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Empowering Caregivers to Improve Working Posture Management for Preventing Musculoskeletal Injuries in Long Term Care Settings

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Abstract

Physically demanding tasks in long-term care, such as lifting and repositioning patients, increase caregivers' risk of musculoskeletal disorders, highlighting the need for empowerment through targeted education and skills training to ensure safe practices. This community service aimed to evaluate the effectiveness of an educational training program for caregivers, focusing on working posture management and technique in transferring older people to reduce the risk of musculoskeletal injuries. A pre- and post-intervention design was used to assess cognitive improvement and participant satisfaction among 41 caregivers in community setting. Results showed a marked increase in correct responses across all questionnaire items following the training, indicating improved knowledge and satisfaction throughout the training. The increased to 95.1% after the training was found, indicating a significant gain in knowledge about the basic concepts of transfer techniques. Participants expressed high satisfaction, with simulation-based learning identified as the most effective instructional method. The findings suggest that targeted, practical training can enhance caregivers' competencies and contribute to safer caregiving practices. Despite these positive outcomes, limitations included a participant bias, limited follow-up, or the socio-economic context of the participants in short-term evaluation. Future programs are recommended to include follow-up assessments and wider community involvement to ensure long-term impact and sustainability.

Keywords: Caregiver, Long Term Care, Musculoskeletal Injury, Working Posture.

Abstrak

Tugas fisik yang berat dalam perawatan jangka panjang, seperti mengangkat dan memposisikan ulang pasien, meningkatkan risiko gangguan muskuloskeletal pada caregiver, sehingga pentingnya pemberdayaan melalui pendidikan dan pelatihan keterampilan yang terarah diperlukan untuk memastikan praktik kerja yang aman. Program pengabdian masyarakat ini bertujuan untuk mengevaluasi efektivitas program pelatihan edukatif bagi caregiver dengan fokus pada manajemen postur kerja dan teknik pemindahan lansia guna mengurangi risiko cedera muskuloskeletal. Desain pre dan post pelatihan digunakan untuk menilai peningkatan kognitif dan kepuasan partisipan pada 41 caregiver di lingkungan komunitas. Hasil penelitian menunjukkan peningkatan yang signifikan dalam jumlah jawaban benar pada seluruh item kuesioner setelah pelatihan, yang mengindikasikan peningkatan pengetahuan dan kepuasan selama pelatihan. Tingkat jawaban benar meningkat hingga 95,1% setelah pelatihan, menunjukkan adanya peningkatan pengetahuan yang signifikan mengenai konsep dasar teknik transfer. Para peserta menyatakan tingkat kepuasan yang tinggi, dengan metode pembelajaran berbasis simulasi diidentifikasi sebagai metode pengajaran yang paling efektif. Temuan

ini menunjukkan bahwa pelatihan yang terarah dan praktis dapat meningkatkan kompetensi pengasuh dan berkontribusi terhadap praktik perawatan yang lebih aman. Terdapat beberapa keterbatasan seperti bias partisipan, tindak lanjut yang terbatas, serta konteks sosial-ekonomi peserta yang memengaruhi evaluasi jangka pendek. Program di masa depan disarankan untuk mencakup evaluasi lanjutan dan keterlibatan komunitas yang lebih luas guna memastikan dampak jangka panjang dan keberlanjutan.

Kata Kunci: Caregiver, Cedera Muskuloskeletal, Perawatan Jangka Panjang, Postur Kerja.

A. INTRODUCTION

Caregivers in long-term care settings often perform physically demanding tasks, including lifting, repositioning, and supporting immobile patients (Hwang et al., 2019). These activities, especially when done with poor posture or incorrect techniques, can lead to musculoskeletal injuries (Indrayani et al., 2022; Su et al., 2023) also known as work hazards due to overexertion (Galinsky et al., 2021). The key contributors to these disorders is habitual of physical exercise, rest behavior (Yirdaw & Adane, 2024), poor working posture (Oakman et al., 2019; Nourollahi et al., 2019). Frequent exposure of improper posture and prolonged repetitive movements known to lead musculoskeletal disorders (Han et al., 2023). Previous study found through technological assessment found risky posture in caregivers (Yuan et al., 2023). As a result, caregivers are at a heightened risk of developing work-related musculoskeletal disorders (WMSDs), which can negatively impact their physical health, reduce their work productivity, and potentially compromise the quality of care provided to patients (Han et al., 2023). Research consistently shows that incorrect body positioning during work can lead to physical strain and symptoms related to musculoskeletal issues (Dianat et al., 2020). This highlights the importance of training among caregiver who take care during daily tasks.

