Mini-Review

Healthy Aging: A Key Strategy for Retaining Skilled Nursing Professionals

Maria Katsaouni [1,2,*,†], Laura Elena Gligor [3,†], Katica Tripkovic [4,5], Kalina Sotiroska Ivanoska [6], Horatiu Rusu [7], Alma Pobric [8], Sibel Kiran [9,10], Donald M. Truxillo [11] and Evangelia Nena [12]

1 Nursing School, Democritus University of Thrace, 68100 Alexandroupolis, Greece
2 University General Hospital of Alexandroupolis, 68100 Alexandroupolis, Greece
3 Nursing Department, Faculty of Law and Social Science, "1 Decembrie 1918" University of Alba Iulia, 510009 Alba Iulia, Romania
4 Institute for Public Health Belgrade, 11000 Belgrade, Serbia
5 Laboratory for Strengthening Capacity and Performance of Health System and Workforce for Health Equity, Faculty of Medicine, University of Belgrade, 11000 Belgrade, Serbia
6 Faculty of Philosophy, Ss. Cyril and Methodius University in Skopje (UKIM), 1000 Skopje, North Macedonia
7 Centre for Social Research, Faculty of Social Sciences and Humanities, Lucian Blaga University of Sibiu, 550024 Sibiu, Romania
8 Faculty of Science, University of Sarajevo, 71 000 Sarajevo, Bosnia-Herzegovina
9 Department of Public Health, School of Medicine, Koc University, Istanbul 34350, Turkey
10 Global Health, Koc University Graduate School of Health Sciences, Istanbul 34350, Turkey
11 Kemmy Business School, University of Limerick, V94 T9PX Limerick, Ireland
12 Laboratory of Social Medicine, Medical School, Democritus University of Thrace, 68100 Alexandroupolis, Greece
* Correspondence: mkatsaou@med.duth.gr
† These authors contributed equally to this work.

Abstract: Background: Early retirements and decreasing job retention rates have resulted in a growing shortage of nursing staff in the healthcare systems of many countries. Recently, the World Health Organization and the European Commission have joined forces to attract and retain nurses in their systems in a period of increasing demand for healthcare services, due to population aging. While recruiting and training new nurses is a necessary long-term solution, it is equally important for policymakers to focus on retaining the current workforce, as to ensure continuity of care. Aim: This paper aims to review current literature and to discuss the key aspects of this critical issue, focusing on the concept of healthy aging and its significance as a key strategy for retaining nursing staff. Design: This discursive paper explores published literature highlighting the interaction between aging and the challenges that nursing staff faces in daily practice. It also examines global trends in retirement patterns and proposes strategies to retain the aging workforce, with a particular focus on succession planning and knowledge transfer. Results-Conclusion: Both general and more targeted approaches that have been proposed are necessary to enhance nursing staff retention. These approaches include the concept of promoting healthy aging, which can play a key role in this regard. Implications: This paper addresses the nursing staff shortage, highlighting strategies that have been proposed as to prioritize staff retention for healthcare providers and personnel managers.

Keywords: nurses; aging; retirement; job retainment; healthy aging; successful aging

1. Introduction

In recent years, the average age of the active labor force has risen significantly. This phenomenon is associated with increased life expectancy and is particularly evident in most industrialized countries [1–4]. According to Aiyar and Ebeke [5], the ageing of the labor force in Europe exerts measurable pressure on productivity. Cylus further highlighted that population health moderates the relationship between ageing and economic performance across European regions, illustrating how maintaining a healthy workforce can mitigate macroeconomic decline [6].

Aging is associated with a decrease in workers' functional and physical abilities over time, negatively affecting their performance [7–9]. As employees age, shifts in physical, cognitive, and emotional capacities affect their motivation, performance, and well-being at various stages of life. Healthy and successful ageing in the workplace is therefore not merely a biological process but a multidimensional one, encompassing physical, mental, and social well-being, as defined by the World Health Organization [10–12]. While work design and organizational practices like flexible work arrangements and training provenly help maintain workforce participation, additional research is essential to fully understand how to support a multi-age workforce and implement effective interventions [13,14].

The nursing profession possesses unique characteristics, involving the management of disease, pain, and death. Additionally, working night shifts or in high-stress environments significantly impacts psychosocial well-being, efficiency, and interpersonal relationships [15]. Shift workers are more vulnerable to workplace accidents and are at risk of developing chronic diseases due to circadian rhythm disruptions [16–19]. At the same time, increased levels of anxiety, depression, and emotional exhaustion among shift workers are observed [20–23]. These challenges render this profession less appealing, especially with advancing age, and are a probable reason that many nurses seek early retirement [21,24,25].

