



Article

Factors Influencing the Continuation of Work in Patients with Cancer Willing to Work: An Exploratory Study

Kazumi Yano

Nursing Science Department, International University of Health and Welfare Graduate School,
Tokyo 107-8402, Japan; kyano@iuhw.ac.jp

Abstract: Cancer patients, while receiving treatment, face several challenges with respect to their jobs and are sometimes forced to quit them. This study aimed to identify the factors affecting the continuation of work in patients with cancer who expressed a willingness to work. A total of 515 patients who were diagnosed with cancer within the last five years and who were willing to work were included. The factors that decreased the likelihood of working were being an adolescent or young adult, long-term absenteeism, fatigue, dyspnea, and economic problems. Factors that increased the likelihood of working were household income of 10 million yen or more, absenteeism of less than 7 months, and role functions. Our findings suggest that, to support the continuation of work, it is crucial to alleviate symptoms, such as fatigue and breathing difficulties, for patients with cancer, and provide support to ensure that their leave of absence does not exceed 7 months. In particular, psychological, social, and physical support to adolescents and young adults with cancer and those with economic problems are essential.

Keywords: cancer patients; influencing factors; willingness to work; work continuation; work support



Citation: Yano, Kazumi. 2023. Factors Influencing the Continuation of Work in Patients with Cancer Willing to Work: An Exploratory Study. *Social Sciences* 12: 115. <https://doi.org/10.3390/socsci12030115>

Academic Editor: Nigel Parton

Received: 23 January 2023

Revised: 15 February 2023

Accepted: 16 February 2023

Published: 23 February 2023



Copyright: © 2023 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Currently, in Japan, 325,000 patients with cancer are receiving treatment while holding a job (Ministry of Health, Labour and Welfare 2010), and one in three patients is forced to quit, close their business, or take a leave of absence (Sakurai et al. 2009). The annual loss of labor force due to cancer among these workers is 1.8 trillion yen (Ministry of Health, Labour and Welfare 2004). In addition, those unemployed for more than 6 months have difficulty returning to work (Sakurai et al. 2009), which is a critical social concern that may damage the quality of life (QOL) of patients and their families. For patients with cancer, the issue of returning to work is an important one, with several risk factors and interventions identified in the recent literature (Bhatt 2022; Kobayashi et al. 2022; Zecena Morales et al. 2022). Various measures have been implemented in response to the financial and employment problems experienced by patients with cancer, including the development of guidelines, measures to ensure that patients with cancer are supported to continue working (including working hours adjustments and flexible working arrangements), and support with medical fees. However, while patients seek information related to changes in their work and life, nurses, as providers, deliver solutions and information related to symptoms (Junko et al. 2019). Thus, there is a mismatch between the expertise of healthcare providers and the self-perceived needs of patients (Junko et al. 2019).

To balance cancer treatment and work, guidelines have been developed for those providing support, such as employers, workers, family members, and medical institutions. These guidelines developed by the Ministry of Health provide the necessary information for supporting patients with cancer in balancing treatment and work (e.g., symptoms and treatment status, whether to continue working after discharge or during outpatient treatment, desirable work measures, and other considerations) and aim to facilitate more individualized and specific work support. Since the publication of the original 2016

guidelines, the support for balancing medical treatment and work was established in 2018, and a further update in 2020 revised the content regarding medical fees to promote support for balancing medical treatment and work ([Ministry of Health 2022](#)).

Evidently, there is an increasing need to strengthen work support for patients with cancer. Thus, this study aimed to identify the factors that affect the continuation of work in willing patients with cancer.

2. Materials and Methods

2.1. Study Design

This was an exploratory study with a retrospective cross-sectional design to clarify the factors that affect the work status (non-working and working) of patients with cancer within 5 years of diagnosis and who were willing to work.

2.2. Data Source

An internet survey company (Macromill; <https://group.macromill.com/>, accessed on 1 November 2020) was commissioned to conduct the sampling and data collection, and only those registered in their cancer patient panel (patients with cancer on the panels of private research companies in Japan; not operated by the government) and eligible for this study were asked to participate in the survey (“Survey on cancer and work style”) in November 2020. We included patients, aged 20 to 69 years, who were diagnosed with cancer within the preceding five years. There was no restriction on the cancer type and no specific exclusion criteria for the study. A pre-survey was conducted, in which potential participants were asked if they were willing to work; only those that answered “Yes” were able to proceed to the main survey.

2.3. Survey Items

The items included in the survey were as follows: (1) working status, (2) age, (3) sex, (4) performance status (PS) ([Eastern Cooperative Oncology Group n.d.](#)), a measure of activity developed by the Eastern Cooperative Oncology Group (ECOG), (5) period of illness, (6) period of leave, (7) type of cancer, (8) marital status, (9) family support, (10) family income, and (11) the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (QLQ-C30) (Japanese version; use of Promissory Notes). These items were chosen based on prior research in the field. The selected variables are commonly used global indicators of a patient’s overall condition and putative influencing factors based on the authors’ experience in the field.

EORTC QLQ-C30

The EORTC QLQ-C30 tool used in this study is used worldwide ([Aaronson et al. 1993](#)), and its Japanese version has been shown to be reliable and valid ([Kobayashi et al. 1998](#)). The functioning scores include the following five items: physical functioning (PF), role functioning (RF), emotional functioning (EF), cognitive functioning (CF), and social functioning (SF). The symptom scale includes the following eight items: fatigue (FA), dyspnea (DY), nausea/vomiting (NV), pain (PA), insomnia (IN), appetite loss (AP), constipation (CO), and diarrhea (DI). The functioning score is a single item.

