SafeWork NSW

NSW GOVERNMENT

Evidence check

Burnout in the health care and social assistance sector

October 2024

Prepared by the NSW Behavioural Insights Unit for SafeWork NSW

The scope and approach of this current evidence check

This evidence check was conducted to identify drivers of burnout in healthcare and social assistance professions and promising interventions to prevent and manage it. The evidence check applied a behavioural insights lens to existing evidence. The evidence check was conducted to inform the Managing Fatigue and Preventing Burnout Summit that was held on 7 November 2024. This evidence check reflects a rapid assessment of available literature.

What is a behavioural insights lens?

Behavioural insights is an approach that puts the person at the heart of solutions for behaviour change by helping us understand the evidence on how people really think and behave, not how we think they should behave. In this review, by applying a behavioural insights lens, we focused on the strongest available evidence for modifiable drivers of burnout, and the interventions that are most likely to drive large positive changes in the long-term. Here we have focussed on what the existing evidence says is most likely to drive and change burnout.

We will use the Industry Summit as a forum to listen to you, the practice experts – both to engage in a behavioural diagnosis of the issue in the NSW context and to design interventions to address the drivers of burnout in NSW.

Why focus on burnout?

This evidence review focuses on burnout and not fatigue, which is a related and serious challenge in healthcare and social assistance professions in NSW. Although burnout is not a new experience for HCSA workers, organisations and governments measuring and intervening in burnout is relatively recent. Fatigue, in contrast, has been well-researched for decades, and unlike burnout there are existing risk management frameworks and codes of practice in place to manage fatigue in NSW. To address the gap in our understanding of what works to prevent and manage burnout, here we focus specifically on burnout literature. There may be some overlap in models of burnout that address emotional exhaustion and excessive work demands.

The regulatory context

Since 2022, under the Work Health and Safety Act 2011 (NSW) (WHS Act), the Work Health and Safety Regulation 2017 (NSW) (WHS Regulation), and the NSW Code of Practice: Managing Psychosocial Hazards at Work 2021 (the Code of Practice) a Person Conducting a Business or Undertaking (PCBU) must implement control measures to eliminate psychosocial risks so far as is reasonably practicable. If that is not reasonably practicable, they must minimise psychosocial risks that may harm workers' psychological or physical health and safety, so far as is reasonably practicable. Duty holders can most effectively and efficiently eliminate or minimise psychosocial hazards and risks by improving the design of the work, workplace, and systems of work, so workers are not exposed to a psychosocial hazard as described in clause 55A(a) of the WHS Regulation.

The WHS Regulation requires duty holders to have regard to a range of matters when determining control measures to implement, including:

- the duration, frequency and severity of the exposure of workers and other persons to the psychosocial hazards; and
- how psychosocial hazards and risks may interact and combine to create harm; and
- the sources of psychosocial risk, including the design of the work, design and layout of the workplace, how work is organised, and other matters.

Executive summary

Burnout among healthcare and social assistance (HCSA) workers has emerged as a critical global concern, with significant implications for both the workforce and the quality of care they provide. Addressing burnout is essential to safeguard the well-being of HCSA workers, ensuring the sustainability of healthcare services and maintaining high standards of patient care in NSW.

This evidence check examines the literature on burnout and identifies the factors associated with burnout in HCSA workers and interventions that have been shown to prevent and manage burnout in HCSA workers.

Factors associated with burnout in HCSA workers

We identified four key factors associated with burnout in HCSA workers:

1. **Excessive workload:** Particularly when it leads to low autonomy and conflicts with personal life.
2. **Poor organisational culture:** High expectations with little support, low recognition, and unsupportive management.
3. **Low social support:** Lack of community or emotional support among colleagues.
4. **Moral distress:** Conflict between personal values and professional responsibilities, though some workers view moral distress as essential for decision-making.

Interventions to prevent and manage burnout in HCSA workers

We found that organisational interventions generally show more effectiveness than individual-focused interventions, with larger impacts on reducing burnout in healthcare and social assistance settings.

We reviewed 31 studies and identified seven intervention types with sufficient evidence to prevent or manage burnout in HCSA workers, categorised by the strength of evidence:

1. **Strong evidence:**
    - **Workload and scheduling:** Interventions reducing working hours, changing shift patterns, and reducing administrative burdens show clear, positive impacts on reducing burnout.
2. **Promising evidence:**
    - **Job control:** Interventions giving workers more autonomy (e.g., job crafting) show potential benefits but require more robust research.
    - **Models of care:** Certain care models, like dementia care mapping and caseload midwifery, suggest reduced burnout, but more studies are needed.
3. **Mixed evidence:**
    - **Debriefing and deliberation sessions:** Results are inconsistent, with some studies showing limited or negative effects on burnout.
    - **Professional coaching:** Coaching shows promise in reducing burnout and emotional exhaustion, particularly in high-stress roles, though further study is needed.
    - **Educational interventions:** Programs focused on resilience, coping skills, and patient behaviour management show mixed results, with limited impact on burnout.
    - **Mindfulness-based interventions:** While mindfulness reduces stress, its effect on burnout is modest and often not sustained, with mixed results across studies.

In conclusion, our findings underscore the importance of prioritising organisational-level interventions in preventing and managing burnout in HCSA workers. Effective burnout prevention and management is essential to ensuring the well-being of HCSA workers and maintaining the quality and sustainability of healthcare services.

Section 1: Introduction

Burnout among healthcare and social assistance (HCSA) workers has become a critical global concern, with far-reaching implications for both the workforce and the quality of care provided.

Understanding the factors contributing to burnout and identifying effective interventions are crucial steps in safeguarding the well-being of HCSA workers and ensuring the sustainability of healthcare services. By exploring these factors, we can develop targeted strategies to prevent and mitigate burnout, ultimately preserving the HCSA workforce of NSW and maintaining high standards of patient care.

A lot has been written about burnout in the past decade, and here we distil this literature into what the strongest behavioural evidence tells us about what is most likely to work to prevent and manage burnout.

What impact does burnout have on HCSA workers?

Addressing burnout is important because research suggests it can lead to poor outcomes for both HCSA workers and their patients. For example, burnout can lead to:

- **Higher HCSA staff turnover:** A review of the international literature in emergency department nursing, including Australian research, found that burnout was related to higher turnover.[1]
- **Unsafe patient care:** International reviews and meta-analyses have found associations between burnout and unsafe patient care and medical errors,[2,3,4] although it's important to note that factors like staff shortages could be causing both outcomes. However, a review of burnout studies by WorkSafe Victoria concluded that while burnout was associated with healthcare workers believing they're delivering a lower standard of care and making more medical errors, medical records did not show any difference in patient safety or care quality measures due to burnout.[5]

How is burnout defined?

Much of the current research on burnout defines burnout as "*a syndrome … resulting from chronic workplace stress that has not been successfully managed*".[6] There are three generally accepted dimensions of burnout:

1. **Emotional exhaustion:** "feelings of being emotionally overextended and exhausted by one's work"
2. **Depersonalisation:** "unfeeling and impersonal response towards recipients of one's care or service"
3. **Personal achievement/accomplishment:** "competence and successful achievement in one's work with people"

In this three-factor model, someone experiencing burnout is classified as having high emotional exhaustion and/or depersonalisation and/or low sense of personal achievement from work.

Many models of burnout conceptualise it as a mismatch between 'job demands' like workload and time pressure, and 'job resources' like job control and feedback (for an overview, see Appendix 2).

1 McIntyre N, Crilly J, Elder E. (2024). Factors that contribute to turnover and retention amongst emergency department nurses: A scoping review. International Emergency Nursing. 74 (101437).
2 Garcia CL, Abreu LC, Ramos JLS, Castro CFD, Smiderle FRN, Santos JAD, Bezerra IMP. Influence of Burnout on Patient Safety: Systematic Review and Meta-Analysis. Medicina (Kaunas). 2019 Aug 30;55(9):553
3 Panagioti M, Geraghty K, Johnson J, et al. Association Between Physician Burnout and Patient Safety, dProfessionalism, and Patient Satisfaction: A Systematic Review and Meta-analysis. JAMA Intern Med. 2018;178(10):1317–1331
4 Patel, R. S., Bachu, R., Adikey, A., Malik, M., & Shah, M. (2018). Factors related to physician burnout and its consequences: a review. Behavioral sciences, 8(11), 98.
5 Fatigue and burnout in healthcare Prevalence, impact and interventions: An Evidence Review on physical, mental and emotional fatigue in healthcare and social assistance workers. WorkSafe Victoria.
6 De Beer, L. T., van der Vaart, L., Escaffi-Schwarz, M., De Witte, H., & Schaufeli, W. B. (2024). Maslach Burnout Inventory—General survey: A systematic review and meta-analysis of measurement properties. European Journal of Psychological Assessment.

How is burnout measured?

Burnout is generally measured with surveys or self-report scales. Our review found that the Maslach Burnout Inventory, which uses this three-factor concept of burnout, is the most frequently used measure of burnout in HCSA workers.[7] There are other models of burnout and other surveys used to measure those models, such as the Oldenburg Burnout Inventory which measures burnout with the dimensions of exhaustion and disengagement (from work),[8] and the Copenhagen Burnout Inventory which measures burnout in three domains: personal, work-related, and client-related burnout.[9] Burnout is therefore not an observable behaviour we can objectively see and measure. Rather, we must rely on people telling us they are burned out. This means that measuring burnout is hard and subject to bias (for example, people who respond to surveys on burnout may be different to those who don't – and many studies report survey response rates of under 50%).

