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Prognostic factors affecting return to work in cancer patients: a systematic review

Lydia López-Faneca,[1] Carlos Ruiz-Frutos,[2,3] Juan Gómez-Salgado ,[2,3] Javier Fagundo-Rivera,[4] Rocío Palomo-Gómez,[5] Regina Allande-Cussó,[6] Azahara Ruger-Navarrete,[7] Israel Macías-Toronjo,[8] Juan Jesús García-Iglesias[2]

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[1]School of Doctorate, University of Huelva, Huelva, Spain
[2]Department of Sociology, Social Work and Public Health, Faculty of Labour Sciences, University of Huelva, Huelva, Spain
[3]Safety and Health Postgraduate Programme, Universidad de Especialidades Espiritu Santo, Guayaquil, Ecuador
[4]Centro Universitario de Enfermería Cruz Roja, University of Seville, Seville, Spain
[5]Department of Obstetrics, Hospital La Línea de la Concepción, Junta de Andalucía, Servicio Andaluz de Salud, Cadiz, Spain
[6]Department of Nursing, University of Seville, Seville, Spain
[7]Department of Nursing, Faculty of Health Sciences of Ceuta, Universidad de Granada, Ceuta, Spain
[8]Department of Rehabilitation, FREMAP, Huelva, Spain

Correspondence to
Dr Juan Gómez-Salgado; jgsalgad@gmail.com

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ABSTRACT

Return-to-work rates among working-age cancer survivors present a complex challenge, varying by cancer type and individual characteristics. This study aimed to identify prognostic factors influencing return to work in cancer survivors.

A systematic review was conducted following Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines. Searches in PubMed, Scopus and Web of Science databases in December 2024 used keywords based on the Population, Prognostic Factors, Outcomes framework to identify relevant studies. Study quality was evaluated using Joanna Briggs Institute tools and the protocol was registered in PROSPERO (CRD42024596102).

Twenty studies were selected. Identified factors included sociodemographic: older age, educational level, marital status and sex; clinical: aggressive treatments, comorbidities and physical sequelae; psychological: anxiety, stress, fear of relapse and social support; occupational: flexible work schedules and tasks versus rigid conditions.

Multiple factors influence return-to-work outcomes for cancer survivors.Individualised intervention programmes addressing specific patient needs and fostering adapted work environments are essential to promote successful reintegration.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Before this study, return-to-work for cancer survivors was known to be complex, with various influencing factors but limited research on their interactions.
⇒ There was a shortage of longitudinal and comparative studies on returning to work (RTW) interventions, cancer types and patient characteristics.
⇒ This study aimed to systematically identify prognostic factors for RTW, offering a more comprehensive perspective on the issue.

WHAT THIS STUDY ADDS

⇒ Systematic review of 20 studies on prognostic factors affecting cancer survivors' return to work.
⇒ Emphasises the need for personalised interventions and adapted work environments.
⇒ Identifies research gaps, including a lack of longitudinal studies and multifactorial analysis.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study emphasises the need for longitudinal studies that explore the long-term effects of return-to-work interventions, considering individual, social and occupational factors as well as cancer type and stage.
⇒ This investigation highlights the importance of personalised return-to-work programmes that address specific patient needs and create adapted work environments, taking into account various sociodemographic and clinical factors.
⇒ The authors call for legal support to enable tailored return-to-work processes, promoting the development of standardised protocols and universal return to work programmes to enhance survivor well-being and reintegration.

INTRODUCTION

Cancer is one of the leading causes of morbidity and mortality worldwide.[1] Approximately 19.3 million new cases of cancer and almost 10 million deaths were reported globally in 2020.[2] The study carried out by Sung *et al*[3] states that the most common types of cancer are lung, breast, colorectal and prostate cancer, yet there is no uniform pattern, as the prevalence and type of cancer vary significantly across different regions due to factors such as lifestyle, genetics, access to health services and others.

In North America and Europe, lung cancer is one of the leading causes of death in the general population and is closely linked to tobacco use.[4] According to the International Atomic Energy Agency,[5] although antismoking policies have reduced its incidence, it remains a significant public health concern. In contrast, in sub-Saharan Africa and parts of Asia, cervical and liver cancers predominate, linked to infections such as human papillomavirus and hepatitis B, which are prevalent in these regions. In addition, breast cancer incidence rates are rising rapidly in transition countries in South America, Africa and Asia.[3]

In this regard, there are modifiable risk factors such as smoking, which is responsible for 22% of deaths globally,[5] alcohol consumption, obesity and physical inactivity, as well as exposure to carcinogens in the workplace, which significantly contribute to the incidence of cancers such as those of the colorectum, breast and liver.[6 7] These factors can be addressed through public health interventions, with

an emphasis on the importance of prevention and health promotion campaigns.[2 8] On the other hand, non-modifiable factors include genetic predispositions and family history, age or sex.[9]

Cancer represents an economic burden on both health systems and individuals themselves, estimated at US$208.9 billion in the United States in 2020 in direct treatment costs and also indirect costs, such as lost productivity or time off work.[10] Beyond treatment, cancer survival brings new challenges, particularly for working-age adults, who often face disruptions in employment, loss of income and difficulties in returning to work.[11] Some studies indicate that prolonged absence from work and early retirement due to cancer leads to considerable economic losses for both employees and employers.[8 12] Therefore, it is crucial for employers and policymakers to understand the financial impact associated with cancer-related sick leave and the importance of developing strategies to mitigate these costs.[12] This is why authors such as Mitsui *et al*[13] suggest that implementing flexible working policies can reduce these effects, allowing employees to better manage their treatments and symptoms without compromising their employment status.