The higher the functioning score, the better the quality of life. On the symptom scale and for financial difficulties (FI), a higher score indicated a worse quality of life. Scoring was performed according to the European Organization for Research and Treatment Cancer scoring manual ([Fayers 2001](#)).

2.4. Statistical Analysis

Descriptive statistics for the QLQ-C30 and primary data were used to analyze the non-working and working groups, respectively. Group differences in absolute scores and the corresponding effect sizes (Cohen’s *d* statistic pooling the standard deviations of the non-working and working groups) were calculated. The threshold with the highest

Youden's J statistic (Youden 1950) (the sum of sensitivity and specificity minus one) was selected as the binary criterion for the non-working and working groups, that is, for each scale. If Youden's J of two adjacent thresholds was less than 0.05, a more sensitive threshold was selected. According to Lemeshow (Hosmer et al. 1989), an area under the curve (AUC) of 0.70–0.80 indicates acceptable discriminatory power, while an AUC of 0.80 or higher indicates excellent discriminatory power. A multivariate binary logistic regression model with the binary criterion as the dependent variable was used to examine each scale. A preliminary power analysis showed that 500 patients were required for the analysis (power, 80%; two-sided alpha, 0.05).

A univariate analysis was performed to confirm the association by working status, and a binomial logistic regression analysis of the explanatory variables (those with a significant probability of <5%) and with “non-working group = 1,” and “working group = 0” using the incremental variable method and likelihood ratios were conducted. Normality tests were performed using the Kolmogorov–Smirnov test.

The statistical significance level was set at <5% (two-tailed *p*-value). SPSS 25.0 (IBM Corp., Armonk, NY, USA) was used for all statistical analyses.

2.5. Ethical Considerations

This study was approved by the Research Ethics Review Committee of the University [details were blinded for peer review]. The purpose and ethical considerations of the study were explained to the participants before the completion of the questionnaire. To ensure voluntary cooperation, the method of “withdrawal” (opt-out by logging out) was explained to the subjects before the survey started. Then, the system proceeded to the main survey screen. The survey format was anonymous and self-administered to ensure privacy. Written informed consent was obtained from all subjects involved in the study.

Figure 1 shows the flow diagram for our study. As presented in Table 1, 515 participants, comprising 308 men (59.8%) and 207 women (40.2%), responded to the survey. The mean age of the participants was 54.7 ± 10.9 years. The patient characteristics are shown in Table 1.

Table 1. Patient characteristics.

	Work Status (n = 515)		<i>p</i> -Value ^c	<i>p</i> -Value ^a
	Non-Working n = 68 (13.2%)	Working n = 447 (86.8%)		
Age			0.09 ^a	0.045 ^b Ratio Scale
Age $\pm$ SD	52.3 $\pm$ 12.7	55.2 $\pm$ 10.6		
AYA * generation				
<40 years old	13 (19.1)	28 (6.3)	<0.01 ^b	
$\geq$ 40 years old	55 (80.9)	419 (93.7)		
Gender n (%)			<0.01 ^b	0.0000158
Men	44 (64.7)	163 (36.5)		
Women	24 (35.3)	284 (63.5)		
PS n (%)			<0.01	0.000015
0–1	33 (48.5)	332 (74.3)		
2	25 (36.8)	98 (21.9)		
3	5 (7.4)	13 (2.9)		
4	5 (7.4)	4 (0.9)		
Period of illness n (%)			0.23 ^b	0.234
Diagnosis within 2 years	45 (66.2)	258 (57.7)		
Diagnosis 3 to 5 years	23 (33.8)	189 (42.3)		

Table 1. Cont.

	Work Status (n = 515)		<i>p</i> -Value ^c	<i>p</i> -Value ^a
	Non-Working n = 68 (13.2%)	Working n = 447 (86.8%)		
Period of absence (including past absences) n (%)			<0.01	2.2 × 10 ^{−16}
0 days	17 (25.0)	135 (30.2)		
0–1 month	3 (4.4)	119 (26.6)		
2–3 months	4 (5.9)	66 (14.8)		
4–6 months	3 (4.4)	40 (8.9)		
7–11 months	1 (1.5)	32 (7.2)		
1 year or more	40 (58.8)	55 (12.3)		
Type of cancer n (%)			0.02 ^c	0.0181 ^c
Head, neck, and oral cancer	5 (7.4)	31 (6.9)		
Respiratory cancer	3 (4.4)	13 (2.9)		
Gastrointestinal cancer	18 (26.5)	163 (36.5)		
Renal and urological cancer	4 (5.9)	25 (5.6)		
Male genital cancer	2 (2.9)	48 (10.7)		
Female genital cancer	12 (17.6)	35 (7.8)		
Breast cancer	18 (26.5)	73 (16.3)		
Hematological cancer	4 (5.9)	19 (4.3)		
Other	2 (2.9)	40 (8.9)		
Marital status n (%)			0.47 ^b	0.469
Married	52 (76.5)	320 (71.6)		
Unmarried	16 (23.5)	127 (28.4)		
Support family n (%)			0.1 ^b	0.096
Yes	40 (58.8)	309 (69.1)		
No	28 (41.2)	138 (30.9)		
Family income n (%)			0.02	0.0224 ^c
Under 2 million	7 (10.3)	17 (3.8)		
2–4 million	16 (23.5)	94 (21.0)		
4–6 million	16 (23.5)	91 (20.4)		
6–8 million	6 (8.8)	66 (14.8)		
8–10 million	8 (11.8)	56 (12.5)		
10–12 million	3 (4.4)	33 (7.4)		
12–15 million	0 (0)	15 (3.4)		
15–20 million	0 (0)	16 (3.6)		
Over 20 million	0 (0)	8 (1.8)		
Don't know/No answer	12 (17.6)	51 (11.4)		

^a Mann–Whitney U test, ^b Fisher's exact test, ^c χ^2 test; * AYA, adolescents and young adults; PS, performance status.