Section 2: What are the factors associated with burnout in HCSA workers?

Overall, the Australian and international research on burnout suggests that there are four factors that are related to burnout:

1. **Excessive workload** that leads to low professional autonomy and high interference with personal and family life.
2. **Poor organisational culture**, which includes a low-quality training environment, high expectations but low support to meet them, low recognition when they are met, and unsupportive management.
3. **Low social support from colleagues**, where HCSA workers don't feel a sense of community or emotional support from their colleagues.
4. **Moral distress**, although some HCSA workers consider moral distress important for their ability to make difficult decisions.

Below we describe each of these four factors in greater detail. However, the current evidence available tends to be of poor to medium quality, which means we cannot definitively say what causes burnout. Rather, we have strong indicators that suggest these are the primary causes. Some of the challenges with the evidence in the space are outlined in Box 1 below (p.11).

7 Maslach C., Jackson S. E. The measurement of experienced burnout. Unpublished manuscript, Department of Psychology, University of California, Berkeley, 1979.
8 Demerouti, E., & Bakker, A. B. (2008). The Oldenburg Burnout Inventory: A good alternative to measure burnout and engagement. Handbook of stress and burnout in health care, 65(7), 1-25.
9 Kristensen, Tage S., Marianne Borritz, Ebbe Villadsen, and Karl B. Christensen. "Copenhagen burnout inventory." Work & Stress (1999).

1. Excessive workload that leads to low professional autonomy and high interference with personal and family life.

Burnout is more strongly related to low job control and work interfering with personal life than to workload

In the Australian and international literature, there's a clear and consistent relationship between workload and burnout in HCSA professions.[10,11,12,13,14,15,16,17,18] A review and meta-analysis of the international literature on burnout estimated that trainee doctors reporting excessive work demands were more than twice as likely to report meeting criteria for burnout.[19] The Behavioural Economics Team of Australia (BETA) surveyed NDIS workers and found that self-reported workload at or above capacity[20] was associated with higher burnout.[21] Some of these studies and reviews also find associations between burnout and factors that likely cause excessive workloads like chronic understaffing, high turnover, and long shifts. However, the direction of this relationship isn't clear – over time, long hours and excessive workload may lead to burnout, or burnout may make workloads seem excessive. It may also be important what kind of work HCSA workers think is excessive in their role. For example, BETA's survey of NDIS workers found that administrative burden, bureaucracy (red tape or sludge), and compliance with regulatory requirements were particularly associated with higher burnout and/or lower job engagement.[22]

As described in the next section, there is also evidence in the literature that it's not as simple as excessive workload or long hours leading to burnout.

Work-home and work-family conflict

Research suggests that conflict between work and personal/family life may be important in explaining why excessive workload don't cause burnout in every HCSA worker, and why workload isn't the only factor associated with burnout. That is, an HCSA worker working fewer than the average hours per week for their role may be burned out because those hours conflict with the times their friends and family spend time together.

Surveys of Australian mental health service workers[23] and Australian surgical trainees[24] found that burnout was associated with work-home conflict, difficulty balancing work and personal commitments, and work negatively affecting their family. Evidence also comes from a positive relationship between job control and lower burnout - in a survey of Australian disability support workers, job control was associated with lower burnout, even when workload was excessive.[25]

10 McCormick, E., Devine, S., Crilly, J., Brough, P., & Greenslade, J. (2023). Measuring occupational stress in emergency departments. Emergency Medicine Australasia, 35(2), 234-241.
11 Ryan, C., Bergin, M., & Wells, J. S. (2021). Work-related stress and well-being of direct care workers in intellectual disability services: A scoping review of the literature. International Journal of Developmental Disabilities, 67(1), 1-22.
12 Bouskill, K. E., Danz, M. S., Meredith, L. S., Chen, C., Chang, J., Baxi, S. M., ... & Hempel, S. (2022). Burnout: Definition, Prevalence, Risk Factors, Prevention, and Interventions Literature Reviews. RAND.
13 Sidhu, R., Su, B., Shapiro, K. R., & Stoll, K. (2020). Prevalence of and factors associated with burnout in midwifery: a scoping review. European Journal of Midwifery, 4.
14 Dall'Ora, C., Ball, J., Reinius, M., & Griffiths, P. (2020). Burnout in nursing: a theoretical review. Human resources for health, 18, 1-17.
15 Singh, N., Wright, C., Knight, K., Baird, M., Akroyd, D., Adams, R. D., & Schneider, M. E. (2017). Occupational burnout among radiation therapists in Australia: findings from a mixed methods study. Radiography, 23(3), 216-221.
16 Hodge, E., & Sandford, A. (2024). Workforce nurturing: an approach to improving wellbeing, burnout and professional fulfilment among Australian doctors. International Journal of Medical Education, 15, 59-65.
17 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.
18 Mcmillan, K., Butow, P., Turner, J., Yates, P., White, K., Lambert, S., ... & Lawsin, C. (2016). Burnout and the provision of psychosocial care amongst Australian cancer nurses. European Journal of Oncology Nursing, 22, 37-45.
19 Zhou, A. Y., Panagioti, M., Esmail, A., Agius, R., Van Tongeren, M., & Bower, P. (2020). Factors associated with burnout and stress in trainee physicians: a systematic review and meta-analysis. JAMA network open, 3(8), e2013761-e2013761.
20 5-point Likert scale ranging from 'Well below capacity' to 'Well above capacity'
21 Behavioural Economics Team of the Australian Government (2022). NDIS workforce retention: Findings from the NDIS workforce survey. behavioraleconomics.pmc.gov.au/sites/default/files/projects/ndis-workforce-retention-survey.pdf
22 Behavioural Economics Team of the Australian Government (2022). NDIS workforce retention: Findings from the NDIS workforce survey. behavioraleconomics.pmc.gov.au/sites/default/files/projects/ndis-workforce-retention-survey.pdf
23 Scanlan, J. N., & Still, M. (2019). Relationships between burnout, turnover intention, job satisfaction, job demands and job resources for mental health personnel in an Australian mental health service. BMC health services research, 19, 1-11.
24 Raftopulos, M., Wong, E. H., Stewart, T. E., Boustred, R. N., Harvey, R. J., & Sacks, R. (2019). Occupational burnout among otolaryngology–head and neck surgery trainees in Australia. Otolaryngology–Head and Neck Surgery, 160(3), 472-479.
25 Vassos, M., Nankervis, K., Skerry, T., & Lante, K. (2019). Can the job demand-control-(support) model predict disability support worker burnout and work engagement?. Journal of Intellectual & Developmental Disability, 44(2), 139-149.

A longitudinal study of Dutch aged care workers found that work schedules that fit around workers' personal lives reduced the effect of excessive workloads on emotional exhaustion one year later.[26] However, this study also found that perceived control over work schedule (e.g. whether their roster has a fixed pattern and if it's easy to swap shifts) made the negative effect of working hours on emotional exhaustion worse. This study did not directly test the effect of giving aged care workers more control over their work schedule, or a greater ability to fit their irregular hours around their personal life. However, considering these correlations, this study suggests that control over a demanding work schedule would not prevent burnout if this control doesn't give HCSA workers the ability to fit work around their personal life.

Job control

Job control refers to HCSA workers' ability to decide how they do the work that's been assigned to them or falls within their role. Autonomy and job control are related, as excessive workload leaves less time and cognitive capacity for decision-making. Often excessive workload and exacerbating factors like low job control are reported together with burnout in studies of HCSA workers, such as research among Australian cancer nurses.[27]

However, studies have also shown that autonomy and control is related to burnout independent of workload. A review of burnout in US clinicians found stronger evidence for relationships between job control and burnout, and work-life balance and burnout, than for workload and burnout.[28] A review of the international literature on burnout in midwives similarly found a stronger relationship between burnout and lack of autonomy than between burnout and workload.[29] Supporting the theory that lack of job control causes burnout, there is evidence that 'job crafting' interventions which give employees control in changing their work environment (e.g. seeking resources, reducing demands) can have a positive impact on the exhaustion component of burnout,[30] and can mitigate the negative effects of excessive workload[31] in healthcare workers.

Case study: Midwives

Australian and international literature has consistently found that midwives who work in a caseload (also known as group practice) model report less burnout than their standard care peers, despite the long working hours and requirement to be on call.[32,33,34,35,36] Qualitative research with Australian midwives has identified increased job satisfaction,[37] flexibility and autonomy in work schedule and practice, and building relationships with patients as positive aspects of caseload midwifery.[38] However, it's unclear whether the autonomy and job control caseload midwifery offers prevents burnout, or whether midwives who are more resilient against burnout tend to choose caseload midwifery.

