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EDICIONES COMPLUTENSE

Returning to work in cancer survivors: a multi-center cross-sectional study in Spain

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Resumen. Objetivo: Analizar la situación laboral, así como variables sociodemográficas (edad, sexo, estado civil y titulación) relacionadas con el cáncer (tipo de cáncer, estrategia de tratamiento primario y fase de supervivencia) en supervivientes españoles de cáncer. Método y procedimiento: Estudio transversal sobre una muestra heterogénea de 772 supervivientes de cáncer de inicio en la edad adulta en edad laboral. Se realizaron análisis correlacionales y de regresión logística para estudiar la capacidad predictiva de las variables sociodemográficas y relacionadas con el cáncer sobre la situación laboral y la posible modulación de los resultados por la CVRS evaluada mediante el QLACS. Resultados: Sólo el 55% de los supervivientes de cáncer estaban empleados. La edad, la cualificación y el tipo de cáncer fueron predictores independientes de la situación laboral, así como de la fase de supervivencia en los supervivientes con una CVRS baja. Conclusiones: Un alto porcentaje

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de supervivientes en edad laboral no vuelve a trabajar tras la experiencia oncológica. Algunas variables sociodemográficas y relacionadas con la enfermedad pueden ayudar a la identificación precoz de la población de riesgo en la que centrar la atención.
Palabras clave: Trabajo, supervivientes de cáncer, variables sociodemográficas

[es] La vuelta al trabajo en supervivientes de cáncer: un estudio transversal multicéntrico en España

Abstract. Objective: To analyze the employment status as well as sociodemographic (age, gender, marital status, and qualification) and cancer-related variables (cancer type, primary treatment strategy, and survival phase) in Spanish cancer survivors. Method and procedure: Cross-sectional study on a heterogeneous sample of 772 working-age survivors of adult-onset cancer. Correlational and logistic regression analyses were performed to study the predictive ability of sociodemographic and cancer-related variables on employment status and the possible modulation of results by HRQOL assessed by the QLACS. Results: Only 55% of cancer survivors were employed. Age, qualification, and type of cancer were independent predictors of employment status as well as the survival phase in survivors with a low HRQOL. Conclusions: A high percentage of working-age survivors do not return to work after the cancer experience. Some sociodemographic and disease-related variables can help in the early identification of the risk population on which to focus attention.
Keywords: Work, cancer survivors, socio-demographic variables

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1. Introduction

The cancer survivors' population is steadily growing as a consequence of the improvements in cancer detection and advances in medical treatments[1-6]. Consequently, a greater understanding of the consequences and sequelae of cancer and its treatments is required to achieve successful rehabilitation following the disease experience.

Approximately 50% of cancer patients are employed at the time of diagnosis so returning to work is an important issue[7-11]. Working has been pointed out by several authors as of key importance[11-13] since it relates to self-efficacy, belonging, and financial security[10,14].

Return to work in cancer survivorship can pose a serious challenge since a disease-free status is not synonymous with the absence of physical and psychosocial problems related to cancer and its treatment[15]. The effects of cancer and its treatment affect practically every area of the survivor's life[16-18]. Cancer survivors may experience residual, persistent, and frequent symptoms, such as fatigue and pain[14,19]; mental health issues such as depression and anxiety; and cognitive impairment, including attention and memory problems[17,20].

The potential deterioration of health and well-being associated with the survivor status may constitute a deterrent to (re)entering work and thriving as productive individuals in society[20-22]. In addition, a return to work does not imply the

disappearance of work-related problems. Two points can illustrate this statement: the possible limited productivity in professional activity[23,24], and the absence of adequate conditions from an occupational health perspective[25].

Comprehensive care of the person affected by cancer must contemplate their reintegration into the workplace. To the more obvious economic problems associated with not returning to work after the experience of cancer it can also be added the negative impact of such a situation on the Quality of Life (QOL)[26]. Indeed, having a job has been revealed as a critical indicator of improved QOL in cancer survivors[10,19,20,24,27,28]. Certainly, employed cancer survivors report that the work activity is a way of returning to normal life, allowing for professional and personal development, increased social support, and improved quality of life; all of which in turn revert to society by improving their economic and social participation[3,29].

Currently, the cancer survivors' risk of unemployment is higher than in the general population[3,24,28]. A systematic review by Mehnert (2011)[21] concluded that the average rate of cancer survivors returning to work was 63.5%. Data from subsequent studies provide even lower employment rates. A study by Rashid et al. (2020)[10] with lung cancer survivors show that 51% of those who were employed before the disease did not return to work. In Spain, around 55% of people are unable to work due to cancer[30]000 new cases of cancer arose in Spain in 2017 in the working population (18 to 65 years. This places this group at particular risk of labor and social exclusion. In estimate, 40% of cancer survivors are aged < 65 years, and 35% are between 40 and 64 years, an age at which career and work-related issues play a crucial role[21,29]. Thus, returning to work after cancer diagnosis and treatment has become a major challenge for this population in Western or developed countries[3,24].