Returning to work (RTW) after cancer is a complex challenge that involves multiple inter-related factors. Many survivors experience ongoing physical limitations, such as chronic fatigue, pain or cognitive impairments related to treatment (eg, 'chemo brain').[14 15] Psychological effects including anxiety, depression, fear of recurrence and low self-efficacy also contribute to the difficulty of resuming employment.[16] Workplace-related barriers—such as physically or mentally demanding tasks, lack of job accommodations or perceived stigma—can further complicate reintegration. Structural inequities, including limited access to rehabilitation programmes or flexible work policies, disproportionately affect certain groups.[17] Moreover, RTW outcomes vary substantially by cancer type: while breast cancer survivors often achieve higher return rates, lung, brain and haematologic cancers are associated with more severe impairments and delayed recovery.[18] Individual characteristics such as age, gender, educational attainment, job type, pre-existing health conditions and the presence of social support also play a crucial role in shaping RTW trajectories.[19] These factors collectively highlight the need for individualised, context-sensitive approaches to supporting cancer survivors in the workplace.[20]

RTW is increasingly recognised as a key indicator of functional recovery among cancer survivors. However, RTW after cancer is not always straightforward.[16 19] Mental health is a crucial component when it comes to RTW, and anxiety, depression and post-traumatic stress disorder are common among cancer survivors and can negatively affect their ability to RTW.[21] Perceived self-efficacy, or perceived ability to handle job demands, is a key predictor of successful return.[22] Several studies suggest that survivors who feel in control of their work situation and who receive adequate support are more likely to successfully RTW and remain in employment.[21] On the other hand, Munir *et al*[23] highlight that the stigma of cancer can lead to job discrimination, which exacerbates stress and anxiety among survivors.

RTW rates vary widely depending on the type of cancer, treatment intensity and personal and occupational characteristics.[20] According to Mehnert *et al*,[24] approximately 63.5% of cancer survivors manage to RTW 1 year after diagnosis, although this rate varies across cancer types and countries, ranging from 24% to 94%. For example, a systematic review conducted by Tay *et al*[25] reports that RTW rates for women with breast cancer within 12 months of diagnosis range from 43% to 93%, while those who have received more intensive treatments, such as prolonged chemotherapy or invasive surgeries, may need more time to recover before RTW.[13] There is no doubt that the work environment and company policies are fundamental to a successful RTW.[8] Successful reintegration into work requires a collaborative approach that includes support from employers, coworkers and health professionals[1]; in addition, several studies suggest that personalised RTW programmes that give individual consideration to the worker's health can significantly shorten the time needed to RTW.[1 8] Thus, organisations that offer their employees flexible working hours and specific adaptations according to their health needs, as well as the possibility of teleworking or reduced workloads, have higher RTW success rates.[13]

Despite advances in identifying prognostic factors for RTW after cancer-related sick leave, the current literature has significant limitations. Many studies focus on individual, social or occupational aspects alone, without considering how these factors interact to influence RTW.[26] Moreover, there is a lack of comprehensive background summarising the extent and implications of this issue. Understanding RTW outcomes is not only important for the well-being of survivors but also for society, given the economic costs associated with workforce detachment.[27 28]

Additionally, there is a notable paucity of longitudinal research analysing the long-term impact of interventions addressing RTW as well as of studies assessing differences according to cancer type, stage of diagnosis or patients' demographic and occupational characteristics.[29] Therefore, the aim of this study was to identify prognostic factors associated with RTW in cancer survivors.

METHODS

Study design

A systematic review was conducted following the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines[30] on prognostic factors associated with RTW after cancer-related sick leave. The authors relied on a protocol to carry out this systematic review, which was registered in the International Prospective Register of Systematic Reviews (PROSPERO) of the University of York, with identification code CRD42024596102.

Search strategy

Using the Population, Prognostic Factors, Outcomes (PFO) format,[31] the research question from which the keywords used were derived was formulated (table 1).

The search was carried out in the PubMed, Scopus and Web of Science electronic databases, without restrictions of language or year of publication, based on the keywords resulting from the PFO.

Based on these keywords, the Medical Subject Heading (MeSH) thesaurus was consulted, so that studies were identified by combining terms related to employees and workers

Table 1 PFO format: keywords

Population	Working-age adults diagnosed with cancer who are employed or self-employed and currently receiving or having completed treatment.
Prognostic Factors	Socio-demographic, clinical, psychological and occupational variables affecting return to work.
Outcomes	Measurable return-to-work indicators such as time, rate and quality of reintegration.
Research question	*What are the prognostic factors associated with return to work in working-age cancer survivors?*

PFO, Population, Prognostic Factors, Outcomes.

with terms related to sick leave (sick leave, disability leave, sick day or illness day) and terms related to neoplasms and cancer (neoplasms, tumour, neoplasia, cancer or malignancies). In addition, specific RTW or back to work terms were included. These terms were applied both in titles/abstracts and MeSH terms to ensure retrieval of relevant articles.

Online supplemental table 1 lists the search strategy employed on 28 December for each of the above-mentioned databases used during the search process.

Inclusion criteria

The following criteria were used for the selection of the articles:

- Population: studies involving working-age adults (employed or self-employed) who have been diagnosed with any type of cancer and are either receiving treatment or have completed it. This includes individuals who are or have been on sick leave due to their cancer diagnosis and treatment.
- The review also included studies that explored prognostic factors for RTW from various perspectives, including not only patients but also healthcare professionals, employers and stakeholders involved in cancer survivorship and employment. This inclusive approach was intended to capture a more comprehensive understanding of barriers and facilitators related to RTW. During synthesis, the origin of each data source was considered in order to distinguish between individual-level and systemic-level influences in the interpretation of findings.
- Prognostic factors: studies that examine sociodemographic, clinical, psychological or occupational variables as prognostic factors—either as barriers or facilitators—related to RTW.
- Outcomes: studies that report clear RTW outcomes, such as time to RTW, RTW rates or quality of work reintegration.
- Study design: observational studies (quantitative or qualitative), controlled clinical trials and meta-analyses published in any language.