26 Peters, V., Houkes, I., de Rijk, A. E., Bohle, P. L., Engels, J. A., & Nijhuis, F. J. (2016). Which resources moderate the effects of demanding work schedules on nurses working in residential elder care? A longitudinal study. International journal of nursing studies, 58, 31-46.
27 Mcmillan, K., Butow, P., Turner, J., Yates, P., White, K., Lambert, S., ... & Lawsin, C. (2016). Burnout and the provision of psychosocial care amongst Australian cancer nurses. European Journal of Oncology Nursing, 22, 37-45.
28 Bouskill, K. E., Danz, M. S., Meredith, L. S., Chen, C., Chang, J., Baxi, S. M., ... & Hempel, S. (2022). Burnout: Definition, Prevalence, Risk Factors, Prevention, and Interventions Literature Reviews. RAND.
29 Andina‐Díaz, E., Rodríguez‐Puente, Z., Arias‐Gundín, O., & Pérez‐Rivera, F. J. (2024). Lack of autonomy and professional recognition as major factors for burnout in midwives: A systematic mixed‐method review. Journal of Advanced Nursing.
30 Gordon, H. J., Demerouti, E., Le Blanc, P. M., Bakker, A. B., Bipp, T., & Verhagen, M. A. (2018). Individual job redesign: Job crafting interventions in healthcare. Journal of Vocational Behavior, 104, 98-114.
31 Hakanen, J. J., Seppälä, P., & Peeters, M. C. (2017). High job demands, still engaged and not burned out? The role of job crafting. International journal of behavioral medicine, 24, 619-627.
32 Sidhu, R., Su, B., Shapiro, K. R., & Stoll, K. (2020). Prevalence of and factors associated with burnout in midwifery: a scoping review. European Journal of Midwifery, 4.
33 Newton, M. S., McLachlan, H. L., Willis, K. F., & Forster, D. A. (2014). Comparing satisfaction and burnout between caseload and standard care midwives: findings from two cross-sectional surveys conducted in Victoria, Australia. BMC pregnancy and childbirth, 14, 1-16.
34 Newton, M. S., McLachlan, H. L., Forster, D. A., & Willis, K. F. (2016). Understanding the 'work' of caseload midwives: a mixed-methods exploration of two caseload midwifery models in Victoria, Australia. Women and Birth, 29(3), 223-233.
35 Fenwick, J., Lubomski, A., Creedy, D. K., & Sidebotham, M. (2018). Personal, professional and workplace factors that contribute to burnout in Australian midwives. Journal of advanced nursing, 74(4), 852-863.
36 Sidhu, R., Su, B., Shapiro, K. R., & Stoll, K. (2020). Prevalence of and factors associated with burnout in midwifery: a scoping review. European Journal of Midwifery, 4.
37 Kashani, A., Ingberg, J. L., & Hildingsson, I. (2021). Caseload midwifery in a rural Australian setting: A qualitative descriptive study. European Journal of Midwifery, 5.
38 Newton, M., Dawson, K., Forster, D., & McLachlan, H. (2021). Midwives' views of caseload midwifery–comparing the caseload and non-caseload midwives' opinions. A cross-sectional survey of Australian midwives. Women and Birth, 34(1), e47-e56.

2. Poor organisational culture, which includes a low-quality training environment, high expectations but low support to meet them and low recognition when they are met, and unsupportive management.

Organisational factors like employer expectations, learning environment, and support from management are associated with burnout. Across the HCSA sector, organisational culture and structures will vary depending on profession, location, workplace and team. Supporting the theory that organisational culture can cause or prevent burnout, a study of Australian nurses found that the more aspects of a 'high performance work system' nurses identified, such as employment security, self-managed teams, and extensive training, the lower their reported burnout.[39] A systematic review of burnout studies with Australian postgraduate medical trainees found that bullying, harassment and discrimination were associated with burnout.[40] Junior doctors also reported that these behavioural are "an integral part of medical culture, perpetuated by staff at all levels."

Employer expectations

High employer expectations, lack of support to meet them, and lack of recognition when they're met, have all been linked to burnout. A systematic review of burnout studies with Australian postgraduate medical trainees found that a culture of high expectations, challenging work, and fear of making mistakes was associated with higher burnout.[41] Other researchers have described medicine as a profession that doesn't tolerate mistakes.[42] In a qualitative study, Australian disability support workers described lack of recognition by management about the drivers of workload and job demands (high expectations for care, staff shortages, challenging client behaviour) as a negative aspect of their work that they felt led to burnout.[43]

Inadequate reward and recognition

A review of the international literature found a stronger relationship between burnout and lack of recognition than between burnout and workload.[44] Australian researchers have also found high burnout in cancer nurses who said they were inadequately rewarded.[45] Burnout isn't just related to inadequate recognition from employers. For example, a cross-sectional survey of midwives employed in one Melbourne maternity service found that lack of acknowledgement was associated with client-related burnout.[46]

Learning environment

Some roles like junior doctor are explicitly training roles, but most HCSA professions have a culture of continuous learning and professional development. Workers' perceptions of the learning environment they work in have been associated with burnout. A systematic review of burnout studies with Australian postgraduate medical trainees found an association between perception of a low quality training environment and higher burnout.[47] A survey of Victorian trainee anaesthetists found an association between lower ratings of the clinical learning environment and higher burnout scores.[48] There is also an association in the literature between having a mix of heavy and/or challenging workload and low skill in HCSA roles and burnout.[49] For example, Australian junior doctors have reported that working overtime is more stressful because of the lack of adequate supervision and perceived skill to treat patients on their own than the additional hours.[50]

39 Bartram, T., Casimir, G., Djurkovic, N., Leggat, S. G., & Stanton, P. (2012). Do perceived high performance work systems influence the relationship between emotional labour, burnout and intention to leave? A study of Australian nurses. Journal of Advanced Nursing, 68(7), 1567-1578.
40 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.
41 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.
42 Kumar S. (2016). Burnout and Doctors: Prevalence, Prevention and Intervention. Healthcare, 4(3), 37.
43 Judd, M. J., Dorozenko, K. P., & Breen, L. J. (2017). Workplace stress, burnout and coping: a qualitative study of the experiences of Australian disability support workers. Health & social care in the community, 25(3), 1109-1117.
44 Andina‐Díaz, E., Rodríguez‐Puente, Z., Arias‐Gundín, O., & Pérez‐Rivera, F. J. (2024). Lack of autonomy and professional recognition as major factors for burnout in midwives: A systematic mixed‐method review. Journal of Advanced Nursing.
45 Mcmillan, K., Butow, P., Turner, J., Yates, P., White, K., Lambert, S., ... & Lawsin, C. (2016). Burnout and the provision of psychosocial care amongst Australian cancer nurses. European Journal of Oncology Nursing, 22, 37-45.
46 Matthews, R. P., Hyde, R. L., Llewelyn, F., Shafiei, T., Newton, M. S., & Forster, D. A. (2022). Who is at risk of burnout? A cross-sectional survey of midwives in a tertiary maternity hospital in Melbourne, Australia. Women and Birth, 35(6), e615-e623.
47 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.
48 Castanelli, D. J., Wickramaarachchi, S. A., & Wallis, S. (2017). Burnout and the learning environment of anaesthetic trainees. Anaesthesia and Intensive Care, 45(6), 744-751.
49 McCormick, E., Devine, S., Crilly, J., Brough, P., & Greenslade, J. (2023). Measuring occupational stress in emergency departments. Emergency Medicine Australasia, 35(2), 234-241.
50 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.

Meaningful support from management

Support from management has been linked to lower burnout in HCSA workers. However, there is evidence that this support needs to feel meaningful to employees to be effective. A systematic review of burnout studies with Australian postgraduate medical trainees found an association between burnout and lack of wellbeing support, perception that support was tokenistic, and fear of stigma or reprisal from accessing support.[51] Supervisor support may also be more meaningful when it's in the context of the HSCA worker's role, not outside of it. For example, in interviews and surveys, Australian junior doctors[52] and surgical trainees have identified lack of supervision when working after hours and feeling uncomfortable approaching a supervisor as sources of stress and burnout.[53] A survey of Australian residential child protection support workers found that low perceived supervisor support was associated with higher burnout.[54] Supervisor support was measured using the Perceived Organisational Support scale, which has items like "My supervisor really cares about my wellbeing" and "Even if I did the best job possible, my supervisor would fail to notice". Workers who reported feeling less supported by their manager on this scale also reported higher work-related burnout.

3. Low social support from colleagues

Social support may 'buffer' the effect of other proposed drivers of burnout in HCSA workers

Social support from colleagues may reduce burnout, as there is evidence that burnout is low when HCSA workers feel supported, even when proposed drivers like workload are high. Surveys of Australian residential aged care workers,[55] cancer nurses[56] and workers,[57] and midwives[58] have all found associations between low co-worker support and perception of the workplace as an unsupportive community and burnout.

Some of these studies have found this association even when controlling for other factors like organisational culture and work schedule.[59] There is also evidence that low social support may cause burnout from studies showing that having workplace social support can 'buffer' the effects of excessive workload,[60] lack of job control,[61] and work-family conflict on burnout.[62] That is, if HCSA workers have social support, excessive workload, low job control, and work-family conflict may not lead to burnout.

