

BMJ Open Return to employment for working-aged adults after burn injury: a scoping review protocol

Akane Katsu ^{1,2}, Zephania Tyack ³, Martin Mackey,⁴ James M Elliott,^{4,5} Lynette Mackenzie¹

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For numbered affiliations see end of article.

Correspondence to

Ms Akane Katsu;
akat7413@uni.sydney.edu.au

ABSTRACT

Introduction Cutaneous burns can have a catastrophic effect on people's lives and may restrict opportunities for employment due to physical impairment and psychosocial deficits. Failure or delay in return to work can result in loss of income and support for the family unit. It can also negatively affect life role and identity and present difficulties with future opportunities. Current literature indicates multiple discrete influences on return to work as a result of burn injury but an understanding of how working-aged adults resume employment after burn injury is lacking. This scoping review will provide a comprehensive overview of the current literature by mapping and consolidating knowledge in this area of burn recovery and thus provide an informative basis for developing return-to-work programmes for survivors of burn injury.

Methods and analysis This scoping review protocol will follow the Arksey and O'Malley's (2005) methodological framework. A comprehensive search strategy has been developed with subject expert librarians. These databases were used: OvidSP: Medline, Embase, PsycINFO, PubMed and Cochrane Central Register of Controlled Trials and EBSCOhost: CINAHL and Scopus. Reference lists of selected full text will be hand searched for additional literature. To enhance consistency and rigour, all reviewers will undertake a calibration exercise before paired reviewers independently screen all records using Rayyan. Full-text articles meeting the study inclusion criteria will be retrieved and examined. Extracted data will be analysed using the International Classification of Functioning, Disability and Health.

Ethics and dissemination Ethics approval is generally not required for scoping reviews. Findings of this scoping review will be reported in a peer-reviewed journal and presented at conferences.

INTRODUCTION

Background

Burn injury results in changes to health with physical, psychological, social and financial well-being.¹ Consistent with International Classification of Functioning, Disability and Health (ICF),^{2,3} in the short term, burn injuries have the potential to result in physical impairment, activity limitations, participation restrictions and environmental barriers

Strengths and limitations of this study

- This scoping review protocol will provide a comprehensive framework investigating the gaps in the current literature on returning to employment after burn injury for working-aged adults.
- This protocol follows the latest guidelines for conducting scoping reviews and intends to use the recently published Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews.
- Researchers undertaking this scoping review represent clinical and research expertise from burns, return to work and trauma.
- The study will be inclusive of all types of assessments, interventions and outcomes of return to employment after burn injury to enable a broad overview of this aspect of burn recovery.
- This scoping review will be limited to English-language literature from high-income countries (World Bank's 2019 definition) and the results may not be applicable to burn injury populations from low-income and middle-income countries.

making return to employment difficult on a person-by-person basis.^{4,5} Physical impairments such as scarring, contractures, chronic pain and itch and thermoregulation problems can result in long-term disability post burn.⁶⁻⁹ Psychological issues resulting from disfigurement, anxiety, depression and post-traumatic stress disorders also contribute to the long-term disability experienced by people with burn injuries.⁸⁻¹² These long-term health-related complications affect participation in activities of daily living and resumption of life roles. Work and employment are considered major life roles in which a person can be expected to participate in and contribute to their communities.² The terms 'work' and 'employment' are used interchangeably in this paper and refer to paid work. These terms are not currently distinguished in the literature.