Exclusion criteria

- Studies that are not observational or controlled trials (eg, narrative reviews, case reports, editorials, commentaries, technical reports, theses).
- Studies involving populations without a cancer diagnosis.
- Studies that systematically omit relevant subgroups of the working-age population, such as self-employed individuals or people receiving cancer treatment, even if they have already returned to work.
- Studies that include other health conditions but do not specifically focus on cancer survivors. Studies that examine cancer in combination with other major pathologies (eg, cardiovascular disease, mental illness, musculoskeletal disorders) were excluded to reduce clinical heterogeneity and to focus specifically on the prognostic factors related to cancer as a distinct condition.
- Studies that do not assess prognostic factors related to RTW.
- Studies lacking minimum methodological quality as assessed by validated tools, or those reporting limitations such as data insufficiency, poor participation or unreliable measures.

Data collection and extraction

Two researchers conducted the searches independently, eliminating duplicate studies and selecting articles that were likely to be included after reading the abstract and title, according to previously established criteria. Subsequently, the same two authors reviewed the full text of studies potentially eligible for inclusion in the review, and the decision to include or exclude them was made by consensus. Discrepancies were resolved with the intervention of a third author. A summary table of the selected articles is presented, including authors and year of publication, country, type of study, objectives, participants, methods, main findings and quality of the study.

Methodological quality assessment

The methodological quality of the selected studies was determined using the critical appraisal tools for studies of the Joanna Briggs Institute at the University of Adelaide (Australia).[32] These tools allow assessment of the methodological quality of a study and determine the extent to which a study has excluded or minimised the possibility of bias in its design, conduct and/or analysis. The versions for cross-sectional studies (8 items), for qualitative studies (10 items) and for cohort studies (11 items) were used. The cut-off points were set at 6, 8, 9 and 10 points, respectively, for acceptance for inclusion in this review (online supplemental tables 2–4).

RESULTS

The initial search strategy identified a total of 427 references, of which 20 studies were selected after further screening according to the objective of this review. These included 10 qualitative studies,[33–42] 7 cross-sectional studies[43–49] and 3 cohort studies[50–52] (figure 1).

By country, four studies were conducted in Sweden[35 36 46 50]; two in the Netherlands,[40 51] the USA,[34 48] France[43 47] and Belgium[38 39]; and one in each of the following countries: Taiwan, Canada, Ireland, Norway, Brazil, Japan, Spain and Australia.[33 37 41 42 44 45 49 52]

Regarding cancer type, 8 of the 20 studies focused on breast cancer,[36–39 42 43 46 51] 3 on head and neck cancer,[33 35 44] 2 on colorectal cancer,[34 50] 1 on cervical cancer[52] and 6 studies involved mixed cancer types.[40 41 45 47–49]

The included studies varied in methodological design and outcome reporting, with a wide range of qualitative and quantitative approaches. While this diversity contributed to a more holistic understanding of prognostic factors, it also introduced heterogeneity in terms of measurement tools, populations studied and analytical depth. No subgroup analysis was conducted based on cancer site, country or study design due to this variability and the limited number of studies per category.

It is also important to note that the included studies varied in how RTW was defined and measured. Some studies reported time to RTW as a primary outcome,[43 44 51] while others focused on RTW rates at fixed follow-up intervals.[47 48 52] Several studies distinguished between full and partial RTW, particularly in relation to part-time reintegration or gradual return strategies.[35 42 43] In terms of data sources, some studies relied on self-reported RTW status,[36 46 50] while others used administrative or employment records.[47 52] This lack of consistency in operational definitions and measurement tools made it difficult to compare outcomes directly across studies. The use of standardised RTW indicators would improve comparability and strengthen the evidence base for identifying prognostic factors.[27]

A number of studies also addressed the quality of RTW, describing whether individuals returned to the same position, required job modifications or experienced changes in workload or satisfaction.[35 42] In several cases, outcomes were interrelated with clinical or occupational characteristics; for instance, persistent fatigue[37] or physical limitations[42] delayed RTW and led to partial or modified returns. Similarly, quality of return

