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REVIEW ARTICLE

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Supporting individuals with chronic health conditions in the workplace: a scoping review

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ABSTRACT

Purpose: Globally, individuals living with chronic health conditions are becoming more prevalent, with many continuing to be engaged in paid employment; however, there has been no collation of the types of workplace accommodations, modifications and supports available globally for working age individuals with any type of chronic health condition.

Methods and materials: A scoping review was conducted of electronic databases utilising the JBI methodology for scoping reviews. The review aimed to determine the types of workplace accommodations, modifications and supports that were provided to individuals who were living with at least one chronic health conditions and aged 16–67.

Results: Thirteen research articles were included in the scoping review with two overarching categories identified. The first category, the organisation's immediate responses to the current symptoms of the individual consisted of four main themes. The second category had five themes focused on the organisation's ongoing or longer-term responses to the chronic disease process.

Conclusion: Workplace accommodations, modifications and supports provided to those living with chronic health conditions varied between countries and may depend upon award conditions and stipulations. Self-advocacy and employer understanding of the impacts of chronic health conditions played an important role in whether workplace accommodations, modifications and supports were offered.

IMPLICATIONS FOR REHABILITATION

- Both reactive (immediate) and proactive (long-term) approaches are needed to support individuals with chronic health conditions within the workplace.
- Supporting individuals to advocate (self-advocacy) for their required workplace accommodations, modifications and supports is vital.
- Rehabilitation plans should include flexible working hours to lessen the impact of an individual's chronic health condition within the workplace while also supporting their ongoing participation in employment.

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Accommodation; employment; modification; chronic; disability; workplace; rehabilitation

Introduction

In 2023, the World Health Organisation (WHO) attributed the deaths of 41 million people globally to non-communicable diseases, also known as chronic health conditions; while in Australia in 2022, these were associated with 90% (171,500) of all deaths [1,2]. Chronic health conditions are described as "the result of a combination of genetic, physiological, environmental and behavioural factors" [3]. Chronic health conditions invariably last longer than six months, cause persistent and ongoing ill-health and disability, and although they are not immediately life-threatening, may result in premature death [1]. Globally, the frequency of chronic health conditions increases with age, is more common among women and more prevalent in low and middle-income countries [1,2,4,5]. Over 100 chronic health conditions

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have been identified, among the most common are: cardiovascular disease, mental health conditions, chronic respiratory diseases, cancer, dementia, diabetes and chronic musculoskeletal conditions [1,4].

In 2022, 81.4% of all people living in Australia had at least one long-term health condition, while 61% had at least one chronic health condition – a chronic health condition being considered a subset of long-term health conditions [6]. Chronic health conditions in Australia made up 85% of the non-fatal burden of disease; this caused an estimated loss of 4.4 million years of healthy life in 2023 [1]. Chronic health conditions may be associated with disability due to the persistent impact of symptoms which can include impairment, activity limitation and restrictions on participation. Some chronic health conditions, such as cerebrovascular accidents, arthritis and emphysema are more likely to be associated with disability than other chronic health conditions such as asthma [7]. Chronic health conditions present numerous challenges in all aspects of an individual's life, including the ability to engage in and maintain paid employment. Individuals living with chronic health conditions are more likely to retire early from employment, reduce work hours, and face economic challenges [8,9]. The individual's capacity to continue to engage in work-related activities is important for maintaining their financial stability and psychological health. Workplaces which provide accommodations, modifications and supports help to reduce barriers which are associated with chronic health conditions and enable individuals to be productive, complete tasks, and continue working [10]. Workplace accommodation, modification and support policies, processes, and workflows are important within human resource management departments and ensure individuals with chronic health conditions and associated disability are supported in their role, while still enabling the vision of the organisation to be met [11]. Workplace adjustments may include flexible or reduced work hours, modifications to the work environment, task adjustment or rotation as well as working from home [12]. Historically reasonable work adjustments were not a requirement in many countries; however, the 2008 United Nations Convention on the Rights of Persons with Disabilities (CRPD) legally bound member states to support people with disabilities [13]. The expectation globally, is that employers provide 'reasonable accommodations' for people living with disabilities, including those with chronic health conditions; however, there are inconsistences on the types of accommodations, modifications and supports which are provided by organisations and businesses [10,14].

In Australia, the *Workplace Health and Safety Act 2011* s8 defines a workplace as "a place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work" [15]. The definition of workplace environments changed during the late 20th and early twenty first century due to proliferation in technology; however, the COVID-19 pandemic expediated further changes with the introduction of innovative technologies and automation as well as use of artificial intelligence. To allow businesses to remain viable, hybrid work environments and practices such as home offices became acceptable during the COVID-19 pandemic thus allowing employees to work remotely [16,17]. Many workplaces now incorporate home offices and remote workstations along with more traditional venues such as corporate buildings, factories, construction sites and small businesses. It is noted that there have been some retractions of these hybrid workspaces; however, the proliferation of technologies and the changing zeitgeist, is that the hybrid workplace/workspace model may have provided additional potential accommodations for those living with chronic health conditions [18,19].