Return to work as an outcome is an emerging factor for how recovery from burn injury is measured.¹³ Ten million disability adjusted life years are lost as a result of fire-related burn injuries globally each year and over 40% of these occur in those aged 15–59 years, who are of working age.¹⁴ In Australia, 65% of hospitalised burn patients are 15–64 years of age, with the largest proportion (30%) in the 25–44 age group.¹⁵ These adults are most likely to sustain full-thickness burn injuries as well as larger size full-thickness burn injuries compared with all other age groups.¹⁵ High-income countries such as Australia, the USA and the Netherlands have similar mean healthcare costs per burn patient, averaging about US\$88 218 in total and US\$4159 per 1% total body surface area (TBSA).¹⁶ In 2015, over \$A112 million was spent on healthcare costs for burn injuries in Australia.¹⁷ Healthcare costs do not represent the entirety of the economic burden of burn injuries with 90% of costs shouldered by patients and their families because of the loss of productive income and informal care needs.^{16 18} Working-age adults are financially responsible for their dependants and are likely to be the most economically productive members of their communities. The ability to return to and effectively manage one's employment role at work is thus an important indicator of the recovery made by working-age adults as it demonstrates the reintegration into community and restoration of functional performance after burn injury.^{7 13 19–21} Rehabilitation for burn injury can assist individuals towards regaining their preinjury roles and survivors of burn injuries highly value rehabilitation that assist return to work.²²

Studies have been undertaken to identify barriers to return to work for burn-injured patients, outcomes of intervention studies and how burn care centres address return to work in their clinical settings.^{11 13 19 20 23–30} Of these, at least four systematic reviews have investigated return to work after burn injury.^{13 19 20 29} These reviews primarily investigated injury-related and personal factors affecting return to work. Per cent TBSA (%TBSA) burn is the most commonly reported measure of burn severity,^{13 19 29} followed by %TBSA grafted and %TBSA full-thickness burns.^{19 29} Electrical burns result in more complex injury sequelae that delay return to work.²⁰ Surprisingly, the presence of hand burns has not been conclusively associated with delayed return to employment.¹⁹ Length of stay is most likely a proxy marker for burn severity associated with delayed return to employment.^{19 29} People who have pre-existing medical and psychiatric conditions or who were unemployed prior to burn injury were less likely to re-engage in work post burn.^{10 13 19 29} Rates of return to work reported in the literature vary greatly—from 14% to 91%²⁹ with almost a third never returning to any form of work¹⁹ but few studies define what actually constitutes successful return to work.

The difficulty of and the lack of consistent definitions and outcome measures for reporting return to work in the burn literature have been highlighted in previous systematic reviews.^{13 19 29} Clarification of work and

employment for individuals may be helpful as work can represent different types of meaningful activities. While return to work has been used to describe both paid and unpaid work activities,^{19 31} employment is the means through which people are socially productive and refers to work done specifically to earn money.³² Without a clear definition of the meaning of work in this context, it will be difficult to achieve consistency in how return to work is quantified and outcomes measured.³³

Although it is obvious that severe and catastrophic burns can result in complex recovery needs across the physical, psychological and social aspects of one's health and well-being,^{6 7 9 10} disruption in health and well-being may also be experienced by those with less severe injuries.³⁴ Currently, little is known about the return-to-work process for burns patients, which modifiable factors can be successfully used to assist return to work,²⁶ and what interventions are suitable at which time points in the burn recovery process. Previous reviews are limited by a focus on physical or psychological outcomes rather than work performance and environmental changes in the workplace.^{7 19 27}

Aims and objectives

The aim of this scoping review protocol is to map the body of literature informing what is known about working-age adults with burn injuries returning to their previous employment. The objectives of this scoping review are to (a) provide a comprehensive overview of the current literature to consolidate our knowledge and (b) guide future research strategies measuring return to employment after burn injury.

METHODS AND ANALYSIS

A scoping review methodology is useful for examining a broad range of literature to explore complex, conceptual and emerging areas of research.³⁵ This methodological approach is helpful for determining what the influences on return to employment are, the timeframes within which this should be achieved, the manner in which those injured return to employment and how such outcomes are accomplished. Studies on return to work for other population groups indicate the need to be comprehensive in assessment to look beyond injury factors and assess other aspects of recovery.^{36–39} There is scope to investigate how these factors have an impact on the ability to return to employment. For these reasons, a scoping review will be helpful in systematically mapping the research in this area to inform further study on return to employment after burn injury.

The scoping review methodology based on Arksey and O'Malley's⁴⁰ framework modified by Levac *et al*⁴¹ and Peters *et al*⁴² will be used to guide this review. Details of each stage of the scoping review process are described below.