Case study: Australian doctors in rural placements

Rural and regional placements for doctors may exacerbate lack of social support and therefore burnout. A survey of Australian surgical trainees found that high scores on any of the three burnout dimensions (excessive workload, depersonalisation and low personal achievement) was associated with social isolation, which was exacerbated by training in rural locations.[63] Similarly, a systematic review of burnout studies with Australian postgraduate medical trainees found that lack of social support was exacerbated by training in rural locations.[64] Junior doctors were more socially isolated in rural locations, and there were few formal support structures to compensate for this.

51 Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.
52 Hoffman, R., & Bonney, A. (2018). Junior doctors, burnout and wellbeing: Understanding the experience of burnout in general practice registrars and hospital equivalents. Australian Journal of General Practice, 47(8), 571-575.
53 Raftopulos, M., Wong, E. H., Stewart, T. E., Boustred, R. N., Harvey, R. J., & Sacks, R. (2019). Occupational burnout among otolaryngology–head and neck surgery trainees in Australia. Otolaryngology–Head and Neck Surgery, 160(3), 472-479.
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55 Low, Y. S., Bhar, S., & Chen, W. S. (2022). Exploring the relationship between co-worker and supervisor support, self-confidence, coping skills and burnout in residential aged care staff. BMC nursing, 21(1), 135.
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4. Moral distress, although some HCSA workers consider moral distress important for their ability to make difficult decisions.

There is mixed evidence for the role of moral distress in burnout

Moral distress occurs when HCSA workers can't act in a way that aligns with their personal values because of external pressures like patient load and challenging behaviour. Compared to the other proposed drivers, there is relatively less research in Australian HCSA workers on moral distress. The research that does exist is mixed as to whether moral distress causes burnout.

Reviews and meta-analyses of the international literature have found associations between moral distress and burnout, most commonly explored in nurses.[65] A survey of Australian frontline health workers during the COVID-19 pandemic found that the pandemic exacerbated moral distress, and that moral distress was associated with higher burnout.[66] However, a survey of doctors and nurses in a Victorian NICU found that while many wanted to mitigate its negative impacts, few thought moral distress should be removed from their work.[67] These healthcare workers saw moral distress as an important component of their work that helps them make medical decisions.

A Dutch intervention study on Moral Case Deliberation found a dissociation between moral distress and burnout.[68] MCD is a team-based, facilitated, structured discussion about the moral and ethical difficulties doctors encounter in their work. Introducing MCD reduced moral distress, but did not impact emotional exhaustion or depersonalisation, and in fact reduced personal accomplishment.

Case study: Community appreciation during the COVID-19 pandemic

The COVID-19 pandemic put additional stress on the Australian healthcare system and changed the way nurses and doctors were able to interact with and care for their patients. A survey of frontline health workers during the COVID-19 pandemic found an association between moral distress and burnout.[69] However, health workers feeling appreciated by the community for their work during the pandemic was associated with lower burnout even when they experienced moral distress.

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Box 1. Challenges with the quality of evidence when looking at fatigue and burnout in the HCSA sector.

- **Most of the evidence in this review uses cross-sectional surveys of HCSA workers, which show correlations with burnout, not causes of burnout.** The majority of studies in the burnout literature are cross-sectional surveys, which means they collect data from HCSA workers at only one point in time. They explore what factors seem to be correlated to higher burnout scores, and infer that these factors are likely drivers of burnout. However, we can't make any conclusions about the causes of burnout from these studies. Just because burnout is correlated with other factors the researchers asked about in their survey, like workload and organisational culture, doesn't mean that those proposed drivers cause burnout. For example, it's equally likely that burnout causes proposed drivers (reverse causation), the relationship between burnout and the proposed driver is cyclical (bidirectional causation), or that a third factor that has not been measured causes both burnout and the proposed driver (latent causes).
- **Longitudinal studies of the drivers of burnout offer better evidence, but not causal evidence.** Few studies on burnout are longitudinal, meaning they collect data at more than one point in time. These give us a little more confidence about what might be causing burnout, because they can show that a proposed driver like excessive workload in the first survey might be associated with increases and decreases with burnout over time. However, these studies can't 'prove' that a proposed driver causes burnout.[70]
- **Research into the drivers of burnout is more useful to identify who is likely to be burned out.** Although there are problems with using the available literature to make conclusions about what causes burnout, we can still use these studies to more effectively identify who is likely to be or become burned out in HCSA professions.
- **Fatigue and burnout are associated in HCSA workers, but there's no definitive evidence that fatigue causes burnout.** Fatigue and its relationship to burnout has mostly been studied through cross-sectional surveys of HCSA workers. Fatigue is generally understood to be the result of insufficient and/or disrupted sleep, but there is no universal definition of fatigue in HCSA workers.[71] The nature of HCSA work often requires long working hours and shiftwork which can't always be avoided. For example, safety management system frameworks and regulation cap working hours for junior doctors, but they still experience fatigue when working within those limits.[72] Fatigue is a serious issue in HCSA work, as fatigue can lead to compromised patient or client care due to impaired judgement and decision-making.[73] International[74] and Australian[75,76] surveys have found that HCSA workers who report high fatigue also tend to report higher burnout. However, there is no definitive evidence that fatigue causes burnout. In fact, fatigue has been conceptualised as a part of burnout,[77] particularly the emotional exhaustion component,[78] and burnout has been conceptualised as mental or emotional fatigue.[79] Given the lack of a consistent definition of fatigue, and its overlap with burnout, this review will focus on burnout.

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Section 3: Interventions to prevent and manage burnout in HCSA workers

We reviewed 31 intervention studies and have identified seven intervention types with sufficient evidence for review in the Australian and international evidence. We have divided interventions below based on both the availability and strength of evidence (see Box 2 for an overview of the limitations identified in the evidence). We describe three categories:

1. **Strong evidence:** interventions that are consistently supported by robust research (such as randomised controlled trials) that demonstrate clear causal impacts on burnout.
2. **Promising Evidence:** interventions for which studies show potential benefits, but more research is needed because there are few robust studies, or the studies lack rigour.
3. **Mixed evidence:** interventions that have either been studied with less robust methods (e.g. small sample sizes, non-randomised or controlled trials), or where there are conflicting or inconclusive results between studies. This also includes interventions studied using robust methods, but where the results show only small effect sizes, or where the impacts are not sustained over time.

Intervention type	Definition	Effectiveness appraisal
Organisation interventions		
1. Workload and scheduling	Interventions that modify workload and scheduling such as reducing number of hours worked, the pattern of hours worked, ensuring adequate staffing and reducing administrative burden.	**Strong evidence**
2. Job control	Interventions that give HCSA workers more autonomy in the way they conduct their work.	**Promising evidence**
3. Models of care	Adopting different frameworks, routines and practices for providing patient or client care.	**Promising evidence**
4. Debriefing and deliberation sessions	Interventions that provide structured conversations designed to help HCSA workers process challenging experiences, reflect on their work, and develop strategies to reduce burnout.	**Mixed evidence**
Individual-focused interventions		
5. Coaching	Professional or trained peer coaches provide individual or group coaching sessions to healthcare professionals.	**Promising evidence**
6. Education	Interventions typically include training in communication skills, mental health promotion, compassion fatigue resiliency, relaxation techniques, and overall wellness.	**Mixed evidence**
7. Mindfulness	Mindfulness-based interventions are structured programs designed to reduce stress, emotional exhaustion, and burnout by promoting mindfulness practices.	**Mixed evidence**

Organisational interventions are more effective than individual-focused interventions

There are two broad approaches to tackling burnout in HCSA professions: intervening at the organisational (or structural) level, or intervening with individuals. Organisational interventions focus on changing the environment or system that healthcare workers operate in.[80] For example, reducing workload or changing shiftwork schedules to give workers more frequent breaks. Individual-focused interventions target an individual worker's ability to manage burnout by providing coping skills or improved competency in how they think and behave at work. In this context, we focus solely on individual-focused interventions that are implemented by HCSA employers within their organizations.

Multiple systematic reviews and meta-analyses of burnout interventions have concluded that organisational interventions have a larger positive impact on burnout than individual-focused interventions.[81,82]

Organisational interventions

1. Strong evidence: Workload and scheduling

Interventions that modify workload and scheduling in attempts to reduce burnout generally focus on reducing number of hours worked, the pattern of hours worked, adequate staffing and reducing administrative burden.

Reducing work hours / changing pattern of hours worked

Evidence from studies of US doctors suggests that reducing workload and limiting continuous work periods is effective to reduce burnout. Shorter rotations (2-weeks on instead of 4-weeks on continuously),[83] working in shifts instead of working day shifts and being on-call at night,[84] and having weekends off[85] have all been found to reduce ICU doctor burnout compared to working uninterrupted for a week or more. Studies of (short) protected sleep periods[86] and shorter overnight shift lengths[87] have found no impact on burnout. This research suggests that giving doctors more breaks when they would be continuously on shift and on call for a week or more appears to be more effective to reduce burnout than making shift lengths shorter or giving doctors longer sleep breaks on those shifts.

Reducing administrative burden

Reducing administrative burden on doctors may also reduce burnout. Randomised and non-randomised controlled trials run in the US have shown that providing doctors with certified medical assistants and offloading administrative tasks to them, and reducing time pressure by increasing appointment times, can reduce GP burnout.[88,89]

2. Promising evidence: Job control

Interventions that give healthcare workers more autonomy in the way they conduct their work show promising indications.[90] Two studies with medical specialists and nurses utilised job crafting – giving workers some decision making authority on how they performed certain duties and responsibilities – showed lower levels of burnout compared to control groups.[91] These were both small scale studies however, and more research needs to be conducted to determine the effectiveness of job design interventions in healthcare.

