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eHealth interventions to facilitate work participation: a scoping review

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ABSTRACT

Objective: The objective of this scoping review was to identify studies combining the concepts of eHealth and work participation for sick-listed employees across diagnostic groups in health care and workplace contexts.

Introduction: There is an increased demand for better health care services and technologies, and eHealth is proposed as a useful tool to improve efficiency and reduce costs. eHealth functions at the intersection of medical informatics, public health, and business, and may be a promising solution for managing the process of return to work among employees on sick leave. Assessment of work outcomes is essential in evaluating the effectiveness of health services, and there is a need to map the research literature on existing eHealth interventions to facilitate work participation.

Inclusion criteria: This scoping review considered studies combining two core concepts: eHealth and work participation. It considered studies on eHealth interventions for employees (18 to 65 years of age) on sick leave due to any type of diagnosis or disability, conducted by any stakeholder in workplace or health care contexts and in any country. Empirical data from both quantitative and qualitative studies were included.

Methods: Published and unpublished studies from January 1, 2008, to August 21, 2020, written in English were included in this review. The search was conducted in MEDLINE, Scopus, Embase, PsycINFO, WHO clinical registry, and ClinicalTrials.gov. A three-step search strategy was followed. Data extraction was performed by two independent reviewers and undertaken using an extraction tool developed specifically for the scoping review objectives.

Results: This review identified 15 studies eligible for inclusion. Four studies delivered the eHealth intervention by telephone, while 10 interventions were web-based. Of the web-based interventions, five had a blended approach, such as website and email support, or website and social media platforms. One study used an app-based intervention. Only eight studies targeted employees sick-listed due to common sick leave diagnoses, such as common mental disorders and musculoskeletal disorders. The workplace context was the target of the eHealth intervention in seven studies, although the intervention was still delivered by health personnel such as therapists or occupational physicians. Collaboration on individual cases between the health professional, employer, and employee to facilitate work participation seemed to be rare. Four studies reported both a theoretical and an empirical base for the intervention used.

Conclusions: This review demonstrated that the use of eHealth interventions to facilitate work participation is limited, and there is a need for future studies on the use of eHealth technology for this purpose. Developing eHealth interventions specifically for populations at risk of long-term sick leave, and encouraging collaboration between all relevant stakeholders, may help improve work participation.

Keywords: eHealth; occupational rehabilitation; return to work; sick leave; workplace intervention

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Introduction

Health care expenditures are increasing worldwide due to the higher costs of services, technologies, and medicines.¹ The World Health Organization (WHO) encourages member states to improve efficiency, and the application of information and communication technology is becoming a useful tool to attain this goal.¹ Approximately 50% of all member states have an eHealth strategy (ie, a strategy for the use of information and communication technology in support of health and health-related fields and to promote universal health coverage), and the use of eHealth technology in the delivery of health care services is growing rapidly.^{2,3} In accordance with the recommendations of the WHO, the European Union has created an eHealth network to support the member states in eHealth-related issues and increase the use of eHealth to improve prevention, diagnosis, treatment, monitoring, and management of health.⁴ Because eHealth functions at the intersection of medical informatics, public health, and business,⁵ it may be a promising solution to help manage the process toward work participation for employees during sick leave.⁶⁻⁸ Long-term sick leave and work disability are costly for society and the individual,⁹ and assessment of work outcomes is needed to evaluate the effectiveness of health services.¹⁰

Research on eHealth is growing, and eHealth interventions are offered and examined for different patient groups (eg, patients with anxiety or cancer) and in different health care contexts.¹¹⁻²¹ Web-based follow-up interventions have shown promising results in terms of faster return to work (RTW) for employees sick-listed due to common mental disorders,⁸ and for women after gynecological surgery.²² There is some evidence to suggest that eHealth interventions have been cost-effective in some specialties (eg, teleophthalmology, telecardiology), but there is limited evidence from randomized controlled trials (RCTs).^{23,24} Lokman *et al.*⁶ concluded that an eHealth intervention aimed at improving RTW among sick-listed employees showed a positive cost-benefit for the involved stakeholders, but studies regarding the cost-effectiveness of eHealth interventions for work-related outcomes are few. eHealth interventions were initially developed as a tool for an interaction between health care professionals and patients.²⁵ Still, studies among sick-listed employees seem to focus on health outcomes, rather than work

outcomes, and studies on eHealth in occupational health are sparse.²⁶ There is a pertinent gap in the literature regarding how to combine the concepts “eHealth” and “work participation.”

Improvements in health care efficiency and increased labor participation rates serve the interest of governments, health care institutions, organizations, and individuals.^{9,25} As the conceptualization of work disability has expanded, the number of stakeholders interested in work disability prevention has increased.²⁷ Additionally, recognition of the central role of stakeholder involvement in influencing actions, aims, and successful implementation, as well as optimizing the effect of RTW interventions, has improved across health care and workplace contexts.²⁷⁻³¹ The use of eHealth technology to facilitate work participation is an evolving field, and when new services are provided, it is necessary to investigate the delivery of the intervention. This includes examining which stakeholders are involved, as they often reflect the values and goals of the interventions.²⁸ The definition of what enhances success of the intervention may also vary among different stakeholder groups.²⁸ Furthermore, the implementation of new technology may challenge organizations and health care workers, with technological possibilities often in conflict with prevailing service delivery systems and user preferences.³² Successful implementation of eHealth tools depends on cross-disciplinary support and strategies both inside and outside of organizations,³³ and on support from the health care providers who acknowledge the benefits for their patients.³⁴ Thus, it is important to investigate which stakeholders are involved in eHealth interventions, as well as in which contexts such interventions are provided. In the current scoping review, the term “stakeholder” refers to all professionals in the workplace and health care contexts.

It is important also to inform practice about when, why, and how interventions might work.³⁵ To answer these questions, a theory-based approach to research is often sought.^{35,36} In behavioral sciences, theories, such as the theory of planned behavior, provide tentative explanations for why and in which circumstances behavior change is most likely to occur.³⁷ Hence, a theory-based approach brings forth a way of understanding the effect of an intervention or lack thereof.³⁷ The explicit use of a theory offers a generalizable framework for interpreting behavior and evaluating potential causal mechanisms.³⁷

Knowledge about whether an intervention is theory-driven, based on empirical evidence, or both is valuable when assessing intervention implementation. Therefore, this scoping review also explored whether identified interventions were theory-driven or mainly empirically grounded.

The objective of the current scoping review was to identify studies combining the two concepts of “eHealth” and “work participation” for sick-listed employees across diagnostic groups in both health care and workplace contexts. All types of quantitative and qualitative intervention studies were included. This scoping review provides knowledge on eHealth and work participation beyond measures of effect, which is necessary for developing a situational understanding of the active elements and identifying gaps in evidence.³⁵

Based on the preliminary search for existing reviews, we limited the search period to include studies published after 2007. The preliminary search, including studies combining eHealth interventions with reports of work-related outcomes, was conducted in the *JBIR Database of Systematic Reviews and Implementation Reports*, the Cochrane Database of Systematic Reviews, MEDLINE, and Trip Database. Only one systematic review, searching for literature up to and including February 2007, was identified on this topic. This review focused on clinical outcomes where RTW was a secondary outcome in only two of the identified studies.³⁸ Furthermore, eHealth is a relatively young discipline with a constant and rapid change in technology,³⁹ and it is reasonable to assume that recent studies are more relevant for current practice.