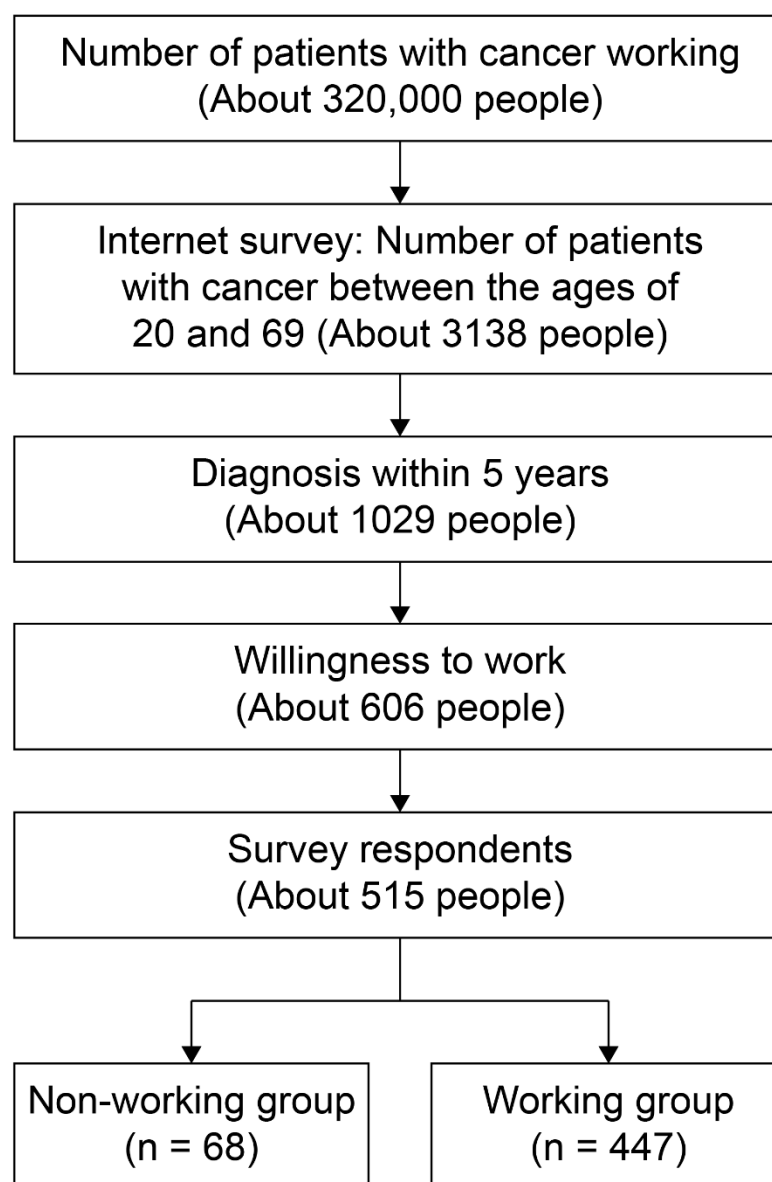


Figure 1. Study flow diagram.

3. Results

3.1. Non-Working Group

The results of the survey showed that 68 (13.2%) respondents were unemployed despite their willingness to work. The mean age of these patients was 52.3 ± 12.7 years. Of the 68 participants in the non-working group, 44 (64.7%) patients were men and 24 (35.3%) were women. The PS was 0–1 (able to work without problems, able to walk with limited strenuous activity, able to do light work, and sitting) in 33 patients (48.5%), 2 (able to walk and perform all personal activities but finding it difficult to work) in 25 patients (36.8%), 3 (able to perform limited personal activities) in five patients (7.4%), and 4 (unable to move entirely and finding it difficult to engage in personal activities) in four patients (7.4%). Five patients (7.4%) were unable to move entirely and had difficulty with personal care, and five (7.4%) were completely confined to a bed or chair. The types of cancer were head, neck, and oral (5, 7.4%); respiratory (3, 4.4%); digestive (18, 26.5%); urinary (4, 5.9%); male genital (2, 2.9%); female genital (12, 17.6%); breast (18, 26.5%); hematological (4, 5.9%); and other (2, 2.9%). With respect to marital status and family situation, 52 (76.5%) were married, 16 (23.5%) were unmarried, 40 (58.8%) were dependent, and 28 (41.2%) were independent.

Family income was less than 2 million for 7 respondents (10.3%), between 2 and 4 million for 16 (23.5%), between 4 and 6 million for 16 (23.5%), 6–8 million for 6 (8.8%), 8–10 million for 8 (11.8%), 10 million or more for 3 (4.4%), and 12 respondents (17.6 %) did not know or did not answer. The period of illness was within 2 years of diagnosis in 45 patients (66.2%) and within 3–5 years in 23 patients (33.8%). The duration of absence from work (including past absences) was 0 days in 17 (25.0%), 0–1 month in 3 (4.4%), 2–3 months in 4 (5.9%), 4–6 months in 3 (4.4%), 7–11 months in 1 (1.5%), and > 1 year in 40 (58.8%) patients.