Research is available on pre-employment training for individuals living with chronic health conditions as well as studies discussing workplace accommodations for those with specific health concerns; however, there were no identified research studies collating and discussing the types of accommodations, modifications and supports available to working age individuals living with any type of chronic health conditions in countries globally [20,21]. To address this deficit in research and to provide foundational information for a larger research project, it was determined that a scoping review should be undertaken [22]. A preliminary search of Cochrane Database of Systematic Reviews, JBI Evidence Synthesis and Open Scientific Framework was conducted and no current or underway systematic reviews or scoping reviews on the topic were identified.

This scoping review aimed to identify the types of workplace accommodations, modifications and supports currently being provided to individuals aged 16–67 years living with chronic health conditions in a variety of workplace settings globally. The scoping review provides foundational understanding for a broader research project on Chronic Disease in the workplace with a focus on Parkinson's Disease.

Ongoing research into Parkinson's disease is vital due to the annual 4% increase of incidences within Australia and the doubling of the prevalence of Parkinson's disease over the last 25 years globally [3,23].

Review question

What types of workplace accommodations, modifications and supports are provided for individuals in paid employment who are living with chronic health conditions?

Methods

The scoping review was conducted in accordance with the JBI methodology for scoping reviews [22]. The title of this review was registered with the Open Scientific Framework. The research was conducted in accordance with an *a priori* protocol registered with the Open Scientific Framework [24].

Inclusion criteria

Participants

Participant inclusion criteria:

- Individuals living with one or more chronic health conditions not present or evident at birth.
- Aged 16 to 67 years.
- In paid employment or employed but on leave (e.g. sick leave) or employed but retiring and their workplace accommodations are discussed.
- Studies discussing employer/manager/supervisor workplace support and accommodations for the eligible participants were also considered for this study.

Participant exclusion criteria:

- Younger than 16 years or older than 67 years.
- Health conditions or genetic conditions evident at birth e.g. Down syndrome.
- Drug addiction as a chronic condition.
- No chronic condition.
- Not in paid employment e.g. volunteer, unemployed.

Drug addiction as a chronic health condition was excluded due to treatment adherence and complexity in this population. Studies which included supervisor/employer discussion on workplace accommodations, modifications and supports for eligible participants were also considered for inclusion. Workplace environments in which there was a mix of participants who met eligibility criteria and individuals who were not in paid employment or were not remunerated for work, were excluded from this scoping review unless data on those who were being remunerated was discussed separately.

Concept

Workplace accommodations, modifications and supports for individuals engaged in paid employment who are living with chronic health conditions. These workplace accommodations, modifications and supports include, but are not limited to, flexible working hours, work-from-home arrangements, use of assistive technology, and modifications to an individual's work area.

Concept exclusion criteria:

- Pre-employment worker support
- Unemployed or activities in which an individual is not remunerated
- Volunteer support
- Support with gaining employment, e.g. prison development and vocational training; pre-employment training

Context

The workplace includes environments in which individuals are renumerated while engaging in employment-related activities. This includes, but is not limited to, organisational offices and buildings, educational institutions, construction sites, home office, retail and wholesale businesses and healthcare facilities. No geographical limiters were applied.

Workplace exclusion criteria:

- Detention centres and prisons

Types of sources

This scoping review considered primary research studies including both experimental and quasi-experimental study designs, including randomised controlled trials, non-randomised controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies were considered for inclusion. This review also considered descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.

Qualitative studies were considered that focused on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research.

In addition, systematic and scoping reviews that met the inclusion criteria were considered, depending on the research question and dates of studies included in the review.

Text, opinion papers and editorials were not considered for inclusion in this scoping review.

Search strategy

The search strategy aimed to locate both published and unpublished studies. An initial limited search of MEDLINE (Web of Science) and CINAHL Ultimate (EBSCOhost) was conducted on 9th September 2024 to identify articles on the topic ($n = 228$). The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy. The search strategy, including all identified keywords and index terms, was adapted for each included database and/or information source with a search of all databases undertaken on 20th September 2024 (Online Appendix A). The search strategy was developed jointly between the two reviewers of this scoping review. The reference lists of all included sources of evidence were screened for additional studies; and the included studies list and reference list of all systematic and scoping review retrieved for full-text screening were manually searched for additional eligible research studies.

Studies published in English, or which have English language version readily available from 1st January 2014 onward were considered for inclusion. Limiting studies to English was undertaken due to the research in this area available and the linguistic limitations of the authors. Limiting the study to the last 10 years ensured detection of contemporary practice following the 2008 legal requirement for United Nations member states to provide reasonable adjustments for individuals with a disability [13].

Databases searched included: APA PsychINFO (EBSCOhost); CINAHL Ultimate (EBSCOhost); Cochrane Library; Google Scholar; Health Source: Nursing Academic Edition (EBSCOhost); Joanna Briggs Institute' ProQuest; PubMed; Scopus (Elsevier) and Web of Science.