In rural areas, caregivers are often family members who provide home care for relatives with limited mobility, particularly in home care settings. Assessments showed that most caregivers had limited knowledge of ergonomic principles. Even though some training had been conducted in the past, it lacked a routine, structured approach such as proper working posture and mechanism, safe transfer techniques (Nourollahi et al., 2019). This not only affects caregivers' health but also the quality of care provided to the clients with immobility (Dianat et al., 2020). Moreover, the phenomena puts caregivers at risk for musculoskeletal injuries and affects the quality of care delivered to individuals with mobility limitations.

The proposed solution includes implementing a comprehensive training program collaborated with community focused on proper working posture, ergonomic risk awareness, and safe patient transfer methods (Indrayani et al., 2022; Su et al., 2023; Watts & Green, 2023). The program will use a blended learning approach combining self-directed learning, instructional materials, interactive discussions, and hands-on simulations (Watts & Green, 2023; Palsson et al., 2020) using the concept of nursing science (Indrayani, 2025). Additionally, a follow-up monitoring system will be introduced to ensure proper application of the techniques in daily practice. The expected outcomes of this initiative include increased caregiver knowledge and skills in posture management, reduced incidence of musculoskeletal complaints, and improved overall caregiver well-being. In long-term capacity, this is anticipated to enhance the quality of care for elderly residents and reduce absenteeism due to work-related injuries. Therefore, the aim of the current article is to implement the education training for caregiver in order to manage working posture to improve the possibility of musculoskeletal injuries.

B. METHODS AND IMPLEMENTATION

This community service program was conducted in March 2025, located at Institute of Technology and Health Bali, Indonesia and targeting cadres who are caregivers and tutor adult residents engaged in community of Melinggih and Pedungan. The program aimed to promote adequate body posture to prevent musculoskeletal injuries through a combination of right posture education while performing the assisting intervention and simulation activity after the cognitive activity. The activity provided direct assistance and guidance to community members. Six lecturer from Institute of Technology and Health Bali together with one expert as a consultant from nursing

department, Hacettepe University Ankara, Turkey were involved. The program was evaluated using a one-group pre-test–post-test design involving 41 purposively selected adult and elderly participants to represent the target population. The primary objective was to improve participants' cognitive understanding and practical skills in applying working posture management as a preventive strategy for long-term care focusing in musculoskeletal problem. The evaluation instruments were tailored to accommodate participants' literacy levels and were systematically developed to measure training satisfaction. These questions covered knowledge of working posture management and the correct procedures for their implementation.

The program was implemented through three structured, face-to-face phases: pre-intervention, implementation, and evaluation. During the pre-intervention phase, the community service team conducted initial field assessments to evaluate participants' characteristics and research team engagement (Figure 1). Subject characteristics were employed as a community nursing assessment tool, enabling direct observation of the environmental context, interaction with the caregivers (Sutini et al., 2024; Suyasa et al., 2024). Prior to the implementation of the training, an agreement was established to administer a pre-test as the initial agenda item, aimed at assessing participants' baseline knowledge and skills. Engaging stakeholders at an early stage was deemed essential for ensuring contextual appropriateness and enhancing the precision of program targeting (Watts & Green, 2023). The pre-test knowledge had been delivered in paper-based to understand their basic knowledge related to work posture.

During the implementation phase (Figure 2), the team conducted a series of structured capacity-building activities, encompassing didactic training sessions, targeted health education, and guided practical working posture management. The intervention content focused on promoting musculoskeletal health through the application of static stretching techniques, based on the standardized framework outlined by Page (2012). The research team initially delivered a structured health promotion session using a PowerPoint presentation, designed to enhance participants' knowledge of occupational health and safety. Following this theoretical component, a practical demonstration was conducted to translate the acquired knowledge into practice. This involved interactive simulations and scenario-based learning that illustrated key aspects of occupational health nursing care, including hazard identification, immediate response to workplace accidents, and appropriate management of occupational diseases (Guzik, 2013). The combined use of didactic and experiential learning methods aimed to reinforce cognitive understanding while developing practical competencies.