3.2. Working Group

The results showed that 447 respondents (86.8%) were employed. The mean age of the patients was 55.2 ± 10.6 years. A total of 163 (36.5%) patients were men and 284 (63.5%) were women. The PS was 0–1 (able to work without problems, able to walk with limited strenuous activity, able to perform light and sedentary work) in 332 (74.3%) patients, 2 (able to walk and perform all personal activities but find it difficult to work) in 98 (21.9%), 3 (able to perform only limited personal activities) in 13 (2.9%), and 4 (unable to move entirely and find it difficult to engage in personal activities) in 4 (0.9%) patients. The types of cancer included head, neck, and oral (31; 6.9%); respiratory (13; 2.9%); digestive (163; 36.5%); urinary (25; 5.6%); male genital (48; 10.7%); female genital (35; 7.8%); breast (73; 16.3%); hematological (19; 4.3%); and other (40; 8.9%) cancers. Regarding marital status and family situation, 321 (71.8%) were married, 126 (28.2%) were unmarried, 309 (69.1%) were dependent, and 138 (30.9%) were independent. The family income of 17 respondents (3.8%) was less than 2 million; 94 (21.0%), between 2 and 4 million; 91 (20.4%), between 4 and 6 million; 66 (14.8%), between 6 and 8 million; 56 (12.5%), between 8 and 10 million; 72 (16.2%), over 10 million; and 51 (11.4%), unknown. The number of respondents who did not answer was 51 (11.4%). The period of illness was within two years of diagnosis in 258 patients (57.7%) and within three to five years in 189 patients (42.3%). The period of leave (including the past) were 0 days for 135 (30.2%), 0–1 month for 119 (26.6%), 2–3 months for 66 (14.8%), 4–6 months for 40 (8.9%), 7–11 months for 32 (7.2%), and >1 year for 55 (12.3%) patients.

3.3. Summary of the QLQ-C30 Scores by Work Type

Supplementary Table S1 presents the scores for the QLQ-C30 in the working and non-working groups in our study. The significant results from this table are described in Section 3.4.

3.4. The Relationship between Work Status and Each Variable

As shown in Table 1 and Supplementary Table S1, the variables with a significant difference in relation to work status were age (significantly higher in the working group; $p < 0.05$), AYA generation (higher proportion of ≥ 40 -year-olds in the working group; $p < 0.01$), sex (higher proportion of females and lower proportion of males in the working group; $p < 0.01$), PS (a higher proportion of patients with PS 0–1 in the working group; $p < 0.01$), length of absence from work (a higher proportion of patients absent from work for 1 year or longer in the non-working group; $p < 0.01$), cancer type ($p < 0.05$), household income (a lower proportion of patients with a family income of ≤ 2 million Yen in the working group; $p < 0.05$), PF (higher in the working group; $p < 0.05$), RF (higher in the working group; $p < 0.01$), EF (higher in the working group; $p < 0.05$), CF (higher in the working group; $p < 0.05$), SF (higher in the working group; $p < 0.01$), FA (lower in the working group; $p < 0.05$), DY (lower in the working group; $p < 0.01$), DI (lower in the working group; $p < 0.05$), and FI (lower in the working group; $p < 0.01$). No significant differences were observed in NV, PA, IN, AP, or CO.

3.5. Factors Related to the Continuation of Work for Patients with Cancer

As shown in Table 2, scatter plots of the variables were observed and there was no significant linear relationship among the variables. Variables associated with a non-

working status were AYA generation (OR = 3.64, 95%CI = 1.35–9.77), family income of more than 10 million (OR = 0.18, 95%CI = 0.05–0.66), period of leave (OR = 1.43, 95%CI = 1.22–1.67), leave of absence of less than 7 months (OR = 0.23, 95%CI = 0.13–0.43), RF (OR = 0.97, 95%CI = 0.95–0.98), FA (OR = 1.01, 95%CI = 1.003–1.023), DY (OR = 1.02, 95%CI = 1.001–1.034), and FI (OR = 1.02, 95%CI = 1.004–1.021).

Table 2. Factors related to the continuation of work in patients with cancer.

	B	OR (95%CI)	p Value
AYA (<40 years old)	1.292	3.64 (1.35–9.77)	* 0.010
Family income ($\geq$ 10 million)	−1.731	0.18 (0.05–0.66)	** 0.000
Period of leave	0.356	1.43 (1.22–1.67)	** 0.000
Leave of absence of less than 7 M	−1.838	0.23 (0.13–0.43)	** 0.000
Role functioning (RF)	−0.033	0.97 (0.95–0.98)	** 0.000
Fatigue (FA)	0.013	1.01 (1.003–1.023)	* 0.009
Dyspnea (DY)	0.017	1.02 (1.001–1.034)	* 0.039
Financial difficulties (FI)	0.014	1.02 (1.004–1.021)	** 0.000

* Logistic regression analysis (incremental variable method with likelihood ratio). * $p < 0.05$. ** $p < 0.01$. OR: Odds Ratio, 95%CI: 95% Confidence Intervals. Modulo χ^2 test $p < 0.01$. Discrimination rate: 86.8%. Hosmer–Lemeshow test $p = 0.670$. Dependent variable: work status (non-working group = 1; working group = 0). Independent variables: adolescents and young adults (AYA) generation, sex, period of leave, leave of absence (<7 M:1, ≥ 7 M:0), cancer type, annual income, etc. The table displays only the QLQ-C30 items for which significant differences were found.

