RESEARCH ARTICLE

Factors Related to Employment Situation among Korean Cancer Survivors: Results from a Population-Based Study

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Abstract

   Background: Due to the increased incidence and survival rate of cancer, the number of cancer survivors has been increasing. In addition, many problems have been reported regarding the employment of these survivors. Therefore, this study aims to investigate the employment situation of cancer survivors and associated factors. **Methods:** We analyzed data from the Korean National Health and Nutrition Examination Survey (2010-2014), which is a nationwide cross-sectional health survey, and included a total of 1,060 participants who were diagnosed with cancer. Multivariate logistic regression analysis was conducted to investigate the factors associated with the participants' employment situation. **Results:** The employment rate among cancer survivors was 42.0%. The variables found to be associated with being employed were male gender, younger age, higher household income level, educational level at middle school level or under, and not having activity limitations. Conclusion: These findings suggest that, in addition to cancer-related factors, general characteristics such as gender, age, household income, and education level are important factors associated with the employment status of Korean cancer survivors.

Keywords: Employment- work- cancer- survivor

Introduction

   According to the World Health Organization (WHO)'s World Cancer Report in 2014, there were approximately 14 million cancer patients in 2012 alone. Furthermore, the incidence of cancer is expected to increase by 70% in the following two decades (Stewart and Wild, 2014). In South Korea, the incidence of cancer was 445.7 patients per 100,000 population in 2013 (male 449.9, female 441.5), and this rate shows a tendency to increase annually (Statistics Korea, 2016a). Despite the increase in the incidence of cancer, due to e.g., earlier diagnoses, progress in treatment modalities have helped to improve the survival rate of cancer patients each year. The five-year survival rate has improved from 41.2% in 1995 up to 69.4% in 2013. Moreover, the 10-year survival rate has also increased from 38.2% (1993-1995) to 56.9% (2004-2008) (National Cancer Information Center, 2016).

   Cancer survivors typically progress through a process that begins with a cancer diagnosis followed by surgical procedures, chemotherapy and/or radiation therapy, which may cause various physical, mental, and social side effects (Teo et al., 2015). So far, previous studies have predominantly focused on the physical and mental aspects of treatment. However, with the recent increase in survival rates, more attention is being devoted to recognizing cancer survivors as members of the community and to facilitate cancer survivors to adapt their social life (Clarke et al., 2015; Nekhlyudov et al., 2016; Tevaarwerk et al., 2016). Based on previous reports, employment positively affects the individual in terms of physical and mental well-being, with significant implications for economic stabilization and recovery of self-esteem (Amir et al., 2008; Cooper et al., 2013). For this reason, developed countries including the United States, have implemented laws that prohibit discrimination against cancer survivors (Gibson, 1998). According to previous studies the probability that cancer survivors will return to their job shows a range from 23-84% (Taskila and Lindbohm, 2007; Amir and Brocky, 2009; Mehnert, 2011). In addition, the factors associated with being employed included men, younger age, higher level of education, higher level of income, type of cancer, fatigue, activity limitation, relationship with employer, and uncertainty of the disease (Schultz et al., 2002; Taskila and Lindbohm, 2007; Amir et al., 2008; Short et al., 2008; Amir and Brocky, 2009; Grunfeld et al., 2010; Mehnert 2011; van Muijen et al., 2013; Lindbohm et al., 2014).

   In South Korea, a previous longitudinal study on the influence of cancer on the employment of status of cancer survivors aged between 25 and 55 years old based on national health insurance data from 2001 to 2006 revealed that cancer survivors, after being diagnosed with cancer, were more likely to lose their job and that chance of returning to the original work place was low (Park et al., 2009). According to a National Cancer Center study that

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was conducted with 305 male cancer patients, 53% of the study participants lost their job, and only 23% succeeded in finding a new one.