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89 Linzer, M., Poplau, S., Grossman, E., Varkey, A., Yale, S., Williams, E., ... & Barbouche, M. (2015). A cluster randomized trial of interventions to improve work conditions and clinician burnout in primary care: results from the Healthy Work Place (HWP) study. Journal of general internal medicine, 30, 1105-1111.

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3. Promising evidence: Models of care

'Model of care' refers to the frameworks HCSA workers use to guide the way they care for clients or deliver care to patients.

Evidence from the international and Australian literature shows that some models of care are associated with and may lead to lower burnout compared to others. An Australian cluster randomised controlled trial found evidence that dementia care mapping can reduce burnout in residential aged care workers, compared to person-centred care alone and standard care.[92] Dementia Care Mapping (DCM) is a comprehensive approach to improving the quality of care for people living with dementia in residential care settings and involves trained observers conducting structured observations of the interactions between care workers and individual residents living with dementia. These observers then give feedback to staff on the care approaches that worked well and those that were less successful to improve the approaches used. DCM might also be used to remind staff of the importance of viewing what they do and how they do it through the eyes of the person living with dementia.[93] As described in Section 2 on the factors associated with burnout, midwives who work in a caseload (also known as group practice) model report less burnout than their standard care peers.[94,95,96,97] One Australian study that directly compared midwives working in caseload and standard care models found that midwives working in a caseload model had, on average, burnout scores around half of those reported by midwives working in standard care at baseline and at follow-up.[98] However, this wasn't an intervention study, so we can't conclude whether caseload midwifery prevents burnout.

4. Mixed evidence: Structured debriefing and deliberation sessions

Another proposed organisational intervention for burnout in healthcare workers is structured debriefing and deliberation sessions.[99] Debriefing and deliberation sessions are structured conversations designed to help healthcare and social assistance (HCSA) workers process challenging experiences, reflect on their work, and develop strategies to reduce burnout. However, evidence on this type of intervention is too scarce to make a judgement about its effectiveness. A UK cross-sectional study in in adult and paediatric intensive care staff found that attending debriefing sessions reduced risk of burnout.[100] One higher-quality Dutch study assessed the impact of introducing moral case deliberation (MCD) into ICU teams on burnout.[101] MCD is a structured, facilitated, team moral discussion about ethical challenges healthcare staff encounter in their work. This study found a backfire effect where MCD decreased personal accomplishment and had no impact on emotional exhaustion or depersonalisation. Overall, the evidence remains mixed, and more rigorous studies are needed to determine the effectiveness of these interventions in preventing and managing burnout.

Individual-focused interventions

5. Promising evidence: Professional coaching interventions

Professional coaching for HCSA workers is a personalised, goal-oriented intervention designed to reduce burnout, improve well-being, and enhance professional fulfilment through one-on-one or group sessions. The coaching process typically involves rapport building, identifying challenges, setting actionable goals, and developing strategies to improve work-life balance and resilience. Coaching can be delivered by professionals or trained peers either face-to-face or via phone.

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94 Sidhu, R., Su, B., Shapiro, K. R., & Stoll, K. (2020). Prevalence of and factors associated with burnout in midwifery: a scoping review. European Journal of Midwifery, 4.

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There is promising evidence to suggest that individual and group coaching sessions can significantly reduce burnout and improve well-being, particularly among healthcare professionals in high-stress roles like resident physicians.[102,103] One international RCT found that only 3.5 hours of coaching over 5 months reduced doctors' emotional exhaustion and overall burnout.[104]

6. Mixed evidence: Educational interventions

Educational interventions for burnout are structured programs that either focus on:

1. Resilience and coping: building resilience and coping skills through training in communication skills, mental health promotion, compassion fatigue resiliency, relaxation techniques, and overall wellness, or
2. Client or patient behaviour management - training staff to manage challenging client or patient behaviour that may be contributing to burnout.

These interventions have been delivered through various formats such as seminars or weekly sessions over several months, these programs target key components of burnout, including emotional exhaustion and depersonalisation.

Resilience and coping education

Reviews of the international burnout literature conclude that resilience and coping education interventions generally lead to small but statistically significant reductions in stress and burnout,[105] particularly in emergency department (ED) staff.[106] However, the quality of this literature is generally low, and other reviews report no effect of resilience and coping education interventions on burnout in residential care workers.[107]

Client or patient behaviour management education

A review of the international literature on burnout in residential care workers, and a high-quality cluster randomised controlled trial, both found no impact of education on managing difficult client behaviour on burnout.[108,109] In the cluster randomised controlled trial the intervention consisted of an education package and various structured assessment tools that guide professionals through the multidisciplinary detection, analysis, treatment and evaluation of challenging behaviour. While significant positive effects were found on job satisfaction, no significant changes on burnout were identified.[110]

102 Fainstad T, Mann A, Suresh K, Shah P, Dieujuste N, Thurmon K, Jones CD. (2022). Effect of a Novel Online Group-Coaching Program to Reduce Burnout in Female Resident Physicians: A Randomized Clinical Trial. JAMA Network Open, 5(5), e2210752.
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7. Mixed evidence: Mindfulness-based interventions and relaxation techniques

Mindfulness-based interventions (MBIs) for HCSA workers are structured programs designed to reduce stress, emotional exhaustion, and burnout by promoting mindfulness practices. These interventions typically include guided meditation sessions, mindfulness workshops, relaxation techniques, and activities aimed at enhancing mental well-being. MBIs are delivered through various formats, such as brief meditation sessions, multi-modal activities, or weekly workshops, often tailored to the needs of healthcare staff. The goal of MBIs is to improve well-being, increase self-awareness, and foster resilience among HCSA workers, particularly those in high-stress environments like emergency departments. Research indicates that while MBIs can lead to reductions in stress, their impact on burnout is variable based on implementation and individual engagement and may depend on the intervention's design and duration.

Evidence from the Australian[111] and international literature[112,113,114,115] shows that mindfulness-based interventions can be helpful in reducing burnout among healthcare workers. However, the effects of mindfulness on burnout are inconsistent, modest, and often not sustained at follow-up (3-6 months after the intervention). An international narrative review[116] of RCTs found that mindfulness-based interventions decreased emotional exhaustion and depersonalization among primary care physicians and nurses. However, results were mixed:

A tailored mindfulness program reduced burnout in resident physicians at 6 months, but not at 2 or 12 months.

- An 8-week mindfulness program improved personal accomplishment but had no effects on emotional exhaustion or depersonalization.
- Conversely, another study showed benefits for emotional exhaustion but not depersonalization or personal accomplishment.

Finally, several RCTs found no significant effects from Mindfulness-based interventions. A large scale RCT of over 2,000 UK healthcare workers found no effect of an unguided digital mindfulness practices,[117] while other studies found no effect from brief mindfulness interventions (4-5 weeks) in reducing emotional exhaustion, depersonalisation,[118] or improving personal accomplishment[119].

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114 Pérez, V., Menéndez-Crispín, E. J., Sarabia-Cobo, C., de Lorena, P., Fernández-Rodríguez, A., & González-Vaca, J. (2022). Mindfulness-based intervention for the reduction of compassion fatigue and burnout in nurse caregivers of institutionalized older persons with dementia: a randomized controlled trial. International Journal of Environmental Research and Public Health, 19(18), 11441.
115 Mistretta EG, Davis MC, Temkit M, et al. (2018). Resilience training for work-related stress among health care workers. Journal of Occupational & Environmental Medicine, 60, 559–68.
116 Shiri, R.; Nikunlaakso, R.; Laitinen, J. Shiri, R., Nikunlaakso, R., & Laitinen, J. (2023, June). Effectiveness of workplace interventions to improve health and well-being of health and social service workers: A narrative review of randomised controlled trials. In Healthcare (Vol. 11, No. 12, p. 1792). MDPI.
117 Taylor, H., Cavanagh, K., Field, A. P., & Strauss, C. (2022). Health care workers' need for headspace: Findings from a multisite definitive randomized controlled trial of an unguided digital mindfulness-based self-help app to reduce healthcare worker stress. JMIR mHealth and uHealth, 10(8), e31744.
118 Ameli, R., Sinaii, N., West, C. P., Luna, M. J., Panahi, S., Zoosman, M., ... & Berger, A. (2020). Effect of a brief mindfulness-based program on stress in health care professionals at a US biomedical research hospital: a randomized clinical trial. JAMA network open, 3(8), e2013424-e2013424.
119 Watanabe, N., Horikoshi, M., Shinmei, I., Oe, Y., Narisawa, T., Kumachi, M., ... & Furukawa, T. A. (2019). Brief mindfulness-based stress management program for a better mental state in working populations-Happy Nurse Project: A randomized controlled trial. Journal of Affective Disorders, 251, 186-194.

Box 2. Challenges with the quality of evidence when looking at interventions to prevent and manage fatigue and burnout in the HCSA sector.