4. Discussion

In this study, we identified factors that increased or decreased the likelihood of working among patients with cancer. The factors that decreased the likelihood of working were AYA generation, long-term absenteeism, fatigue, dyspnea, and economic problems. Factors that increased the likelihood of working were household income of 10 million yen or more, absenteeism of less than 7 months, and role functions. Past studies have suggested that being of the AYA generation decreases the likelihood of working, thus, it is essential to consider this in assessment when providing work support (Roelen et al. 2011; Masayasu and Yoshitaka 2015; Arndt et al. 2019). Patients with cancer may also experience long-term absenteeism and unemployment, which can be affected by medical treatment and its side effects (Yabroff et al. 2004; Nekhlyudov et al. 2016; Tsuchiya et al. 2020). The results of this study also showed that long-term absenteeism decreased the likelihood of working. In contrast, absenteeism for less than 7 months was cited as a factor that increased the likelihood of working. An absence of 6 months or more is likely to lead to job separation; thus, it is essential to provide extensive work support. Factors that decreased the likelihood of working with respect to physical symptoms include fatigue and dyspnea (Stone et al. 2000; Stasi et al. 2003; Gupta et al. 2007; Mock et al. 2007; Bower 2014), but malaise and pain can also have a significant impact on work, QOL, and physical activity, such as early retirement, reduced productivity, disadvantages at work, and concerns about medical costs (psychological distress) (Duijts et al. 2014; Lou et al. 2017; Damani et al. 2018; Dorland et al. 2018; Halpern et al. 2022). In contrast, physical functioning supports social and role functions, thereby reducing anxiety and depression and facilitating earlier return to work (Cooper et al. 2013; Hung et al. 2020; Rollin et al. 2020).

Interestingly, economic problems were cited as a factor that decreased the likelihood of working, whereas earning an annual household income of ten million yen or more increased the likelihood of working. Notably, annual income generally decreases following a diagnosis of cancer, with a rate of decrease as high as 40% (Sakurai et al. 2009; Matsuda et al. 2015; Shimizu et al. 2018). This is a significant problem for patients, considering the additional expenses required for treatment and other purposes (CSR Project n.d.; Shizuoka Cancer Center Research Group on the Sociology of Cancer n.d.; Takahashi et al. 2018; Saito et al. 2014). Economic problems resulting from a decreased income and increases in expenditure after a cancer diagnosis are associated with increased physical and emotional distress, decreased QOL, and reduced adherence to treatment

(Neugut et al. 2011; Holland et al. 2013; Fenn et al. 2014; Dusetzina et al. 2014; Zafar et al. 2015; Lathan et al. 2016; Meeker et al. 2016). In addition, the annual income also affects survival (Ansell et al. 1993; Ramsey et al. 2016), and severe financial stress (i.e., bankruptcy) can increase the risk of death in patients with cancer by a factor of two (Ramsey et al. 2016).

Based on these considerations, we believe that it is crucial for patients with cancer who have the desire and ability to work to know their role functions and be provided with comprehensive work support, including all concerns and sufferings, considering the factors that increase and decrease the likelihood of working.

There are a few limitations to this study. The study population were identified by a private research company and we do not have access to detailed information, for example, about how representative the study population is and whether they are reimbursed for their participation in the research. This could have implications for bias in our results. The small sample size makes it difficult to draw conclusions that are similar to those for the general population. In addition, the results were limited by the bias between the non-working and working groups and in the type of cancer and leave period. Therefore, future studies are required to clarify these aspects. Moreover, it is vital to increase the sample size of both the non-working and working groups and clarify QOL by type of cancer to propose more individualized and specific work support. Furthermore, restricting this study to patients who were diagnosed in the preceding five years may have potentially influenced our conclusions. The factors affecting their willingness to work may vary over time following a cancer diagnosis. In the future, further studies should include patients who have been diagnosed for some time (particularly patients who were diagnosed with cancer more than five years ago). By following up with the same patients longitudinally, at multiple time points, the results may be more generalizable. An additional limitation is the relatively limited selection of variables that we have studied. As mentioned earlier, these variables were selected based on prior research in the field. However, there are other variables which we did not study that could be relevant to the working status of patients with cancer. For example, specific features about the patient's job such as the industry they work in and the work environment are likely to influence their working status. Future studies should incorporate variables external to the patient, including more details about their specific employment, working conditions, and the workplace regulations that apply to them. Clearly, large study populations would be required to perform adequately powered statistical analyses in the presence of many variables.

For patients with cancer to continue working, it is essential to alleviate symptoms such as fatigue and dyspnea and support them to continue working to ensure that the period of leave is not prolonged (not exceeding 7 months). It is also important to provide psychological, social, and physical support to AYA and those with economic problems.

4.1. Implications for Occupational Health Nursing Practice or Implications for Occupational Health Practice

Our results indicate that several factors are associated with continuing to work. Further research is required to better understand the reasons for these associations and how best to support individuals with cancer. From a clinical occupational health nursing practice perspective, our study highlights the need to provide specific and specialist nursing care while focusing on the factors that affect the continuation of work following diagnosis (including age, household income, duration of absence from work, leave of absence <7 months, role functioning, fatigue, dyspnea, and financial difficulties).

4.2. Applications to Professional Practice

For patients with cancer to continue working, it is essential to provide them with the appropriate information and support. To support patients to continue working and ensure that the period of leave does not exceed 7 months, it is also important to address and alleviate symptoms, such as fatigue and dyspnea. Patients should also be made aware of the importance of addressing symptoms, such as fatigue and dyspnea, as these can add

to difficulties with continuing work. It is also important to provide psychological, social, and physical support to adolescents, young adults, and to those with economic problems.