Another search was conducted in PROSPERO, revealing 30 ongoing systematic reviews on eHealth interventions. One of these reviews combined the eHealth intervention with a work-related outcome.⁴⁰ However, the ongoing systematic review by Schumacher *et al.*⁴⁰ limited its objective to include only RCTs aimed to facilitate RTW, therefore differing from this scoping review.

Review questions

The scoping review focused on the following questions:

- For which populations were eHealth interventions aimed at work participation provided?
- In which contexts were eHealth interventions aimed at work participation provided?

- By which stakeholders were eHealth interventions aimed at work participation provided?
- Were eHealth interventions aimed at work participation theory-driven or based on empirical evidence?

Inclusion criteria

Participants

This scoping review considered studies that included employees of working age (range: 18 to 65 years of age) who were on sick leave (full or partial) due to any type of diagnosis or disability.

Concepts

The scoping review investigated the combination of two core concepts: eHealth and work participation. eHealth is a much-used term, with no clear definition, and the precise meaning may vary with context and among stakeholders.⁴¹ We used both the definition from Eysenbach⁵ and the WHO,⁴² two broad and widely accepted definitions, to understand and operationalize eHealth. Eysenbach⁵ defines eHealth as health services and information delivered or enhanced through the internet and related technologies. The WHO defines eHealth as the use of information and communication technology for health.⁴² In this review, eHealth interventions were operationalized as health services and information delivered through the internet (eg, by a website and/or by email), by a mobile device or telephone, or by a computer program or software. This included studies using terms that are interchangeable with eHealth, such as telecare, telehealth, telemedicine, or mHealth.

Work participation was defined as work-related outcomes operationalized by different outcome measures (eg, work participation, sick leave duration, time to RTW, work productivity) and obtained through both quantitative and qualitative data. Return-to-work is not an isolated event, but rather an evolving process with several phases before and after work re-entry,⁴³⁻⁴⁶ and the terminology and measurements of work-related outcomes vary between studies⁴⁷ depending on the purpose of the study and available data.^{44,48} Measures of work participation may also be influenced by differences in the legal system, the labor market, and work environments in different countries.^{47,49} Because of this variation in terminology and available data, we chose to use a broad approach to capture work participation in this scoping review.

Contexts

This review included studies on eHealth interventions that aimed to facilitate work participation for a specified population and were conducted in the workplace or health care contexts (eg, primary or secondary health care).

Types of studies

This review included empirical studies on eHealth interventions aimed at work participation, independent of study design. Exclusion criteria were studies on eHealth interventions offered to unemployed persons and studies focusing on presenteeism (reflecting people working with an injury or illness that impact on their work productivity).

Based on the study aim (ie, to identify studies comprising both an eHealth intervention and outcome measures on work participation), the search for unpublished literature was limited to scientific databases (WHO clinical registry and ClinicalTrials.gov). Book chapters, editorial letters, guidelines, and websites were excluded, in addition to all types of reviews and protocols.

Methods

This scoping review was conducted according to JBI methodology.⁵⁰ The objectives, inclusion criteria, and methods of analysis were specified in advance and documented in an a priori protocol.⁵¹ As recommended by the *JBI Manual for Evidence Synthesis* and by Levac *et al.*,⁵² a stakeholder with specialist expertise in eHealth practice and research was consulted when preparing the study protocol and when discussing the scoping review results.

Search strategy

A comprehensive search strategy was conducted to identify both published and unpublished studies. The following databases were searched: MEDLINE (PubMed), Scopus (Elsevier), Embase (Elsevier), PsycINFO (ProQuest), WHO clinical registry, and ClinicalTrials.gov. A research librarian assisted in refining the search strategy developed for MEDLINE for use in the other electronic databases. A three-step search approach was utilized to identify relevant studies.⁵⁰ Step 1 involved an initial limited search in MEDLINE using preliminary keywords for study population (patients and employees), content of the intervention (eHealth), context (health care and workplace), and work-related outcomes, followed

by an analysis of the index terms and text words from the titles and abstracts. For step 2, an extensive search including all identified index terms and keywords was performed across databases. In step 3, the reference lists of all included papers were searched for additional studies. Articles written in English and published from January 1, 2008, until August 21, 2020 were considered for inclusion. A detailed search strategy is presented in Appendix I.

Study selection

Following the search, all identified citations were uploaded into RefWorks (ProQuest LLC, Ann Arbor, USA). Two reviewers (TJ and IØ) independently reviewed all titles and abstracts. The full texts of studies were retrieved and independently reviewed by two reviewers (TJ and IØ). Full-text studies that did not meet the inclusion criteria were excluded and reasons for their exclusion are provided in Appendix II. Any disagreements that arose between the reviewers were resolved through discussion with a third reviewer (TLJ).

Data extraction

Data were extracted from included studies by teams of two independent reviewers per study (TJ, IØ, TLJ, THT, AMHM, and CVN) using the data extraction tool specified in the review protocol.⁵¹ The data extracted included specific details about the population, context, stakeholders, type and content of the intervention, efficacy, theoretical or empirical base of the intervention, and concepts of significance to the specific objective of the scoping review (eHealth and work participation). Any disagreements between the reviewers were resolved through discussion with a third reviewer (TLJ and IØ). For three of the included studies,^{8,53,54} additional papers such as protocols and cost-benefit articles reporting findings from the same studies were used as supplementary information in the review process. Authors of two papers, Vonk Noordegraaf *et al.*²² and Bouwsma *et al.*,⁵³ were contacted to clarify that these two papers were not from the same study.

Data analysis and presentation

The extracted data are presented in both diagrammatic and tabular form as recommended in the scoping review guidelines. The diagrammatic and tabular presentations are accompanied by a narrative summary of results in a figure. The objective of

this scoping review was broad, including studies on eHealth interventions for any type of diagnosis, using different outcomes to measure work participation. Therefore, the presentation of results and the discussion are also broad.