Study/source of evidence selection

Following the search, all identified citations were collated and uploaded into EndNote 21.4 (author/reviewer 1) (Clarivate Analytics, PA, USA) and EndNote 21.3 (author/reviewer 2) (Clarivate Analytics, PA, USA) and duplicates removed. Following a pilot test, titles and abstracts were then screened by two independent reviewers for assessment against the inclusion criteria for the review. The full text of potentially relevant sources was retrieved and their citation details imported into an Excel spreadsheet (Microsoft® Excel® for Microsoft 365 MSO (Version 2406 Build 16.0.17726.20078)). The full text of the

selected studies were independently assessed in detail against the inclusion criteria by the two reviewers with disagreements being resolved through discussion.

A variation to the age range for eligible participants was agreed upon between the two independent reviewers after the full database searches were conducted and studies selected for full-text assessment. The original intended age range for the scoping review was 18 to 64 years-old and was to include young adults, adults and middle-aged participants as these groups were likely to be of working age. Further, many databases have associated age ranges of 18/19 to 64 years-old (dependent on specific database expanders/limiters). Although these specified database age ranges were used in the full-text database searches, articles retrieved for potential inclusion had participants with ages ranging from 15 to 81+, the most common ages being 16 to 67 years-old. Further research determined that according to the Organisation for Economic Co-operation and Development (OECD), the working age population globally was 15 to 64 years-old; however, the OECD also indicated that the peak working age varied between 64 to 67 years-old in different years [25]. Based upon these findings, it was decided to vary the eligible participant age range to include 16 to 67 years-old to avoid removing potentially relevant studies.

Reasons for exclusion of sources of evidence at full text screening were recorded and are reported in the scoping review. The inclusion or not, of systematic and scoping reviews were discussed between the two reviewers as most reviews included studies between 1988 and 2014 - studies between 1988 and 2013 were not reflective of contemporary practice, while 2014 studies were considered if they met inclusion criteria. Any disagreements that arose between the two reviewers at each stage of the selection process were resolved through discussion. The results of the search and the study inclusion process are reported in full in the final scoping review and presented in Figure 1 PRISMA Flow Diagram [26].

Data extraction

Data was extracted from articles included in the scoping review by two reviewers using the developed data extraction tool (Online Appendix B). The draft extraction tool developed *a priori* was modified during the process of extracting data from evidence sources and is detailed in this scoping review. A variation was required to the planned data extraction process due to one of the authors, who lives with a chronic health condition, experiencing an exacerbation. To ensure the scoping review continued in a timely manner, the two reviewers jointly worked together to extract data from the research studies

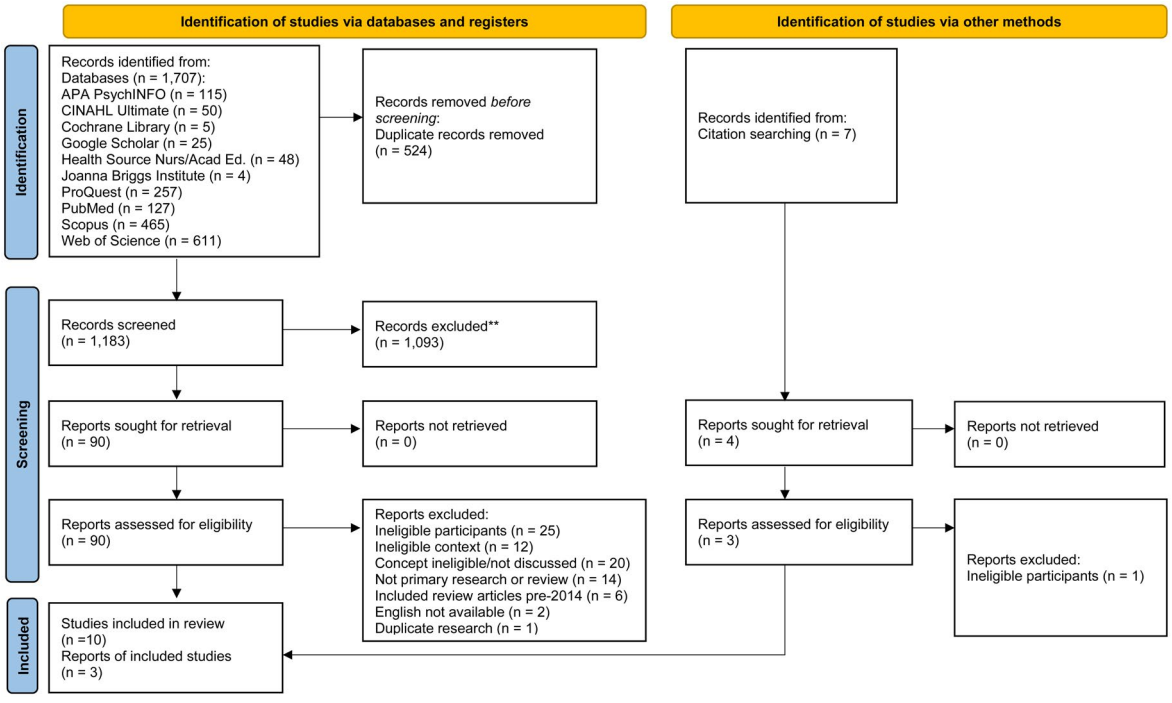

Figure 1. PRISMA flow diagram: Chronic disease scoping review 2024.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

included in the review. The data extracted included: specific details about the author/s, year of publication, the aims of the studies, study methodologies and methods, the country of the study, the sample size and participants, the workplace context and key findings relevant to the review question on workplace accommodations, modifications and supports. Any disagreements were resolved through discussion. As this is a scoping review which maps current research available, no critical appraisal of the individual sources of evidence was undertaken.