5. Conclusions

It is widely known that patients with cancer, particularly those on active treatment, face a number of challenges including the continuation of work and are sometimes forced to stop working. In this study, we surveyed 515 patients with cancer who were willing to work and identified factors that increased or decreased the likelihood of working. The factors that decreased the likelihood of working were AYA generation, long-term absenteeism, fatigue, dyspnea, and economic problems. Factors that increased the likelihood of working were household income of 10 million yen or more, absenteeism of less than 7 months, and role functions. This study highlights the importance of not only alleviating symptoms, such as fatigue and breathing difficulties, in patients with cancer, but also providing them with adequate support to ensure that their leave of absence does not exceed 7 months. Furthermore, the need for psychological, social, and physical support among adolescents and young adults and those with economic problems is also critical.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/socsci12030115/s1>, Table S1: QLQ-C30 by work status.

Funding: This research was funded by MEXT KAKENHI Grant Number 19K24266.

Institutional Review Board Statement: The study was approved by the Research Ethics Review Committee of my university [Identification number: 20-Ig-83, Date of approval: 2020.11.23].

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Aaronson, Neil K., Sam Ahmedzai, Bengt Bergman, Monika Bullinger, Ann Cull, Nicole J. Duez, Antonio Filiberti, Henning Flechtner, Stewart B. Fleishman, Johanna C. J. M. De Haes, and et al. 1993. The European Organization for Research and Treatment of Cancer QLQ-C30: A Quality-of-Life Instrument for Use in International Clinical Trials in Oncology. *Journal of the National Cancer Institute* 85: 365–76. [\[CrossRef\]](#) [\[PubMed\]](#)
- Ansell, David, Steven Whitman, Rebecca Lipton, and Richard Cooper. 1993. Race, income, and survival from breast cancer at two public hospitals. *Cancer* 72: 2974–78. [\[CrossRef\]](#)
- Arndt, Volker, Lena Koch-Gallenkamp, Heike Bertram, Andrea Eberle, Bernd Holleczeck, Ron Pritzkeleit, Mechthild Waldeyer-Sauerland, Annika Waldmann, Sylke Ruth Zeissig, Daniela Doege, and et al. 2019. Return to work after cancer. A multi-regional population-based study from Germany. *Acta Oncologica* 58: 811–18. [\[CrossRef\]](#) [\[PubMed\]](#)
- Bhatt, Neel S. 2022. Prevalence and Determinants of Return to Work as a Patient-Centered Outcome in Survivors of Hematopoietic Cell Transplantation. *Current Hematologic Malignancies Reports* 17: 228–42. [\[CrossRef\]](#) [\[PubMed\]](#)
- Bower, Julianne E. 2014. Cancer-related fatigue—Mechanisms, risk factors, and treatments. *Nature Reviews Clinical Oncology* 11: 597–609. [\[CrossRef\]](#) [\[PubMed\]](#)
- Cooper, Alethea F., Matthew Hankins, Lorna Rixon, Emma Eaton, and Elizabeth A. Grunfeld. 2013. Distinct work-related, clinical and psychological factors predict return to work following treatment in four different cancer types. *Psycho-Oncology* 22: 659–67. [\[CrossRef\]](#) [\[PubMed\]](#)
- CSR Project. n.d. A Survey on Work and Family Finances of Cancer Patients. Available online: <http://workingsurvivors.org/img/110215re-20120416.pdf> (accessed on 21 April 2020).
- Damani, Anuja, Arunangshu Ghoshal, Naveen Salins, Jayita Deodhar, and MaryAnn Muckaden. 2018. Prevalence and Intensity of Dyspnea in Advanced Cancer and its Impact on Quality of Life. *Indian Journal of Palliative Care* 24: 44–50. [\[CrossRef\]](#)
- Dorland, H. F., F. I. Abma, C. A. M. Roelen, R. E. Stewart, B. C. Amick, U. Bültmann, and A. V. Ranchor. 2018. Work-specific cognitive symptoms and the role of work characteristics, fatigue, and depressive symptoms in cancer patients during 18 months post return to work. *Psycho-Oncology* 27: 2229–36. [\[CrossRef\]](#)
- Duijts, Saskia F. A., Martine P. Van Egmond, Evelien Spelten, Peter Van Muijen, Johannes R. Anema, and Allard J. van der Beek. 2014. Physical and psychosocial problems in cancer survivors beyond return to work: A systematic review. *Psycho-Oncology* 23: 481–92. [\[CrossRef\]](#)