Results

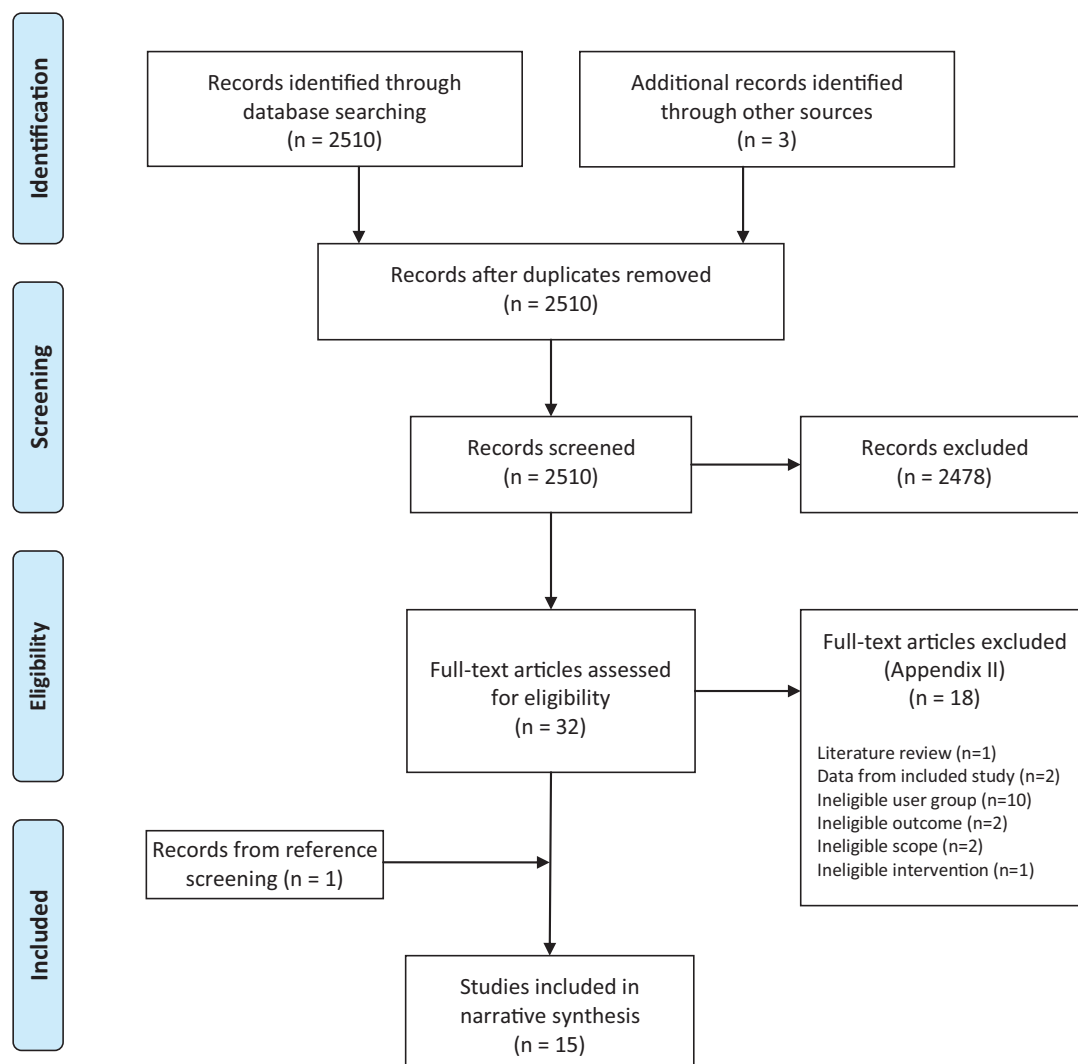
Study inclusion

The database search and search of other sources resulted in 2513 studies after duplicates were removed. After screening titles and abstracts, 32 full-text papers were retrieved, 18 of which were

excluded based on inclusion criteria (Appendix II). One additional paper was identified through screening of references, which resulted in a total of 15 studies included in the final scoping review (Figure 1).

Characteristics of included studies

Thirteen of the 15 studies were from European countries, eight of which were conducted in the Netherlands (Table 1). Ten studies were RCTs evaluating the effect of eHealth interventions on the duration of sick leave.^{8,22,26,53-59} One study used



Source: Moher D, Liberati A, Tetzlaff J, Altman DG; the PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. PLoS Med 2009;6(7):e1000097

Figure 1: Search results and study selection and inclusion process

Table 1: Characteristics of included studies

Author, year	Country	Aims	Type of eHealth intervention	Intervention A: based on theory B: based on empirical evidence	Design	User group	Context	Stakeholders	Work-related outcomes
De Jong <i>et al.</i> (2009) ⁵⁰	Netherlands	Examine feasibility of a web-based counseling program	Web-based counseling program, website	B	Semi-structured in-depth interviews	Employees sick-listed due to non-specific back or neck pain	Occupational health care	OPs	Self-reports of whether the program helped the employees RTW faster
Bee <i>et al.</i> (2010) ⁵⁵	United Kingdom (England)	Examine feasibility and pilot testing of telephone-delivered CBT	Telephone-delivered CBT	B	Pilot RCT	Employees sick-listed due to mental health condition	Workplace	CBT therapists	Self-reported actual and effective working hours
Sullivan <i>et al.</i> (2012) ⁵²	Canada	Examine feasibility of a telephonic occupational rehabilitation program	Telephonic occupational rehabilitation program	B	Matched control study	Patients with chronic musculoskeletal condition	Community of residence	Occupational therapists	Clinician-reported RTW: Not working, modified-, part-time, or full-time work
Vonk Noordegraaf <i>et al.</i> (2014) ²²	Netherlands	Evaluate effectiveness of an eHealth intervention	Web-based program, website	B	Multicenter RCT	Patients scheduled for gynecological surgery	Secondary health care	Clinical OPs and occupational therapist	Duration of sick leave until full sustainable RTW
Brown <i>et al.</i> (2015) ⁶¹	United Kingdom (Scotland)	Evaluate effectiveness of a telephone-based sick leave management service	Telephone-based sick leave management	B	Time-series analysis	Employees with all type of sick leave diagnoses	Workplace and OHS	Trained staff at the OHS	Percentage reduced sick leave
Volker <i>et al.</i> (2015) ⁸	Netherlands	Evaluate effectiveness of a blended eHealth intervention	Blended web-based intervention, Return@Work with email decision aid	B	RCT	Employees sick-listed due to common mental disorder	Occupational health care	OPs	Duration until first RTW, until full RTW, and total number of days on sick leave
Tamminga <i>et al.</i> (2016) ⁷	Netherlands	Develop and examine the feasibility of an eHealth intervention to enhance RTW	Internet program Cancer@Work, website	A & B	Mixed-method, semi-structured interviews, telephone interviews, and questionnaires	Cancer survivors	Secondary health care	OPs, GPs, specialized nurses, and employers	Need for support regarding RTW
Beiwinkel <i>et al.</i> (2017) ⁵⁸	Germany	Evaluate effectiveness	Interactive web-based program Therapist feedback upon request via email or telephone	B	Open-label RCT	Employees sick-listed due to depression	Statutory health insurance company and a private integrated care company	Psychologists or other therapists trained in the intervention approach	Information on work absence frequency was retrieved from health insurance records
Bouwisma <i>et al.</i> (2017) ⁵³	Netherlands	Evaluate effectiveness and cost-effectiveness of an internet-based care program	Interactive web portal	A & B	Step-wedge cluster RCT	Patients scheduled for gynecological surgery	Secondary health care	Gynecologists, GPs, and OPs	Duration until full sustainable RTW

Table 1: (Continued)

