school custodial workers. *Ergonomics*, *52*(6), 723–734. https://doi.org/10.1080/00140130802524633

Von Thiele Schwarz, U., & Lindfors, P. (2015). Improved fitness after a workbased physical exercise program. *International Journal of Workplace Health*

Management, *8*(1), 61–74. https://doi.org/10.1108/IJWHM-10-2013-0038

Vyavahare, R. T. (2015). *An Ergonomic Evaluation of an Industrial Workstation : A Review*. *5*(3), 1820–1826.

Wadsworth, E., Bhattacharya, S., & Walters, D. (2015). Representing workers on arrangements for occupational safety and health in a global industry: Dock-workers' experiences in two countries. *Policy and Practice in Health and Safety*, *13*(2), 87–107. https://doi.org/10.1080/14774003.2015.11667819

Wanave, S. B., & Bhadke, M. K. (2013). An Ergonomic Evaluation & Assessment Of The Workstation To Improve The Productivity For An Enterprise : -A Review. *International Journal of Engineering Research and Applications*, *3*(6), 1598–1602.

Wang, J., Cui, Y., He, L., Xu, X., Yuan, Z., Jin, X., & Li, Z. (2017). Work-Related Musculoskeletal Disorders and Risk Factors among Chinese Medical Staff of Obstetrics and Gynecology. *International Journal of Environmental Research and Public Health*, *14*(6), 562. https://doi.org/10.3390/ijerph14060562

Wang, W. J., Yu, S. H., Wang, S. X., Chen, J., & Deng, L. (2015). Multilevel comprehensive evaluation and decision making of ergonomics. *Discrete Dynamics in Nature and Society*, *2015*. https://doi.org/10.1155/2015/689203

Welcome, D. E., Dong, R. G., Xu, X. S., Warren, C., McDowell, T. W., & Wu, J. Z. (2015). An examination of the vibration transmissibility of the hand-arm system in three orthogonal directions. *International Journal of Industrial Ergonomics*, *45*, 21–34. https://doi.org/10.1016/j.ergon.2014.11.001

Westgaard, R. H., & Winkel, J. (2011). Occupational musculoskeletal and mental health: Significance of rationalization and opportunities to create sustainable production systems - A systematic review. *Applied Ergonomics*, *42*(2), 261–296. https://doi.org/10.1016/j.apergo.2010.07.002

Widanarko, B., Legg, S., Devereux, J., & Stevenson, M. (2014). The combined effect of physical, psychosocial/organisational and/or environmental risk factors on the presence of work-related musculoskeletal symptoms and its consequences. *Applied Ergonomics*, *45*(6), 1610–1621. https://doi.org/10.1016/j.apergo.2014.05.018

Widanarko, B., Legg, S., Devereux, J., & Stevenson, M. (2015). Interaction between physical and psychosocial work risk factors for low back symptoms and its consequences amongst Indonesian coal mining workers. *Applied Ergonomics*, *46*(Part A), 158–167. https://doi.org/10.1016/j.apergo.2014.07.016

Wilson, J. R. (2000). Fundamentals of ergonomics in theory and practice. *Applied Ergonomics*, *31*(6), 557–567. https://doi.org/10.1016/S0003-6870(00)00034-X

Xiang, J., Bi, P., Pisaniello, D., & Hansen, A. (2014). *Health Impacts of Workplace*

Heat Exposure : An Epidemiological Review. 91–101.

Ya'Acob, N. A., Abidin, E. Z., Rasdi, I., Rahman, A. A., & Ismail, S. (2018). Reducing work-related musculoskeletal symptoms through implementation of Kiken Yochi training intervention approach. *Work*, *60*(1), 143–152. https://doi.org/10.3233/WOR-182711

Yanagisawa, N. (2016). The future of occupational and general health in Japan. In *Industrial Health* (Vol. 54, Issue 3, pp. 191–193). https://doi.org/10.2486/indhealth.54-191

Yazdani, A., & Wells, R. (2018). Barriers for implementation of successful change to prevent musculoskeletal disorders and how to systematically address them. In *Applied Ergonomics* (Vol. 73, Issue June, pp. 122–140). Elsevier. https://doi.org/10.1016/j.apergo.2018.05.004

Yoon, S.-Y., Ko, J., & Jung, M.-C. (2016). A model for developing job rotation schedules that eliminate sequential high workloads and minimize between-worker variability in cumulative daily workloads: Application to automotive assembly lines. *Applied Ergonomics*, *55*, 8–15. https://doi.org/10.1016/j.apergo.2016.01.011