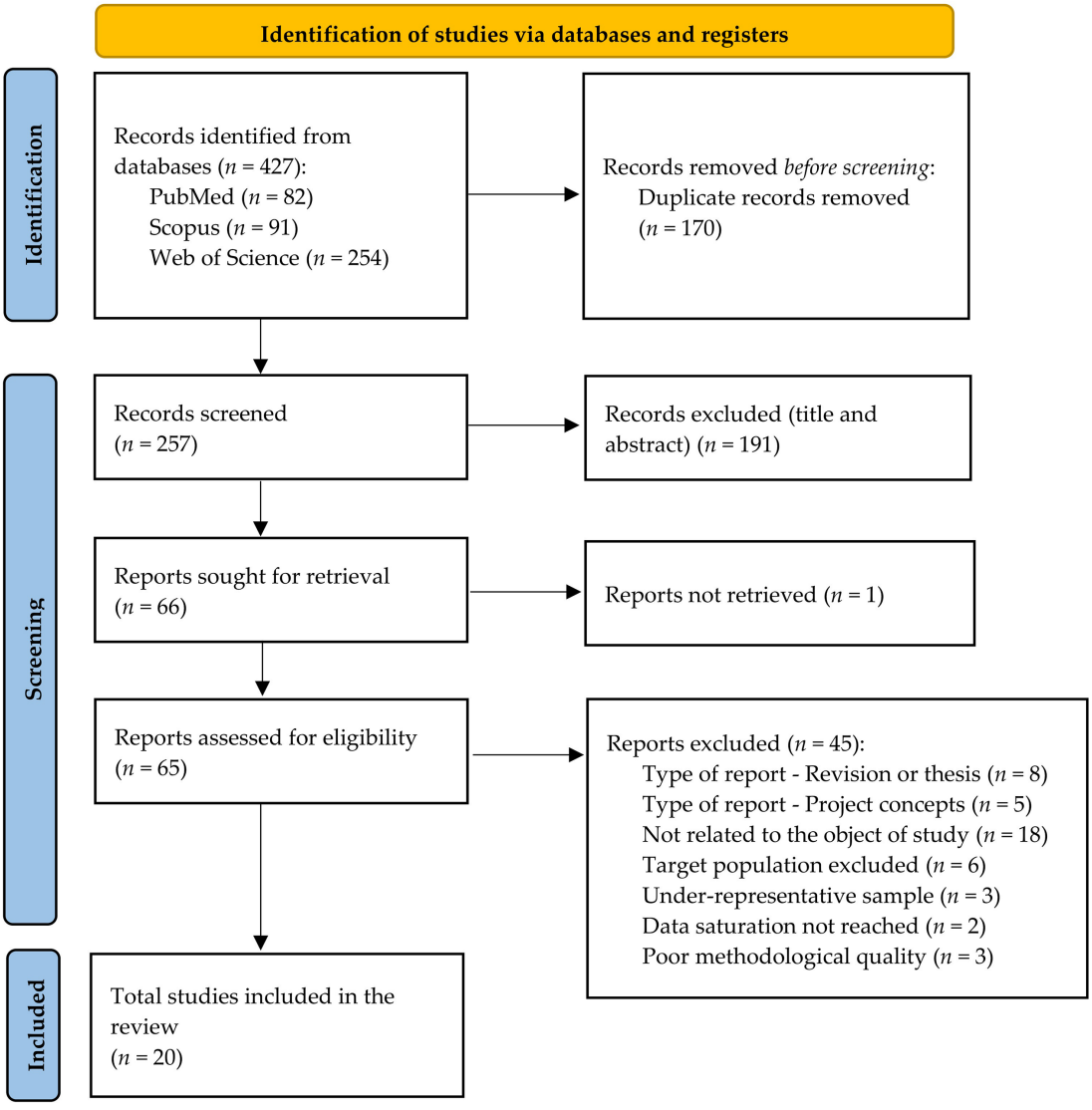

Figure 1 PRISMA flowchart. PRISMA, Preferred Reporting Items for Systematic reviews and Meta-Analyses.

was closely linked to workplace flexibility, employer support and psychological readiness.[45]

The characteristics of each of the 20 articles included in the review are shown in online supplemental table 5, based on the Iberoamerican Cochrane Centre Handbook.[53] A summary of the main findings by prognostic factors extracted from these studies is provided in table 2.

Sociodemographic factors

The studies reviewed show that characteristics such as age, sex, marital status and educational level influence RTW. People over the age of 50 have higher rates of RTW compared with those under the age of 30.[43 44 46 49 54] However, in women with breast cancer, some studies indicate that older women do not manage to RTW, while others find no significant relationship between age and RTW.[36 51]

In terms of sex, while research on cancers such as breast and cervical cancer has a focus on women,[43 46 51 52] in head and neck cancer, a male predominance is reported. Yet, in other cancer studies, equal distributions by sex are observed.[33 35 44] Differences in the type of employment are also identified: women predominate in salaried jobs, while self-employment is more predominant among men.[49]

Moreover, married people have higher rates of RTW than single or divorced people.[43 44 46 49 51] In addition, those with a university education face the fewest barriers to RTW.[43 44 46]

Clinical factors

The duration and type of cancer treatment can affect RTW. Aggressive treatments, such as lymph node dissection, make it more difficult to RTW than other treatments such as chemotherapy and radiotherapy.[43] However, the combination of these treatments often impedes RTW, especially in the self-employed.[36 44 49–51]

Cancer stage is also key: patients in remission have it easier to return to the labour force,[47] while those with advanced-stage cancer face longer work absences.[34 35] Physical sequelae, such as lymphoedema or loss of mobility, especially in cases of head, neck and breast cancer, also limit work performance as well as side effects such as fatigue due to treatment.[33 38 44 51] The presence of comorbidities, such as hypertension or kidney disease, can aggravate these difficulties, and this particularly affects the self-employed, who report a poorer quality of life and work capacity.[49 52]

Psychological factors

Psychological sequelae, such as anxiety, depression or fear of relapse, can impede RTW due to emotional vulnerability and

Table 2 Prognostic factors associated with return to work (RTW) after cancer: main findings

Category	Key findings	Facilitators identified
Clinical	Persistent fatigue, pain, physical limitations (eg, shoulder mobility), side effects from treatment, advanced stage.	Physical activity, functional rehabilitation and medical follow-up.
Psychological	Anxiety, depression, emotional distress, self-demand, fear of recurrence, loss of work identity.	Emotional support, psychosocial programmes, personal motivation.
Occupational	Lack of accommodations, physically demanding tasks, low-skilled jobs, inflexible work conditions.	Task adaptations, phased return, cognitive roles, reduced hours.
Social	Varying social support (partner, family, colleagues), perceived stigma or discrimination.	Strong personal support network, understanding workplace environment.
Legal/workplace policy	Lack of clear protocols, legal uncertainty, poor coordination between employer, employee and healthcare system.	Legal counselling, inclusive workplace policies, collaboration with occupational health.
Organisational context	Company size influenced flexibility: larger firms offer structured policies; smaller ones, informal arrangements.	Personalised approaches, direct communication with employer, flexible corporate culture.
Socioeconomic	Income loss, financial pressure, unstable employment (especially among self-employed or low-wage workers).	Social benefits, job stability, insurance, RTW support programmes.
RTW outcomes	Sick leave ranged between 6 and 18 months; RTW rates varied from 50% to 91% across studies.	Higher quality of life and reduced mortality linked to successful RTW.

perceived stigma in the work environment.[33 37 38 43] Conversely, support from family members, friends and coworkers can improve emotional well-being, thereby reducing stress and anxiety.[35 43 44]

For some patients, RTW means returning to normality and overcoming being a 'patient'.[33 36 44] However, this process also generates emotional conflicts, particularly in less financially stable patients, who must balance their emotional needs with work demands.[39 40 48]

Occupational factors

The work environment plays a crucial role in the RTW. While adjusted working hours and tasks facilitate the process, lack of support and rigid working conditions represent major obstacles.[33 35 42 44] Likewise, patients with permanent contracts or in administrative positions are more likely to successfully RTW than those in manual or particularly demanding jobs.[42 44 47 49]

At the economic level, the self-employed face greater challenges due to the lack of benefits and are forced to RTW before they are fully recovered.[38 42 48 49]

Legal inequalities in access to sick leave are observed, particularly affecting self-employed workers in countries with inconsistent regulations.[34 41 42 49] Lack of information on labour rights also hampers RTW, leaving employees vulnerable to dismissal in cases of prolonged absences.[37–39]

DISCUSSION

The results of this systematic review highlight the complexity of factors influencing RTW in patients with cancer. The analysis shows that this process is determined by sociodemographic, clinical, psychological and occupational factors.