Research findings also show that shift work exerts a measurable effect on sleep quality, overall health, and life satisfaction among healthcare workers [26]. Sleep disturbances, chronic fatigue, and reduced social participation constitute significant contributors to early exit from the workforce, especially among older nurses.

The concept of "healthy ageing" refers to maintaining functional ability that enables well-being in older age, encompassing both physical and cognitive health, participation, and security [10]. In nursing, this includes interventions that support vitality, learning, and psychological resilience through work redesign and health promotion [11,27].

Last year, the European Commission signed a contribution agreement with the World Health Organization (WHO) Regional Office for Europe to support Member States in retaining nurses in their health systems [28]. Previously, the State of the World's Nursing Report published by WHO reported that 17% of nurses globally are aged >55 years and are expected to retire within the following 10 years [29]. The report further estimated that an additional 10.6 million nurses are required globally to meet the demands of healthcare systems. This underscores the critical need to reduce early retirement through all available means, particularly as the demand for nursing staff continues to grow.

The aim of this paper was to reach a clear consensus and create a research agenda promoting the concept of successful ageing among nurses, focusing on enhancing health and well-being to ultimately improve retention rates in the workplace. This paper is the result of collaboration among researchers from different European countries within a EU-funded COST-Action (https://www.cost.eu/). It represents a structured literature review aimed at identifying, synthesizing, and comparing existing interventions and conceptual models supporting healthy and successful ageing among nurses. The specific aims of this paper are to summarize the critical challenges faced by ageing nurses and to propose recommendations for enhancing occupational health, thereby promoting successful ageing. This analysis highlights key areas for policymakers to address, with the goal to improve retention rates within the nursing workforce.

2. Methods

A narrative review methodology was employed, guided by the PRISMA 2020 framework [30]. Searches were conducted in PubMed database between May and September 2024 using the keywords: nursing workforce AND aging, AND retention.

Inclusion criteria: peer-reviewed empirical studies, reviews, or reports published from 1 January 2010 to 31 August 2024, focusing on nurses ≥45 years, workforce ageing, or healthy ageing interventions. Exclusion criteria: non-English papers, commentaries without empirical data, and studies outside the nursing sector.

A total of 99 records were initially identified, of which 63 papers were fully screened, and 47 were included in the final synthesis. Data were analyzed thematically across four domains: physiological, psychosocial, organizational, and policy-level factors influencing the retention of older nurses.

This methodological approach ensured transparency and replicability of results while following the core PRISMA principles of systematic identification, screening, eligibility, and inclusion [30,31].

3. Relevant Sections

3.1. Nursing Profession and Aging: Key Characteristics

The nursing profession is characterized by several unique and challenging features (Table 1). It requires close interaction with suffering patients, demanding high levels of empathy, effective communication, and substantial emotional and physical resilience [32–34]. As nurses age, functional and cognitive capacities may change; however, evidence suggests that marked cognitive decline is uncommon between ages 55–65, with most age-related differences reflecting normal cognitive ageing rather than pathology [32]. Empirical studies in health professionals indicate that perceived lapses are often linked to fatigue, circadian disruption, and chronic stress rather than neurodegenerative disease [33], and that late-career nurses generally sustain safe performance when supported with appropriate work design [34]. The broader economic and demographic context of workforce ageing also exerts pressure on the nursing sector, as it may reduce productivity (unless compensated by innovation, training, and health investment).

Another distinctive feature is shift structure. In general, shift work has been shown to adversely affect sleep quality, overall health, and quality of life among healthcare workers [26], which may disproportionately discourage older nurses from undertaking night duties. Moreover, prolonged or 12-h shifts—often reinforced by implicit peer pressure to accept them—create cumulative strain; nurses who decline long shifts may experience guilt or fear of burdening colleagues [35,36].

Psychosocial risk factors such as burnout, job stress, anxiety, and depression remain prevalent in nursing, with cumulative load increasing across the career span [37–39]. At the same time, experience, higher education, and a supportive environment can buffer burnout and sustain engagement in older nurses, underscoring the value of recognition and continuing education [37,39]. Moreover, evidence indicates that organizational culture promoting fairness, inclusion, and respect for senior expertise can protect older nurses from disengagement and early retirement [40–42].