In the subsequent evaluation phase, post-test evaluation were implemented. Paper based tests were delivered to all cadres in purpose to understand their knowledge related to working posture management. Pre and post-test were designed in an identical questions to maintain their relationships. Collaborative efforts were undertaken with caregivers and cadres of community stakeholders to carry out follow-up activities. These efforts were designed to support the continuity of program outcomes and to promote long-term sustainability within the community context.

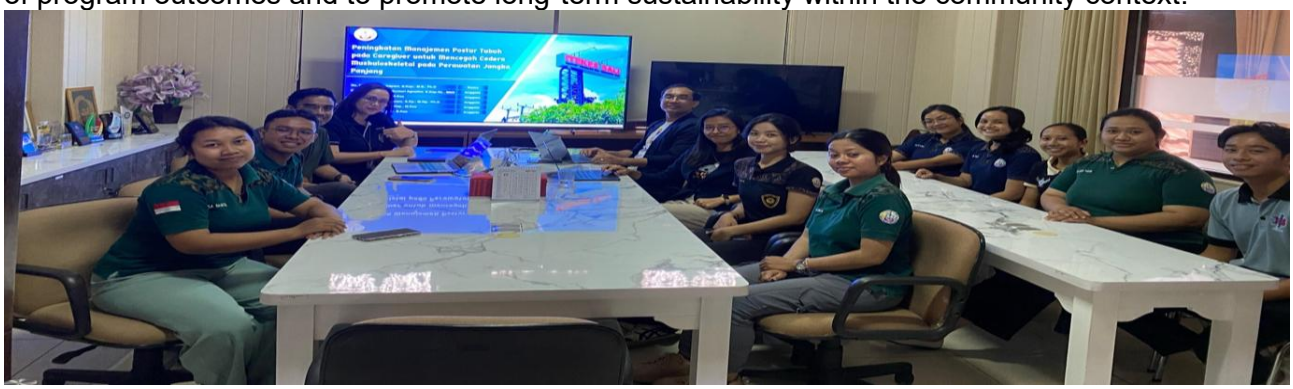

Figure 1. Preparation for students as volunteers, supervised by the lecturers to working posture management

Figure 2. Activities of knowledge transfer and performance skills of caregivers in working posture management

C. RESULTS AND DISCUSSION

Figure 3 illustrates the distribution of respondents based on their educational background. Majority of respondents hold a senior high school level, indicating a relatively well-educated participant group. A smaller portion completed only Junior high school education, while a few respondents possess postgraduate qualifications. This educational distribution suggests that the sample population has a strong academic foundation, which may influence their awareness and engagement with community health innovations specifically in working posture management.