In addition, cancer survivors who return to work often report a loss of income due to changes in the workplace or their professional role, a decreased scope of work, and even early retirement[24,31-33]. Thus, the return to work requires significant attention in the integral care of the cancer survivor. Supporting the need to optimize the employment of cancer survivors, the American National Cancer Institute has proposed the investigation of predictors of employment and the development of appropriate interventions as a priority goal[34].

Although issues related to employment and work in cancer survivors are receiving increasing attention, the research on this topic is still scarce and limited[19,21,28,35]. To date, previous studies highlight the role of some variables that hinder the development of work activity in cancer survivors. Survivors who return to work earlier are those whose primary treatment has been shorter, such as surgery only[32]. However, survivors treated with repeated sessions of radiotherapy or chemotherapy take more time before returning to work[34,10]. The presence of psychological distress or negative physical symptoms such as fatigue has also been identified as barriers to employment[10,20,24]. Finally, previous research also emphasizes the role of some socio-demographic variables such as female gender, lower educational attainment, older age[10,23,27,36], and not having a stable relationship[10,35,37] as factors hindering the return to work in cancer survivors.

Furthermore, the aforementioned studies present some relevant limitations. They have mainly been conducted in Western Europe, North America, and Australia[8]. In this sense, it is considered relevant to analyze the socio-demographic characteristics of working cancer survivors in other geographical areas to delineate the socio-occupational profile of the cancer survivor. Data from Mediterranean and Central

European countries are urgently needed to understand whether the return to work is also a problem in these areas and whether socio-rehabilitative interventions are required to mitigate the potential negative impact of cancer on individuals and society[38]. At the same time, it would also be of interest to focus studies on specific countries to take into account socioeconomic contextual sensitivity and constraints[22,39]. Another major limitation of the studies conducted so far is that they have mainly focused on survivors diagnosed before the age of 30 and, in particular, in childhood and adolescence [20]. The need for studies addressing occupational issues in a wider age range of adult cancer survivors is highlighted by data indicating that 50% of survivors are diagnosed at working age and 35% are over 35 years old[7,10,29]. Finally, it should also be noted that the existing studies have almost exclusively (i) focused on a particular type of cancer, making it difficult to obtain more general conclusions, and (ii) considered bivariate associations between predictors and criteria, impeding the determination of relevant predictors.

Accordingly, with the above, the present study aims to explore the percentage of employed cancer survivors as well as to identify sociodemographic and cancer-related factors associated with returning to work in a large and heterogeneous sample of Spanish adult cancer survivors. A secondary objective is to explore the possible modulatory role of the Health-Related Quality of Life (HRQOL) in the relationship between the predictors and the criterion variable.

2. Method

Participants

This cross-sectional study is part of a research project on HRQOL and unmet psychosocial needs in survivors of adult-onset cancer approved by the Ethics Committee of the different participating medical institutions and cancer patient associations. Of the total number of participants (N=1862) diagnosed with adult cancer, with no evidence of disease and who had completed primary treatment (surgery, radiotherapy, and chemotherapy) with curative intent at least one month, the present study analyzed only those in working age (n=772) (see Table 1).

Table 1. Characteristics of the participants

		Total N=772	**Employed n=427**	**Unemployed /Early retired n=345**	**Chi2**
		n (%)	**n (%)**	**n (%)**	
Age (mean: 52.4; SD=8.5; Range=22-64)	≤45 years	157 (20.3)	116 (27.2)	41 (11.9)	27.51***
	46-64 years	615 (79.7)	311 (72.8)	304 (88.1)	
Gender	Female	532 (68.9)	314 (73.5)	218 (63.2)	9.54**
	Male	240 (31.1)	113 (26.5)	127 (36.8)	
Marital status	With Partner	543 (70.3)	302 (70.7)	241 (69.9)	.07
	Single	229 (29.7)	125 (29.3)	104 (30.1)	

Qualification	Higher education	304 (40.4)	230 (55.2)	74 (22.0)	84.85***
	No Higher education	449 (58.2)	187 (44.8)	262 (78.0)	
Cancer type	Breast	372 (48.2)	224 (52.5)	148 (42.9)	31.38***
	Prostate	76 (9.8)	38 (8.9)	38 (11.0)	
	Colorectal	76 (9.8)	33 (7.7)	43 (12.5)	
	Hematologic	64 (8.3)	37 (8.7)	27 (7.8)	
	Head & neck	58 (7.5)	20 (4.7)	38 (11.0)	
	Gynecologic	52 (6.7)	35 (8.2)	17 (4.9)	
	Melanoma	38 (4.9)	27 (6.3)	11 (3.2)	
	Multiple	36 (4.7)	13 (3.0)	23 (6.7)	
Primary treatment	S, RT, or S+RT	297 (38.5)	174 (40.7)	123 (35.7)	
	S, CT, or S+CT	129 (16.7)	72 (16.9)	57 (16.5)	
	S+CT+RT	346 (44.8)	181 (42.4)	165 (47.8)	2.56
Survival phase	RES	157 (20.3)	80 (18.7)	77 (22.3)	2.96
	EH	361 (46.8)	211 (49.4)	150 (43.5)	
	LTS	254 (32.9)	136 (31.9)	118 (34.2)	