From a systems perspective, workforce ageing in nursing should be approached as a multidimensional phenomenon—physiological (stamina and sleep), cognitive (slower processing offset by greater judgment accuracy), psychosocial (emotional load and caregiving fatigue), and institutional (ageism or exclusion from innovation). Addressing all levels with age-inclusive policies is essential for sustainable staffing.

Table 1. Distinctive Characteristics of the Nursing Profession.

Category	Description	Examples	Implications for Ageing Workforce
Physical Demands	Repetitive movement, lifting patients, long standing hours	Manual handling, emergency response	Musculoskeletal strain, fatigue, need for ergonomic redesign
Emotional Labour	Exposure to suffering and death	Oncology, ICU, palliative care	Burnout, compassion fatigue
Shift Work	Night duties and rotating shifts	12-h shifts, peer pressure to cover	Sleep disorders, reduced recovery, early exit
Cognitive Complexity	Rapid decision-making, multitasking	Intensive care, triage, emergency nursing	Cognitive fatigue, need for job rotation and rest scheduling
Social Factors	Interpersonal conflict, teamwork under stress	Interprofessional communication	Risk of isolation, ageism; importance of mentoring culture

3.2. The Retiring Nursing Workforce: A Global Challenge

Nurse shortages are a worldwide concern, with many regions anticipating high retirements alongside rising demand [2,29]. Cross-national comparisons suggest that in Japan and Australia mean retirement ages are near 59–60, whereas in Nordic systems, which have adopted flexible scheduling and age-friendly policies, longer working lives are observed [43]. In contrast, Southern European systems with rigid shift patterns often see earlier exits, a pattern consistent with the broader macroeconomic links between ageing, health, and productivity highlighted for Europe [5,6].

These disparities indicate that retirement design, labor flexibility, and health-promotion frameworks strongly shape workforce longevity. Integrating healthy-ageing principles into workforce planning is therefore a strategic necessity for sustaining nursing capacity [10–12,43–45].

3.3. Retaining the Aging Nursing Workforce

The challenges of managing and retaining an aging nursing workforce require targeted interventions [46–50]. Retention strategies can be categorized as theoretical (conceptual or emerging), pilot-tested, or evidence-based (supported by empirical evidence).

1. Individual-level interventions: promoting physical activity, ergonomic support, cognitive stimulation, and lifelong learning.
2. Organizational-level interventions: flexible scheduling, supportive supervision, mentoring, and participatory decision-making.
3. Policy-level interventions: pension incentives, health promotion frameworks, and age-inclusive workforce legislation.

Among these, flexible scheduling, ergonomic redesign, and structured mentorship have demonstrated consistent benefits [40,41,51]. Other strategies, such as age-sensitive career counselling and phased retirement, remain theoretical but promising and merit cross-country pilot studies [42,52].

Additionally, successful ageing at work depends not only on the presence of resources but also on employees perceived autonomy, social support, and recognition of competence [53]. Interventions that cultivate self-efficacy and peer collaboration significantly enhance older nurses' willingness to continue working.

Hospitals that embed age-inclusive practices—such as team diversity, flexible schedules, and ergonomically improved environments—report both higher job satisfaction and reduced absenteeism among senior staff [54–56]. Conversely, rigid scheduling and persistent stigma regarding older age remain key predictors of early exit [57,58].

3.4. The Role of Knowledge Transfer and Effective Succession Planning

Succession planning is essential to address the growing nursing shortage and ensure leadership continuity [59–63]. Structured mentorship programs enhance confidence among younger nurses while allowing senior nurses to transmit knowledge, thereby reducing errors and reinforcing organizational identity [64,65]. Digital repositories and simulation-based learning tools provide continuous professional development opportunities and strengthen organizational resilience [66].

Evidence demonstrates that organizations implementing structured leadership succession programs exhibit greater staff retention, stronger morale, and improved patient outcomes [67,68]. For example, in tertiary hospitals in Asia and the Middle East, structured promotion programs and digital mentoring platforms increased leadership readiness significantly over two years [62,69,70].

Succession planning must be regarded not merely as an administrative process but as a central strategy for sustainable workforce capacity. By integrating mentorship, professional growth, and well-being policies, healthcare institutions can bridge generational gaps while maintaining clinical excellence [24,27,71,72].

4. Recommendations and Concluding Remarks

As the workforce ages, the integration of healthy-ageing principles into occupational health and workforce policy becomes imperative [12,73,74]. Employers can adopt strategies such as reducing shift length, encouraging flexible scheduling, providing ergonomic adjustments, supporting continuous education, and recognizing the expertise of senior nurses [33,60,73].