Individual factors, such as age and educational level, play a crucial role in cancer patients' RTW. In the case of age, studies indicate that patients over 50 years of age tend to have higher rates of RTW—possibly due to greater job and family stability—and are able to RTW more easily. Similarly, people with higher education take less physical effort in their work and have more flexibility to adapt their working patterns.[43 44 46 49] The systematic review and meta-analysis carried out by Fong *et al*[55] and the Delphi study by Kiasuwa *et al*[56] report that people over 50 are more likely to RTW than those under 30, and note that people with a university education RTW earlier, possibly owing to higher incomes and less physically demanding jobs, while people with a low level of education often have physically demanding jobs (usually with low incomes), so they are less inclined to RTW and are more concerned about their health.

The literature review carried out by the European Agency for Safety and Health at Work[28] on rehabilitation and RTW after cancer confirms the results discussed in this review. Less aggressive and early-stage cancers with shorter duration of sick leave and mild physical symptoms are positively associated with RTW. In contrast, advanced stages, extensive disease, functional limitations and severe symptoms significantly hinder RTW. Furthermore, they state that patients with breast cancer are more likely to RTW compared with those with other types of cancer. Rollin *et al*[47] reported that patients in remission returned to work more easily, while those with progressing cancer faced greater difficulties. Isaksson *et al*[35] also found that patients with advanced stage III and IV head and neck cancer experienced more barriers to RTW. Similarly, Gruß *et al*[34] identified longer work absences in survivors of advanced stage (II and III) colon cancer due to more intensive treatments.

Regarding treatment, aggressive procedures, such as extensive surgery and chemotherapy, tend to negatively affect RTW, while less invasive treatments have a more favourable impact. Although the duration and side effects of treatment are also important factors, the evidence on their influence is inconclusive. A wide variety of studies in recent years have confirmed that more aggressive treatments, such as lymph node dissection, combination chemotherapy and radiotherapy or hormonal treatments, lead to greater difficulties in RTW compared with less intensive treatments, such as radiotherapy alone.[36 43 44 49] The physical effects of cancer treatments represent significant barriers to RTW, a clear documented example being patients with head and neck cancer, who have reported to experience physical symptoms such as difficulty swallowing, sleeping, breathing or chronic pain, which directly affect their performance at work.[33 44] Also in the assessed studies, patients who returned to work reported fewer symptoms, indicating a link between the ability to work and better physical recovery. In the case of breast cancer, studies report that breast-conserving surgeries, such as mastectomy, and postoperative treatments, such as irradiation and chemotherapy, may have long-term effects on the patients' ability to perform work activities,[38 39 51] as the physical sequelae range from loss of shoulder mobility to lymphoedema or fatigue, affecting quality of life and, in some cases, limiting RTW.[37 43 51]

In line with the data presented in the review by the European Agency for Safety and Health at Work,[28] at the workplace level, environments that offer flexibility, specific adaptations and social support from colleagues facilitate RTW, while jobs with inflexible conditions make it more difficult. Having a supportive environment from workers, peers and supervisors, offering emotional support, visits and opportunities to participate in work activities contributes significantly to improving the return experience.[35 37 42] Also, to reduce barriers to RTW, it is essential to adapt the workplace through flexible working hours, reduction of workload or adjustments in tasks.[33 44 46]

However, failing to take these measures can create significant barriers. There is documented evidence that a hostile environment, lack of flexibility, pressure to return prematurely, lack of empathy or recurring inappropriate comments impede reintegration.[34 38 42] In the study conducted in the USA, some cancer survivors faced a work environment in which they were pressured to RTW quickly, even when they were not ready.[34]

Other personal factors, such as mental and emotional health, are also determinants. Problems such as depression, anxiety, fear of becoming unemployed or frustration may impede RTW, while a positive perception of the disease, time since diagnosis and access to psychological and medical counselling favour RTW.[37 43] The results of this review show that, despite emotional difficulties, in some cases, RTW can be perceived as a means of emotional recovery. Johnsson *et al*[36] found that for many women, RTW meant returning to the normality they had lost, seeing it as a 'personal victory' to reconnect with an active life and overcome the feeling of being a 'patient'. Similarly, Morales *et al*[44] concluded that those patients who were able to return to the same workload or even more working hours reported better levels of emotional well-being and quality of life, emphasising the role that work can play in psychological recovery.

Conversely, in other cases, the fear of relapse or physical limitations may outweigh the emotional benefits of RTW. Tiedtke *et al*[38] observed that many patients with breast cancer faced emotional distress after their diagnosis, and the RTW was seen as a struggle between their emotional needs and work demands. In addition, financial concerns also play a significant emotional role. In this sense, Swanberg *et al*[48] found that the working poor in the USA experienced greater psychological distress due to the possibility of losing their health insurance and the pressure to RTW quickly. Moreover, in countries such as Ireland or Austria, where medical expenses are not covered by insurance, reduced income leads to worsening financial precariousness, forcing many individuals to RTW prematurely.[34 41 44]

The wide variety of countries in which studies have been conducted indicates that significant progress is yet to be made with respect to cancer patients' employment rights and access to sick leave. For instance, although sick leave entitlements exist in Brazil and Ireland, the inconsistent enforcement of these provisions often results in many patients lacking the necessary support to RTW.[41 42] In countries such as the USA and Spain, many employees are unaware of legal protections that could help them during their recovery, which delays access to benefits and increases financial insecurity.[34 37] In the case of Belgium, legislation does not actively facilitate RTW, leaving employees vulnerable to dismissal for prolonged absences.[38 39]