In this study, the researchers utilized source data from the Korean National Health and Nutrition Survey (KNHANES), which is conducted annually, to identify the employment situation of cancer survivors and the factors that affect these results according to two categories, i.e., general characteristics and cancer-related factors.

Materials and Methods

Data and study population

For this study, data from 5 years (2010-2014) of the KNHANES were gathered and used for the analysis. The KNHANES is conducted annually, with the aim of examining the health situation of the Korean population, as well as their health behavior, food, and nutrition situation, and to calculate representative and national statistics.

The inclusion criteria were that participants 1) were aged 19 and over, and 2) reported being diagnosed with cancer by a doctor. According to the definition of the American Cancer Society (ACS), cancer survivors include not only patients who completely recover from cancer but also patients who are being treated for cancer while living their normal lives (ACS, 2016). For the five-year period (2010-2014) of interest, the total number of participants who participated in the survey was 41,102. Of these, the number of cancer survivors, i.e., those who answered that they had been diagnosed with cancer by a doctor, was 1,092. In this study, 32 cases with missing values were excluded, and a total of 1,060 participants (male 390, female 670) were finally included in the analysis.

Source data were downloaded from the webpage of the KNHANES located within the Korea Centers for Disease Control and Prevention (KCDC) (http://knhanes. cdc.go.kr/) as an open raw data file. The KNHANES was conducted after Institutional Review Board (IRB) approval from the KCDC and all participants signed an informed consent form. In addition, this study was conducted after being reviewed by the IRB of Catholic University of Korea, which issued approval.

Measures
General characteristics

Gender, age, marital status, place of residence, income, and educational level were included. The age groups were divided into those in their 20/30s, 40/50s, and 60s and above. Marital status was divided into 'yes' (the respondent was married and living with a current spouse) or 'no' (the respondent was not living with a current spouse because the respondent was single, separated, widowed, or divorced). The places of residence were divided into urban and rural areas. Income levels were divided into quartiles based on the average monthly equalized household income (=average monthly household income/ √number of household members), which corrects the total household income for the number of household members. Educational level was divided into middle school graduates or lower and high school graduates or higher.

Cancer-related factors

The cancer-related factors included the type of cancer, time since the diagnosis, full recovery, ongoing treatment, perceived health, and activity limitation. Type of cancer was divided into eight categories (i.e., stomach cancer, liver cancer, colon cancer, lung cancer, breast cancer, uterine cancer, thyroid cancer, and other types of cancer). The time since the diagnosis of cancer was sub-divided into less than 5 years, 5-10 years, and 10 years or more. For full recovery, this variable was defined as whether the patient was still suffering from the disease since the initial diagnosis (yes; no). Additionally, ongoing treatment status was defined as whether the participant was still receiving cancer treatment. Perceived health was divided into three levels: good, moderate and bad. The activity limitation variable was grouped to indicate whether the patient experienced limitations in his or her daily or social life activities due to health issues.

Employment situation of the cancer survivors

To understand the employment situation of cancer survivors, employment status, occupational classification, status of workers, employment type, type of working time, and working hours per week were used as the variables for employed participants, while the cause of unemployment was included for the unemployed participants.

Employment status

The subjects were divided into employed (persons who during the reference week were working for a paid job for at least one hour, without pay in a family business for 18 hours or more) (OECD, 2017; Statistics Korea, 2016b) and unemployed (persons who did not work at all for an income during the survey period).

Occupational classification

The 6th version of the Korean standard classification of occupations was used to classify the occupations into administration/office jobs (managers, experts, office clerks, and other related occupations), services/sales (service providers and sales clerks), and laborers (skilled agricultural or fishery workers, technicians, equipment or machine operators, equipment assembly workers, unskilled laborers, and other occupations for the related functions).

Status of workers

This variable was divided into wage/salary workers (persons who were hired by other persons or companies and worked for them in return for a wage), self-employed persons and employers (business owners), and unpaid family workers (persons who worked for a business operated by a member of their family without a wage for at least 18 hours per week).