Note: * = p < .05, ** = p < .01, *** = p < .001; Primary treatment: S=Surgery, RT= Radiotherapy, CT=Chemotherapy; Survival phase: RES=Re-entry survivorship (≤ 12 months), EH=Early survivorship (13-59 months), LTS=Long-term survivorship (≥ 5 years)

Measures

The Quality of Life in Adult Cancer Survivors (QLACS) scale[40], Spanish version by Escobar et al.[41]. It comprises 47 items concerning twelve domains (negative feelings α=.79, positive feelings α= 87, cognitive problems α= .83, physical pain α= .87, problems with sexual functioning α= .84, fatigue α= .89, and social avoidance α= .90, financial problems α= .76, family-related distress α= .83, appearance concerns α= .79, distress over recurrence α= .67, and benefits of cancer α= .86). Each domain consists of 4 items (except for family-related distress with only 3 items; thus, the resulting score is multiplied by 1.33 to be compared with the other domains). The QLACS assesses health-related QOL in the past month on a seven-point Likert scale (1=never trough 7=always), with higher scores indicating lower HRQOL (except for positive feelings and benefits). Previous results with the Spanish version of QLACS support the good psychometric properties of the instrument as well as the obtaining of a total score on the scale, with the exclusion of the benefits-of-cancer domain [42]. Reliability indices obtained in this study were satisfactory (Cronbach's αTotal = .94; range Cronbach's αsubscales = .67 - .90). It should be noted that α = .67 for the distress-recurrence variable is an acceptable value of internal consistency since this scale has less than 10 items[43].

Data analysis

Descriptive statistics were calculated to summarize sociodemographic and cancer-related variables. Chi-square analyses were performed to explore possible bivariate relationships between sociodemographic and illness-related variables, and employment. To determine the isolated contribution of these variables to the variance of the criterion variable, a logistic regression analysis with a forward conditional method, including all those sociodemographic and illness-related variables that had shown a significant association with the employment status, was performed. The reference category used for the comparison between types of cancer was melanoma because it is the diagnosis with the highest percentage of people in the workforce. To analyze possible differences as a function of the level of HRQOL, the total HRQOL score was partitioned into two groups by the median (Me=129). Then, the sequential analysis was repeated separately to compare the predictors of employment status between each group of HRQOL. The statistical significance level for analyses was $p \leq .05$. Statistical analysis was performed using IBM SPSS Statistics, version 22.0.

3. Results

Participants' age ranged from 22 to 64 years (M=52.1; SD=8.7) with a majority (79.7%) being over 45 years of age. Most of the participants were women (68.9%), were married or living with a partner (70.3%), did not have a university education (58.2%), and were employed (55.3%). The frequency of cancer diagnosis was: breast (48.2%), colorectal (9.8%), prostate (9.8%), hematological (8.3%), head and neck (7.5%), gynecological (6.7%), melanoma (4.9%), and multiple (4.7%). A substantial proportion of the participants (44.8%) had received combined treatment with radio and chemo whether or not in combination with surgery, 38.5% had received local treatment, and 16.7% had received chemotherapy treatment with or without surgery. The average length of time elapsed after the completion of primary treatment was 4.3 years (range: 1 month - 30 years). Considering the three phases of survival that have been suggested to be distinguished (Stanton et al., 2015), 20.3% had completed treatment in the previous 12 months (re-entry survivorship phase, RES), 32.9% had completed it at least 5 years before the moment of interview (long-term survivorship phase, LTS), and 46.8% had exceeded 12 months after primary treatment but had not yet reached 5 years (early survivorship phase, ES). Finally, the percentage of cancer survivors who remained employed was 55.3% (see Table 1).

Attending to the sociodemographic variables, a higher level of employment was associated with younger age (in particular, being younger than 46 years) ($p \leq .001$), higher qualification ($p \leq .001$), and being female ($p \leq .01$). While the percentage of employees among those ≤ 45 years old was 74%, it only reached 51% among those > 45 years old. The total percentage of women who were employed was 59% compared to 47% of employed men. Finally, 76% of the qualified survivors remained employed whereas only 42% of the unqualified survivors did so.

The only disease-related variable that was associated with employment level was the type of cancer ($p \leq .001$). The diagnoses in which the percentage of employed survivors exceeded that of those unemployed/pre-retired were: melanoma (71%),

gynecologic (67%), breast (60%), and hematologic (58%). Those in which the percentage of unemployed/ pre-retired was higher than that of employees were colorectal (43%), multiple (36%), and head and neck (35%). In prostate diagnosis, the percentages were 50% in each case.

The results of the regression analysis showed that age ($p \leq .01$), qualification ($p \leq .001$) and type of cancer ($p \leq .05$) independently contribute to the prediction of employment status (Hosmer-Lemeshow = 6.427; $p>.05$).

They also showed that head and neck ($p \leq .01$), multiple ($p \leq .05$), colorectal ($p \leq .05$) and hematologic ($p \leq .05$) diagnoses are those in which unemployment/pre-retirement was significantly higher for melanoma survivors (see Table 2).