Limitations and strengths

This review has a number of limitations. First, there is an overrepresentation of studies focused on breast cancer, while other types such as prostate, lung or haematological cancers are notably absent. This imbalance, combined with the diversity of cancer types and treatment-related sequelae, makes it difficult to establish generalisable conclusions. Recovery time and work reintegration conditions vary widely depending on the cancer site, treatment intensity and physical or psychological aftermath.[57] Additionally, another limitation relates to the exclusion of studies involving participants with comorbid conditions in addition to cancer. While comorbidities such as cardiovascular disease, mental illness or musculoskeletal disorders often influence RTW outcomes,[58] they were excluded to preserve the specificity of the analysis and reduce heterogeneity. As a result, the findings may not fully reflect the complexity of real-world cases where cancer coexists with other chronic conditions. Future reviews or primary studies could explore these interactions more explicitly to address the cumulative impact of multiple health conditions on work reintegration.

Second, there is substantial methodological heterogeneity across the included studies, with different designs (qualitative, cross-sectional, cohort), diverse occupational backgrounds and the use of non-standardised measurement instruments. This heterogeneity limits the comparability of findings and precluded the possibility of conducting subgroup analyses based on cancer type, country or methodological design, which could have strengthened the explanatory power of the results.

Furthermore, few studies adopt an integrated approach that considers the interaction of sociodemographic, clinical, psychological and occupational variables. There is also a persistent lack of longitudinal research exploring the long-term impact of workplace interventions and how these effects vary according to cancer stage, employment type or legal context, which discourages the ability to draw cross-national or context-specific conclusions.

Third, another limitation of this review is the inclusion of studies that collected data not only from cancer survivors themselves but also from health professionals, employers and representatives of patient associations. While these diverse perspectives enrich the analysis and provide valuable contextual insights into the RTW process, they may also introduce heterogeneity that complicates the interpretation of prognostic factors strictly from the patient's point of view. As a result, some conclusions may reflect broader systemic or organisational dimensions rather than patient-specific predictors. This limitation should be considered when interpreting the findings.

Among the strengths of this review is the geographic diversity of the research, which allows for the identification of common patterns and cultural and legislative differences in the RTW process. This review identifies and examines multiple dimensions—sociodemographic, clinical, psychological, occupational and legal—providing a comprehensive picture of RTW in patients with cancer. The findings can guide the design of inclusive workplace policies as well as drive the development of cancer screening, monitoring and follow-up programmes for workers.

Although this review does not allow for the analysis of interactions between prognostic factors due to the lack of individual-level data, the findings suggest potential synergies between clinical, psychological and occupational dimensions. For example, the negative effects of physical sequelae may be intensified in individuals with low educational attainment and limited social support.[36 44] These types of interactions should be explored in future studies using multivariable statistical models.

Conceptually, possible interactions can be inferred from recurrent patterns observed across different studies. For instance, women with low education and physically demanding jobs tend

to experience lower RTW rates.[43 46] Similarly, self-employed women with significant physical impairments often report greater financial pressure to RTW before full recovery.[42] Emotional vulnerability—such as anxiety or fear of recurrence—may also combine with inflexible working conditions and minimal employer support, creating additional challenges.[21 35] Other combinations, such as younger age with unstable employment,[59] or immigrant status with limited awareness of labour rights,[60] can contribute to complex situations that make the RTW process more difficult.

Furthermore, theoretical frameworks and integrative models[27 55 56] highlight the value of considering multiple domains simultaneously. These perspectives point to the need for longitudinal studies that assess the long-term effects of RTW interventions, while explicitly incorporating interaction analyses and cross-context comparisons. Such approaches would support the development of more effective and inclusive reintegration strategies for cancer survivors.

CONCLUSION

This systematic review highlights the multifactorial nature of RTW outcomes among cancer survivors. The evidence shows that sociodemographic factors (eg, age, sex, marital status and education level), clinical factors (eg, cancer stage, treatment type, physical sequelae), psychological factors (eg, anxiety, fear of recurrence, perceived stigma) and occupational factors (eg, job type, contract stability, workplace flexibility and support) all influence RTW processes, often in overlapping ways.

Patients with higher education, stable employment and access to supportive and adaptable work environments had better reintegration outcomes, while those facing complex physical or emotional sequelae, precarious job conditions or legal uncertainty encountered greater obstacles. Importantly, the review also identifies a persistent gap in studies analysing how these factors interact, and a lack of longitudinal research examining long-term RTW trajectories.

To improve RTW outcomes, it is essential to promote personalised intervention programmes that address individual barriers and promote supportive, flexible workplaces. Furthermore, legal and institutional frameworks should facilitate personalised RTW processes that protect vulnerable groups, especially self-employed workers and those in precarious employment.

In practical terms, employers should implement gradual RTW options, adjust workloads according to medical needs and provide clear communication channels for affected employees. Policymakers are encouraged to ensure equitable access to extended sick leave, job protection measures and income support schemes that cover both salaried and self-employed workers. For clinicians, systematic screening for work-related needs during follow-up care, coordinated referrals to occupational health services and collaboration with employers and insurers can significantly enhance work reintegration. Future research should focus on multifactorial and longitudinal approaches to better understand the interplay of prognostic factors and to inform more inclusive, evidence-based RTW policies.