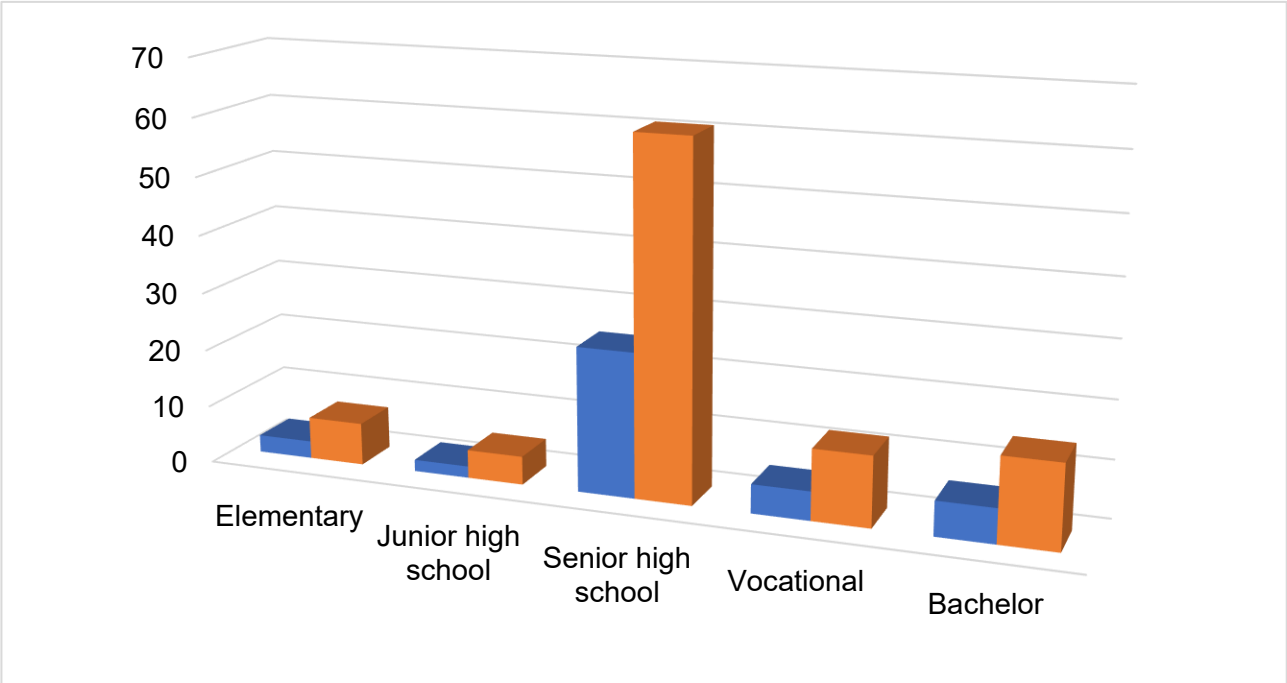

Figure 3. Education characteristic among respondents

Figure 4 presents the age distribution of the respondents. The data show that most participants fall within the adult age range of 19-44 years, with a few representations of elder respondents aged more than 60 years. There is also a notable group of older adults aged 45 and above. This age variation provides a broad perspective across different life stages, which can impact attitudes and

responsiveness to modernized community nursing services focusing in working posture management.