Data analysis and presentation

Data extracted during this scoping review was analysed using inductive thematic analysis [27]. Each of the included studies was read several times to ensure familiarity with the research. Initial themes and sub-themes were identified on the types of workplace accommodations, modifications and supports being provided to individuals living with chronic health conditions. Two categories were identified from the themes. Clear descriptions for each of the categories, themes and sub-themes were developed through analysis of the extracted data. Analysed data is presented in tabular format with an accompanying narrative summary analysing the findings, including how the scoping review has addressed the review question.

Results

Study inclusion

Database searches on 20th September 2024 resulted in 1707 records being identified with an additional six records identified through manual searches. Following duplicate removal, the title and abstract of 1189 records were assessed for eligibility with the removal of 1096. The full text of 93 records were sort for retrieval, with all 93 assessed for eligibility against the inclusion criteria. None of the systematic reviews ($n=8$) or scoping reviews ($n=4$) were included in this scoping review; however, searches of their included studies and reference lists resulted in an additional three studies being sought for full-text review. One further research study was identified through manual searches. Thirteen primary research studies were included in the scoping review. Reasons for exclusion included: ineligible participants ($n=26$); ineligible context ($n=12$); ineligible concept or the concept was not discussed ($n=20$); not primary research or a systematic or scoping review ($n=14$); systematic or scoping review articles were pre-2014 ($n=6$); English not available ($n=2$) and duplicate research ($n=1$) (Online Appendix C).

Characteristics of included studies

Table 1 details the characteristics of the included studies. Thirteen journal articles published between 2015 and 2024 from Canada ($n=3$), Netherlands ($n=3$), United States ($n=2$), and one each from United Kingdom, Japan, Finland, Sweden and Norway were included in this scoping review. Seven quantitative research studies employed cross-sectional ($n=7$) research methodologies, while six qualitative research studies used exploratory descriptive ($n=4$), exploratory ($n=1$) and grounded theory ($n=1$) research methodologies. Surveys ($n=7$) were the most common method used for data gathering with the remaining studies utilising interviews, either semi-structured ($n=5$) or phone interviews ($n=1$). Nine studies included participants with chronic health conditions totalling 11,236 eligible participants – data for ineligible participants from these studies was not included in this scoping review. Three studies had supervisors/managers/human resource director participants ($n=261$), while one included occupational physicians ($n=303$). Chronic health conditions discussed in seven studies included: hearing loss; rheumatoid arthritis, osteoarthritis, inflammatory arthritis or axial spondyloarthritis; cardiovascular disease; fatigue; Crohn's disease or ulcerative colitis and chronic kidney disease with the six other studies including multiple different types of chronic health conditions or not specific. Participants with the chronic health conditions worked in a variety of settings in white collar and blue-collar roles including office work, healthcare, education and training, public sector, retail, service and sales, transport, equipment and manual work positions.

The importance of self-advocacy of the individual with chronic health conditions was a unifying concept across all 13 included research studies. Nine themes were identified which could be collated into two overarching categories.

Table 1. Characteristics of included studies.

Study & Country	Methodology & Method	Participants & chronic health concerns	Context – workplace environment or employment type	Concept – Accommodations or modifications or support themes	Author's conclusion	Reviewers conclusion
Alma et al. [28] Netherlands	Quantitative cross sectional Survey	participants with chronic kidney disease ($n=634$) Employed ($n=409$) (data included in scoping review) Not employed ($n=225$) (data not included)	Not specified	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Employer support to maintain health; Long-term role modification	Difficulties associated with chronic kidney disease (CKD) require workplace accommodations and ongoing employment may be impacted by the treatment requirements of the health concern.	The stage of CKD and the associated treatments impact the requirements for workplace accommodations.
Bakker et al. [29] Netherlands	Quantitative cross sectional Online survey	Participants with rheumatoid arthritis or axial spondyloarthritis ($n=884$)	Healthcare; education and training; retail and sales	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Employer support to maintain health; Modifying or supplying equipment; Long-term role modification	Work-related problems are reported by workers with rheumatoid arthritis (RA) and axial spondyloarthritis (axSpA); however, only around half received workplace support. Discussions with health care providers (HCPs) relating to workplace problems is important.	Reporting of work-related problems by those with RA and axSpA is high by comparison to those receiving workplace support. Discussions with HCPs may help identify appropriate supports.
Bastien & Corbière [30] Canada	Qualitative exploratory descriptive Semi-structured phone interview	Participants ($n=219$): human resource directors ($n=150$) and employers ($n=69$)	Small and medium enterprises in Quebec	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Relational support; Employer support to maintain health; Work environment accommodations or modifications	Workplace accommodations were prioritised after return-to-work following depression, while relational aspects were not a focus.	Workplace accommodations to role duties, work schedule and work setting were a focus of the human resource directors and employer over relations with other staff including supervisors.
Chhibba et al. [31] Canada	Quantitative cross sectional Mailed out Survey	Participants with Crohns or ulcerative colitis ($n=881$)	Multiple >10 identified	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Employer support to maintain health; Work environment accommodations or modifications	Various types of accommodations are required for those with irritable bowel syndrome; however, there can be reluctance requesting these and difficulty arranging them.	Workers with IBD may be reluctant to request workplace accommodations or experience difficulty in arranging them, even when suitable accommodations may be available.
Gifford & Zong [32] USA	Quantitative cross sectional Survey	Participants with various chronic health concerns ($n=1021$)	White collar; services; sales and office; blue collar	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Employer support to maintain health; Modifying or supplying equipment; Long-term role modification	Health problems make it difficult for employees to perform their jobs well, but workplace accommodations can reduce loss of productivity.	Workplace accommodations can reduce the loss of productivity for workers with chronic health conditions.