1. **Studies rely on self-report measures of burnout as an outcome, not behaviours, which likely biases findings.** Most studies of what works to prevent or manage burnout rely on the Maslach Burnout Inventory[120] or a similar questionnaire. Burnout is therefore only directly measured by a voluntary, self-report subjective measure, and not through independently observable behaviours. Many studies report questionnaire return rates of below 50%, indicating that burnout studies are vulnerable to selection bias. It's likely that the kinds of HCSA workers who return burnout surveys are systematically different from those that don't, which biases the findings.
2. **Short follow-up periods mean we don't know how long the effects of interventions last.** Most burnout intervention studies use short follow-up periods (0-6 months) so we can't tell how long the effects of an intervention last. In fact, many studies that do report longer follow-up periods report that the effect of the intervention waned over time.
3. **Poor quality evaluation methods mean we can't definitively say if the intervention caused a decrease in burnout.** There is limited application of evaluation designs that can determine if the interventions actually caused a change in burnout (e.g. randomised controlled trials), particularly for structural or organisational solutions. When these causal inference designs are used, often they involve very small sample sizes (<100 participants). In addition, transferability of results across specialties or healthcare systems remains largely unexplored.
4. **Focus on individual-focused interventions means organisation-level interventions are understudied.** Individual-focused interventions for burnout like mindfulness programs are easier to implement and evaluate with robust methods like randomised controlled trials. This has resulted in the majority of the burnout literature being focused on individual-level interventions and interventions at the organisational level being understudied. When organizational interventions are studied, researchers tend to use lower quality evaluations (typically small-scale with less robust study designs).[121,122,123] While there are more high quality evaluations of individual-focused interventions, this is likely due to individual interventions being easier to measure and evaluate in a robust way rather than being more effective in reducing burnout.

120 Maslach C., Jackson S. E. The measurement of experienced burnout. Unpublished manuscript, Department of Psychology, University of California, Berkeley, 1979.
121 DeChant, P. F., Acs, A., Rhee, K. B., Boulanger, T. S., Snowdon, J. L., Tutty, M. A., ... & Craig, K. J. T. (2019). Effect of organization-directed workplace interventions on physician burnout: a systematic review. Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 3(4), 384-408.
122 Bes, I., Shoman, Y., Al-Gobari, M., Rousson, V., & Guseva Canu, I. (2023). Organizational interventions and occupational burnout: a meta-analysis with focus on exhaustion. International Archives of Occupational and Environmental Health, 96(9), 1211-1223.
123 Cohen, C., Pignata, S., Bezak, E., Tie, M., & Childs, J. (2023). Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review. BMJ open, 13(6), e071203.

Appendix 1: Summary table of interventions reviewed

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Australian studies						
Jeon, Y. H., Luscombe, G., Chenoweth, L., Stein-Parbury, J., Brodaty, H., King, M., & Haas, M. (2012). Staff outcomes from the caring for aged dementia care resident study (CADRES): a cluster randomised trial. *International journal of nursing studies, 49*(5), 508-518.	Residential aged care workers	**Dementia Care Mapping reduced EE scores by 4.4 points.** No effect on DP or PA.	**Organisational** Model of care	Cluster RCT 15 urban residential aged care sites in Sydney, Australia randomised to practice Dementia Care Mapping (n = 45), Person Centred Care (n = 56), or Standard Care (n = 23) Follow up: Burnout measured before, immediately after 4-month intervention period, andwat 4-month follow-up. N = 124 Comparison group: Standard care and person-centred care only.	Maslach Burnout Inventory-Human Services Survey	Moderate
Xu HG, Eley R, Kynoch K, Tuckett A. Effects of mobile mindfulness on emergency department work stress: A randomised controlled trial. *Emergency Medicine Australasia, 34(2)*, 176-185.	Emergency Department staff	**Improvement in all three burnout subscales**	**Individual** Mindfulness	RCT Participants randomised to daily 10 min app-guided mindfulness for 4 weeks, or control. N = 98 Comparison group: waitlist control.	Maslach Burnout Inventory	Low: small sample size (<100). Only half of participants (48%) reported continuous use of the app.
Gunasingam N, Burns K, Edwards J, Dinh M, Walton M. (2015). Reducing stress and burnout in junior doctors: the impact of debriefing sessions. *Postgraduate Medicine Journal, 91(1074)*, 182-187	Junior doctors	**No effect** of debriefing sessions on burnout.	**Organisational** Debriefing sessions	RCT. Junior doctors randomised to receive four debriefing sessions over 2 months (n = 13) or to the control group (n = 18), who had no debriefing sessions. N = 31 Comparison group: No debriefing sessions.	Maslach Burnout Inventory	Low: very small sample size (<50)

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Newton, M. S., McLachlan, H. L., Willis, K. F., & Forster, D. A. (2014). Comparing satisfaction and burnout between caseload and standard care midwives: findings from two cross-sectional surveys conducted in Victoria, Australia. *BMC pregnancy and childbirth, 14,* 1-16.	Midwives	**Midwives working in a caseload model had significantly lower client-related burnout at baseline (10 points lower) and 2-year follow-up (work-related burnout: 15.3 points lower; client-related burnout: 10 points lower)**	**Organisational** Model of care	Copenhagen Burnout Inventory	Maslach Burnout Inventory	Low: observational study
Review of Australian studies: Balhatchet, B., Schütze, H., Williams, N., & Ashford, B. (2023). Factors that impact burnout and psychological wellbeing in Australian postgraduate medical trainees: a systematic review. Global Surgical Education-Journal of the Association for Surgical Education, 2(1), 65.	Junior doctors	Few studies of individual-focused interventions have found any significant long-term impact on burnout and/or wellbeing of Australian Junior doctors.	**Individual** **Review**	There are a small number of studies that have investigated individual interventions in Australian hospitals, such as wellbeing and resilience workshops, mentoring programs, yoga and group fitness, debriefing sessions, and Therapeutic Relaxation and Enhanced Awareness Training (TREAT).	Multiple	Looked at overall psychological wellbeing, not just burnout.

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
International studies: Organisational interventions						
Parshuram CS, Amaral AC, Ferguson ND, Baker GR, Etchells EE, Flintoft V, Granton J, Lingard L, Kirpalani H, Mehta S, Moldofsky H, Scales DC, Stewart TE, Willan AR, Friedrich JO (2015). Canadian Critical Care Trials Group. Patient safety, resident well-being and continuity of care with different resident duty schedules in the intensive care unit: a randomized trial. CMAJ. *187(5)*:321-9. **Canada**	Doctors	**No effect** of shorter in-house overnight schedules on burnout or fatigue.	**Organisational** Shift length	RCT Residents (n = 47) in 2 university-affiliated ICUs were randomly assigned to in-house overnight schedules of 24, 16 or 12 hours. N = 47 Comparison group: 24-hour shifts.	Maslach Burnout Inventory	Low: very small sample size (<50), data collected in 2009; short follow-up period (2 months)
Garland A, Roberts D, Graff L. (2012). Twenty-four-hour intensivist presence: a pilot study of effects on intensive care unit patients, families, doctors, and nurses. American Journal of Respiratory and *Critical Care Medicine, 185(7)*, 738-743. **Canada**	Doctors (ICU)	**Intensivists doing shift work experienced less burnout (-6.9 points; p = 0.04)**	**Organisational** Shift work model	Crossover pilot trial 32-weeks of alternating 8-week blocks of two staffing models: 1. Standard model, where intensivist works for 7 days straight, taking night call from home. 2. Shift work model, where one intensivist worked 7 day shifts, while other intensivists remained in the ICU at night. N = 24 Comparison group: Intensivists rotated weekly in both models.	Emotional Exhaustion subscale of the Maslach Burnout Inventory	Low: very small sample size (<50), but crossover design allows participants to be their own controls

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Lucas BP, Trick WE, Evans AT, et al. (2012) Effects of 2-vs 4-week attending physician inpatient rotations on unplanned patient revisits, evaluations by trainees, and attending physician burnout: a randomized trial. *JAMA, 308(21)*, 2199–207 **USA**	Doctors	**Significantly lower burnout after 2-week rotations** compared to 4-week rotations. 18ppt decrease in rotations where doctors report burnout: if they report burnout after approximately 35% of 4-week rotations, they would be expected to report it after only 17% of 2-week rotations.	**Organisational** Shorter rotation length	Cluster randomised crossover noninferiority trial. Compared general medicine attending physicians' outcomes from 2-vs 4-week rotations. N = 62 Comparison group: doctors rotated through both models.	Emotional Exhaustion subscale of Maslach Burnout Inventory -Human Services Survey	Low: very small sample size (<50), but crossover design allows participants to be their own controls
Ali NA, Hammersley J, Hoffmann SP, O'Brien JM Jr, Phillips GS, Rashkin M, Warren E, Garland A; Midwest Critical Care Consortium. (2011). Continuity of care in intensive care units: a cluster-randomized trial of intensivist staffing. *American Journal of Respiratory Critical Care Medicine. 184(7)*, 803-808 **USA**	Doctors (ICU)	**ICU doctors reported significantly lower burnout after working interrupted schedules.** Interrupted schedule reported average burnout score of 12.35 (± 4.54) compared to 15.40 (± 4.46) in continuous group (p = 0.007).	**Organisational** Interrupted work schedule	Cluster RCT in 5 ICUs, crossover design. Daily coverage by a single intensivist in half-month rotations (continuous schedule) was compared with weekday coverage by a single intensivist, with weekend cross-coverage by colleagues (interrupted schedule). Surveys provided 24–72 hours after each rotation ended. N = 39 Comparison group: continuous schedule.	Burnout scale derived from the National Study of the Changing Workforce	Low: Very small sample size (<50)