Employment type of wage/Salary workers

Participants were grouped into regular workers and non-regular workers. The definition of regular workers was permanent workers including those who were recruited in accordance with a certain employment process and complied with the human resource rules of the

company or those who could receive bonuses, severance allowances, or other benefits, with the term of employment contract being at least one year or longer. The definition of non-regular workers was temporary workers included those with employment contract terms more than one-month but less than a full year, those with an employment contract period less than a month, and day-job workers (Lee et al., 2010).

Type of contract of wage/Salary workers

The participants were defined as either full-time (persons with a contract requiring at least 36 hours of work per week) or part-time workers (persons working less than 36 hours per week).

Average working hours per week

The participants' total working hours per week, including overtime and night shifts, were classified into 'less than 40 hours', '40-52 hours', and 'more than 52 hours'.

Reasons for unemployment

The most substantive reasons that people were not working were classified into seven categories (not seeing the necessity of working, attending school or a training course, retiring due to age or other reasons, having health concerns, providing childcare, nursing other ill people, and other).

Statistical analyses

The KNHANES is a national cross-sectional survey that uses a complex sampling design. To appropriately represent the Korean population, the data were analyzed using the complex sample design while considering weight, cluster, and stratification (KCDC, 2013). The collected data were analyzed through SPSS 18.0 software. The characteristics of the subjects were analyzed using complex sample frequency analysis and descriptive statistics. The differences in the characteristics of the participants according to their employment status were analyzed through χ^2 tests and simple linear regression. To verify the factors that affected employment situation, a complex sample logistic regression analysis was conducted. In the first step, a univariate logistic regression analysis was performed to identify the variables that could significantly affect employment situation. These variables were entered into a multivariable logistic regression analysis after adjusting for other factors. Two-tailed p-values less than .05 were considered statistically significant.

Results

General characteristics

The general characteristics of participants are shown in Table 1. Of the participants 62.1% was female. For the age groups, participants in their 20/30s, 40/50s and 60s and above accounted for 8.0%, 44.4%, and 47.6% of the sample, respectively. In addition, 78.2% of the participants were married and living with their spouses, and 77.9% of the participants were living in cities. As for income level,

Table 1. General Characteristics and Cancer-Related Factors of Cancer Survivors (n=1,060)

Characteristic /Categories	Total (n=1,060, 100%)	
	N	%
General characteristics		
Gender		
Male	390	37.9
Female	670	62.1
Age (years)		
19-39	58	8
40-59	383	44.4
≥ 60	619	47.6
Marital status		
Married	839	78.2
Single/divorced/separated/widowed	221	21.8
Place of residence		
Urban	813	77.9
Rural	247	22.1
Income		
1st quartile	304	26.4
2nd quartile	272	26.3
3rd quartile	241	23.3
4th quartile	243	24
Education level		
≤ Middle school	579	51.5
≥ High school	481	48.5
Cancer-related factors		
Type of cancer		
Stomach	199	17.8
Liver	30	3.2
Colon	118	11.1
Lung	32	2.2
Breast	140	12.7
Cervix	123	11.6
Thyroid	175	17.9
Other	243	23.5
Time since diagnosis (years)		
< 5	453	44.9
9-10	283	25.9
≥ 10	324	29.2
Full recovery		
Yes	578	54.1
No	482	45.9
Ongoing treatment		
Yes	379	36.7
No	681	63.3
Perceived health		
Good	206	18.5
Moderate	471	45.7
Poor	383	35.8
Activity limitation		
Yes	211	19.1
No	849	80.9

Table 2. Employment Situation of Cancer Survivors (n=1,060)