Stage 1: identifying the research question

To ensure this scoping review would remain broadly focused on the topic area, we developed the primary

research question: What is known and unknown about the body of evidence with respect to return to employment after burn injury?

We further identified subquestions to align our research question and objective:

- ▶ What are the barriers and benefits to return to employment experienced by people with burn injuries?
- ▶ What are the assessment tools or outcome measures used to qualify and/or quantify return to employment?
- ▶ What are the management strategies reported to assist with return to employment?
- ▶ What interventions have been described or investigated specifically for addressing work capacity after burn injury?
- ▶ What are the models of care used?
- ▶ What are the work outcomes achieved?

Stage 2: identifying relevant studies

Inclusion criteria

We used the Population, Concept and Context Mnemonic to develop and refine the review inclusion criteria.⁴³

Population

Studies that examined adults who are 18–65 years old at the time of their burn injury will be included. Only people with burn injuries that result in cutaneous damage as a result of thermal, chemical, electrical or friction causes will be included as these types of burn injuries are treated by multidisciplinary burn teams in specialist burn services. Burns to internal organs are usually managed by other medical specialities (eg, ophthalmology for ocular burns, respiratory physicians for inhalation burns) and will thus be excluded. Extravasation injuries are also excluded. As cancer treatment can confound return to employment, people with ionising radiation burns from cancer treatment are also excluded. There is no limitation on the physical geolocation of where the burn injury occurred. Both work-related and non-work-related injuries will be considered as long as the participants are working for an income at the time of burn injury.

Concept

While return to work has been used to describe both paid and unpaid work activities,^{19 31} employment is the means through which people are socially productive and refers to work done specifically to earn money.³² Employment undertaken specifically to earn an income for sustenance is defined as work in this review. Papers will be excluded if only unpaid work is investigated. As there are no established definitions of what constitutes return to work in the literature, all potential aspects of resumption of work in regard to capacity (eg, full time, part time), intensity (eg, same duties, reduced duties, work hours), frequency (eg, work days), type (eg, same occupation, different job) or location (eg, same or different employer) of employment are included to consider all employment outcomes. Proxy measures such as sick days, work absence and vocational retraining/training days will also be included.

While participants must have been reported to have had time off from employment because of their burn injury, there are no limits placed on the commencement of time off work or duration of absence.

Context

Globally, differences in burn injury aetiology, epidemiology and social and healthcare systems in countries can be attributed to age and income status.¹ There are also differences in safety precautions in the general community, culturally determined behaviours and values regarding employment. It is likely that these differences will affect how return to employment is managed after burn injury. As such, only research reporting on high-income countries (as defined by the World Bank, 2019) will be included. Studies in all healthcare and research settings will be included: hospital-based, community-based, primary care, specialist care, workplace, non-workplace and private or public settings.

Stage 3: study selection

Search strategy

The search strategy was designed and extensively tested by the lead author (AK) with the assistance of two research librarians. A three-step search strategy was used: Initial search terms were tested in different combinations in a limited search on Medline and Embase (Ovid platforms) followed by analysis of the title and abstract text and index terms used to describe the articles. To ensure a comprehensive search, the broadest possible search terms were chosen based on return to work as the primary outcome and/or process measure.⁴⁴ A second search using all the identified keywords and index terms was then undertaken across all the included databases. The research librarians independently reviewed the search strategy to guide testing. At each iteration, the search strategy was refined after discussion with the research team. The search strategy used for Medline is included in online supplemental appendix 1. Key authors known to publish in this area will also be identified and contacted for further information, if available and willing. Finally, the reference lists of papers included in the full-text retrieval will also be searched for additional studies. Only English-language documents or English-language abstracts of non-English documents will be included, as the review team do not have capacity for translation.