- Dusetzina, Stacie B., Aaron N. Winn, Gregory A. Abel, Haiden A. Huskamp, and Nancy L. Keating. 2014. Cost Sharing and Adherence to Tyrosine Kinase Inhibitors for Patients With Chronic Myeloid Leukemia. *Journal of Clinical Oncology* 32: 306–11. [CrossRef]
- Eastern Cooperative Oncology Group. n.d. Performance Status (PS) Japanese Translation. Available online: http://www.jcog.jp/doctor/tool/C_150_0050.pdf (accessed on 30 March 2019).
- Fayers, P. M. 2001. Interpreting quality of life data: Population-Based Reference Data for the EORTC QLQ-C30. *European Journal of Cancer* 37: 1331–34. [CrossRef] [PubMed]
- Fenn, Kathleen M., Suzanne B. Evans, Ruth McCorkle, Michael P. DiGiovanna, Lajos Pusztai, Tara Sanft, Erin W. Hofstatter, Brigid K. Killelea, M. Tish Knobf, Donald R. Lannin, and et al. 2014. Impact of Financial Burden of Cancer on Survivors' Quality of Life. *Journal of Oncology Practice* 10: 332–38. [CrossRef] [PubMed]
- Gupta, Digant, Christopher G. Lis, and James F. Grutsch. 2007. The Relationship Between Cancer-Related Fatigue and Patient Satisfaction with Quality of Life in Cancer. *Journal of Pain and Symptom Management* 34: 40–47. [CrossRef] [PubMed]
- Halpern, Michael T., Janet S. de Moor, and K. Robin Yabroff. 2022. Impact of Pain on Employment and Financial Outcomes Among Cancer Survivors. *Journal of Clinical Oncology* 40: 24–31. [CrossRef] [PubMed]
- Holland, Jimmie C., Barbara Andersen, William S. Breitbart, Bruce Compas, Moreen M. Dudley, Stewart Fleishman, and Caryl D. Fulcher. 2013. Distress Management. *Journal of the National Comprehensive Cancer Network* 11: 190–209. [CrossRef] [PubMed]
- Hosmer, David W., Stanley Lemeshow, and Rodney X. Sturdivant. 1989. *Applied Logistic Regression*, 3rd ed. New York: John Wiley & Sons.
- Hung, Chia-Tai, Yen-Ju Chen, Jui-Chun Chan, Yuan-Yuan Fang, In-Fun Li, Hui-Hsuan Shih, Hsin-Yi Ku, Wen-Tzu Chiu, and Yun-Hsiang Lee. 2020. Psychological distress, social support, self-management ability and utilization of social resources for female patients with cancer in Oncology Outpatient Settings in Taiwan. *Supportive Care in Cancer* 28: 3323–30. [CrossRef]
- Junko, Nitta, Shimodaira Yuiko, and Yano Kazumi. 2019. Content Analysis of Difficulty Factors for Working Support of Nurses Who Provide Cancer Consultation. *Journal Japanese Red Cross Akita College Nurs. Japanese Red Cross Jr College Akita* 23: 1–11.
- Kobayashi, K., F. Takeda, S. Teramukai, I. Gotoh, H. Sakai, S. Yoneda, Y. Noguchi, H. Ogasawara, and K. Yoshida. 1998. A cross-validation of the European organization for research and treatment of cancer QLQ-C30 (EORTC QLQ-C30) for Japanese with Lung Cancer. *European Journal of Cancer* 34: 810–15. [CrossRef]
- Kobayashi, Masamitsu, Izumi Sezai, Takako Ishikawa, and Mariko Masujima. 2022. Psychological and educational support for cancer patients who return to work: A scoping review. *Work* 73: 291–300. [CrossRef]
- Lathan, Christopher S., Angel Cronin, Reginald Tucker-Seeley, S. Yousuf Zafar, John Z. Ayanian, and Deborah Schrag. 2016. Association of Financial Strain With Symptom Burden and Quality of Life for Patients With Lung or Colorectal Cancer. *Journal of Clinical Oncology* 34: 1732–40. [CrossRef]
- Lou, Vivian WQ, Elaine J. Chen, Hong Jian, Zhen Zhou, Jingfen Zhu, Guohong Li, and Yaping He. 2017. Respiratory Symptoms, Sleep, and Quality of Life in Patients With Advanced Lung Cancer. *Journal of Pain and Symptom Management* 53: 250–56.e1. [CrossRef] [PubMed]
- Masayasu, Muakami, and Ito Yoshitaka. 2015. Current Status and Issues of Work of Cancer Patients by Stage and Work Status Through a Survey of Patients at a Cancer Treatment Center Hospital in Yamagata Prefecture. *Journal of Health and Medical Sociology* 26: 37–47. [CrossRef]
- Matsuda, Yoshimi, Kumiko Tanaka, Yukari Watanabe, Ikumi Sato, and Mariko Tomuro. 2015. The Actual Employment Conditions of Cancer Survivors Living in the Tohoku Region Who Are Visiting the Outpatient Department After Being Diagnosed with Cancer. *Journal of Japanese Society of Cancer Nursing* 29: 73–78.
- Meeker, Caitlin R., Daniel M. Geynisman, Brian L. Egleston, Michael J. Hall, Karen Y. Mechanic, Marijo Bilusic, and Elizabeth R. Plimack. 2016. Relationships Among Financial Distress, Emotional Distress, and Overall Distress in Insured Patients With Cancer. *Journal of Oncology Practice* 12: e755–e764. [CrossRef]
- Ministry of Health. 2022. Guidelines for Supporting the Balancing of Medical Treatment and Work at Workplaces. Available online: <https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000115267.html> (accessed on 7 January 2023).
- Ministry of Health, Labour and Welfare. 2004. *Grant-In-Aid for Scientific Research on Health, Labour and Welfare, Joint Research Group on "Sociology of Cancer" Funded by Cancer Research Grant (Chief Researcher Ken Yamaguchi)*; Tokyo: Ministry of Health, Labour and Welfare.
- Ministry of Health, Labour and Welfare. 2010. *Survey on the Basics of National Life*; Tokyo: Ministry of Health, Labour and Welfare.
- Mock, Victoria, Amy Pickar Abernethy, Ashley Atkinson, Andrea M. Barsevick, Ann M. Berger, David Cella, and Bernadine Cimprich. 2007. Cancer-related fatigue clinical practice guidelines in oncology. *Journal of the National Comprehensive Cancer Network* 5: 1054–54. [CrossRef]
- Nekhyudov, Larissa, Rod Walker, Rebecca Ziebell, Borsika Rabin, Stephanie Nutt, and Jessica Chubak. 2016. Cancer survivors' experiences with insurance, finances, and employment: Results from a multisite study. *Journal of Cancer Survivorship* 10: 1104–11. [CrossRef]
- Neugut, Alfred I., Milayna Subar, Elizabeth Ty Wilde, Scott Stratton, Corey H. Brouse, Grace Clarke Hillyer, Victor R. Grann, and Dawn L. Hershman. 2011. Association Between Prescription Co-Payment Amount and Compliance With Adjuvant Hormonal Therapy in Women With Early-Stage Breast Cancer. *Journal of Clinical Oncology* 29: 2534–42. [CrossRef]
- Ramsey, Scott D., Aasthaa Bansal, Catherine R. Fedorenko, David K. Blough, Karen A. Overstreet, Veena Shankaran, and Polly Newcomb. 2016. Financial Insolvency as a Risk Factor for Early Mortality Among Patients With Cancer. *Journal of Clinical Oncology* 34: 980–86. [CrossRef]