Author, year	Country	Aims	Type of eHealth intervention	Intervention A: based on theory B: based on empirical evidence	Design	User group	Context	Stakeholders	Work-related outcomes
Hara <i>et al.</i> (2017) ⁵⁶	Norway	Evaluate effect of boosted RTW follow-up after occupational rehab	Telephone or videoconference follow-up	A & B	Pragmatic RCT	Patients with musculoskeletal pain, fatigue, and common mental disorder	Secondary health care	RTW coordinators	Full or partial RTW
Deady <i>et al.</i> (2018) ⁵³	Australia	Evaluate the usability, acceptability, feasibility, and preliminary efficacy	Smartphone app-based intervention, HeadGear	B	Feasibility and acceptability study	Employees with mental health problems	Workplace	Self-management	Self-reported sick days past month
Kaldo <i>et al.</i> (2018) ⁵⁴	Sweden	Evaluate effectiveness of internet-based CBT targeting work-related areas	Internet-based CBT, website	B	RCT	Patients with depression	Primary health care	Clinical psychologist	Employment status and number of full-time sick-leave days per month
Notenbomer <i>et al.</i> (2018) ²⁶	Netherlands	Evaluate effect of an eHealth intervention	Personalized web-based intervention with feedback and advice	A & B	Three-armed RCT	Employees with frequent sickness absence	Workplace	Employer, GP, or OP	Number of sickness absence episodes and total sickness absence days
Van der Meij <i>et al.</i> (2018) ⁵⁷	Netherlands	Evaluate effect of a personalized interactive eHealth-care program	Interactive, tailored eHealth care, with feedback and chat line; website and mobile application with activity tracker	B	Multicenter single-blind RCT	Patients scheduled for abdominal surgery	Hospitals	Health care professional at hospitals	Time until first day of work resumption and days of complete work resumption
Suman <i>et al.</i> (2019) ⁵⁹	Netherlands	Assess effectiveness and cost-utility	Multifaceted eHealth strategy including a website, digital monthly newsletters, and social media platforms	B	Stepped-wedge cluster RCT	Patients diagnosed with non-specific low back pain	Primary health care	Self-management Patients were recruited from their GPs, OPs, and physical therapists	Self-reported mean number of absence days over previous three months

CBT, cognitive behavioral therapy; GP, general practitioner; OHS, occupational health service; OP, occupational physician; RCT, randomized controlled trial; RTW, return to work

qualitative interviews,⁶⁰ one study used a time-series analysis,⁶¹ and one study used a mixed methods design.⁷ In four studies, the main aim was to explore the feasibility or acceptability of the eHealth intervention.^{7,60,62,63} The population sizes ranged from 23 to 22,524 patients/employees.

Review findings

Populations

There were six groups of populations identified in this review. Five groups were employees who were sick-listed due to a particular diagnosis or health condition, while the sixth population group included employees who were sick-listed due to various diagnoses. Five eHealth interventions were provided for employees who were sick-listed due to common mental disorders,^{8,54,55,58,63} two eHealth interventions for employees with gynecological conditions,^{22,53} three eHealth interventions for employees with musculoskeletal conditions,^{59,60,62} one eHealth intervention for employees scheduled for abdominal surgery,⁵⁷ and one eHealth intervention for cancer survivors.⁷ Three of the identified studies reported on an eHealth intervention for employees sick-listed due to various diagnoses; one of the studies included employees with musculoskeletal pain, fatigue, or common mental disorders,⁵⁶ and two studies included employees sick-listed due to any type of diagnosis.^{26,61}

Length of sick leave before inclusion varied from less than one week to several years. The shortest sick leave (less than one week) was among employees scheduled for gynecological surgery,^{22,53} and among employees with new sick leave incidents in a Scottish sick leave program.⁶¹ Among employees with depression in a primary care context,⁵⁴ 79% of the employees had no or very few days of full-time sick leave at baseline, whereas 7.8% had full-time or part-time sick leave for the duration of one month or more. In another study,⁵⁶ 56% of the employees participating in occupational rehabilitation had received temporary medical benefits for more than one year. The longest duration of sick leave before inclusion was among employees with chronic musculoskeletal conditions, who had been out of work for an average of 31 months.⁶²

Contexts

The contexts for the eHealth interventions were the following: the workplace^{8,26,55,60,61,63}; the health

sector, either primary^{54,59} or secondary care^{7,22,53,56,57}; the local community (in a clinic or at home)⁶²; and a statutory health insurance company.⁵⁸ For the studies taking place in an occupational context, the workplace involvement in the intervention varied. In two studies from the Netherlands,^{8,60} the interventions were delivered through the occupational health services (OHS) without any collaboration from the workplaces. In the intervention in one of the studies from the UK (Scotland), a politically initiated program was delivered by a collaboration between the workplace and the OHS.⁶¹ In the other study from the UK (England), the department of human resources in a large company conducted a telephone-delivered intervention to the included employees without any involvement from OHS.⁵⁵ In a Swedish primary care context, eHealth cognitive behavioral therapy (CBT) was delivered by clinical psychologists engaged in the project without collaboration with ordinary primary care.⁵⁴ The eHealth programs in the secondary care were delivered through gynecological hospital units^{7,22,53} or through occupational rehabilitation.⁵⁶

Stakeholders providing the interventions

Most of the stakeholders providing the interventions were health professionals working in primary or secondary health care, such as physicians, psychologists, or occupational therapists.^{7,22,53,54,56,57} One or more stakeholders were involved in the delivery of the eHealth intervention (ie, CBT-therapist⁵⁵; gynecologist, general physician, and occupational physician⁵³; line manager and OHS staff⁶¹; employer, occupational physician, and general physician²⁶; RTW coordinators⁵⁶; psychologists^{54,58}; occupational therapists⁶²; several health professionals^{7,22,57}; and occupational physicians^{8,60}). Studies conducted at the workplace involved mainly occupational physicians from occupational health care or stakeholders from OHS.^{8,55,60,61} One study had a multi-stakeholder perspective with support from occupational physicians, general physicians, and nurses, as well as employers.⁷ Two studies were mainly focused on self-management, one with help from relevant stakeholders (employer, general physician, and occupational physician).^{59,63}

The stakeholders' role and active involvement in the eHealth interventions varied among studies. Some stakeholders used techniques based on cognitive behavioral principles,^{54-56,58} and some were trained in their therapeutic role and in the purpose

and use of the particular program.⁶⁰⁻⁶² A typical task was to suggest individually tailored advice on health and work issues.^{8,22,53} In the study by van der Meij *et al.*,⁵⁷ an alert from the eHealth program advised participants to contact a specific health care professional if a patient's recovery was delayed. Stakeholder involvement could be brief with a single contact⁶¹ or comprehensive.⁵⁴ In the study by Kaldo *et al.*,⁵⁴ the clinical psychologists gave active and individually tailored weekly support through 30 modules.

Type of eHealth interventions

Four studies reported eHealth programs mainly delivered by telephone,^{55,56,61,62} and 10 programs were web-based.^{7,8,22,26,53,54,57-60} Of these, five eHealth interventions had a blended approach, such as a web-based program and email or telephone feedback,⁵⁸ website and email support,⁸ personalized web-based feedback and email,²⁶ website and social media platforms,⁵⁹ and website and a mobile application.⁵⁷ One study used a smartphone app-based intervention.⁶³

In general, the eHealth interventions were tailored and structured according to the individual employee's work- and health-related needs. The eHealth interventions delivered by telephone enabled personal communication and close collaboration between the employee and a stakeholder. For example, in the single telephone call from trained OHS staff in Scotland, the aim was to give the employee early support on the health issue and RTW possibilities, and to deliver information about available services to which the employee could self-refer if necessary.⁶¹ In another study, RTW coordinators in Norway telephoned the employees once a month for six months to boost the RTW process after occupational rehabilitation.⁵⁶ The interventions delivered via the internet consisted of the following: self-help CBT texts tailored to the employee's clinical profile⁵⁴; health- and work-related information⁷; an interactive web portal to monitor one's own recovery rate⁵³; web-based modules on work and health⁸; peri- and post-operative instructions supporting recovery related to daily life and work²²; a guided program with therapist contact on request⁵⁸; personalized web-based feedback and preventive advisory consultation²⁶; a Facebook page where patients could contact health care providers⁵⁹; customized recovery advice and day-to-day feedback

tailored to their personal situation⁵⁷; and individually tailored interventions based on questionnaire responses.⁶⁰ The study using a smartphone app provided participants with personalized risk feedback.⁶³