Employment Status	Characteristic	Categories	N	%
Employment (n=410, 42.0%)	Occupation classification [a]	Administration/manager	114	29.8
		Service/sales	82	22.4
		Labor	214	47.7
	Status of workers [a]	Wage/salary worker	203	52.9
		Self-employed/employer	156	34.9
		Unpaid family worker	51	12.2
	Employment type of wage/salary workers [b]	Regular	132	63.8
		Non-regular	71	36.2
	Type of contract of wage/salary workers [b]	Full-time	154	77.4
		Part-time	49	22.6
	Average working hours per week [a]	< 40	188	45
		40-51	130	31.4
		≥ 52	92	23.5
Unemployment (n=650, 58.0%)	Reasons [c]	Health-related reasons	339	56
		Lack of necessity	145	19.9
		Child care, nursing	50	8.2
		Retirement	51	6.2
		Between jobs	44	6.3
		Student or trainee	4	1.3
		Other	17	2.1

a), Employed cancer survivors (n=410); b), Wage/salary workers among the employed (n=203); c), Cancer survivors without a job (n=650).

the first quantile, which was the lowest, accounted for 26.4%. Of all participants 51.5% had attained a middle school or lower level of education.

Cancer-related factors

Cancer survivors with thyroid cancer comprised 17.9%, stomach cancer 17.8%, and breast cancer 12.7% of the participants. Additionally, 44.9% of the participants had been diagnosed within the past five years and 29.2% more than a decade ago, 45.9% of the participants were not fully cured of the disease and still had cancer, and 36.7% of the participants were still receiving cancer treatment. For perceived health, 45.7% of the participants described their health as moderate, 35.8% of the participants as poor, and 18.5% of the participants as good; and 19.1% of the s participants said that they had limitations in their daily life and social activities (Table 1).

Employment situation of the cancer survivors

Table 2 shows the employment status of the cancer survivors, with 42% (n=410) being employed and 58.0% (n=650) being unemployed. Of the employed subjects, 29.8% worked in administration/office jobs, 22.4% in services/sales, and 47.7% of the subjects in labor. As for worker status, 52.9% of the participants were wage/salary workers, 34.9% of the participants were self-employed or employers, and 12.2% of the participants were unpaid family workers. Of the wage/salary workers, 63.8% were regular employees, 77.4% worked full-time, and 23.5% of the employed participants worked more than 52 hours per week.

The reasons unemployed cancer survivors were not able to participate in economic activities were, in most cases, due to health conditions, which accounted for 56.0% of the participants, while 19.9% did not perceive a necessity to work.

Factors associated the employment situation of the cancer survivors

The univariate logistic analysis showed that several factors were associated with cancer survivors' employment status, including male gender (OR=2.11, 95% CI 1.56-2.87), younger age (OR=3.13, 95% CI 1.65-5.94), living with a spouse (OR=2.13, 95% CI 1.42-3.18), higher income level (OR=4.01, 95% CI 2.68-6.00), educational level of middle school or under (OR=0.68, 95% CI 0.51-0.90), breast (OR=0.54, 95% CI 0.31-0.96) and cervix (OR=0.43, 95% CI 0.24-0.77) cancer site, having good perceived health (OR=2.59, 95% CI 1.69-3.98), and not having activity limitation (OR=3.46, 95% CI 2.21-5.42).

After adjusting for significant variables from the univariate analysis and performing a multivariate logistic regression analysis, the factors that increased the employment of cancer survivors included male gender (aOR=2.68, 95% CI 1.77-4.05), younger age (aOR=4.16, 95% CI 2.15-8.05), higher income level (aOR=2.59, 95% CI1.57-4.28), educational level of middle school or under (aOR=1.70, 95% CI 1.17-2.46), and not having activity limitation (aOR=2.50, 95% CI 1.49-4.18) (Table 3).