Table 2. Predictors of returning to work (multivariable logistic regression)

Independent variable	B	S.E.	Wald	d.f.	p	Exp(B)
Age	-.663	.221	9.011	1	.003	.515
Type of cancer			17.608	7	.014	
Head and neck	-1.475	.484	9.276	1	.002	.229
Multiple	-1.335	.530	6.346	1	.012	.263
Colorectal	-.954	.453	4.431	1	.035	.385
Prostate	-.551	.449	1.510	1	.219	.576
Hematological	-.952	.473	4.045	1	.044	.386
Breast	-.539	.395	1.863	1	.172	.583
Gynecological	-.475	.498	.910	1	.340	.622
Qualification	1.400	.171	66.864	1	.000	4.055
Constant	.505	.127	15.843	1	.000	1.657

SE, standard error; d.f., degree of freedom

The results obtained regarding the modulation effects of HRQOL are presented in Tables 3 and 4.

In the subgroup with low HRQOL, the variables associated with employment were age ($p \leq .001$), gender ($p \leq .01$), survival phase ($p \leq .05$), diagnosis type ($p \leq .05$), and qualification ($p \leq .001$). The results of the regression analysis showed that age ($p \leq .001$), survival phase ($p \leq .05$), and qualification ($p \leq .001$) were the variables that made an independent contribution to the prediction of employment status (Hosmer-Lemeshow = 3.315; $p > .05$).

In the subgroup with high HRQOL, the variables associated with employment were age ($p \leq .001$), diagnosis ($p \leq .01$), and qualification ($p \leq .001$). The results of the regression analysis confirmed only age ($p \leq .05$) and qualification ($p \leq .001$) as independent predictors of employment status (Hosmer-Lemeshow = 1.104; $p > .05$).

Table 3. Chi-square test relating sociodemographic variables and employment level for low and high HRQOL groups

HRQOL group	Sociodemographic variable	c^2	*p* value
High	Age	11.706	.001
	Qualification	41.360	≤ .001
	Diagnosis type	17.922	.021
Low	Age	19.817	≤ .001
	Gender	9.956	.002
	Qualification	39.920	≤ .001
	Survival phase	6.836	.033
	Diagnosis type	15.888	.026

Table 4. Predictors of returning to work (multivariable logistic regression) for low and high HRQOL groups

HRQOL group	Independent variable	B	S.E.	Wald	d.f.	p	Exp(B)
High	Age	-.562	.268	4.394	1	.036	.570
	Qualification	1.374	.234	34.450	1	.000	3.953
	Constant	.190	.134	1.990	1	.158	1.209
Low	Age	-1.460	.439	11.084	1	.001	.232
	Qualification	1.389	.260	28.511	1	.000	4.013
	Survival phase			6.326	2	.042	
	Early survival	.793	.316	6.305	1	.012	2.210
	Long survival	.520	.335	2.416	1	.120	1.682
	Constant	1.152	.224	26.503	1	.000	3.163

SE, standard error; d.f., degree of freedom

4. Discussion

The central objective of the present study was to explore the employment status of a large and heterogeneous sample of cancer survivors under 65 years of age, as well as to determine possible sociodemographic and disease-related predictors of employment status after the cancer experience.

The total percentage of survivors employed was only 55%. This value is within the range of percentages found in previous studies[10, 21,24] and underlines the importance of addressing the return to work of cancer survivors[2,20].

As noted in the introduction, cancer survivors face several challenges in terms of return to work and work productivity. However, returning to work after the cancer experience is a way of returning to normal life to the extent that it allows professional and personal development, and facilitates greater social support, contributing to the

improvement of the survivor's quality of life[3,10,28 29]. Thus, improving the quality of life of cancer survivors also requires addressing such an important issue as the return to work. A first step in this direction is the early identification of survivors at higher risk of not returning to work, allowing efforts to be focused on those survivors in particular need.

The results of the regression analysis showed that among the sociodemographic variables, age and qualification were independent predictors of employment. Specifically, older age and lower qualification were barriers to maintaining an active working life. These results are consistent with previous studies [10, 23, 24, 27, 36]. Although the relationship status has been little explored, results point to a positive association between having a stable relationship and being employed[35,37].

However, having a partner did not play a significant role in maintaining an active working life among participants in this study. This result is not consistent with the findings of Paltrinieri et al. (2018)[38]. According to Paltrinieri's findings, being male, having an upper-middle income and a higher education, and living with a partner/children are protective factors associated with returning to work after cancer. However, current studies have not addressed the specific influence of relationship status on return to work after cancer[10,24]. Future studies should capture this information with interest, as the social context plays an important role in the day-to-day life of the cancer survivor.

Finally, it should be noted that although gender showed a bivariate association with employment, it was not an independent predictor. Results regarding the role of this variable are inconsistent. Studies in adult cancer survivors find that being female would be a barrier to employment[24,29,31,44]. On the other hand, men's cultural expectations to "be strong", and for everyone to work to contribute to family well-being, may influence job search and increase pressure to return to work[45]. However, in their review of studies in survivors whose cancer was diagnosed in childhood, adolescence, and early adulthood, Devine et al. (2022)[20] conclude that being male would be a barrier to returning to work. Socio-demographic and disease-related profiles of the participants under study may determine some of the associations found. In our case, the frequency of breast cancer in the group of survivors studied may be the cause of the results obtained regarding being a woman/female as a facilitator. The fact that gender was not an independent predictor of employment supports our reasoning. Previous exploration of possible variables associated with employment only through bivariate correlations may have led to non-independent predictors of return to work on cancer survival.