Based on theory or empirical evidence

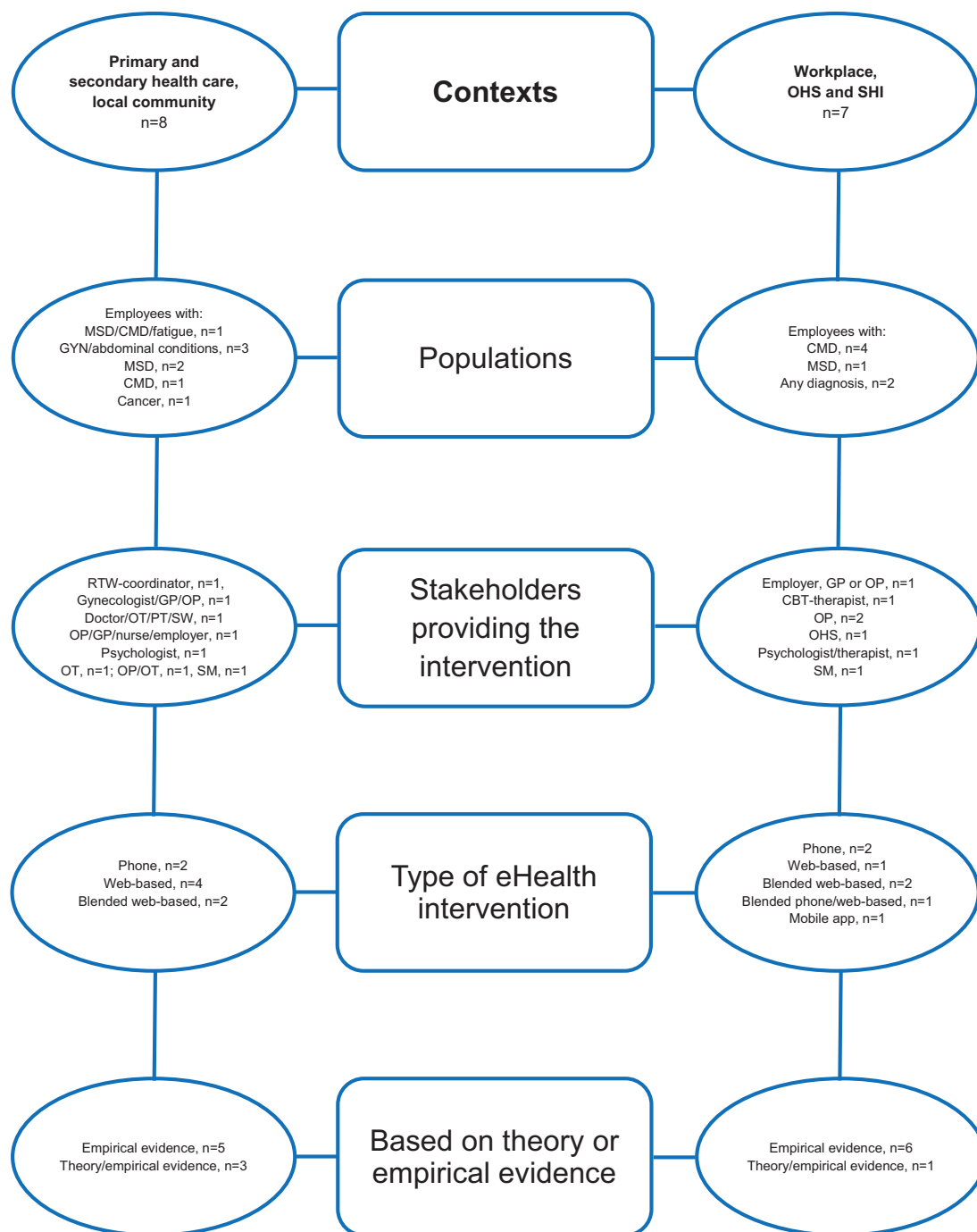
None of the included interventions appeared to be explicitly theory-based. However, four studies were inspired by theory in combination with empirical evidence to inform the development or design of the eHealth intervention.^{7,26,53,56} Tamminga *et al.*⁷ developed an eHealth intervention for employees with cancer based on the theory of self-management and integrated care management. Bouwsma *et al.*⁵³ used the theory of planned behavior as a theoretical framework for determinants of behavior change towards recovery and RTW among employees scheduled for gynecological surgery. Acceptance and commitment therapy guided the development of an intervention for a mixed group of employees participating in occupational rehabilitation.⁵⁶ Notenbomer *et al.*²⁶ used the job demands-resources model as a theoretical framework for their eHealth intervention. See Figure 2 for a diagrammatic presentation of the results.

Work-related outcomes

Work participation was either a primary or a secondary outcome, and was measured with a variety of work-related outcomes. None of the included sources used exactly the same measure. Five studies collected register-based sick leave data,^{8,26,56,58,61} one study used clinician-reported RTW rates,⁶² and seven studies collected self-reported sick leave data.^{22,53-55,57,59,63} The self-reports were either quantified by actual and effective working hours (work productivity)⁵⁵; with a single question on the current employment or sick leave status⁵⁴; self-reported mean number of absence days⁵⁹; self-reported sick days in the past month⁶³; time until first resumption of work⁵⁷; or collected by monthly, self-reported electronic calendars.^{22,53} Two studies measured work participation in a non-standardized way, such as the need for support regarding RTW⁷ or a question asking whether the eHealth intervention helped the employee to a faster RTW.⁶⁰

Effect of eHealth interventions on work-related outcomes

All studies, apart from the studies with qualitative data collection,^{7,60} measured the effect or quality of



CBT, cognitive behavioral therapy; CMD, common mental disorder; GP, general practitioner; GYN, gynecological; MSD, mus-culoskeletal disorder; OHS, occupational health services; OP, occupational physician; OT, occupational therapist; PT, physio-therapist; RTW, return to work; SHI, statutory health insurance; SM, self-management; SW, social worker

Figure 2: eHealth and work participation: overview of identified contexts with corresponding populations, stakeholders, types of interventions, and theoretical or empirical base for intervention development

the eHealth interventions. Half of the studies employing an RCT design showed effect on work participation and RTW,^{8,22,55-57} while the other half did not.^{26,53,54,58,59} In the matched control study by Sullivan *et al.*,⁶² the control group had higher clinician-rated RTW compared to the eHealth group, whereas in the study by Brown *et al.*,⁶¹ the sick leave rates in the study group were reduced by 21% compared to 9% across the rest of Scotland. The feasibility studies collecting qualitative data found that participants wanted to receive information and support regarding opportunities for RTW and regarding financial and legal aspects of their position.⁷ Furthermore, few employees reported a faster RTW although they were satisfied with the web-based counseling program.⁶⁰ The pilot and feasibility study of Deady *et al.*⁶³ found a reduction in overall past month sick days.