Information sources

To ensure a comprehensive search as required for a scoping review, all selected databases (OvidSP: Medline, Embase, PsycINFO, PubMed and Cochrane Central Register of Controlled Trials and EBSCOhost: CINAHL and Scopus) were searched from 2000 to March 2019 and no limits were placed on study design. All types of interventions across all settings and all types of outcome measures will be included. While there are no restrictions on study design, methodology or reporting formats, papers must provide original data for relevant information to

**Table 1** Study selection criteria

Inclusion criteria	Exclusion criteria
The literature on burn injury and return to work in working adults (aged 18–65 years) who were in paid employment prior to burn injury	Burn injuries occurring to internal parts of the body (eg, ocular, lung, oesophageal) without cutaneous involvement; extravasation injuries or ionising radiation burns from cancer treatment
Burn injuries can occur at any setting (eg, home, community, farm, road, waterway, retail/commercial, industrial, construction) and while doing any activities (ie, non-work, work, leisure, etc)	Participant group with burn injury not separately analysed if part of general trauma study
Examine all employment outcomes <ul style="list-style-type: none"> ▶ Directly related to return to work ▶ Includes some measurement of employment regardless of specificity 	Unpaid work such as volunteer, homemaker and retiree positions
Examines physical, psychological, social and/or vocational factors that may have a direct effect on ability to work	Animal-based, cellular studies, surgical techniques, wound management, burn injury prevention or minimisation, prehospital/intensive care/acute management, burn care staffing issues and event-based reports that do not directly relate to employment after burn injury
All study designs, methodologies and reporting formats that present original data and analysed that data	Management strategies, interventions and models of care for a comorbidity that is not directly related to a person's ability to work regardless of whether the burn injury was present or not
Research based on populations from high-income countries (World Bank's definition, 2019)	Commentary/opinion/editorial papers, conference abstracts/theses papers and books/book chapters

be extracted. Opinion/editorial papers and conference abstracts will be excluded. For relevant review articles, we will examine individual studies that were included in that review if these meet the scoping review study criteria. The selection criteria presented in [table 1](#) may be further refined as part of the iterative review process to meet the stated research objective.

Selecting the evidence

Citations will be imported into a reference manager software program (Endnote X9, Clarivate Analytics, Pennsylvania, USA) to remove duplicates. The remaining citations will then be exported to an online screening tool (Rayyan, Qatar Computing Research Institute, Doha, Qatar).⁴⁵ The research team will screen 10 random titles independently using the a priori inclusion criteria to further refine the study criteria. All reviewers will be paired with the first author (who will screen all titles) to independently screen title and abstracts for another 100 records using the refined study criteria to increase consistency among reviewers. Once the calibration exercise is completed, two reviewers (including the first author) will screen the titles and abstracts. Disagreements on study selection will be based on consensus and discussion with other reviewers if required. Results of how selection of sources of evidence was undertaken will be reported using a flow diagram.

Stage 4: charting the data

A predefined charting form based on the research questions and objectives will be used to extract the data from the selected articles. Two reviewers will trial the extraction in a calibration exercise using the first 10% of full-text articles retrieved to ensure reliability and accuracy for

recording key information. We anticipate changes to the charting form based on the iterative process of a scoping review and will update changes based on consensus between both reviewers. A third reviewer will resolve any disagreements. Key changes made to the charting form will be reported in the final report. Key information to be extracted will include:

- ▶ Citation details (author, year and country of origin).
- ▶ Study details (study purpose, type of study design, country location, healthcare settings, patient demographics, methodology, interventions, assessment and outcome measures used, methods of analysis, study limitations).
- ▶ Conceptual details used (definitions of work, quantification of return to work, classifications of work).
- ▶ Key outcomes on return to employment.

Stage 5: collating, summarising and reporting the results

We plan to identify key themes, methods of assessing outcomes, intervention types and care settings. A biopsychosocial approach is preferable to the current biomedical model of burn injury management when investigating return to employment as it integrates the biological, physical, psychological and social dimensions involved and prevents a narrow focus on singular factors that have predominated previous research in the area of return to work.^{46 47} It is anticipated that the ICF will provide a useful framework to analyse the findings in relation to participation, which is affected by other components of the ICF such as activity levels, body systems and structures and environmental barriers and facilitators.² However, the ICF does not include classifications for personal factors that are equally important.^{3 48 49} Personal factors such as motivation, coping and resilience are

emerging as important to understand burn recovery.^{31 50 51} Motivational factors such as decisional balance, self-efficacy and change processes have also been identified as key influences on return to work more broadly.^{52 53} We will therefore consider a behavioural change model (such as the Readiness for Change Model)^{52 54} to examine personal motivation factors for returning to employment if appropriate. This will enable a more person-centred approach contextualised to its appropriate sociocultural setting and environment.⁵⁵