Among the disease-related variables, neither the primary chemotherapy treatment strategy nor the time since completion of primary treatment showed an association with employment. Although some studies have pointed to the shorter duration of primary treatment as a possible facilitator on return to work[10, 32,34], our results do not support this finding. Research has emphasized the more severe sequelae of systemic therapies [46, 47] and underlined that the combination of radiation and chemotherapy has the worst effects on the survival phase[48-51]. Accordingly, we compared three primary treatment strategies (local, systemic, and radiotherapy plus chemotherapy). However, we found no differences between the three resulting groups regarding employment. On the other hand, we found that a non-significantly different percentage of survivors remained active in the three survival phases explored: re-entry (first year), early survival (up to 5 years), and long survival (more than 5 years). The lack of exploration of survival time in previous research precludes comparison with existing results.

Cancer type did prove to be an independent predictor of employment. Only one in three survivors of head and neck and multiple cancers were still working, compared to about two in three after a diagnosis of melanoma or gynecological cancer. All other diagnoses showed figures in the 40-60% range. The absence of studies with heterogeneous samples that consider the type of cancer as a predictor of employment prevents the comparison of our results. Notwithstanding, our results support those obtained by studies with survivors of a single type of cancer, which also point to the same locations as those in which the highest and lowest percentage of occupationally active survivors are found[1,17,24,31].

Findings of the modulation by HRQOL confirmed that age and qualification were independent predictors of employment, and cancer type disappeared as an independent predictor. In this regard, we believe that the reduction in the number of participants with a particular diagnosis that resulted from the division of the initial sample into two subgroups may have been the cause of this result. Finally, modulation by HRQOL showed the survival phase as an independent predictor of employment in the subgroup with low HRQOL. Specifically, the lowest percentage of occupationally active survivors in this subgroup is found in the first year after completion of primary treatment (re-entry phase). Certainly, it seems reasonable that the percentage of employed survivors among those reporting low HRQOL would be lower during the first year after the completion of primary treatment. These results further support the need for special consideration of this phase within early survival insofar as it constitutes a transitional phase from patient to survivor. The re-entry phase involves psychosocial and behavioral experiences more pronounced and has a greater impact on HRQOL than other phases of post-treatment survival[20,24,28,38,45].

In sum, our results emphasize the relevance of age, qualification, and type of cancer in the return to work of cancer survivors and also reveal the importance of the re-entry phase as a phase in which low HRQOL hinders the return to work. These findings allow health and social care services to identify patients at higher risk of delayed return to work and provide a timely referral for occupational rehabilitation in the early stages of cancer, following the different recommendations proposed [24, 31, 52]. Ultimately, these results support the idea of developing programs for occupational integration, orientation, and adaptation to the workplace after cancer treatment. Survivors express a need to be guided and supported by healthcare professionals and vocational providers in order to have a job[10,24,53]. Consequently, it is essential to acknowledge and address the concerns that are often expressed by cancer survivors relating to the workplace (e.g. disclosing their diagnosis), their ability to work, their physical appearance, and the difficulties when negotiating workplace accommodations with employers[10].

Although it is difficult to establish the directionality of the relationships found and we believe that a bidirectional influence may be likely, previous studies[28, 44] have shown the benefit to the HRQOL of cancer survivors of maintaining an active work life. Based on the authors' previous results[28], being employed has a positive impact on the domains of financial problems, sexual problems, concern about appearance, social avoidance, and negative and positive affectivity. Having a job was also associated with better HRQOL in areas directly related to common side effects of cancer treatment, such as pain and fatigue.

A disease such as cancer can cause major changes in people's structure and lives, in large part due to the temporary interruption of working life. For many people,

therefore, return to work is a sign of recovery. Beyond the well-known role that work plays in people's lives by providing economic sustenance, a sense of identity, social interaction, routine, etc., the return to work of those who have suffered from cancer, once the treatment is over, can have very positive effects on the process of recovery from the disease itself[38, 44].

Furthermore, we must also consider the social side of returning to work among cancer survivors. Cancer places a significant economic burden on society and increased survival of cancer patients means costs[3,10,20,27]. With increasing life expectancy, retirement age thresholds have been extended in many countries with a high human development index (e.g. the United States and Europe); it is not uncommon to see fully active older adults in the labor force[35]. Working is, therefore, a way of maintaining the balance between the treatment received by the health and social care system and the contribution to society although, depending on the country, the contributions may be different. In any case, thinking and feeling that you are not a "burden" and that you contribute to your own and others' well-being is a comforting thought. Therefore, as long as the survivor's circumstances permit, returning to the labor market is good not only for the survivor and his or her environment but for society as a whole. However, the ability to work is not only a function of one's capacities (e.g. physical and mental abilities) but also of the job demands and resources[20,53]. Return to work can be facilitated by the willingness of employers to make job accommodations that mitigate the effects of cancer by maintaining a supportive work culture and environment. The significance of such adjustments is underlined by findings indicating that cancer survivors who receive workplace accommodations or whose jobs have more favorable employment protection policies have better employment outcomes[10,25,32]. Consequently, the social sector should play a complementary role to the health sector in improving the reintegration of cancer survivors into normal social roles and activities without discrimination.