Adherence to eHealth interventions

Few of the included studies reported or discussed adherence and compliance to the eHealth intervention. Low adherence among stakeholders providing the intervention was reported in one study, mainly due to limited access to the employees engaging in the program on a daily basis, but also due to time constraints and low expected value.⁶⁰ One study reported low adherence to the eHealth tool itself, where a process evaluation revealed that 27% of the participants had not received or fully read the digital advice.²⁶ Two studies reported high adherence among participating employees,^{53,61} and four studies reported problems with recruitment, drop-out, or loss to follow-up.^{55,58,59,63}

Discussion

The broad literature search between 2008 and 2020 identified 15 studies reporting eHealth interventions aimed to facilitate work participation. The low number of studies retrieved demonstrates that research on eHealth interventions to facilitate work participation is sparse. Although work is the foundation of many important determinants of health,⁶⁴ RTW is not a main outcome of interest in the health care sector. Generally, the main objective of health care providers is to protect the health of patients. eHealth involves new modes of interaction between health care professionals and patients, and originates from the health care sector,⁶⁵ which may explain the low number of eHealth interventions focusing on

and measuring work participation. Also, the financial interests linked to maintaining a certain level of patient flow and health care utilization may be a consideration when deciding which RTW interventions to support.^{27,66} Franche *et al.*²⁷ argued that health care providers may be prone to respond to RTW interventions that improve well-being without reducing health care utilization.

The populations identified in this review ranged from employees with musculoskeletal disorders or common mental disorders to employees with more specific conditions, such as gynecological surgery or cancer. However, more than one-half of the identified eHealth interventions focused on employees sick-listed due to common mental disorders or musculoskeletal disorders. This was not surprising, as these are the most common diagnoses reported for sick leave and are considered a major public health problem with significant consequences for society.^{67,68} From a societal perspective, developing effective work-related eHealth interventions for these populations may be beneficial. By providing a platform for communication, eHealth may serve as a useful tool for sick-listed employees to maintain contact with the workplace and to assist in the RTW process. Furthermore, eHealth may be an important asset to target occupational disability in rural or remote communities where face-to-face services are not available.⁶² However, it should be noted that a strong therapeutic alliance often is an important criterion for successful work-oriented interventions.⁶² The development of this strong therapeutic alliance may be more challenging through an eHealth intervention than in a face-to-face interaction.⁶²

In their review of the state of RTW research, Pransky *et al.*⁴³ argue that the greatest opportunities and barriers to achieving improved RTW outcomes exist in the workplace. The results from Brown *et al.*⁶¹ support this statement, showing that telephone-delivered support initiated in the workplace resulted in a significant reduction in sick leave. In line with this, Bee *et al.*⁵⁵ claimed that eHealth delivered in the workplace may be an innovative service model helping employees to maintain productivity. This may be achieved through effectively linking health, employment, and OHS.⁵⁵ There seems to be agreement on the necessity of collaboration between the health care sector and the workplace, but the costs and benefits of work-related eHealth interventions are often separated between the different stakeholders and

contexts.⁵³ This inconsistency may be a potential barrier to future implementation of collaborative eHealth interventions.

Stakeholders influence the outcome of interest measured in research studies, and it may be a challenge if eHealth research mainly originates from the environment in which the intervention takes place. For example, a literature review focusing on specific models of RTW for musculoskeletal disorders highlighted that health care providers were predominantly influenced by a biomedical understanding in their professional practice and recovery measurements.⁶⁹ The causality of work disability is recognized to be multifactorial, and the biomedical approach tends to be too limited to capture all facets of the concept.⁶⁹ Accordingly, several researchers stress the need for an integrated approach across different policy domains to promote better health and employment outcomes.^{9,69,70} Work and health are not separate concepts but are closely intertwined; work participation may influence health and health may influence work participation.^{71,72} Thus, both concepts should be of interest in health and employment policies and actions, but current policies are often delivered in silos, considering only their own sectorial outcomes.⁷³

Ideally, interventions to increase RTW should make sense from the perspective of multiple stakeholders, including health care providers.⁴³ A promising result from this scoping review was that the majority of eHealth interventions that aimed to facilitate work participation were provided in, and included stakeholders from, the health care sector. On the other hand, this also indicates that the use of eHealth technology in the workplace is limited, at least when it comes to involvement from leaders and managers. A recent review concluded that workplace interventions are most effective if multiple stakeholders (eg, from the health care, workplace, and service coordination sectors) support the employees towards work participation.³¹ We agree with this conclusion, and argue that the quality and effectiveness of eHealth interventions on work participation will increase if stakeholders from multiple areas are simultaneously involved, emphasizing the potentially important role stakeholders such as leaders and managers could have in eHealth interventions.

Reasons for sick leave are often diverse, and Notenbomer *et al.*²⁶ argue that for health professionals, it may be easier to develop disease-specific interventions

rather than interventions targeting sick leave. Despite this, it is important to continue to address sick leave reduction in effectiveness studies.²⁶ Not only is sick leave an objective measurement directly reflecting economic costs, but reductions in future long-term and frequent sick leave is also an approach to prevent disease and ill-health.²⁶ Future developments should consider both the specific health condition or diagnosis together with the nature of the sick leave.²⁶ The nature of sick leave may involve knowledge regarding the length of sick leave, number of sick leave episodes, and whether sick leave is work-related, non-work-related, or a combination. Such specificity in sick leave measures may provide better insight into the effectiveness of interventions.

Only four studies used theory in combination with empirical evidence in developing the content of their eHealth interventions.^{7,26,53,56} However, none of the studies discussed their results in light of the chosen theory. The use of a theory in intervention development and implementation offers a way to elaborate on the effects of the key elements of the intervention.⁷⁴ To understand the causal determinants of an outcome, we also need to understand the theoretical mechanisms of change.⁷⁴ Interventions that are based purely on clinical experience or empirical evidence may not be able to answer such questions. Therefore, use of theoretically informed eHealth interventions may provide practice with better evaluations of when, why, and how interventions work. Furthermore, interventions that are theory-based, and thus indicate an understanding of what works for whom and how, may also provide a basis for developing better theories across different populations, behaviors, and contexts.⁷⁵

As expected, there was large variability in the measurement of work-related outcomes. None of the included studies used the same measure. Consequently, it may be difficult to generalize the findings on this topic and to summarize the effect of interventions in a future systematic review. As early as 2005, Pransky *et al.*⁴³ argued that to fully understand the implications of an intervention, future research on RTW should focus on better measures of outcome in terms of multiple and longitudinal observations. Although the process of RTW can be operationalized in a variety of ways, measures of sick leave have the advantage of being relatively objective and available through official or workplace records.⁴³ The stakeholder perspective should also

be considered, as failure to measure outcomes in a way that is meaningful to a particular stakeholder may weaken the ability to produce change.⁴³ A solution for future studies may be to use eHealth interventions as a platform for stakeholder collaboration.⁵⁴ The eHealth intervention and outcome measures must be considered useful by all stakeholders, including participating employees, employers, and the different health care professionals engaged in the delivery. Stakeholder involvement in program development will secure better tailoring to stakeholder needs.^{60,62}