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Gregory ST, Menser T, Gregory BT. (2018). An Organizational Intervention to Reduce Physician Burnout. *Journal of Healthcare Management. 63(5)*, 338-352. **USA**	Doctors	**Workload reduction reduced EE by 7 points**	**Organisational** Workload reduction	Cluster controlled (non-randomised) trial. The healthcare system management chose eight clinic sites to participate: four clinics, and all their physicians and clinical staff, received the workload intervention, while four additional clinics did not, and served as a control group. 3-and 6-month follow-up. N = 112 Comparison group: no intervention	Maslach Burnout Inventory	Low: non-randomised
Linzer, M., Poplau, S., Grossman, E., Varkey, A., Yale, S., Williams, E., ... & Barbouche, M. (2015). A cluster randomized trial of interventions to improve work conditions and clinician burnout in primary care: results from the Healthy Work Place (HWP) study. *Journal of general internal medicine, 30*, 1105-1111. **USA**	Doctors (GPs)	**More intervention clinicians showed improvements in burnout (21.8 % vs 7.1 % less burned out, p=0.01) compared to controls.**	**Organisational** Workload reduction, workflow improvement, improved communication	Cluster RCT. Intervention sites chose a variety of methods including monthly meetings to discuss worklife and patient issues; offloading administrative tasks to non-physicians; extending appointment times; improving patient flow efficiency through the clinic. N = 166 GPs at 34 clinics. Comparison group: no intervention.	A five item scale based on the Maslach Burnout Inventory, focusing primarily on emotional exhaustion	Moderate: Cluster RCT with decent sample size.
Shea JA, Bellini LM, Dinges DF, Curtis ML, Tao Y, Zhu J, Small DS, Basner M, Norton L, Novak C, Dine CJ, Rosen IM, Volpp KG (2014). Impact of Protected Sleep Period for Internal Medicine Interns on Overnight Call on Depression, Burnout, and Empathy. *Journal of Graduate Medical Education, 6(2)*, 256-263. **USA**	Doctors (interns)	**No effect** on burnout, but this may be because it was measured at the end of each rotation.	**Organisational** Protected sleep period	RCT Four-week blocks were randomly assigned to either overnight call permitted under the 2003 duty hour standards or a protected sleep period from 12:30 am to 5:30 am. N = 106 Comparison group: doctors rotated through both models.	Maslach Burnout Inventory-Human Services Survey	Low: small sample size but crossover design allows participants to be their own controls; burnout measured immediately, no follow-up

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Colville, G. A., Smith, J.G.; Brierley, J., Citron, K., Nguru, N. M., Shaunak, P.D., Tam, O., Perkins-Porras, L. (2017) Coping With Staff Burnout and Work-Related Posttraumatic Stress in Intensive Care. *Pediatric Critical Care Medicine* 18(7). **UK**	ICU staff	**Attending debriefing reduced risk of burnout.**	**Organisational** Debriefing sessions	Point prevalence cross-sectional study N = 377	An abbreviated version of the Maslach Burnout Inventory	Low : cross sectional study
Kok N, Zegers M, Teerenstra S, Fuchs M, van der Hoeven JG, van Gurp JLP, Hoedemaekers CWE, (2023). Effect of Structural Moral Case Deliberation on Burnout Symptoms, Moral Distress, and Team Climate in ICU Professionals: A Parallel Cluster Randomized Trial. *Critical Care Medicine, 51(10)*, 1294-1305. **Netherlands**	ICU staff	**Backfire - significantly reduced personal accomplishment.** **No effect** on emotional exhaustion or depersonalisation. **Significantly reduced moral distress.**	**Organisational** Moral case deliberation: a team-based and facilitator-led, structured moral dialogue about ethical difficulties encountered in practice.	Cluster randomised controlled trial involving six ICUs. Three ICUs were randomised to organised structural moral case deliberation, and the other three had no intervention. N = 435 staff Comparison group: No structured discussions of moral problems.	Maslach Burnout Inventory	Moderate
Zwijsen SA, Gerritsen DL, Eefsting JA, Smalbrugge M, Hertogh CM, Pot AM (2015). Coming to grips with challenging behaviour: a cluster randomised controlled trial on the effects of a new care programme for challenging behaviour on burnout, job satisfaction and job demands of care staff on dementia special care units. *International Journal of Nursing Studies, 52(1)*, 68-74. **Netherlands**	Aged care workers	**No effect** of staff training in managing difficult client behaviour on burnout.	**Organisational** Staff training on detection, analysis, treatment and evaluation of treatment on challenging behaviour in dementia patients.	Cluster randomised stepped-wedge design in which rollout of the training was staggered to 5 dementia care units at a time (17 units total). Dementia care units were randomly assigned to different start times for implementation. N = 380 staff Comparison group: Care units pre-rollout.	Maslach Burnout Inventory (Dutch version)	Moderate

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
International studies: Individual-focused interventions						
Gordon, H. J., Demerouti, E., Le Blanc, P. M., Bakker, A. B., Bipp, T., & Verhagen, M. A. (2018). Individual job redesign: Job crafting interventions in healthcare. *Journal of Vocational Behavior, 104*, 98-114. **Netherlands**	Medical specialists and nurses	**Both studies significantly reduced exhaustion component of burnout by a small amount.** Study 1: job crafting reduced exhaustion by 0.07 points (1.93 to 1.86) compared to control (increased by 0.16). Study 2: Job crafting reduced exhaustion by 0.15 (2.20 to 2.05) compared to control (increased by 0.06).	**Individual** Job crafting training	RCT Both studies used the same intervention: a 3-hour workshop on job crafting strategies (seeking challenges and resources and reducing demands) and experiential learning narratives. Participants developed a personal crafting plan defining specific job crafting actions to undertake in the 3 weeks after the workshop. Study 1: medical specialists (N = 119). General job crafting where the goals were based around effective teamwork and quality of care. Study 2: nurses (N = 58). Specific job crafting where goals were around completing more checklists and monitoring. Comparison group in both studies was waitlist control.	Exhaustion subscale of the Oldenburg Burnout Inventory	Low: small sample size

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Fainstad, T., Mann, A., Suresh, K., Shah, P., Dieujuste, N., Thurmon, K., & Jones, C. D. (2022). Effect of a novel online group-coaching program to reduce burnout in female resident physicians: a randomized clinical trial. *JAMA network open, 5*(5), e2210752-e2210752. **USA**	Doctors	**EE reduced by 3.26 points in coaching group,** and increased by 1.07 points in control group. No effect on DP or PA.	**Individual** Coaching (professionals)	The intervention group (n = 50) was offered a 6-month, web-based group-coaching program, Better Together Physician Coaching, developed and facilitated by trained life coaches and physicians. The control group (n = 51) received residency training as usual, with no coaching during the study. The control group was offered the 6-month coaching program after study completion N = 101 Comparison group: No coaching.	Maslach Burnout Inventory	Low: Small sample size
Kiser SB, Sterns JD, Lai PY, Horick NK, Palamara K. (2024). Physician Coaching by Professionally Trained Peers for Burnout and Well-Being: A Randomized Clinical Trial. *JAMA Network Open, 7*(4) **USA**	Doctors	**Peer coaching reduced burnout by significantly more in the intervention group** (reduction in burnout scores of 21% in coaching group compared to 2.5% reduction in control group).	**Individual** Coaching (trained peers)	Participants were randomised to 6 coaching sessions facilitated by a peer coach over 3 months or a control condition using standard institutional resources for burnout and wellness. N = 138 Comparison group: Standard resources.	modified Maslach Burnout Inventory (mMBI) and the work exhaustion and interpersonal disengagement subscales of the Stanford Professional Fulfillment Index	Low: Small sample size
Dyrbye LN, Shanafelt TD, Gill PR, Satele DV, West CP. (2019). Effect of a Professional Coaching Intervention on the Well-being and Distress of Physicians: A Pilot Randomized Clinical Trial. *JAMA Internal Medicine, 179(10)*, 1406-1414.	Doctors	**Coaching reduced EE by 5.2 points at 5-month follow-up.** No effect on DP or PA.	**Individual** Coaching	Randomised controlled trial. Participants randomised to 6 coaching sessions facilitated by a professional coach (n = 41), or control (n = 41). N = 82 Comparison group: Waitlist control.	Maslach Burnout Inventory	Low: small sample size (<100)

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Mistretta EG, Davis MC, Temkit M, et al. (2018). Resilience training for work-related stress among health care workers. *Journal of Occupational & Environmental Medicine, 60*, 559–68. **USA**	Healthcare workers	**Significant reduction in EE scores in MBRT group by 9.45 points.** No effect on DP or PA, and no effect on burnout of smartphone intervention.	**Individual** Mindfulness-based resilience training (MBRT)	RCT . Participants (n = 60) randomised to either the Mindfulness-Based Resilience Training (MBRT) intervention (n = 22), the smartphone resilience intervention app (n = 23), or the control group (n = 15). Burnout measured at baseline, after 6-week intervention, and at 12-week follow-up. N = 60 Comparison groups: Intervention groups compared to waitlist control (offered training at the end of the trial)	Maslach Burnout Inventory-Human Services Survey	Low: small sample size (<100)
Taylor, H., Cavanagh, K., Field, A. P., & Strauss, C. (2022). Health care workers' need for headspace: Findings from a multisite definitive randomized controlled trial of an unguided digital mindfulness-based self-help app to reduce healthcare worker stress. *JMIR mHealth and uHealth, 10*(8), e31744. **UK**	Healthcare workers	**No difference** in burnout between mindfulness and psychoeducation interventions.	**Individual** Mindfulness-based self-help	RCT Participants randomised to MBSH Headspace digital program (n = 1095) or Moodzone (n = 1087). Headspace offers mindfulness-based practices and psychoeducation. Moodzone is a psychoeducation digital platform. N = 2182 Comparison group: Active control – Moodzone.	Maslach Burnout Inventory	High: Powered RCT.