This study provides insight into the sociodemographic and disease-related variables involved in a topic of relevance such as return to work in cancer survival. It attempts to determine independent predictors and does so in the subpopulation of survivors where research has been more scarce: adult cancer survivors. Finally, we explore the possible modulation by HRQOL of the results obtained. We address the study aim in a relatively large number of cancer survivors, including eight different types of diagnostics, and an extended post-treatment survival period of up to 30 years. However, the size of the subgroups by cancer type was limited, especially for HRQOL modulation analysis. Some diagnoses with high prevalence (e.g., lung cancer) were not included in our study. Also, the cross-sectional nature of the present study does not allow to analyze the possible intra-individual change in cancer survivors' employment status over time. Finally, the wide range of variance in employment not explained by the variables examined indicates the need for future research to continue to explore other possible predictors of employment.

5. References

1. Firkins J, Hansen L, Driessnack M, Dieckmann N. Quality of life in "chronic" cancer survivors: a meta-analysis. J Cancer Surviv 2020;14:504-17. https://doi.org/10.1007/s11764-020-00869-9

2. Brinkman TM, Recklitis CJ, Michel G, Grootenhuis MA, Klosky JL. Psychological symptoms, social outcomes, socioeconomic attainment, and health behaviors among survivors of childhood cancer: Current state of the literature. J Clin Oncol 2018;36:2190-7. https://doi.org/10.1200/JCO.2017.76.5552
3. Thandrayen J, Joshy G, Stubbs J, Bailey L, Butow P, Koczwara B, et al. Workforce participation in relation to cancer diagnosis, type and stage: Australian population-based study of 163,556 middle-aged people. J Cancer Surviv 2022;16:461-73. https://doi.org/10.1007/s11764-021-01041-7
4. Besó Delgado M, Ibáñez Cabanell J, Pérez Sanz E, Valverde Roig MJ, Fernández García C, Vanaclocha Espi M, et al. Resultados de 10 años del Programa de Prevención de Cáncer Colorrectal en la Comunitat Valenciana. Rev Esp Salud Pública 2021 [Acceso 20 de febrero de 2023];95(1): e1-9. Disponible en: https://medes.com/publication/163866
5. Alonso-Belmonte C, Montero-Vilchez T, Arias-Santiago S, Buendía-Eisman A. Situación actual de la prevención del cáncer de piel: una revisión sistemática. Actas Dermo-Sifiliográficas 2022 [citado 20 de febrero de 2023];113(8):781-91. https://doi.org/10.1016/j.ad.2022.04.015
6. Rivera F, Andres R, Felip E, Garcia-Campelo R, Lianes P, Llombart A, et al. Medical oncology future plan of the Spanish Society of Medical Oncology: challenges and future needs of the Spanish oncologists. Clin Transl Oncol 2017;19:508-18. https://doi.org/10.1007/s12094-016-1595-9
7. Yang SW, Chen WL, Wu WT, Wang CC. Investigation on returning to work in liver cancer survivors in Taiwan: a 5-year follow-up study. BMC Public Health 2022;21:1846. https://doi.org/10.1186/s12889-021-11872-9
8. Islam T, Dahlui M, Majid HA, Nahar AM, Mohd Taib NA, Su TT, et al. Factors associated with return to work of breast cancer survivors: a systematic review. BMC Public Health 2014;14(3):S8. https://doi.org/10.1186/1471-2458-14-S3-S8
9. Molina R, Feliu J. La reinserción laboral: un nuevo reto en el paciente con cáncer. Psicooncología 2011;8:45-51. Disponible en: http://revistas.ucm.es/index.php/PSIC/article/view/21345
10. Rashid H, Eichler M, Hechtner M, Gianicolo E, Wehler B, Buhl R, et al. Returning to work in lung cancer survivors-a multi-center cross-sectional study in Germany. Support Care Cancer 2021;29:3753-65. https://doi.org/10.1007/s00520-020-05886-z
11. Moura AOR, Oliveira-Silva LC. Work centrality, goals and professional fulfillment: Intersections between work and career. Revista de Administração Mackenzie 2018; 20(1). https://doi.org/10.1590/1678-6971/eRAMG190087 Rev Adm Mackenzie
12. Feuerstein M, Todd BL, Moskowitz MC, Bruns GL, Stoler MR, Nassif T et al. Work in cancer survivors: a model for practice and research. J Cancer Surviv Res Pract 2010;4:415-37. https://doi.org/10.1007/s11764-010-0154-6
13. Lee MK, Yun YH. Working situation of cancer survivors versus the general population. J Cancer Surviv 2015;9:349-60. https://doi.org/10.1007/s11764-014-0418-7.
14. European Agency for Safety and Health at Work. Rehabilitation and return to work after cancer: literature review. [Internet]. LU: Publications Office; 2017 [Acceso 20 de febrero de 2023]. Disponible en: https://data.europa.eu/doi/10.2802/712
15. 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;12:54-64. https://doi.org/10.1016/j.ejcsup.2014.03.005.