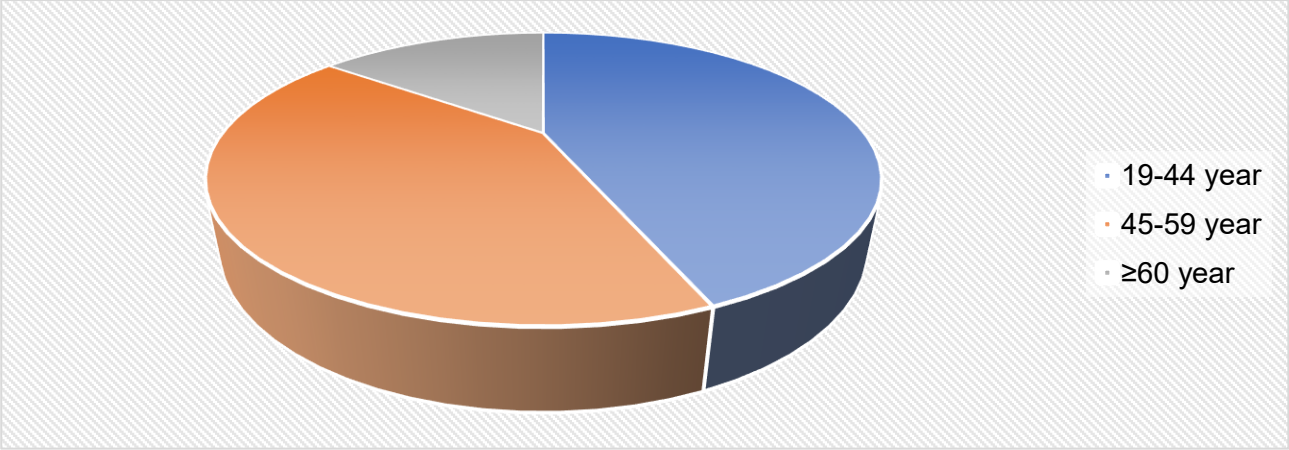

Figure 4. Age characteristics among respondents

The results in Table 2 illustrate the improvement in caregivers' cognitive understanding related to elderly transfer techniques before and after attending a training session. Four key questions assessed their knowledge on various aspects of safe and proper transfer practices. For the first question, which asked about the number of transfer methods available for the elderly, 85.4% of caregivers answered correctly before the training. This increased to 95.1% after the training, indicating a significant gain in knowledge about the basic concepts of transfer techniques. The second question focused on the correct body position when transferring an elderly person from a bed. Pre-training, 82.9% of caregivers provided correct responses, and this rose slightly to 85.4% post-training. Although the increase was modest, it shows that the training helped reinforce existing knowledge. A more substantial improvement was observed in the third question, which assessed understanding of the correct positioning when transferring an elderly person from a wheelchair. Correct answers increased from 78% before the training to 87.8% afterward. This suggests that the training effectively addressed a more complex or less familiar transfer scenario. The fourth question evaluated caregivers' knowledge of a stable standing stance (or body position) while assisting the elderly. The pre-training correct response rate was already high at 95.1%, and this improved slightly to 97.6% post-training. This result indicates that most caregivers already had a strong understanding of this principle, which was further strengthened by the training. Overall, the narrative of these results shows that the training program had a positive impact on improving caregivers' cognitive understanding of safe elderly transfer techniques, particularly in areas where prior knowledge was more limited. The consistent increase in correct responses across all questions highlights the effectiveness of the educational intervention.

Table 2. Score distribution of cognitive-related questionnaire items among caregivers

No	Questions	Pre		Post	
		Correct f(%)	**Incorrect f(%)**	**Correct f(%)**	**Incorrect f(%)**
1	How many types of methods are there for transferring the elderly?	35 (85.4)	6 (14.6)	39 (95.1)	2 (4.9)
2	Proper body position when transferring an elderly person from the bed	34 (82.9)	7 (17.1)	35 (85.4)	6 (14.6)
3	Proper position when transferring an elderly person from a wheelchair	32 (78)	9 (22)	36 (87.8)	5 (12.2)

4	Stable standing position (stance) when assisting the elderly	39 (95.1)	2 (4.9)	40 (97.6)	1 (2.4)

Table 3 has two sections. The first part of the result presents caregiver satisfaction with a training program on elderly transfer and body positioning techniques. Across all six evaluation items, the average satisfaction score was consistently 4 on a 5-point Likert scale, with relatively low standard deviations (SD ranging from ±0.331 to ±0.436). This indicates a high level of satisfaction and consistency among respondents. Caregivers felt that the training provided adequate explanations, was helpful, and improved their understanding of transfer techniques. They also expressed a strong intention to apply the knowledge in practice, recommend it to others, and continue using it after the program ended. The second part of the results focuses on the preferred learning techniques used during the training. The second part of the result demonstrated the vast majority of caregivers (87.8%) favored simulation as the most effective learning method. Interactive discussion was the second most selected method (7.3%), while content delivery and video were only chosen by 2.4% of respondents each. Notably, no respondents selected self-directed learning, suggesting a strong preference for active, hands-on instructional strategies. These findings underscore the importance of practical, experience-based learning methods in caregiver training programs, as well as a high level of acceptance and satisfaction with the training content provided.

Table 3. Training satisfaction and learning technique strategy among caregivers

No	**Questions**	**(M±SD)**
1	Do you think the material on transferring and body positioning provided the explanation you needed?	4±0.331
2	Would you recommend the transfer and body positioning methods to a friend if they needed similar assistance?	4±0.4
3	If you were seeking related help, would you apply the knowledge gained from this program?	4±0.4
4	Did this training help you?	4±0.358
5	Do you feel this study helped improve your understanding of the transfer process and proper body positioning?	4±0.358
6	Will you continue to use the knowledge from this training after the study ends?	4±0,436
No	**Learning technique**	**f (%)**
1	Self-directed learning	0 (0)
2	Material delivery / Content presentation	1 (2.4)
3	Interactive discussion	3 (7.3)
4	Video	1 (2.4)
5	Simulation	36 (87.8)

In summary, the results of this study demonstrate a clear improvement in caregivers' cognitive understanding of safe client transfer techniques following the implementation of targeted educational training. Post-training data show an increase in correct responses across all four cognitive-related questions, particularly in areas such as proper transfer positions from a wheelchair and recognition of stable standing postures. The current result suggested that education increase possibility to enhance their cognitive level (Indrayani, 2025).