(*Continued*)

Table 1. Continued.

Study & Country	Methodology & Method	Participants & chronic health concerns	Context – workplace environment or employment type	Concept – Accommodations or modifications or support themes	Author's conclusion	Reviewers conclusion
Gignac et al. [33] Canada	Quantitative cross sectional Phone interviews	Participants with osteoarthritis or inflammatory arthritis ($n=219$)	Multiple >10 identified	Adjustments or accommodations to work hours; Flexibility to change work site; Employer support to maintain health; Modifying or supplying equipment	Workers with arthritis do not use benefits/ accommodations until needed; however, some who did need accommodations did not use them.	Workplace benefits/ accommodations were not used by all workers with arthritis who needed them. Workplace benefits/ accommodations reduced workplace limitations, disruption and productivity loss.
Gignac et al. [34] Canada	Quantitative cross sectional Survey *via* online or telephone	Participants with chronic health concerns ($n=1028$) (data included) Health control group ($n=538$) (data not included)	Multiple >10 identified	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Employer support to maintain health; Modifying or supplying equipment	No significant differences in workplace accommodations used for diabetes or arthritis or both. Accommodation needs were met or exceeded.	The types of workplace accommodations used were not dependent upon the type of chronic health condition.
Harada et al. [35] Japan	Quantitative cross sectional Online survey	Participants with various chronic health concerns ($n=6775$)	Desk work; manual work; other	Adjustments or accommodations to work hours; Long-term role modification	Variations on receiving workplace accommodations and may be linked to law requirements for support.	Workplace accommodations are more likely to be provided if there is a lawful requirement for a particular chronic health condition.
Hjärtström et al. [36] Sweden	Qualitative: Exploratory descriptive Semi-structured interviews	Participants with hearing loss, fatigue or cardiovascular disease ($n=10$)	Public sector employees - office	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Modifying or supplying equipment; Long-term role modification	Worker attributes such as initiative, confidence and motivation impact the provision of workplace support.	Worker initiative to have workplace accommodations is implemented is important; however, some workers choose not to disclose their health status to employers.
Holland and Collins [37] United Kingdom	Qualitative: Exploratory descriptive Semi-structured interviews	Participants with rheumatoid arthritis ($n=11$) Employed ($n=9$) (data included) Home duties/retired ($n=2$) (data not included)	Not specified	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Flexibility to change work site; Relational support; Employer support to maintain health; Work environment accommodations or modifications; Modifying or supplying equipment	Pre-existing relationships influenced social support in the workplace, while employer personal knowledge and experiences impacted support and modifications. These may be removed if there are negative impacts in workflow or with co-workers.	Workplace modifications and supports were dependent upon relationship factors, employer knowledge and on the impact these workplace accommodations had within the work environment.
Honkonen et al. [38] Finland	Qualitative: Exploratory Internet survey	Occupational physicians ($n=303$)	Work ability meetings	Modifications to task expectations and workload; Modifying or supplying equipment; Long-term role modification	The focus of work ability meetings (WAMs) was on supporting workers to remain employed, including early interventions for return to work.	Workplace accommodations support individuals with chronic health conditions to remain in work and assist with early return to work.

(*Continued*)

Table 1. Continued.

Study & Country	Methodology & Method	Participants & chronic health concerns	Context – workplace environment or employment type	Concept – Accommodations or modifications or support themes	Author's conclusion	Reviewers conclusion
Nelson et al. [12] USA	Qualitative: Grounded theory Semi-structured interviews	Supervisors of employees with chronic health concerns ($n = 32$)	Not specified	Adjustments or accommodations to work hours; Modifications to task expectations and workload; Relational support; Employer support to maintain health; Employer daily support; Long-term role modification	Workplace policies provided structure for workplace supports; the communication abilities and relationships of supervisors increase effectiveness; strategies are aimed at individual, interpersonal and institutional supports.	Supervisors and organisations play an important role in supporting workers with chronic health concerns. An interactive, multi-faceted approach is needed to provide the workplace accommodations and supports required.
Svinndal et al. [39] Norway	Qualitative: Exploratory descriptive Semi-structured interviews	Managers of employees with hearing loss ($n = 10$)	Not specified	Modifications to task expectations and workload; Employer support to maintain health; Modifying or supplying equipment; Employer daily support; Long-term role modification	Barriers exist for workers with hearing loss to having less stressful working conditions and there needs to be a recognition of the fatigue associated with hearing loss. Appropriate services can provide support.	It is important that employers and organisations recognise that health concerns can have consequential impacts on health, such as fatigue, over what would be expected for a particular health concern. Recognising this is important so that appropriate supports can be implemented.