Moreover, investment in lifelong learning, digital literacy, and occupational health programs serve as stabilizing factors against productivity decline associated with an aging workforce [5,6]. These interventions not only improve nurse retention but contribute to national economic resilience.

Special attention should also be given to sleep hygiene, fatigue management, and circadian adaptation programs, which are vital in high-shift environments [26,75]. Regular screening for sleep disorders, cardiovascular strain, and mental exhaustion should form part of routine occupational health practice for older nurses.

Creating age-friendly hospitals requires collaboration among administrators, occupational health specialists, and policy- makers. Governments can encourage this by recognizing or subsidizing institutions that achieve measurable improvements in nurse retention through ergonomic and psychosocial innovations [76,77].

Ultimately, promoting healthy ageing among nurses is a multidimensional public health priority. By creating supportive, age-inclusive work environments, healthcare systems can prolong careers, preserve quality of care,

and strengthen workforce resilience [27,78,79]. Investment in healthy-ageing policies not only benefits older nurses but secures intergenerational knowledge transfer and continuity of care—key pillars for sustaining global healthcare systems [12,58,80].

Table 2 summarizes multi-level strategies to retain ageing nurses, presenting each intervention according to level (individual, organizational, policy), evidence status (theoretical, pilot-tested, evidence-based), and expected outcomes.

Table 2. Evidence-Based Strategies for Retaining Older Nurses.

Level	Strategy	Evidence Status	Description/Expected Outcome
Individual	Health promotion, ergonomic support, cognitive training	Evidence-based	Improves physical stamina, cognitive resilience, and overall well-being.
Organizational	Flexible scheduling, mentoring, peer support	Evidence-based	Enhances satisfaction, engagement, and prolongs tenure.
Policy	Incentives for delayed retirement, age-inclusive workforce legislation	Emerging	Promotes retention through social protection and career flexibility.
Theoretical	Age-sensitive career counselling, leadership transition models	Under Evaluation	Encouraging early evidence from EU and OECD pilot projects.

Author Contributions

M.K., L.E.G., K.T., K.S.I., H.R., A.P., S.K., D.M.T. and E.N.: Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; M.K., L.E.G., K.T., K.S.I., H.R., A.P., S.K., D.M.T. and E.N.: Involved in drafting the manuscript or revising it critically for important intellectual content; M.K., L.E.G., K.T., K.S.I., H.R., A.P., S.K., D.M.T. and E.N.: Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; M.K., L.E.G., K.T., K.S.I., H.R., A.P., S.K., D.M.T. and E.N.: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest. Given the role as the Editorial Board Member, Sibel Kiran had no involvement in the peer review of this paper and had no access to information regarding its peer-review process. Full responsibility for the editorial process of this paper was delegated to another editor of the journal.

References

1. Eurostat. *Ageing Europe—Looking at the Lives of Older People (2020 Edition)*; Publications Office of the European Union: Luxembourg, 2020. Available online: https://ec.europa.eu/eurostat/documents/3217494/11478057/KS-02-20-655-EN-N.pdf (accessed on 17 September 2025).

2. United Nations. *World Population Ageing 2022 Highlights*; United Nations: New York, NY, USA, 2022. Available online: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_summary_of_results.pdf (accessed on 17 September 2025).

3. OECD. *Retaining Talent at All Ages*; OECD Publishing: Paris, France, 2023. Available online: https://www.oecd.org/en/publications/retaining-talent-at-all-ages_00dbdd06-en.html (accessed on 1 November 2025).

4. Eurofound. *Working Conditions and Sustainable Work: An Analysis Using the Job Quality Framework*; European Foundation for the Improvement of Living and Working Conditions: Dublin, Ireland, 2021. Available online: https://www.eurofound.europa.eu/en/publications/all/working-conditions-and-sustainable-work-analysis-using-job-quality-framework (accessed on 1 November 2025).

5. Aiyar, M.S.; Ebeke, M. *The Impact of Workforce Aging on European Productivity*; IMF Working Paper; International Monetary Fund: Washington, DC, USA, 2016. Available online: https://www.imf.org/external/pubs/ft/wp/2016/wp16238.pdf (accessed on 17 September 2025).

6. Cylus, J. Health, an ageing labour force, and the economy: Does health moderate the relationship between population age-structure and economic growth? *Eur. J. Public Health* **2024**, *34*(Suppl. 3), ckae144–ckae445. https://doi.org/10.1093/eurpub/ckae144.445.