Discussion

The findings of this study were intended to be used

Table 3. Characteristics of Cancer Survivors According to Employment Situation (n=1,060)

Characteristic	Categories	Univariate			Multivariate		
		OR	95% CI	p value	OR	95% CI	p value
General characteristics							
Gender	Male	2.11	1.56-2.87	<.001	2.68	1.77-4.05	<.001
	Female	1			1		
Age (years)	19-39	3.13	1.65-5.94	<.001	4.16	2.15-8.05	<.001
	40-59	2.67	1.98-3.61	<.001	3.11	2.12-4.58	<.001
	≥ 60	1			1		
Marital status	Married	2.13	1.42-3.18	<.001	1.26	0.81-1.97	0.304
	Single/divorced/separated/widowed	1			1		
Region	Urban	0.75	0.53-1.04	0.088			
	Rural	1					
Income	1st quartile	1			1		
	2nd quartile	2.74	1.79-4.19	<.001	2.23	1.38-3.61	0.001
	3rd quartile	3.08	2.05-4.62	<.001	1.92	1.19-3.09	0.007
	4th quartile	4.01	2.68-6.00	<.001	2.59	1.57-4.28	<.001
Education level	≤ Middle school	0.68	0.51-0.90	0.007	1.7	1.17-2.46	0.005
	≥ High school	1			1		
Cancer-related factors							
Cancer Site	Stomach	0.93	0.56-1.52	0.766			
	Liver	0.9	0.36-2.24	0.815			
	Colorectal	0.82	0.46-1.45	0.49			
	Lung	0.98	0.39-2.49	0.965			
	Breast	0.54	0.31-0.96	0.035	0.89	0.48-1.64	0.711
	Cervix	0.43	0.24-0.77	0.005	0.84	0.45-1.59	0.596
	Other cancers	0.69	0.42-1.14	0.145			
	Thyroid	1			1		
Time	< 5	0.84	0.60-1.20	0.338			
since diagnosis (years)	9-10	1.09	0.73-1.63	0.669			
	≥ 10	1					
Full recovery	Yes	1.24	0.91-1.68	0.17			
	No	1					
Ongoing treatment	Yes	1.07	0.78-1.46	0.695			
	No	1					
Perceived health	Good	2.59	1.69-3.98	<.001	1.47	0.92-2.34	0.711
	Moderate	1.84	1.30-2.61	0.001	1.19	0.80-1.76	0.596
	Poor	1					
Activity limitation	Yes	1			1		
	No	3.46	2.21-5.42	<.001	2.5	1.49-4.18	0.001

as baseline data for factors associated with employment status of cancer survivors. In our study, 42.0% of cancer survivors were employed, and the unemployment rate (unemployed persons/cancer survivors 19 years and older x100) was 58.0%. A cohort study conducted by Taskila and Lindbohm (2007) found that the employment rate among cancer patients, was 78% and did not greatly differ from that of the normal population before the diagnosis, but was reduced to 64% in the 2.5 years after the diagnosis. In addition, it was significantly lower than the 73% employment rate of the normal population. Likewise, a study conducted by Maunsell et al., (2004)

in breast cancer survivors showed that survivors had a 1.29-fold chance of losing their job within the three years after the diagnosis compared to the normal population. Furthermore, Ahn et al., (2009) reported in a study on breast cancer survivors that although the employment rate of the female population was 52.1%, the employment rate among breast cancer survivors after completing treatment was significantly lower, i.e., only 33.2%. Also, a review of the related studies indicated that while it was difficult to provide a direct figure, cancer survivors compared to the general population, showed a lower employment rate and a higher unemployment rate.

As for the employment situation, in 42% of the cancer survivors that were actually working, 52.9% were wage/salary workers, 63.8% of whom were regular workers and 36.2% non-regular. These results are similar to the figures in the March 2016 Economically Active Population Survey, in which 68.0% of the subjects were working as regulars and 32.0% as non-regulars. Moreover, 23.5% of the employed persons were working more than 52 hours a week, which was 12 hours longer than the legal working limit of 40 hours a week. According to the 2014 OECD statistics, the average working hours of employed persons in South Korea was the third longest of all OECD member states and 1.6 times more than that of Germany (OECD, 2014). It is common for many cancer survivors and ordinary workers to be non-regulars or to work longer than the legal working hours. This is an issue that the government should address through policies to ensure that all workers, irrespective of health status, can work appropriate hours.