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ORCID iD

Juan Gómez-Salgado http://orcid.org/0000-0001-9053-7730

REFERENCES

1 van Egmond MP, Duijts SFA, Scholten APJ, *et al*. Offering a tailored return to work program to cancer survivors with job loss: a process evaluation. *BMC Public Health* 2016;15:940.
2 Ferlay J, Colombet M, Soerjomataram I, *et al*. Cancer statistics for the year 2020: An overview. *Intl J Cancer* 2021;149:778–89.
3 Sung H, Ferlay J, Siegel RL, *et al*. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin* 2021;71:209–49.
4 Piñeros M, Vignat J, Wiesner C, *et al*. La carga del cáncer a nivel mundial: patrones para la toma de decisiones. *Med Bogota Colomb* 2020;42:640–55.
5 International Atomic Energy Agency (IAEA). Cancer care for all. Viena, Austria IAEA; 2022. Available: https://www.iaea.org/sites/default/files/22-00185sweb.pdf
6 American Cancer Society. Cancer prevention & early detect la carga del cáncer a nivel mundial: patrones para la toma de decisionesion. Facts & figures 2023-2024. Atlanta, Georgia American Cancer Society; 2024. Available: https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-prevention-and-early-detection-facts-and-figures/2024-cped-files/cped-2024-cff.pdf
7 Fagundo-Rivera J, Gómez-Salgado J, García-Iglesias JJ, *et al*. Relationship between Night Shifts and Risk of Breast Cancer among Nurses: A Systematic Review. *Medicina (Kaunas)* 2020;56:680.
8 Vicente Pardo JM, López-Guillén García A. Aptitud sobrevenida tras incapacidad laboral prolongada por cáncer. *Med segur trab* 2019;65:112–38.
9 Greidanus MA, Tamminga SJ, de Rijk AE, *et al*. What Employer Actions Are Considered Most Important for the Return to Work of Employees with Cancer? A Delphi Study Among Employees and Employers. *J Occup Rehabil* 2019;29:406–22.
10 Siegel RL, Giaquinto AN, Jemal A. Cancer statistics, 2024. *CA Cancer J Clin* 2024;74:12–49.
11 Yabroff KR, Doran JF, Zhao J, *et al*. Cancer diagnosis and treatment in working-age adults: Implications for employment, health insurance coverage, and financial hardship in the United States. *CA Cancer J Clin* 2024;74:341–58.
12 White AG, Birnbaum HG, Mareva MN, *et al*. Economic burden of illness for employees with painful conditions. *J Occup Environ Med* 2005;47:884–92.
13 Mitsui K, Endo M, Imai Y, *et al*. Predictors of resignation and sick leave after cancer diagnosis among Japanese breast cancer survivors: a cross-sectional study. *BMC Public Health* 2021;21:138.
14 Von Ah D, Storey S, Crouch A. Relationship between self-reported cognitive function and work-related outcomes in breast cancer survivors. *J Cancer Surviv* 2018;12:246–55.
15 dos Santos Pereira A, Miller A, Akinyemi AO. Bridging the gap: Advancing occupational therapy in cancer recovery for better outcomes. *J Med Surg Public Health* 2025;6:100196.