Organisations immediate responses to current symptoms

The first category, 'Organisations immediate responses to the current symptoms of the individual' included those measures which were instigated in response to the symptoms which were currently impacting the individual. An organisation's responses to the current symptoms of the individual living with a chronic health condition focuses on the employee's perspective and what was immediately required to allow the individual to continue to engage in employment. A reactive response.

The measures within this category could potentially require amendments made to them over time or could become permanent. Four themes were identified within this first category:

1. *Adjustments or accommodations to work hours* provided the individual with the capacity to reduce or adapt their work hours to alleviate the impact of their chronic health condition symptoms [12,28–39].
2. *Modifications to task expectations and workload* allows adjustment to the individuals current role duties in response to the symptoms of the chronic health condition [12,28–39].
3. *Flexibility to change work site* enables the ability of the individual to determine the most suitable site for work in response to symptoms of the chronic health condition [12,28–39].
4. *Relational support* provides both tangible and non-tangible as well as moral support and assistance for the individual experiencing symptoms of their chronic health condition [12,28–39].

Immediate accommodations in the workplace which reduced barriers while maintaining productivity of the individual with the chronic health condition involved the flexibility to work from home, work less hours, or utilising supportive equipment [28,31,33–37]. Various modifications such as the removal or adjustment of work tasks, working at a slower pace, limiting work activities, modified duties and

changing work to less demanding tasks also resulted in changes to work expectations for individuals with chronic health conditions [12,28–30,33,36–39]. Bastien and Corbière [30] found that human resource professionals and employers do not have the requisite knowledge to determine the functional limitations of the individual with a chronic health condition, while the individual's physician may be more focused on improving the health condition rather than on identifying the functional limitations within the workplace. The importance of incorporating support from healthcare agencies and including healthcare professionals in discussions on accommodations and modifications was identified in Bakker et al. [29] and Hjärtström et al. [36].

Organisation's ongoing or longer-term responses

The second category, 'Organisation's ongoing or longer-term responses to the chronic disease process' included the overall accommodations, modifications and supports available regardless of the type of chronic health condition, but which could be tailored to the needs of the individual. The second category was a proactive approach which included ongoing and long-term responses of the organisation to the chronic health condition processes. The second category encompassed five themes:

1. *Employer support to maintain health* were employment conditions which were made available to individuals with chronic health conditions to assist in maintaining their health [12,28–39].
2. *Work environment accommodations or modifications* included variations to the work environment to meet the needs of individuals with chronic health conditions [12,28–39].
3. *Modifying or supplying equipment* involved the provision of equipment and technologies to enable individuals with chronic health conditions to perform their role duties/tasks [12,28–39].
4. *Employer daily support* incorporated ongoing responses to enable participation in required work duties for individuals with chronic health conditions [12,28–39].
5. *Long-term role modification* was a response to ongoing chronic symptoms to maintain employment of the individual with chronic health conditions [12,28–33,35–40].

This category included activities which supported health including wellness programs, extended health benefits, occupational health support, enabling attendance at medical appointments as well as enabling short-term and long-term leave [12,31–34,36,37,39]. Additional accommodations aimed at supporting longer term participation included redesigning workplaces, moving locations of work stations or changing the role expectations or jobs [,30–32,36–38]. Nelson et al. [12] describe on-going strategies used by supervisors as encouraging teamwork, keeping an eye on workers, cross-training workers so they can fill in for each other and rotating more physically demanding jobs, while Gifford and Zong [32, p. 888] discussed a common type of employee accommodation was "getting help for the employee with some other person".

Within each of the themes for both categories, several sub-themes were identified. These are included in Table 2.

Discussion

According to the 'Americans with Disabilities Act' cited in Maestas et al. [41, p.1005], a reasonable accommodation is "any change or adjustment to a job, work environment, or the way things are usually done that would allow an individual with a disability to apply for a job, perform job functions, or enjoy equal access to benefits available to other employees". Chronic health conditions are often associated with some degree of disability and as a result of improved and targeted medical treatments, there is, internationally, an increase in the number of individuals continuing employment whilst living with and adapting to chronic health conditions [7,41]. Many of the workplace accommodations, modifications and supports are focused on responding to the current symptoms of individuals to allow them to continue working with the cost of these to the employer usually being minimal [10,42]. Telwatte et al. [43] indicates that the average one-time cost for an employer for providing workplace accommodations, modification and supports is US$500, while 59% cost nothing.

Table 2. Workplace accommodations, modifications and support.