7. Ilmarinen, J. Work ability—A comprehensive concept for occupational health research and prevention. *Scand. J. Work. Environ. Health* **2009**, *35*, 1–5.

8. Schaufeli, W.B.; Bakker, A.B. Job demands, job resources, and their relationship with burnout and engagement. *J. Organ. Behav.* **2004**, *25*, 293–315.

9. De Lange, A.H.; Taris, T.W.; Kompier, M.A.J. Different mechanisms to explain the reversed effects of mental health on work characteristics. *Scand. J. Work. Environ. Health* **2005**, *31*, 3–14. https://doi.org/10.5271/sjweh.843.

10. World Health Organization. *Decade of Healthy Ageing 2020–2030*; WHO: Geneva, Switzerland, 2020. Available online: https://www.who.int/initiatives/decade-of-healthy-ageing (accessed on 17 September 2025).

11. World Health Organization. *Framework for countries to achieve an integrated continuum of long-term care*; WHO: Geneva, Switzerland, 2021. Available online: https://www.who.int/publications/i/item/9789240038844 (accessed on 17 September 2025)

12. Beard, J.R.; Officer, A.; de Carvalho, I.A.; et al. The World report on ageing and health: A policy framework for healthy ageing. *Lancet* **2016**, *387*, 2145–2154. https://doi.org/10.1016/S0140-6736(15)00516-4.

13. Johnson, R.W. The aging workforce and strategies to maintain employment. *Int. J. Manpow.* **2019**, *40*, 458–472.

14. Truxillo, D.M.; Cadiz, D.M.; Hammer, L.B. Supporting the aging workforce: A review and recommendations for workplace intervention research. *Annu. Rev. Organ. Psychol. Organ. Behav.* **2015**, *2*, 351–381. https://doi.org/10.1146/annurev-orgpsych-032414-111435.

15. Adriaenssens, J.; De Gucht, V.; Maes, S. Causes and consequences of occupational stress in emergency nurses. *J. Nurs. Manag.* **2015**, *23*, 346–358.

16. Booker, L.A.; Magee, M.; Rajaratnam, S.M. Sleep and sleepiness in shift-working nurses: A systematic review. *Sleep Med. Rev.* **2018**, *39*, 220–233.

17. Caruso, C.C. Negative impacts of shiftwork and long work hours. *Rehabil. Nurs.* **2014**, *39*, 16–25.

18. Lin, S.H.; Liao, W.C.; Chen, M.Y. The impact of shift work on mental and physical health. *J. Nurs. Res.* **2021**, *29*, e143.

19. Kecklund, G.; Axelsson, J. Health consequences of shift work and insufficient sleep. Sleep Med. Rev. 2016, 29, 1–12. https://doi.org/10.1016/j.smrv.2015.10.004.

20. Cheng, H.; Liu, G.; Yang, J.; Wang, Q.; Yang, H. Shift work disorder, mental health and burnout among nurses: A cross-sectional study. *Nurs. Open* 2023, 10, 1521. https://doi.org/10.1002/nop2.1521.

21. Thorsen, S.V.; Jensen, P.H.; Bjørner, J.B. Psychosocial work environment and retirement age: A prospective study of 1876 senior employees. *Int. Arch. Occup. Environ. Health* **2016**, *89*, 891–900. https://doi.org/10.1007/s00420-016-1125-7.

22. Rudman, A.; Gustavsson, J.P. Early-career burnout among new graduate nurses: A prospective observational study of intra-individual change trajectories. *Int. J. Nurs. Stud.* **2011**, *48*, 292–306. https://doi.org/10.1016/j.ijnurstu.2010.07.012.

23. Theorell, T. Psychosocial factors in the workplace and health. *Scand. J. Work. Environ. Health* **2020**, *46*, 473–474.

24. Stichler, J.F. Healthy work environments for the ageing nursing workforce. *J. Nurs. Manag.* **2013**, *21*, 956–963. https://doi.org/10.1111/jonm.12174.

25. World Health Organization Regional Office for Europe; European Commission. *European Commission and WHO/Europe Sign €1.3 Million Agreement to Help EU Member States Retain and Attract More Nurses*; WHO Regional Office for Europe,

Copenhagen & European Commission: Brussels, Belgium, 2024. Available online: https://www.who.int/europe/news/item/06-09-2024-european-commission-and-who-europe-sign--1.3-million-agreement-to-help-eu-member-states-retain-and-attract-more-nurses (accessed on 17 September 2025).