16 Chen X, Xu M, Chen G, *et al*. The relationship between returning to work self-efficacy, anxiety, and depression in renal cancer patients: a cross-lagged analysis. *Support Care Cancer* 2025;33:368.
17 Ayala-García A, Serra L, Rodriguez-Arjona D, *et al*. Understanding Return to Work After a Cancer-Related Sickness Absence. Perceptions of Barriers and Facilitators Among all Relevant Stakeholders. *Psychooncology* 2024;33:e70036.
18 World Cancer Research Fund/American Institute for Cancer Research. Survivors of breast and other cancers (continuous update project expert report 2018). World Cancer Research Fund; 2018. Available: https://www.wcrf.org/research-policy/global-cancer-update-programme/
19 Le GH, Hermansen Å, Dahl E. Return to work after cancer-the impact of working conditions: A Norwegian Register-based Study. *J Cancer Surviv* 2025;19:766–78.
20 Hussey C, Hanbridge M, Dowling M, *et al*. Cancer survivorship: understanding the patients' journey and perspectives on post-treatment needs. *BMC Sports Sci Med Rehabil* 2024;16:82.
21 Roelen CAM, Koopmans PC, Groothoff JW, *et al*. Return to work after cancer diagnosed in 2002, 2005 and 2008. *J Occup Rehabil* 2011;21:335–41.
22 Rosbjerg R, Hansen DG, Zachariae R, *et al*. The Predictive Value of Return to Work Self-efficacy for Return to Work Among Employees with Cancer Undergoing Chemotherapy. *J Occup Rehabil* 2020;30:665–78.
23 Munir F, Kalawsky K, Wallis DJ, *et al*. Using intervention mapping to develop a work-related guidance tool for those affected by cancer. *BMC Public Health* 2013;13:6.
24 Mehnert A, de Boer A, Feuerstein M. Employment challenges for cancer survivors. *Cancer* 2013;119:2151–9.
25 Tay MRJ, Wong CJ, Aw HZ. Return to Work in Breast Cancer Patients following an Interdisciplinary Rehabilitation Program in a Community-Based Cancer Rehabilitation Center: A Pilot Study. *Healthcare (Basel)* 2024;12:805.
26 Butow P, Laidsaar-Powell R, Konings S, *et al*. Return to work after a cancer diagnosis: a meta-review of reviews and a meta-synthesis of recent qualitative studies. *J Cancer Surviv* 2020;14:114–34.
27 European Agency for Safety and Health at Work. Rehabilitation and return to work after cancer: instruments and practices. LU: Publications Office; 2018. Available: https://data.europa.eu/doi/10.2802/170868
28 European Agency for Safety and Health at Work. Rehabilitation and return to work after cancer: literature review. LU: Publications Office; 2017. Available: https://data.europa.eu/doi/10.2802/712
29 Magnavita N, Meraglia I, Terribile DA. Returning to Work after Breast Cancer: A One-Year Mixed-Methods Study. *IJERPH* 2024;21:1057.
30 Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71.
31 Munn Z, Stern C, Aromataris E, *et al*. What kind of systematic review should I conduct? A proposed typology and guidance for systematic reviewers in the medical and health sciences. *BMC Med Res Methodol* 2018;18:5.
32 Jordan Z, Lockwood C, Munn Z, *et al*. The updated Joanna Briggs Institute Model of Evidence-Based Healthcare. *Int J Evid Based Healthc* 2019;17:58–71.
33 Dewa CS, Trojanowski L, Tamminga SJ, *et al*. Work-related experiences of head and neck cancer survivors: an exploratory and descriptive qualitative study. *Disabil Rehabil* 2018;40:1252–8.
34 Gruß I, Hanson G, Bradley C, *et al*. Colorectal cancer survivors' challenges to returning to work: A qualitative study. *Eur J Cancer Care (Engl)* 2019;28:e13044.
35 Isaksson J, Wilms T, Laurell G, *et al*. Meaning of work and the process of returning after head and neck cancer. *Support Care Cancer* 2016;24:205–13.
36 Johnsson A, Fornander T, Rutqvist LE, *et al*. Factors influencing return to work: a narrative study of women treated for breast cancer. *Eur J Cancer Care (Engl)* 2010;19:317–23.
37 Marinas-Sanz R, Iguacel I, Maqueda J, *et al*. Facilitating Factors and Barriers in the Return to Work of Working Women Survivors of Breast Cancer: A Qualitative Study. *Cancers (Basel)* 2023;15:874.
38 Tiedtke C, Donceel P, Knops L, *et al*. Supporting return-to-work in the face of legislation: stakeholders' experiences with return-to-work after breast cancer in Belgium. *J Occup Rehabil* 2012;22:241–51.
39 Tiedtke C, de Rijk A, Donceel P, *et al*. Survived but feeling vulnerable and insecure: a qualitative study of the mental preparation for RTW after breast cancer treatment. *BMC Public Health* 2012;12:538.
40 Tiedtke CM, Blonk RWB, Van Rhenen W, *et al*. Tailored support for preparing employees with cancer to return to work: Recognition and gaining new insights in an open atmosphere. *Work* 2023;76:1519–33.
41 Timmons A, Gooberman-Hill R, Sharp L. The multidimensional nature of the financial and economic burden of a cancer diagnosis on patients and their families: qualitative findings from a country with a mixed public–private healthcare system. *Support Care Cancer* 2013;21:107–17.
42 Zomkowski K, Cruz de Souza B, Moreira GM, *et al*. Qualitative study of return to work following breast cancer treatment. *Occup Med (Lond)* 2019;69:189–94.
43 Guittard M, Capitain O, Guittard E, *et al*. Facteurs influençant le retour au travail et le maintien en emploi après un cancer du sein. *Arch Mal Prof Med Environ* 2016;77:157–64.
44 Morales CZ, McDowell L, Lisy K, *et al*. Return to Work in Survivors of Human Papillomavirus-Associated Oropharyngeal Cancer: An Australian Experience. *Int J Radiat Oncol Biol Phys* 2020;106:146–56.
45 Morioka I, Terashita H, Miyashita K, *et al*. Support for a balance between work schedules and treatment regimens among workers with illness: A questionnaire survey focusing on company size in Wakayama Prefecture, Japan. *Sangyo Eiseigaku Zasshi* 2023;65:28–40.
46 Nilsson MI, Petersson LM, Wennman-Larsen A, *et al*. Adjustment and social support at work early after breast cancer surgery and its associations with sickness absence. *Psychooncology* 2013;22:2755–62.
47 Rollin L, De Blasi G, Boucher L, *et al*. Return-to-work support in cancer patients: Which methodology? *Bull Cancer* 2020;107:200–8.
48 Swanberg JE, Nichols HM, Vanderpool RC, *et al*. Working poor and working nonpoor cancer survivors: Work-related and employment disparities. *Cancer Rep (Hoboken)* 2018;1:e1134.
49 Torp S, Syse J, Paraponaris A, *et al*. Return to work among self-employed cancer survivors. *J Cancer Surviv* 2017;11:189–200.
50 Chen L, Glimelius I, Neovius M, *et al*. Work Loss Duration and Predictors Following Rectal Cancer Treatment among Patients with and without Prediagnostic Work Loss. *Cancer Epidemiol Biomarkers Prev* 2016;25:987–94.
51 Balak F, Roelen CAM, Koopmans PC, *et al*. Return to work after early-stage breast cancer: a cohort study into the effects of treatment and cancer-related symptoms. *J Occup Rehabil* 2008;18:267–72.
52 Sun YS, Chen WL, Wu WT, *et al*. The Fact of Return to Work in Cervical Cancer Survivors and the Impact of Survival Rate: An 11-Year Follow-Up Study. *Int J Environ Res Public Health* 2021;18:10703.
53 Green S, Higgins JP. Preparing a cochrane review. In: *Cochrane handbook for systematic reviews of interventions*. John Wiley & Sons, Ltd, 2008: 11–30. Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/9780470712184.ch2
54 Nilsson M, Olsson M, Wennman-Larsen A, *et al*. Return to work after breast cancer: women's experiences of encounters with different stakeholders. *Eur J Oncol Nurs* 2011;15:267–74.
55 Fong CJ, Murphy KM, Westbrook JD, *et al*. Psychological Interventions to Facilitate Employment Outcomes for Cancer Survivors. *Res Soc Work Pract* 2018;28:84–98.
56 Kiasuwa Mbengi R, Otter R, Mortelmans K, *et al*. Barriers and opportunities for return-to-work of cancer survivors: time for action--rapid review and expert consultation. *Syst Rev* 2016;5:35.
57 Meixner E, Sandrini E, Hoeltgen L, *et al*. Return to Work, Fatigue and Cancer Rehabilitation after Curative Radiotherapy and Radiochemotherapy for Pelvic Gynecologic Cancer. *Cancers (Basel)* 2022;14:2330.
58 National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Health Care Services; Committee on Identifying Disabling Medical Conditions Likely to Improve with Treatment. Cross-cutting issues. In: *Selected health conditions and likelihood of improvement with treatment*. National Academies Press (US), 2020. Available: https://www.ncbi.nlm.nih.gov/books/NBK559516/
59 Stone DS, Ganz PA, Pavlish C, *et al*. Young adult cancer survivors and work: a systematic review. *J Cancer Surviv* 2017;11:765–81.
60 Tergas AI, Prigerson HG, Shen MJ, *et al*. Association between immigrant status and advanced cancer patients' location and quality of death. *Cancer* 2022;128:3352–9.