Even though previous study has been exploring the device to reduce improper posture (Hwang et al., 2019), the awareness of biomechanical among caregiver remain essentials. These findings align with the primary goal of the training—to enhance caregivers' knowledge and awareness of proper body mechanics and posture during patient handling activities (Han et al., 2023), which are critical in minimizing the risk of work-related musculoskeletal injuries. Improper posture and manual handling techniques are well-documented risk factors for musculoskeletal disorders (MSDs) (Indrayani et al., 2022), particularly among caregivers and healthcare workers who regularly assist with patient transfers that has been used as important concept analysis in nursing setting (Indrayani, 2025). The training emphasized correct body positioning and techniques, such as maintaining a stable stance and using appropriate methods for different transfer scenarios. The postural feedback

contributes to the musculoskeletal risk (Hernández et al., 2022) As reflected in the high post-training scores and overwhelmingly positive satisfaction ratings, caregivers not only grasped the content but also expressed strong intentions to apply the knowledge in their daily routines. This suggests that education focused on ergonomic practices can be an effective intervention to foster safer working habits and reduce physical strain.

Furthermore, the dominant preference for simulation-based learning, reported by 87.8% of participants, reinforces the importance of experiential learning in achieving behavioral change. Simulations allow caregivers to practice and internalize correct posture and movements in a realistic setting, bridging the gap between theoretical understanding and practical application (Agustini et al., 2025). By incorporating simulation and partnership during musculoskeletal training program (Wilson et al., 2024), the training program effectively addressed both cognitive and physical dimensions of learning, enhancing its impact on reducing the likelihood of injury and promoting long-term occupational health.

Despite its positive outcomes, the caregiver training program had several limitations include other factors that might affect the outcomes, such as participant biases, limited follow-up, or the socio-economic context of the participants. The current program measured only short-term knowledge gains without assessing long-term retention or behavior change. Time constraints and limited participant availability also reduced the depth of practical learning. Future programs should include follow-up evaluations and wider participant coverage to enhance impact and sustainability.

CONCLUSION

The implementation of educational training for caregivers in Melinggih and Pedungan Villages demonstrated a positive impact on improving their cognitive understanding of proper working posture and elderly transfer techniques. The increase in correct responses across all questionnaire items indicates that the training effectively enhanced caregivers' knowledge, particularly in body mechanics and transfer safety. The high level of satisfaction and preference for simulation-based learning also highlights the importance of interactive, practical methods in delivering health education. Overall, this program contributes to empowering caregivers with the necessary skills to reduce the risk of musculoskeletal injuries and promote safer caregiving practices in the community setting. Future programs should include follow-up evaluations, broader participant coverage, and more mentoring practice or consultation to enhance effectiveness and sustainability, and findings might inform long-term care policies or the scaling of similar programs to other communities.

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REFERENCES

Agustini, N. L. P. I. B., Susanti, N. P. A., Sri, N. K., Wahyuni, I., Israfil, I., & Indrayani, N. L. D. (2025). Pemberdayaan Keluarga Berbasis Video Edukasi dalam Pencegahan dan Perawatan Dekubitus Pada Pasien Post Stroke di RSUD Kabupaten Klungkung.

Dianat, I., Afshari, D., Sarmasti, N., Sangdeh, M. S., & Azaddel, R. (2020). Work posture, working conditions and musculoskeletal outcomes in agricultural workers. International Journal of Industrial Ergonomics, 77. https://doi.org/10.1016/j.ergon.2020.102941

Galinsky, T., Deter, L., Krieg, E., Feng, H. A., Battaglia, C., Bell, R., Haddock, K. S., Hilton, T., Lynch, C., Matz, M., Moscatel, S., Riley, F. D., Sampsel, D., & Shaw, S. (2021). Safe patient handling and mobility (SPHM) for increasingly bariatric patient populations: Factors related to caregivers' self-reported pain and injury. Appl Ergon, 91, 103300. https://doi.org/10.1016/j.apergo.2020.103300

Guzik, A. (2013). Essentials for occupational health nursing. Oxford: John Wiley & Sons