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Ameli, R., Sinaii, N., West, C. P., Luna, M. J., Panahi, S., Zoosman, M., ... & Berger, A. (2020). Effect of a brief mindfulness-based program on stress in health care professionals at a US biomedical research hospital: a randomized clinical trial. *JAMA network open, 3*(8), e2013424-e2013424. **USA**	Healthcare workers	**No effect** on burnout.	**Individual** Mindfulness-based self-help	RCT Participants were randomized to receive mindfulness-based self-care (MBSC; n = 43) training or life-as-usual control (n = 35). N = 78 Comparison group: No intervention.	EE and DP subscales of Maslach Burnout Inventory	Low: small sample size (<100)
Schroeder, D. A., Stephens, E., Colgan, D., Hunsinger, M., Rubin, D., & Christopher, M. S. (2018). A brief mindfulness-based intervention for primary care physicians: a pilot randomized controlled trial. *American Journal of Lifestyle Medicine, 12*(1), 83-91. **USA**	Doctors (GPs)	**Mindfulness reduced EE (-9.53) compared to increase (+1.83) in control group.**	**Individual** Mindfulness	RCT Participants randomised to control (n = 13) or Mindful Medicine Curriculum: 13-hour weekend training program that teaches mindfulness, plus compassion skills training, brief mindfulness techniques designed to be used at work, and "SLO conversation" exercises where participants practice applying mindfulness to the core clinical skills of speaking, listening, and observing (n = 13). N = 26 Comparison group: No intervention	Maslach Burnout Inventory	Low: Very small sample size (<50)

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Pérez, V., Menéndez-Crispín, E. J., Sarabia-Cobo, C., de Lorena, P., Fernández-Rodríguez, A., & González-Vaca, J. (2022). Mindfulness-based intervention for the reduction of compassion fatigue and burnout in nurse caregivers of institutionalized older persons with dementia: a randomized controlled trial. *International Journal of Environmental Research and Public Health, 19*(18), 11441. **Spain**	Aged care nurses	**Burnout reduced in intervention group but not control.**	**Individual** Mindfulness-based stress reduction	Cluster RCT Participants randomised to six-week mindfulness-based stress reduction (n = 39) or control (n = 35). N = 74 Comparison group: Waitlist control.	Burnout subscale of Professional Quality of Life Scale (Spanish)	Low: Small sample size (<100)
Watanabe, N., Horikoshi, M., Shinmei, I., Oe, Y., Narisawa, T., Kumachi, M., ... & Furukawa, T. A. (2019). Brief mindfulness-based stress management program for a better mental state in working populations-Happy Nurse Project: A randomized controlled trial. *Journal of Affective Disorders, 251*, 186-194. **Japan**	Nurses	**No effect** on burnout.	**Individual** Mindfulness-based stress program + omega-3 polyunsaturated fatty acids	RCT junior nurses working in hospitals were randomly allocated either to the brief mindfulness-based stress management program or psychoeducation using a leaflet. The program consisted of four 30 min individual sessions conducted by trained senior nurses using a detailed manual. N = 80 Comparison group: Psychoeducation pamphlet.		Low: small sample size.

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
International studies: Individual-focused interventions						
Panagioti M, Panagopoulou E, Bower P, Lewith G, Kontopantelis E, Chew-Graham C, Dawson S, van Marwijk H, Geraghty K, Esmail A. (2017). Controlled Interventions to Reduce Burnout in Physicians: A Systematic Review and Meta-analysis. *JAMA Internal Medicine, 177(2)*, 195-205	Doctors	**Interventions were associated with small significant reductions in burnout equivalent to a drop of 3 points on the EE subscale of the MBI.** Significantly larger effects from organisational interventions compared to individual-focused interventions.	**Individual and organisational**	Twenty independent comparisons from 19 controlled (randomised and non-randomised) studies were included in the meta-analysis (n = 1550 physicians). The majority (n = 12 [60%]) were physician-directed interventions that comprised mindfulness-based stress reduction techniques, educational interventions targeting physicians' self-confidence and communication skills, exercise, or a combination of these features.	Mostly the Emotional Exhaustion subscale of the Maslach Burnout Inventory	Higher quality than many other reviews and meta-analyses, as it only includes controlled studies.
West CP, Dyrbye LN, Erwin PJ, Shanafelt TD. (2016). Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. *Lancet, 5(388)*, 2272-2281.	Doctors	**Meta-analysis found that overall, interventions reduced burnout** Overall burnout: Average reduction of 10ppt. Organisational interventions were more effective than individual-focused interventions. Emotional exhaustion: Average reduction of 2.65 points. High EE decreased by 14ppt. Depersonalisation: Avg reduction of 0.64 points. High DP decreased by 4ppt.	**Individual and organisational** Most commonly studied interventions involve mindfulness, stress management, and small group discussions, and the results suggest that these strategies can be effective. Duty hour limitation policies also appear effective, but have only been studies in observational studies in the USA.	15 RCTs including 716 physicians and 37 unique cohort studies including 2914 physicians met eligibility criteria. Among the 15 randomised controlled trials, three involved structural interventions within the work environment, consisting of shortened attending rotation length, various modifications to clinical work processes, and shortened resident shifts. 12 involved individual-focused interventions, consisting of facilitated small group curricula, stress management and self-care training, communication skills training, and a so-called belonging intervention.	Maslach Burnout Inventory used in all RCTs but one (which used a single-item measure assessing emotional exhaustion)	Limitations: All RCTs assessed results immediately after the conclusion of the intervention. This review pooled effects from RCTs and cohort studies. Many included studies are from pre-2010.

Study	Population	Findings	Intervention type	Study design	Burnout measure	Evidence quality
Shiri R, Nikunlaakso R, Laitinen J. (2023). Effectiveness of Workplace Interventions to Improve Health and Well-Being of Health and Social Service Workers: A Narrative Review of Randomised Controlled Trials. *Healthcare, 11(12)*, 1792.	HCSA workers	Effects on burnout were generally modest and short-term. Mindfulness was the most promising intervention, but had mixed results.	**Individual and organisational**	56 RCTs on burnout, majority of which studied individual-focused interventions.	Multiple measures used	Higher quality as only reviewed RCTs.
Herz M, Bösl S, Gebhard D. (2024) Individual and organizational interventions to promote staff health and well-being in residential long-term care: a systematic review of randomized controlled trials over the past 20 years. *BMC Nursing, 22;23(1)*, 195.	Residential long-term care staff	Individual-focused interventions can reduce burnout in the short-term (6 months or less). Combined individual and organisational interventions had more sustained impact on burnout (12+ months).	**Individual, organisational and combined**	26 studies, 23 of which were RCTs.	Multiple measures used	Higher quality as reviewed many RCTs.
Xu H, Kynoch K, Tuckett A, Eley R. Effectiveness of interventions to reduce emergency department staff occupational stress and/or burnout: a systematic review. *JBI Evidence Synthesis, 18(6)*, 1156-1188.	Emergency department staff	Very low quality evidence. All studies that investigated educational interventions reported a statistically significant reduction in burnout. The two studies that tested organizational-based interventions reported an increase in burnout levels.	**Individual and organisational**	3 RCTs, 8 quasi-experimental studies involving 603 participants that measured burnout.	Maslach Burnout Inventory, Professional Quality of Life Scale, Copenhagen Burnout Inventory	Evidence quality rated as very low.

Appendix 2: Models of burnout

Two of the most common models used in burnout studies are outlined in the table below – the job demands-resources model (J D-R model) and the multidimensional theory of burnout (which laid the foundation for the three-dimensions conceptualisation of burnout above).

	Job Demands-Resources model (Demerouti et. al., 2001)	Multidimensional theory (Maslach, 1993)
Job demands	Time pressure Physical workload Recipient contact Physical environment Shift work	Excessive workload Lack of resource control Inadequate rewards
Job resources	Feedback Rewards Job control Participation Job security Supervisor support	Poor workplace community connection Perceived workplace unfairness Worker-workplace value divergence

Adapted from Mannix, K. (2021). The future of Australia's nursing workforce: COVID-19 and burnout among nurses. *Victoria: The University of Melbourne*.