26. Nena, E.; Katsaouni, M.; Steiropoulos, P.; et al. Effect of shift work on sleep, health, and quality of life of health-care workers. *Indian J. Occup. Environ. Med.* **2018**, *22*, 29–34. Available online: https://pmc.ncbi.nlm.nih.gov/articles/PMC5932908/ (accessed on 17 September 2025).

27. Kooij, D.T.; Zacher, H.; Wang, M.; et al. Successful aging at work: A process model to guide future research and practice. *Ind. Organ. Psychol.* **2020**, *13*, 345–365. https://doi.org/10.1017/iop.2020.1.

28. European Commission. *Commission Supports Action across Europe to Attract and Retain Nurses*; European Commission: Brussels, Belgium, 2024. Available online: https://health.ec.europa.eu/latest-updates/commission-supports-action-across-europe-attract-and-retain-nurses-2024-09-02_en (accessed on 17 September 2025).

29. World Health Organization. *State of the World's Nursing 2020: Investing in Education, Jobs and Leadership*; WHO: Geneva, Switzerland, 2020. Available online: https://www.who.int/publications/i/item/9789240003279 (accessed on 17 September 2025).

30. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* **2021**, *372*, n71. https://doi.org/10.1136/bmj.n71.

31. Moher, D.; Liberati, A.; Tetzlaff, J.; et al. THE PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Med.* **2009**, *6*, e1000097. https://doi.org/10.1371/journal.pmed.1000097.

32. Harada, C.N.; Love, M.C.N.; Triebel, K.L. Normal cognitive aging. *Clin. Geriatr. Med.* **2013**, *29*, 737–752. https://doi.org/10.1016/j.cger.2013.07.002.

33. Durosaiye, I.O.; Hadjri, K.; Liyanage, C. Identifying challenging job and environmental demands of older nurses within the National Health Service. *Health Environ. Res. Des. J.* **2016**, *9*, 82–105. https://doi.org/10.1177/1937586715613586.

34. Bufano, P.; Di Tecco, C.; Fattori, A.; et al. The effects of work on cognitive functions: A systematic review. *Front. Psychol.* **2024**, *15*, 1351625. https://doi.org/10.3389/fpsyg.2024.1351625.

35. Stimpfel, A.W.; Sloane, D.M.; Aiken, L.H. The longer the shifts for hospital nurses, the higher the burnout. *Health Aff.* **2012**, *31*, 2501–2509. https://doi.org/10.1377/hlthaff.2011.1377.

36. Dall'Ora, C.; Ball, J.; Reinius, M.; et al. Burnout in nursing: A theoretical review. *Hum. Resour. Health* **2020**, *18*, 41. https://doi.org/10.1186/s12960-020-00469-9.

37. Maslach, C.; Leiter, M.P. Understanding the burnout experience. *World Psychiatry* **2016**, *15*, 103–111. https://doi.org/10.1002/wps.20311.

38. Gómez-García, T. Emotional exhaustion and coping in senior nurses. *J. Nurs. Manag.* **2022**, *30*, 323–332.

39. Pool, I.A.; Poell, R.F.; Berings, M.G.M.C.; et al. Strategies for continuing professional development among younger, middle-aged, and older nurses: A biographical approach. *Int. J. Nurs. Stud.* **2015**, *52*, 939–950. https://doi.org/10.1016/j.ijnurstu.2015.02.004.

40. Denton, J.; Evans, D.; Xu, Q. Older nurses and midwives in the workplace: A scoping review. *Collegian* **2021**, *28*, 222–229. https://doi.org/10.1016/j.colegn.2020.06.004.

41. Montayre, J.; Knaggs, G.; Harris, C.; et al. What interventions and programmes are available to support older nurses in the workplace? A literature review of available evidence. *Int. J. Nurs. Stud.* **2023**, *139*, 104446. https://doi.org/10.1016/j.ijnurstu.2023.104446.

42. Markowski, M.; Cleaver, K.; Weldon, S.M. An integrative review of the factors influencing older nurses' timing of retirement. *J. Adv. Nurs.* **2020**, *76*, 2266–2285. https://doi.org/10.1111/jan.14442.

43. World Health Organization. *Global Strategy on Human Resources for Health: Workforce 2030*; WHO: Geneva, Switzerland, 2016.

44. Drennan, V.M.; Ross, F. Global nurse shortages—the facts, the impact and action for change. Br. Med. Bull. 2019, 130, 25–37. https://doi.org/10.1093/bmb/ldz014.