Han, X., Nishida, N., Morita, M., Mitsuda, M., & Jiang, Z. (2023). Visualization of Caregiving Posture

and Risk Evaluation of Discomfort and Injury. Applied Sciences, 13(23). https://doi.org/10.3390/app132312699
Hernández, C. O., Li, S., Rivera, M. D. M., & Rodríguez, I. M. (2022). Does Postural Feedback Reduce Musculoskeletal Risk?: A Randomized Controlled Trial. Sustainability, 14(1). https://doi.org/10.3390/su14010583
Hwang, J., Kuppam, V. A., Chodraju, S. S. R., Chen, J., & Kim, J. H. (2019). Commercially Available Friction-Reducing Patient-Transfer Devices Reduce Biomechanical Stresses on Caregivers' Upper Extremities and Low Back. Hum Factors, 61(7), 1125-1140. https://doi.org/10.1177/0018720819827208
Indrayani, N. L. D. (2025). Trends of concept analysis in nursing science with Walker and Avant approaches: a literature review. Innovation in Health for Society, 5(1), 51-62. https://doi.org/https://doi.org/10.31603/ihs.12858
Indrayani, N. L. D., Wang, J. J., Chang, J. H., Permatasari, H., & Wang, C. J. (2022). Development of an educational protocol for ergonomic risk assessment of working postures to enhance the competence of occupational health nurses. International Journal of Nursing Practice 28(5), e13052. https://doi.org/10.1111/ijn.13052
NIOSH. 2018. Ergonomics and Musculoskeletal Disorders. The National Institute for Occupational Safety and Health (NIOSH) CDC. 2018. https://www.cdc.gov/niosh/topics/ergonomics
Nourollahi, M., Afshari, D., & Dianat, I. (2018). Awkward trunk postures and their relationship with low back pain in hospital nurses. Work, 59(3), 317-323. https://doi.org/10.3233/WOR-182683
Oakman, J., Clune, S., & Stuckey, R. (2019). Work related musculoskeletal in Australia. Canberra: Safe Work Australia.
Palsson, T. S., Boudreau, S., Hogh, M., Herrero, P., Bellosta-Lopez, P., Domenech-Garcia, V., Langella, F., Gagni, N., Christensen, S. W., & Villumsen, M. (2020). Education as a strategy for managing occupational-related musculoskeletal pain: a scoping review. BMJ Open, 10(2), e032668. https://doi.org/10.1136/bmjopen-2019-032668
Su, J. M., Chang, J. H., Indrayani, N. L. D., & Wang, C. J. (2023). Machine learning approach to determine the decision rules in ergonomic assessment of working posture in sewing machine operators. J Safety Res, 87, 15-26. https://doi.org/10.1016/j.jsr.2023.08.008
Sutini, N. K., Suyasa, I. G. P. D., Kamaryati, N. P., Agustini, N. I. B., Susanti, N. L. P. D., Nuartini, N. N., & Sanjana, I. W. E. (2024). Pelatihan perawatan diri dasar pada kader lansia sebagai bagian dari perawatan jangka panjang. Genitri: Jurnal Pengabdian Masyarakat Bidang Kesehatan, 3(1), 69-76.
Suyasa, I. G. P. D., Agustini, N. L. P. I. B., Sani, A. W., Wahyuni, N. W. S., Wangi, N. L. P. A. P., & Putra, K. A. D. (2024). Pemberdayaan Lansia Melalui Edukasi Metode Balance, Eyes, Face, Arm, Speech And Time Sebagai Self Awarness Terhadap Deteksi Dini Stroke. Jurnal Pengabdian kepada Masyarakat Wahana Usada, 6(2), 151-161
Watts, T., & Green, J. E. (2023). Collaborating With Community Partners to Address Population Health in an Online Advanced Nursing Practice Course. Nurse Educ, 48(6), 310-315. https://doi.org/10.1097/NNE.0000000000001414
Wilson, N., Barcellona, M., Lambert, P., Storey, P., Foster, B., Waller, B., & Wilkins, B. (2024). Feasibility of a Community-Based Aquatic and Peer Support Intervention for People With Musculoskeletal Disorders Delivered via a Cross-Sector Partnership—A Service Evaluation. Musculoskeletal Care, 22(4), e1950.Yirdaw, G., & Adane, B. (2024). Self-reported work-related musculoskeletal problems and associated risk factors among three-wheel car drivers in Ethiopia: a cross-sectional community-based study. Journal of Pain Research, 61-71.
Yuan, H., & Zhou, Y. (2023). Ergonomic assessment based on monocular RGB camera in elderly care by a new multi-person 3D pose estimation technique (ROMP). International Journal of Industrial Ergonomics, 95. https://doi.org/10.1016/j.ergon.2023.103440