16. Miller KD, Nogueira L, Mariotto AB, Rowland JH, Yabroff KR, Alfano CM, et al. Cancer treatment and survivorship statistics 2019. CA Cancer J Clin 2019;69:363-85. https://doi.org/10.3322/caac.21565
17. Albrecht TA, Boyiadzis M, Elswick RK, Starkweather A, Rosenzweig M. Symptom Management and psychosocial needs of adults with acute myeloid leukemia during induction treatment: a pilot study. Cancer Nurs 2017;40:E31-8. https://doi.org/10.1097/NCC.0000000000000428.
18. Martínez López P, Universidad de Valencia, Andreu Vaillo Y, Universidad de Valencia. Supervivencia en cáncer: la necesidad de una atención integral y la importancia de asumir un rol activo. Psychol Pap 2018;40(1). https://doi.org/10.23923/pap.psicol2019.2885.
19. Frederiksen LE, Mader L, Feychting M, Mogensen H, Madanat-Harjuoja L, Malila N, et al. Surviving childhood cancer: a systematic review of studies on risk and determinants of adverse socioeconomic outcomes. Int J Cancer 2019;144:1796-823. https://doi.org/10.1002/ijc.31789.
20. Devine KA, Christen S, Mulder RL, Brown MC, Ingerski LM, Mader L, et al. Recommendations for the surveillance of education and employment outcomes in survivors of childhood, adolescent, and young adult cancer: A report from the International Late Effects of Childhood Cancer Guideline Harmonization Group. Cancer 2022;128:2405-19. https://doi.org/10.1002/cncr.34215
21. Mehnert A. Employment and work-related issues in cancer survivors. Crit Rev Oncol Hematol 2011;77:109-30. https://doi.org/10.1016/j.critrevonc.2010.01.004
22. Bradley CJ, Brown KL, Haan M, Glasgow RE, Newman LS, Rabin B, et al. Cancer survivorship and employment: intersection of oral agents, changing workforce dynamics, and employers' perspectives. J Natl Cancer Inst 2018;110:1292-9. https://doi.org/10.1093/jnci/djy172
23. Dumas A, Vaz Luis I, Bovagnet T, El Mouhebb M, Di Meglio A, Pinto S, et al. Impact of breast cancer treatment on employment: Results of a Multicenter Prospective Cohort Study (CANTO). J Clin Oncol 2020;38:734-43. https://doi.org/10.1200/JCO.19.01726.
24. So SCY, Ng DWL, Liao Q, Fielding R, Soong I, Chan KKL, et al. Return to work and work productivity during the first year after cancer treatment. Front Psychol 2022;13. https://doi.org/10.3389/fpsyg.2022.866346.
25. Shim HY, Lee CW, Yu ES, Park BY, Yang EJ. Cancer survivors and returning to work perspectives from occupational health physicians in Korea. J Korean Med Sci [Internet]. 2019 [citado 19 de julio de 2022];34(11):e98. Disponible en: https://jkms.org/DOIx.php?id=10.3346/jkms.2019.34.e98
26. de Souza JA, Yap BJ, Wroblewski K, Blinder V, Araújo FS, Hlubocky FJ et al. Measuring financial toxicity as a clinically relevant patient-reported outcome: The validation of the Comprehensive Score for financial Toxicity (COST). Cancer 2017;123:476-84. https://doi.org/10.1002/cncr.30369
27. Kamal KM, Covvey JR, Dashputre A, Ghosh S, Shah S, Bhosle M, et al. A Systematic review of the effect of cancer treatment on work productivity of patients and caregivers. J Manag Care Spec Pharm 2017;23:136-62. https://doi.org/10.18553/jmcp.2017.23.2.136
28. Andreu Y, Picazo C, Murgui S, Soto-Rubio A, Grarcía-Conde A, Romero R. Exploring the independent association of employment status to cancer survivors' health-related quality of life (in press).
29. Butow P, Laidsaar-Powell R, Konings S, Lim CYS, Koczwara B. 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. https://doi.org/10.1007/s11764-019-00828-z