In this review, low adherence was a problem among some stakeholders and employees. To address this, future studies should build in persuasive technology elements to stimulate engagement, motivation, and adherence (eg, personalization, support, feedback, rewards).⁷⁶ Recent trends in the included studies focused on user friendliness of eHealth interventions to offer a more personalized, individually tailored, and feedback-oriented approach,^{26,57-59} providing a good model for future interventions. Among participants, perceived acceptability may be crucial to the recruitment process.⁵⁵ Although most people in developed countries have access to the internet and mobile devices, internet illiteracy is associated with a lower educational level.⁷ This is an important consideration because low levels of education are also associated with lower RTW rates after sick leave.⁷⁷⁻⁷⁹ Spending enough time and effort to ensure that eHealth interventions to facilitate work participation are easy to use (including for participants with limited internet literacy) could increase participation rates and adherence.⁷ A combination of screening questions assessing health literacy and technological literacy is recommended to tailor eHealth interventions to different users and needs.⁸⁰ Among health care professionals, important factors for successful implementation are the development of practical training programs for clinicians³³; belief in the eHealth tool, both for themselves and for participants; and the eHealth tool not being time-consuming to use.^{34,53} In the development of new eHealth interventions, a multi-stakeholder and mixed-method design is therefore highly recommended.⁷

Strengths and limitations

This scoping review used a systematic approach to search the literature and extract data, including

searching for unpublished studies in the WHO clinical registry and ClinicalTrials.gov and reference screening of included studies. Materials from sources, such as guidelines, websites, or book chapters, were not included. This could introduce potential bias to the results. To identify available studies on this topic, we used a broad definition of work participation and included study designs collecting both quantitative and qualitative data. The focus of a scoping review is to provide breadth rather than depth of evidence.^{50,81} Inherent to this methodology, this review did not address the effectiveness of identified interventions, and the included studies have not been subjected to critical assessment. Given that our objective was to map the evidence on eHealth interventions focusing on RTW, a scoping review was considered to be the appropriate method.

eHealth technology is constantly and rapidly changing. Thus, it was assumed that studies published before 2008 would be less relevant for current practice. Furthermore, the previous review by Kairy *et al.*³⁸ finalized their search on telerehabilitation in 2007. The possibility remains that evidence from older studies could have informed this scoping review. The review was based on international evidence from Europe, Australia, and North America. No evidence was retrieved from South America, Asia, or Africa. Such evidence may have been excluded by our language limits (English only). Language limitations may also have contributed to the low number of studies meeting the inclusion criteria. Another explanation for the low number of identified sources may be the specific key terms utilized in the search strategy.

Conclusion

This review identified 15 studies with varying designs and evidence reporting on work-related outcomes for sick-listed employees after participation in eHealth interventions. The small number of studies identified indicate that further high-quality primary research is needed to identify the effectiveness of eHealth interventions to facilitate work participation across different contexts and populations. eHealth interventions were conducted across workplace and health care contexts, mainly with health care professionals providing the intervention. Intervention development was mostly based on empirical evidence. Populations varied from employees with the most typical sick leave diagnoses (eg, common

mental disorders, musculoskeletal disorders) to smaller, specific diagnostic groups. Generally, person-centeredness appeared to be an important and well-functioning aspect in the delivered eHealth interventions. For the utilization of findings in practice, and in evidence syntheses, studies must clearly report the details of the studied eHealth interventions, collaborating stakeholders, and outcome measures for work participation.

Implications for research

The reviewed literature points to a need for more high-quality primary studies. In particular, eHealth interventions specifically developed for employees sick-listed due to common mental disorders and musculoskeletal disorders are required, as these are the most common causes of sick leave. There is potential for future studies to use eHealth technology for these populations, especially in the workplace, involving collaboration between the workplace and relevant stakeholders from different policy domains. Future studies require larger-scale trials with multiple and longer-term follow-up to examine the effect of relapse on the work-related outcomes. This is crucial to enable systematic reviews about the effectiveness of eHealth interventions to facilitate work participation. Finally, future research should consider the cost-effectiveness of the eHealth delivery on work participation.

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Appendix I: Search strategy

Searches conducted from January 1, 2008 to August 21, 2020

Source	Query	Records retrieved
MEDLINE (PubMed)	((patients OR beneficiaries OR "sickness beneficiaries" OR "benefit recipients" OR "sick listed" OR sicklisted OR worker OR employee) AND (telemedicine OR telerehabilitation OR telecare OR "tele care" OR teleconsultation OR "tele consultation" OR telehealth OR "tele health" OR "electronic health" OR "e health" OR ehealth OR etherapy OR "e therapy" OR mhealth OR "m health" OR internetbased OR "internet based" OR webbased OR "webbased") AND (workplace OR occupational health OR rehabilitation, vocational OR occupational health services OR rehabilitation centers OR ambulatory care facilities OR outpatient clinics, hospital OR secondary care centers OR "vocational rehabilitation" OR "occupational rehabilitation" OR "work rehabilitation" OR "outpatient clinic" OR "inpatient clinic") AND (return to work OR sick leave OR absenteeism OR "returning to work" OR "back to work" OR sick OR sickness OR sicklist* OR sick list* OR "work participation" OR "work disability")) Limited to: 01-01-2008-2020, English	1267
Scopus (Elsevier)	TITLE-ABS-KEY (('patient' OR 'employee' OR 'sickness beneficiaries' OR beneficiaries OR benefit recipients' OR worker' OR 'sick listed' OR 'sicklisted') AND (telemedicine OR telerehabilitation OR telecare OR "tele care" OR teleconsultation OR "tele consultation" OR telehealth OR "tele health" OR "electronic health" OR "e health" OR ehealth OR etherapy OR "e therapy" OR mhealth OR "m health" OR internetbased OR "internet based" OR webbased OR "webbased") AND (workplace OR work place OR occupational health OR OR occupational health service OR rehabilitation center OR ambulatory care facilities OR outpatient clinic OR inpatient clinic OR secondary care centers OR vocational rehabilitation OR occupational rehabilitation OR work rehabilitation) AND (return to work OR absenteeism OR returning to work OR back to work OR sick OR "sick leave" OR sickleave OR sickness OR sicklist OR sick list)) AND DOCTYPE (ar) AND PUBYEAR >2007 AND (LIMIT-TO (SUBJAREA, "MEDI") OR LIMIT-TO (SUBJAREA, "NURS") OR LIMIT-TO (SUBJAREA, "HEAL") OR LIMIT-TO (SUBJAREA, "PSYC") OR LIMIT-TO (SUBJAREA,"MULT")) AND (LIMIT-TO (LANGUAGE, "English"))	925