Yoon, S. Y., Ko, J., & Jung, M. C. (2016). A model for developing job rotation schedules that eliminate sequential high workloads and minimize between-worker variability in cumulative daily workloads: Application to automotive assembly lines. In *Applied Ergonomics* (Vol. 55, pp. 8–15). https://doi.org/10.1016/j.apergo.2016.01.011

Yu, R.-F., Yang, L.-D., & Wu, X. (2017). Risk factors and visual fatigue of baggage X-ray security screeners: a structural equation modelling analysis. *Ergonomics*, *60*(5), 680–691. https://doi.org/10.1080/00140139.2016.1192226

Yuan, L. (2015). Reducing ergonomic injuries for librarians using a participatory approach. *International Journal of Industrial Ergonomics*, *47*, 93–103. https://doi.org/10.1016/j.ergon.2015.03.004

Zameri, M. S. M., & Ying, L. C. (2002). WORK IMPROVEMENT AT A CAR MANUFACTURING COMPANY Effort to increase the productivity is an important factor for any organization , especially for the manufacturing industries . Productivity may be defined as the ratio of output against input [2]. Utiliza. *Technology Journal*, *37*, 73–87.

Zare, M., Black, N., Sagot, J.-C., Hunault, G., & Roquelaure, Y. (2020). Ergonomics interventions to reduce musculoskeletal risk factors in a truck manufacturing plant. *International Journal of Industrial Ergonomics*, *75*, 102896. https://doi.org/10.1016/j.ergon.2019.102896

Zare, M., Bodin, J., Cercier, E., Brunet, R., & Roquelaure, Y. (2015). Evaluation of ergonomic approach and musculoskeletal disorders in two different

organizations in a truck assembly plant. *International Journal of Industrial Ergonomics*, *50*, 34–42. https://doi.org/10.1016/j.ergon.2015.09.009

Zare, M., Croq, M., Hossein-Arabi, F., Brunet, R., & Roquelaure, Y. (2016a). Does Ergonomics Improve Product Quality and Reduce Costs? A Review Article. *Human Factors and Ergonomics in Manufacturing & Service Industries*, *26*(2), 205–223. https://doi.org/10.1002/hfm.20623

Zare, M., Croq, M., Hossein-Arabi, F., Brunet, R., & Roquelaure, Y. (2016b). Does Ergonomics Improve Product Quality and Reduce Costs? A Review Article. *Human Factors and Ergonomics In Manufacturing*, *26*(2), 205–223. https://doi.org/10.1002/hfm.20623

Zare, M., Malinge-Oudenot, A., Höglund, R., Biau, S., & Roquelaure, Y. (2016). Evaluation of ergonomic physical risk factors in a truck manufacturing plant: Case study in SCANIA Production Angers. *Industrial Health*, *54*(2), 163–176. https://doi.org/10.2486/indhealth.2015-0055

Zavadskas, E. K., Turskis, Z., & Bagočius, V. (2015). Multi-criteria selection of a deep-water port in the Eastern Baltic Sea. *Applied Soft Computing Journal*. https://doi.org/10.1016/j.asoc.2014.09.019

Zhang, J., Wu, D., & Olson, D. L. (2005). The method of grey related analysis to multiple attribute decision making problems with interval numbers. *Mathematical and Computer Modelling*, *42*(9–10), 991–998.

Zhang, Q., Dong, H., Zhu, C., & Liu, G. (2019). Low back pain in emergency ambulance workers in tertiary hospitals in China and its risk factors among ambulance nurses: a cross-sectional study. *BMJ Open*, *9*(9), e029264.

Zheng, G., Zhu, N., Tian, Z., Chen, Y., & Sun, B. (2012). Application of a trapezoidal fuzzy AHP method for work safety evaluation and early warning rating of hot and humid environments. *Safety Science*, *50*(2), 228–239. https://doi.org/10.1016/j.ssci.2011.08.042

Ziaei, M., Choobineh, A., Abdoli-Eramaki, M., & Ghaem, H. (2018). Individual, physical, and organizational risk factors for musculoskeletal disorders among municipality solid waste collectors in Shiraz, Iran. *Industrial Health*, *56*(4), 308–319. https://doi.org/10.2486/indhealth.2018-0011