45. OECD. *Pensions at a Glance 2023*; OECD: Paris, France, 2023. Available online: https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/12/pensions-at-a-glance-2023_4757bf20/678055dd-en.pdf (accessed on 1 November 2025).

46. Kooij, D.T.; Zacher, H. Why and when do learning goal orientation and attitude decrease with aging? The role of perceived remaining time and work centrality. *J. Soc. Issues* **2016**, *72*, 146–168. https://doi.org/10.1111/josi.12160.

47. Brady, G.; Rineer, J.R.; Cadiz, D.; et al. Maintaining work ability to support and retain older workers. In *The Aging Workforce Handbook: Individual, Organizational and Societal Challenges*; Emerald Group Publishing: Bingley, UK, 2016; pp. 323–353.

48. Flinkman, M.; Leino-Kilpi, H.; Salanterä, S. Nurses' intention to leave the profession: Integrative review. *J. Adv. Nurs.* **2010**, *66*, 1422–1434. https://doi.org/10.1111/j.1365-2648.2010.05322.x.

49. Lai, Y.-H.; Chang, M.-Y.; Wang, C.-C. Applying meta-analytic structural equation modeling to examine the relationships among work stress, job burnout, and turnover intention in Taiwanese nurses. *Healthcare* **2025**, *13*, 2718. https://doi.org/10.3390/healthcare13212718.

50. Cleaver, K.; Markowski, M.; Wels, J. Factors influencing older nurses' decision making around the timing of retirement: An explorative mixed-method study. *J. Nurs. Manag.* **2022**, *30*, 169–178. https://doi.org/10.1111/jonm.13447.

51. Wynendaele, H.; Gemmel, P.; Pattyn, E.; et al. Systematic review: What is the impact of self-scheduling on the patient, nurse and organization? *J. Adv. Nurs.* **2021**, *77*, 47–82. https://doi.org/10.1111/jan.14579.

52. Söderbacka, T.; Nyholm, L.; Fagerström, L. Workplace interventions that support older employees' health and work ability: A scoping review. *BMC Health Serv. Res.* **2020**, *20*, 472. https://doi.org/10.1186/s12913-020-05323-1.

53. Henning, G.; Berglund, T.; Vingård, E.; et al. Levels and change in autonomous and controlled work motivation in older workers: The role of proximity to retirement and sense of community at work. *J. Occup. Organ. Psychol.* **2023**, *96*, 33–55. https://doi.org/10.1111/joop.12406.

54. Nilsson, K.; Rignell-Hydbom, A.; Rylander, L. Sustainable healthy working life for all ages: Work environment and sustainable work in an ageing workforce. *Int. J. Environ. Res. Public Health* **2023**, 20 1923. https://doi.org/10.3390/ijerph20032712.

55. Gharajeh-Alamdari, N.; Mirzaei, A.; Mehri, S.; et al. Assessing the relationship between supervisor knowledge sharing and innovative behaviors among clinical nurses: The mediating role of organizational learning. *BMC Nurs.* **2025**, *24*, 508. https://doi.org/10.1186/s12912-025-03165-y.

56. Maunula, M.; Maunumäki, M.; Lähdesmäki, S. The connection between mentoring, continuous learning and sustainability. *Athens J. Educ.* **2025**, *12*, 187–204.

57. Kagan, S.H.; Melendez-Torres, G.J. Ageism in nursing. *J. Nurs. Manag.* **2015**, *23*, 644–650. https://doi.org/10.1111/jonm.12191.

58. Chen, C.; Shannon, K.; Napier, S.; et al. Ageism directed at older nurses in their workplace: A systematic review. *J. Clin. Nurs.* **2024**, *33*, 2388–2411. https://doi.org/10.1111/jocn.17088.

59. Yudianto, K.; Sekawarna, N.; Susilaningsih, F.S.; et al. Succession planning leadership model for nurse managers in hospitals: A narrative review. *Healthcare* **2023**, *11*, 454. https://doi.org/10.3390/healthcare11040454.

60. Al Hajri, A.K. Succession planning and leadership development in nursing: A bibliometric analysis (2000–2023). *Nurs. Res. Pract.* **2024**, *2024*, 6191008. https://doi.org/10.1155/2024/6191008.

61. Busby, K.R.; Draucker, C.B.; Reising, D.L. Exploring mentoring relationships among novice nurse faculty: A grounded theory study. *Nurs. Educ. Perspect.* **2023**, *44*, 36–42. https://doi.org/10.1097/01.NEP.0000000000001052.