Themes	Sub-themes
Category 1: Organisation's immediate responses to the current symptoms of the individual	
Adjustments or accommodations to work hours	Reducing or modifyingWork hours, times or schedules • Days worked per week • Making accessible rest periods determined by the individual • Time allowance to attend healthcare commitments
Modifications to task expectations and workload	Reducing or modifyingRole duties, tasks or responsibilities • Removal of duties
Flexibility to change work site	Allowing individuals to determine when they may work from home or remotely
Relational support	Employer/supervisorShowing flexibility according to capacity • Encouraging employee participation in determining needs • Keeping an eye on work and asking how they are doing and if help is needed • Providing education to individuals work team, encouraging support/discretion from colleagues • Providing supervisor/team/clientele change if needed • Removing staff supervision duties • Colleague supportProviding physical, moral or other assistance during exacerbations
Category 2: Organisation's ongoing or longer-term responses to the chronic disease processes	
Employer support to maintain health	• Refining organisational processes to support application of leave • Making workload assistance readily available • Provisioning special transportation/reducing travel requirements • Assisting with access to external providers/wellness programs • Paying for health benefits not covered by insurance • Enabling attendance at medical appointments
Work environment modifications	• Modifying work environment e.g. close to toilet • Redesign of workspace to accommodate needs • Rearrange/adjust workstation
Modifying or supplying equipment	• Modification/supply of work equipment and technologies
Employer daily support	• Restructuring meetings – length, number of attendees • Consideration of work situations which cause difficulties
Long-term role modification	• Changing to a role the individual can do • Relocating to a different work location • Retraining to learn new/different skills • Moving individuals away from physically demanding roles

Self-advocacy was a concept that threaded through and underpinned the provision of workplace accommodations, modifications and supports in all 13 of the included studies. Detaille et al. [44] discusses three components to self-management behaviour at work: personal determinants such as self-efficacy which means asking for help and planning work; socio-cultural determinants which include the attitudes of supervisors and colleagues and lastly the environmental determinants which incorporate the type of job, work tasks and facilities at work. Each of these determinants were identified in the findings of this scoping review. Socio-cultural determinants in the included studies incorporated both the positive and negative attitudes of the supervisors and managers as well as colleagues, while the environmental determinants were demonstrated through the types of workplace accommodations and modifications that were instigated for individuals living with chronic health conditions [10,42].

Self-advocacy is a form of personal agency which incorporates knowing and understanding your rights and speaking up for your needs [45]. This agency may be used for career progression in the workplace, in healthcare settings to obtain the information and care required, or in the case of an individual living with disability, including a chronic health condition, self-advocacy can be used to garner the necessary supports, modifications and accommodations required to continue to be gainfully employed [45–47]. Aligning with the findings of this scoping review that self-advocacy was the underpinning concept for workplace accommodations, modifications and supports, Rumrill et al. [47], discuss the Win-Win approach as a strategy to support the self-advocacy of workers with disabilities living in Kentucky USA. The Win-Win approach includes the RETAIN Kentucky's self-advocacy guide which provides step-by-step guidance on how to self-advocate and what needs to be considered in doing so. Detaille et al. [44] cites in their self-management program for employees with chronic disease that learning communication techniques is important in self-advocacy. Understanding how to communicate with supervisors, colleagues and family regarding problems encountered at work and potential solutions is vital [44].

Workplace supports exist alongside workplace accommodations and modifications. Zhang et al. [48, p.2] define workplace support as "a psychological or material resource provided through social relationships in workplaces" with the authors finding a positive correlation between supervisor support and a decrease in worker turnover. Organisational, supervisor and collegial support is essential for individuals living with chronic health conditions; however, Bosma et al. [10] and Hutting et al. [42] identified barriers to providing support including knowledge deficits of the employer and supervisors around rules and regulations and failure to utilise occupational physicians to assist with identifying the most appropriate accommodations and modifications. These findings aligned with the study by Bastien and Corbière [30] included in the scoping review. Healthcare professionals can provide insights into the most beneficial accommodations and modifications for the individual and can provide understanding into how to more effectively perform work duties with fewer problems. The degree to which support is provided however, is dependent upon self-advocacy and effective communication.

Although the Convention on the Rights of Persons with Disabilities specifies that "reasonable accommodation means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden" [14, p. 4], the degree to which an organisation or employer provides supports for an individual with a chronic health condition may be influenced by the mandatory requirements of the country in which the individual resides. The research by Alma et al. [28] and Bakker et al. [29] was undertaken in the Netherlands where there is an obligation for employers to offer a consultation with an occupational healthcare professional if an individual is on extended sick leave of more than six weeks. Holland and Collins [37] indicated that the UK Equality Act 2010 requires employers to make reasonable workplace adjustments. The countries in which the research of these three studies was conducted, are either current or former members of the European Union, thus the degree of organisational support may be influenced by the requirements of the EC Employment Equality Directive of 2000 cited in Waddington [49].