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews checklist⁵⁶ will be used to report findings. The reporting format will be descriptive and no critical appraisal will be made of included articles as the purpose of this study is not a systematic review on the quality or rigour of the included research.⁴³ Summary tables will be used to present the results. Key themes will be presented in diagrammatically and/or narrative format. We plan to publish the study results and report this in a peer-reviewed journal. Findings will also be presented at conferences.

Stage 6: ongoing consultation of information scientists, librarian and/or experts

We will engage in ongoing consultation with subject matter experts (on burn injury rehabilitation, vocational rehabilitation and academic librarians) throughout the study to refine the study criteria to align with the stated research questions, aims and objectives.

Patient and public involvement

The first author's clinical experience with patients and interacting with consumers confirmed the need for a review of return to work for people with burn injuries. This scoping review protocol did not require patient or general public involvement.

DISCUSSION

This scoping review protocol has been designed to include all relevant information sources to meet the stated study objectives. It is recognised that there could be a high prevalence of mental disorders either pre burn^{25 57–61} or post burn^{62 63} that affect general recovery,⁶⁴ quality of life⁵⁸ and return to work.^{28 65} Likewise, alcohol and substance misuse, physical impairments and job-related factors may also contribute to working or not working after injury.^{39 52 66–69} The search strategy was refined and kept broadly focused on return to work so that the search terms used did not inadvertently exclude results⁴³ or introduce bias in the search elements.⁴⁴ The use of a biopsychosocial framework to analyse results will enable a comprehensive approach towards recognising the value of return to work in activity participation, reintegration into community and resumption of life roles after burn injury.⁷⁰ It is anticipated that the literature will cover a wide range of areas related to burn injury recovery and work participation. This will likely require a lengthy period of screening as a large volume of citations are expected to be retrieved. Lastly, although this review is focused on

high-income countries to reduce heterogeneity in the findings, the inclusion of low-income and middle-income countries is suggested for future research.

Ethics and dissemination

Ethics approval is generally not required for scoping reviews, as existing literature will be examined. While there is research evidence available in this area of burn recovery, the extent and nature of our knowledge is yet to be determined. Sources of evidence may raise ethical issues, which will be discussed in the findings. This proposed review will be beneficial to burn care and rehabilitation clinicians, researchers and policy developers to plan and manage recovery for individuals with burn injuries who wish to return to employment. Results of the scoping review will be published in a peer-reviewed journal and presented at conferences.

Author affiliations

¹Discipline of Occupational Therapy, Faculty of Medicine and Health, The University of Sydney, Sydney, New South Wales, Australia

²Department of Occupational Therapy, Royal North Shore Hospital, St Leonards, New South Wales, Australia

³Centre for Children's Burns and Trauma Research, University of Queensland, South Brisbane, Queensland, Australia

⁴Discipline of Physiotherapy, Faculty of Medicine and Health, The University of Sydney, Sydney, New South Wales, Australia

⁵Kolling Institute, Northern Sydney Local Health District, St Leonards, New South Wales, Australia

Twitter Zephania Tyack @tyack_z

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Contributors All authors have made substantial intellectual contributions and conceptualised, drafted, critically appraised and edited the protocol. AK developed the initial protocol manuscript and developed and executed the search strategy as part of her PhD candidature. LM, ZT, MM and JME guided the protocol development and provided major input into the study methodology. All authors provided specific content expertise to inform the study methodology (burn injury, occupational therapy, physiotherapy and return to work).

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ORCID iDs

Akane Katsu <http://orcid.org/0000-0002-1918-4634>

Zephanie Tyack <http://orcid.org/0000-0003-3376-5731>

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