- Roelen, Corné A., Petra C. Koopmans, Johan W. Groothoff, Jac J. van der Klink, and Ute Bültmann. 2011. Sickness absence and full return to work after cancer: 2-year follow-up of register data for different cancer sites. *Psycho-Oncology* 20: 1001–6. [CrossRef]
- Rollin, Laetitia, Geraldine De Blasi, Line Boucher, Evelyne Bouteyre, and Jean-François Gehanno. 2020. Return-to-work support in cancer patients: Which methodology? *Bulletin Du Cancer* 107: 200–8. [CrossRef]
- Saito, Nobue, Miyako Takahashi, Toshimi Sairenchi, and Takashi Muto. 2014. The Impact of Breast Cancer on Employment among Japanese Women. *Journal of Occupational Health* 56: 49–55. [CrossRef]
- Sakurai, Naomi, Kazuo Ichikawa, and Tei Goto. 2009. Proposal for Working and Work Support for Cancer Patients: For Those Who Live With the Disease to Live Their Own Lives. *Soc Bus Res* 48: 177–87.
- Shimizu, Sachiko, Mitsunori Miyashita, Daisuke Fujisawa, Maiko Fujimori, and Miyako Takahashi. 2018. Cancer Survivors' Experiences of Changes in Employment and Income, and the Factors Affecting Their Experience, Quality of Life and Mental Health. *Palliative Care Research* 13: 209–18. [CrossRef]
- Shizuoka Cancer Center Research Group on the Sociology of Cancer. n.d. Voices of 4,054 People Facing Cancer. Report on the Actual Conditions of Cancer Survivors' Worries and Burdens, Summary Version. Available online: https://www.scchr.jp/cms/wp-content/uploads/2016/06/2013gaiyo_taikenkoe.pdf (accessed on 20 April 2020).
- Stasi, Roberto, Luca Abriani, Patrizia Beccaglia, Edmondo Terzoli, and Sergio Amadori. 2003. Cancer-related fatigue. *Cancer* 98: 1786–801. [CrossRef]
- Stone, P., A. Richardson, E. Richardson, A. G. Ream, D. J. Kerr Smith, and N. Kearney. 2000. Cancer-Related Fatigue: Inevitable, Unimportant and Untreatable? Results of a Multi-centre Patient Survey. Cancer Fatigue Forum. *Annals of Oncology: Official Journal of the European Society for Medical Oncology* 11: 971–75. [CrossRef]
- Takahashi, Miyako, Miyako Tsuchiya, Yoshitsugu Horio, Hatsumi Funazaki, Kenjiro Aogi, Kazue Miyauchi, and Yasuaki Arai. 2018. Job resignation after cancer diagnosis among working survivors in Japan: Timing, reasons and change of information needs over time. *Japanese Journal of Clinical Oncology* 48: 43–51. [CrossRef]
- Tsuchiya, Miyako, Yoshitsugu Horio, Hatsumi Funazaki, Kenjiro Aogi, Kazue Miyauchi, Yasuaki Arai, and Miyako Takahashi. 2020. Impact of gender and employment type on job loss among cancer survivors. *Japanese Journal of Clinical Oncology* 50: 766–71. [CrossRef] [PubMed]
- Yabroff, K. Robin, William F. Lawrence, Steven Clauser, William W. Davis, and Martin L. Brown. 2004. Burden of Illness in Cancer Survivors: Findings From a Population-Based National Sample. *Journal of the National Cancer Institute* 96: 1322–30. [CrossRef] [PubMed]
- Youden, William J. 1950. Index for Rating Diagnostic Tests. *Cancer* 3: 32–35. [CrossRef] [PubMed]
- Zafar, S. Yousuf, Rebecca B. McNeil, Catherine M. Thomas, Christopher S. Lathan, John Z. Ayanian, and Dawn Provenzale. 2015. Population-Based Assessment of Cancer Survivors' Financial Burden and Quality of Life: A Prospective Cohort Study. *Journal of Oncology Practice* 11: 145–50. [CrossRef]
- Zecena Morales, Claudia, Karolina Lisy, Lachlan McDowell, Amanda Piper, and Michael Jefford. 2022. Return to work in head and neck cancer survivors: A systematic review. *Journal of Cancer Survivorship* 1–16, Online ahead of print. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.