30. Pardo JMV, García ALG. Cáncer en población trabajadora. Incapacidad y riesgo de exclusión laboral y social. 2018;25.
31. Kiasuwa Mbengi R, Otter R, Mortelmans K, Arbyn M, Van Oyen H, Bouland C, 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. https://doi.org/10.1186/s13643-016-0210-z
32. López-Guillén García A, Vicente Pardo JM, López-Guillén García A, Vicente Pardo JM. Dificultades del retorno al trabajo tras cáncer de mama. Med Segur Trab 2020;66:47-62. https://dx.doi.org/10.4321/s0465-546x2020000100005
33. Chen WL, Chen YY, Wu WT, Ho CL, Wang CC. Life expectancy estimations and determinants of return to work among cancer survivors over a 7-year period. Sci Rep 2021];11:12858. https://doi.org/10.1038/s41598-021-92306-9.
34. de Moor JS, Alfano CM, Kent EE, Norton WE, Coughlan D, Roberts MC, et al. Recommendations for research and practice to improve work outcomes among cancer survivors. J Natl Cancer Inst 2018;110:1041-7. https://doi.org/10.1093/jnci/djy154
35. Mehnert A, de Boer A, Feuerstein M. Employment challenges for cancer survivors. Cancer 2013;119 Suppl 11:2151-9. https://doi.org/10.1002/cncr.28067
36. Steiner JF, Cavender TA, Nowels CT, Beaty BL, Bradley CJ, Fairclough DL, et al. The impact of physical and psychosocial factors on work characteristics after cancer. Psychooncology 2008;17:138-47. https://doi.org/10.1002/pon.1204
37. Kennedy F, Haslam C, Munir F, Pryce J. Returning to work following cancer: a qualitative exploratory study into the experience of returning to work following cancer. Eur J Cancer Care 2007;16:17-25. https://doi.org/10.1111/j.1365-2354.2007.00729.x
38. Paltrinieri S, Fugazzaro S, Bertozzi L, Bassi MC, Pellegrini M, Vicentini M, et al. Return to work in European Cancer survivors: a systematic review. Support Care Cancer 2018;26:2983-94. https://doi.org/10.1007/s00520-018-4270-6
39. Cadiz D, Brady G, Rineer JR, Truxillo D. A review and synthesis of the work ability literature. Work Aging Retire 2019; 5: 114-138. https://doi.org/10.1093/workar/way010
40. Avis NE, Smith KW, McGraw S, Smith RG, Petronis VM, Carver CS. Assessing quality of life in adult cancer survivors (QLACS). Qual Life Res 2005;14:1007-23. https://doi.org/10.1007/s11136-004-2147-2
41. Escobar A, Trujillo-Martín M del M, Rueda A, Pérez-Ruiz E, Avis NE, Bilbao A. Cross-cultural adaptation, reliability and validity of the Spanish version of the Quality of Life in Adult Cancer Survivors (QLACS) questionnaire: application in a sample of short-term survivors. Health Qual Life Outcomes 2015;13:182. https://doi.org/10.1186/s12955-015-0378-2.
42. Andreu Vaillo Y, Conchado Peiró A, Martinez Lopez P, Martinez Martinez MT, Moreno P, Arribas Alpuente L. Possible substantive improvements in the structure of the Quality of Life in Adult Cancer Survivors (QLACS) scale? A study based on its Spanish version. Qual Life Res 2021;1-11. https://doi.org/10.1007/s11136-021-03036-4
43. Loewenthal KM, Lewis CA. An introduction to psychological tests and scales. 2nd ed. London: Psychology Press; 2015. 184 p.
44. de Boer AGEM, Taskila TK, Tamminga SJ, Feuerstein M, Frings-Dresen MHW, Verbeek JH. Interventions to enhance return-to-work for cancer patients. Cochrane Database Syst Rev. 25 de septiembre de 2015;(9):CD007569. https://doi.org/10.1002/14651858.CD007569.pub3
45. Armaou M, Schumacher L, Grunfeld EA. Cancer survivors' social context in the return to work process: narrative accounts of social support and social comparison information. J Occup Rehabil 2018;28:504-12. https://doi.org/10.1007/s10926-017-9735-9

46. Götze H, Taubenheim S, Dietz A, Lordick F, Mehnert A. Comorbid conditions and health-related quality of life in long-term cancer survivors-associations with demographic and medical characteristics. J Cancer Surviv Res Pract 2018;12:712-20. https://doi.org/10.1007/s11764-018-0708-6
47. Mols F, Vingerhoets AJJM, Coebergh JW, van de Poll-Franse LV. Quality of life among long-term breast cancer survivors: a systematic review. Eur J Cancer 2005;41:2613-9. https://doi.org/10.1016/j.ejca.2005.05.017
48. Aziz NM. Late Effects of Cancer Treatments. En: Ganz PA, editor. Cancer Survivorship: Today and Tomorrow New York, NY: Springer; 2007]. p. 54-76. Disponible en: https://doi.org/10.1007/978-0-387-68265-5_6
49. Deimling GT, Sterns S, Bowman KF, Kahana B. The health of older-adult, long-term cancer survivors. Cancer Nurs 2005;28:415-24. https://doi.org/10.1097/00002820-200511000-00002
50. Ganz PA. Late effects of cancer and its treatment. Semin Oncol Nurs 2001;17:241-8. https://doi.org/10.1053/sonu.2001.27914.
51. Montazeri A. Health-related quality of life in breast cancer patients: a bibliographic review of the literature from 1974 to 2007. J Exp Clin Cancer Res 2008;27:32. https://doi.org/10.1186/1756-9966-27-32
52. Kollerup A, Ladenburg J, Heinesen E, Kolodziejczyk C. The importance of workplace accommodation for cancer survivors – The role of flexible work schedules and psychological help in returning to work. Econ Hum Biol 2021;43:101057. https://doi.org/10.1016/j.ehb.2021.101057.
53. Cohen M, Yagil D, Carel R. A multidisciplinary working model for promoting return to work of cancer survivors. Support Care Cancer 2021;29:5151-60. https://doi.org/10.1007/s00520-021-06074-3