62. Zarif, A.; Drassa, S.; Jones, R.; et al. Delivering medical leadership training through the Healthcare Leadership Academy (HLA) scholarship programme: A multi-country intervention study. *BMC Med. Educ.* **2024**, *24*, 50. https://doi.org/10.1186/s12909-024-05031-y.

63. Chang, W.P.; Lin, P.C.; Wu, Y.H. Factors related to nurse satisfaction with supervisor leadership: The mediating role of job satisfaction and organizational commitment. *Int. J. Environ. Res. Public Health* **2023**, *20*, 3933. https://doi.org/10.3390/ijerph20053933.

64. World Health Organization. *Workplace Health Promotion and Healthy Ageing*; WHO, Geneva, Switzerland, 2022.

65. European Agency for Safety and Health at Work. *Ageing Workforce and OSH Policies*; Publications Office of the EU: Luxembourg, 2022.

66. Cant, R.P.; Cooper, S.J. Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. *Nurse Educ. Today* 2017, 49, 63–71. https://doi.org/10.1016/j.nedt.2016.11.015

67. Okuhara, M.; Okabayashi, K.; Ishikawa, H. The nurses' occupational stress components and outcomes: A cross-sectional study in Japanese hospitals. *Nurs Open.* **2021**, *8*, 2780–2788. https://doi.org/10.1002/nop2.780.

68. World Health Organization (Europe). *Ageing Workforce and Policy Approaches; WHO Regional Office for Europe*: Copenhagen, Denmark, 2022. Available online: https://www.euro.who.int/en/publications/abstracts/ageing-workforce-and-policy-approaches-2022 (accessed on 10 October 2025).

69. OECD. *Health at a Glance 2025: OECD Indicators*; OECD Publishing: Paris, 2025. https://doi.org/10.1787/8f9e3f98-en. (accessed on 17 September 2025).

70. Gharajeh-Alamdari, N.; Mirzaei, A.; Mehri, S.; et al. Assessing the relationship between supervisor knowledge sharing and innovative behaviors among clinical nurses: The mediating role of organizational learning. BMC Nurs. 2025, 24, 508. https://doi.org/10.1186/s12912-025-03165-y.

71. Maunula, M.; Maunumäki, M.; Lähdesmäki, S. The connection between mentoring, continuous learning and sustainability. Athens J. Educ. 2025, 12, 187–204. https://doi.org/10.30958/aje.12-2-1.

72. Einarsen, S.; Hoel, H.; Zapf, D.; et al. *Bullying and Harassment in the Workplace*, 3rd ed.; CRC Press: Boca Raton, FL, USA, 2020.

73. Laschinger, H.K.S.; Wong, C.A.; Grau, A.L. Authentic leadership, empowerment and burnout: A comparison in new graduates and experienced nurses. *J. Nurs. Manag.* **2013**, *21*, 541–552. https://doi.org/10.1111/j.1365-2834.2012.01375.x.

74. Heinen, M.; van Oostveen, C.; Peters, J.; et al. An integrative review of leadership competencies and attributes in advanced nursing practice. *J. Adv. Nurs.* **2019**, *75*, 2378–2392. https://doi.org/10.1111/jan.14092.

75. Nena, E.; Katsaouni, M.; et al. Sleep and circadian health in shift-working nurses. *Indian J. Occup. Environ. Med.* **2018**, *22*, 29–34. Available online: https://pmc.ncbi.nlm.nih.gov/articles/PMC5932908/ (accessed on 15 September 2025).

76. European Observatory on Health Systems. *Addressing Workforce Ageing in Health Care*; European Commission, Brussels, 2023.

77. World Health Organization (Europe). *Ageing Workforce and Policy Approaches*; WHO Regional Office for Europe: Copenhagen, Denmark, 2022.

78. Slater, P.; Roos, M.; Eskola, S.; et al. Challenging and redesigning a new model to explain turnover in nursing. *Scand. J. Caring Sci.* **2021**, *35*, 388–399 https://doi.org/10.1111/scs.12884.

79. Montayre, J.; Knaggs, G.; Harris, C.; et al. What interventions and programmes are available to support older nurses in the workplace? A literature review. *Int. J. Nurs. Stud.* **2023**, 139, 104446. https://doi.org/10.1016/j.ijnurstu.2023.104446.

80. Rush, K.L.; Adamack, M.; Gordon, J.; et al. Best practices of formal new graduate nurse transition programs: An integrative review. *Int. J. Nurs. Stud.* **2013**, *50*, 345–356. https://doi.org/10.1016/j.ijnurstu.2012.06.009.