The studies included in this scoping review used the concepts of accommodations and modifications interchangeably; however, there are differences. In the educational arena, there is a clear distinction between accommodations and modifications. An accommodation is a change or adaptation through which barriers to participation and access are reduced without changing the fundamental standard or expectations, while a modification is a change or adaptation that does alter the fundamental expectations [50]. Comparing these explanations with the implied meaning of workplace accommodations and modifications discussed by the articles included in the scoping review, it is evident that that the principal meanings are the same. Being able to work from home, work less hours, have supportive equipment or have their environment redesigned allows the individual to continue undertaking their usual tasks without changing the basic expectations. This is achieved through reducing barriers, even if there is a decrease in the amount of time working due to some types of accommodations.

In some articles included in the scoping review, accommodations and modifications had a crossover in meaning; there is a modification to activities, but in doing so, there is no change to the overall workplace expectations [12,39]. Strategies such as cross-training workers and rotating tasks can reduce both physical and mental workloads resulting in a reduction in muscle fatigue and the potential for injury [12,51,52]. Not only does the rotation of tasks benefit the individual living with a chronic health condition, but it may also reduce the likelihood of others developing a chronic health condition.

Modifications indicate that there is an alteration in the fundamental workplace expectations. Modifications to work tasks may be needed due to the physical impacts of disability related to chronic health conditions, for example tiredness, mental health impacts such as anxiety and depression, physical impacts such as needing access to toilets or due to the stress created through not being able to undertake the same workload as those who do not have a chronic health condition [9,28]. Further, workplace modifications for individuals with coexistent physical and mental health concerns were found to be at higher risk of reducing work hours or of becoming unemployed, while those with either physical or mental health concerns were more likely to work part-time or change work roles [9].

While chronic health conditions have exacerbations which require immediate responses by an organisation to ensure they can continue working, chronic health conditions are still a long-lasting health concern with persistent effects and disability [1]. This is where proactive approaches and long-term responses are important. These approaches include ongoing support from managers as well as

organisational initiatives. Nelson et al. [12] and Svindal et al. [39] found that organisation and managerial support extended to encouraging collegial support and teamwork, supervisors trusting that the individual with the chronic health condition understands their own limitations and engages in work tasks accordingly as well as having an observant supervisor who identifies early that an individual is having difficulties. Each of these supports align with the findings of Bosma et al. [10] which indicated that all stakeholders needed to work together to create a supportive work environment and to design appropriate organisational policy; however, negative organisational, supervisor and employee attitudes continue to create impediments for individuals living with chronic health conditions.

While organisations and supervisors will consider the reasonableness of recommended accommodations, modifications and supports, they will also appraise the financial impacts of providing these. Human resource support and rehabilitation providers need to ensure the workplace needs of the individual living with the chronic health condition are clear to the employer [10,43]. To bolster this, consideration should be given for the use of tools such as the Job Demands and Accommodation Planning Tool (JDAPT) [53]. Tools such as this can be used to determine the physical, cognitive and interpersonal aspects associated with the workplace role of the individual living with the chronic health condition as well as their working conditions. This allows for rehabilitation planning in a structured format which may increase the support provided by the employing organisation.

Limitations

Limiting the age range of the studies ensured studies included were representative of the OECD understanding of working ages; however, in limiting the age range, specific age-related modifications, accommodations and supports may not have been included. Excluding those involved in pre-employment training as well as unpaid or volunteer roles was necessary as the focus of the scoping review is specifically around paid employment modifications, accommodation and supports. Through excluding research involving these groups, understanding of individual and organisational modifications, accommodations and supports in the workplace may be missed. Drug addiction as a chronic condition was excluded due to the complexities and difficulties with adherence to treatment in this group; however, it is recognised that additional workplace adjustments may have been excluded.

Implications for future research

This research highlights the value of workplace accommodations, modifications and supports for individuals living with chronic health conditions but also identifies barriers to receiving these. The variations in amounts and types of workplace adjustments demonstrates a need for further research into this area to determine a baseline of best/standard practice adjustments for different chronic health conditions. The finding that some organisations use proactive approaches to workplace rehabilitation warrants further research on the impacts of these on workforce stability and turnover as well as financial implications.

Parkinson's disease is on the rise in Australia and globally; however, during the review, it was noted that there is a sparsity of research on Parkinson's disease in the workplace. This provides possible fertile ground for research into understanding the impacts of Parkinson's disease in the workplace and barriers and facilitators to workplace rehabilitation and participation.

Conclusion

Chronic health conditions may limit the capability of individuals to participate fully in the workplace but workplace accommodations, modifications and supports can ensure their ability to continue in gainful employment. This scoping review makes important contributions to research on rehabilitation and disability. The scoping review identified that self-advocacy is vital if individuals living with a chronic health condition are to receive the required workplace accommodations, modifications and supports. The review found that organisations will use both reactive and proactive approaches to supporting individuals with chronic health conditions and disabilities. This is important when considering rehabilitation planning and when working with organisations. While most accommodations, modifications and supports focus on

immediate needs, through providing longer-term, proactive approaches to maintaining the health and well-being of employees, organisations are more likely to sustain a stable experienced workforce. This stable workforce will help ensure that the goals of the organisation are met and may also provide financial benefits for the organisation through decreases in recruitment and training costs.

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Author contributions

CRediT: **Susan Morgan**: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing; **Andrew Davies**: Conceptualization, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing.

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Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article and/or its supplementary materials.

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