<i>(Continued)</i>		
Source	Query	Records retrieved
Embase (Elsevier)	'patient'/exp OR patient' OR 'employee'/exp OR 'employee' OR 'sickness beneficiaries' OR beneficiaries OR 'benefit recipients' OR 'worker' OR 'worker'/exp OR worker OR 'sick listed' OR 'sicklisted' AND 'telemedicine'/exp OR 'telerehabilitation'/exp OR 'telecare'/exp OR 'teleconsultation'/exp OR 'telehealth'/exp OR 'tele medicine' OR 'tele rehabilitation' OR 'tele care' OR 'tele consultation' OR 'tele health' OR 'electronic health' OR 'e health' OR 'ehealth' OR 'e therapy' OR 'etherapy' OR 'm health' OR 'mhealth' OR 'internet based' OR 'internetbased' OR 'web based' OR 'webbased' AND 'workplace'/exp OR 'occupational health'/exp OR 'occupational health service'/exp OR 'vocational rehabilitation'/exp OR 'rehabilitation center'/exp OR 'outpatient department'/exp OR 'secondary care center'/exp OR workplace OR 'work place' OR 'occupational health' OR 'occupational health service' OR 'vocational rehabilitation' OR 'occupational rehabilitation' OR 'work rehabilitation' OR 'rehabilitation center' OR 'secondary care center' OR 'ambulatory care facilities' OR 'inpatient clinic' OR 'outpatient clinic' OR 'hospital unit' AND 'return to work'/exp OR 'return to work' OR 'medical leave'/exp OR 'sick leave' OR 'sickleave' OR 'absenteeism'/exp OR absenteeism OR 'returning to work' OR 'back to work' OR 'sick' OR 'sickness' OR 'sicklist*' OR 'sick list*' OR 'work disability'/exp OR 'work disability' OR 'work participation' AND ([article]/lim OR [article in press]/lim) AND [embase]/lim AND [2008-2020/py	43
PsycINFO (ProQuest)	((patient OR beneficiaries OR "sickness beneficiaries" OR "benefit recipients" OR sicklisted OR worker OR employee) AND (telemedicine OR telerehabilitation OR telecare OR teleconsultation OR telehealth OR "Electronic Health" OR eHealth OR etherapy OR mhealth OR "internet based") AND PEER (yes)) AND (workplace OR "occupational Health" OR rehabilitation OR "vocational rehabilitation" OR "occupational rehabilitation" OR "work rehabilitation" OR "rehabilitation centers" OR "rehabilitation centers" OR "outpatient clinic" OR "secondary care" OR "hospital unit") AND PEER (yes) AND ("Return to work" OR "sick leave" OR absenteeism OR "returning to work" OR "back to work" OR sick OR sickness OR sicklist OR "work participation") AND PEER (yes))	212
WHO trial registry	telehealth AND work	19
Clinical trials.gov	telehealth AND working work and eHealth	44
NOTE: For MEDLINE, MeSH (Medical Subject Headings) were used in the searches		

Appendix II: Studies ineligible following full-text review

1. Aaronson NK, Mattioli V, Minton O, Weis J, Johansen C, Dalton SO, *et al.* Beyond treatment–psychosocial and behavioural issues in cancer survivorship research and practice. *EJC Suppl.* 2014;12(1):54-64.

Reason for exclusion: Literature review

2. Birney AJ, Gunn R, Russell JK, Ary DV. MoodHacker mobile web app with email for adults to self-manage mild-to-moderate depression: randomized controlled trial. *JMIR mHealth and uHealth* 2016;4(1):e8.

Reason for exclusion: Ineligible user group

3. den Bakker CM, Huirne JAF, Schaafsma FG, de Geus C, Bonjer HJ, Anema JR. Electronic health program to empower patients in returning to normal activities after colorectal surgical procedures: mixed-methods process evaluation alongside a randomized controlled trial. *J Med Internet Res.* 2019;21(1):e10674.

Reason for exclusion: No work-related outcome

4. Dorstyn D, Roberts R, Murphy G, Kneebone I, Migliorini C, Craig A, *et al.* Piloting an email-based resource package for job seekers with multiple sclerosis. *Disabil Rehabil* 2017;39(9):867-73.

Reason for exclusion: Ineligible user group

5. Duplaga M. Acceptance of internet-based health care services among households in Poland: secondary analysis of a population-based survey. *J Med Internet Res.* 2012;14(6):e164.

Reason for exclusion: Ineligible user group

6. Ebert DD, Lehr D, Boß L, Riper H, Cuijpers P, Andersson G, *et al.* Efficacy of an internet-based problem-solving training for teachers: results of a randomized controlled trial. *Scand J Work Environ Health.* 2014;40(6):582-96.

Reason for exclusion: Ineligible user group

7. Ebert DD, Kählke F, Buntrock C, Berking M, Smit F, Heber E, *et al.* A health economic outcome evaluation of an internet-based mobile-supported stress management intervention for employees. *Scand J Work Environ Health.* 2018;44(2):171-82.

Reason for exclusion: Ineligible scope

8. Filios MS, Storey E, Baron S, Luensman GB, Shiffman RN. Enhancing worker health through clinical decision support (CDS): an introduction to a compilation. *J Occup Environ Med.* 2017;59(11):e227.

Reason for exclusion: Ineligible scope

9. Geraedts AS, Kleiboer AM, Wiezer NM, Cuijpers P, van Mechelen W, Anema JR. Feasibility of a worker-directed web-based intervention for employees with depressive symptoms. *Internet Interventions* 2014;1(3):132-40.

Reason for exclusion: Ineligible user group

10. Gussenhoven A, van Wier M, Bosmans J, Dekkers J, van Mechelen W. Cost-effectiveness of a distance lifestyle counselling programme among overweight employees from a company perspective, ALIFE@ Work: a randomized controlled trial. *Work.* 2013;46(3):337-46.

Reason for exclusion: Ineligible user group

11. Hallgren M, Kraepelien M, Lindefors N, Zeebari Z, Kaldo V, Forsell Y. Physical exercise and internet based cognitive–behavioural therapy in the treatment of depression: randomised controlled trial. *Br J Psychiatry* 2015;207(3):227-34.

Reason for exclusion: The paper was part of the included study by Kaldo *et al.* 2017

12. Hange D, Ariai N, Kivi M, Eriksson MC, Nejati S, Petersson E-L. The impact of internet-based cognitive behavior therapy on work ability in patients with depression—a randomized controlled study. *Int J Gen Med.* 2017;10:151-9.

Reason for exclusion: Ineligible user group

13. Harden SM, You W, Almeida FA, Hill JL, Linnan LA, Allen KC, *et al.* Does successful weight loss in an internet-based worksite weight loss program improve employee presenteeism and absenteeism? *Health Educ Behav.* 2015;42(6):769-74.

Reason for exclusion: Ineligible user group

14. Hutting N, Staal JB, Engels JA, Heerkens YF, Dettlele SI, Nijhuis-van der Sanden MW. Effect evaluation of a self-management programme for employees with complaints of the arm, neck or shoulder: a randomised controlled trial. *Occup Environ Med* 2015;72(12):852-61.

Reason for exclusion: Ineligible user group

15. Lokman S, Volker D, Zijlstra-Vlasveld MC, Brouwers EP, Boon B, Beekman AT, *et al.* Return-to-work intervention versus usual care for sick-listed employees: health-economic investment appraisal alongside a cluster randomised trial. *BMJ Open.* 2017; 7(10):e016348.

Reason for exclusion: The paper was part of the included study by Volker *et al.* 2015

16. Milligan-Saville JS, Tan L, Gayed A, Barnes C, Madan I, Dobson M, *et al.* Workplace mental health training for managers and its effect on sick leave in employees: a cluster randomised controlled trial. *Lancet Psychiatry,* 2017;4(11):850-8.

Reason for exclusion: Ineligible intervention

17. Proudfoot J, Clarke J, Birch M-R, Whitton AE, Parker G, Manicavasagar V, *et al.* Impact of a mobile phone and web program on symptom and functional outcomes for people with mild-to-moderate depression, anxiety and stress: a randomised controlled trial. *BMC Psychiatry* 2013;13(1):312.

Reason for exclusion: No work-related outcome

18. Stansfeld SA, Kerry S, Chandola T, Russell J, Berney L, Hounscome N, *et al.* Pilot study of a cluster randomised trial of a guided e-learning health promotion intervention for managers based on management standards for the improvement of employee well-being and reduction of sickness absence: GEM Study. *BMJ Open* 2015;5(10):e007981.

Reason for exclusion: Ineligible user group