Based on the multivariate logistic regression analysis conducted to identify the factors affecting the employment situation of cancer survivors, certain characteristics, such as male gender, younger age, higher income level, middle school or lower level of education, and lack of activity limitation, were found to be statistically significant factors.

Male cancer survivors had a higher likelihood of being employed than female survivors. However, other studies on the influence of gender on employment status show conflicting results. That is, studies conducted by Choi et al., (2007) who used Korean National Health Insurance data, and Lee et al., (2008) who studied stomach cancer survivors, show findings that are in line with our study. However, Kim et al., (2014) reported that the difference due to gender and employment status were not significantly associated. Furthermore, many studies conducted in Western countries report that gender does not affect their employment situation (Spelten et al., 2002; Sesto et al., 2013; Tevaarwerk et al., 2016). In our study, participants in 20/30s and 40/50s, who represent the relatively younger groups, had increased odds of being employed compared to the older group of those 60 years old and above. This finding is in line with the results of previous studies (Schultz et al., 2002; Sesto et al., 2013; Yoo et al., 2013; Kim et al., 2014). For the older age group it is more likely for the diagnosis of cancer to occur at the same time as their retirement or at a time at which they are trying to reduce the intensity of their work. In addition, older individuals are more likely to stop working due to the physical limitations caused by cancer treatment (Kim et al., 2014).

In our study, as income level increases, the odds ratio of being employed also increases. This result is in line with the findings of previous studies (Choi et al., 2007; Ahn et al., 2009; Park et al., 2009) who all reported that a high income level was associated with a higher chance of employment. However, the results regarding educational level differed, as the lower educational level group was more likely to be employed than those with a higher educational level of high school or beyond. This relationship between educational level and employment situation conflicts with results of previous study. That

is, in a study on breast cancer survivors in South Korea, lower educational level was associated with a significant increase in the odds of unemployment (Ahn et al., 2009). Among stomach cancer survivors, the employment ratio was higher in those who were high school graduates or beyond, at 63.0%, compared to the 40.0% of the lower education group (Lee et al., 2008). This proportion is equal to that found in studies targeting the general population. According to Clarke et al., (2015) compared to persons with a level of education lower than high school, the chance of employment was two times higher for people who had a high school level of education or beyond and 2.6 times higher for college graduates, meaning that the higher the educational level of the participants was, the more likely it was for the participants to be employed. For cancer survivors with a higher education and income level, it is more likely that they are working in a white-collar job, which is associated with a higher social situation that makes it easier for these individuals to return to their original jobs. In addition, they may be able to take medical leave, thereby avoiding the possibility of unemployment (Park et al., 2009). However, in this study, most of the participants in the employment group (47.7%) had manual labor jobs. Therefore, we think that educational level did not have a large effect on the employment status of participants. Furthermore, while cancer survivors in other countries are highly motivated to work in order to maintain their health coverage, it is believed that this factor is not significant in settings with a national health insurance system, medical aid program, and employment insurance such as the setting found in South Korea (Choi et al., 2007; Park et al., 2009). All employed and self-employed individuals and their dependents can receive health care benefits (National Health Insurance Service, 2010). The findings in this paper imply that future researchers should consider not only the general and cancer-related characteristics of participants but also the relevant health insurance system in order to understand employment in cancer survivors. We have shown that the national health insurance service in South Korea, which covers all Korean citizens, reduces the burden of health care cost among cancer survivors.

In this study, cancer-related factors, such as the type of cancer, complete recovery and treatment, and the time elapsed since the diagnosis, were not associated to the participants' employment situation. Previous studies, in which the relationship between employment status and type of cancer were addressed, show different results. That is, cancers of the liver (Choi et al., 2007), breast (Sesto et al., 2013), prostate (Sesto et al., 2013), and colon (Taskila and Lindbohm, 2007; Sesto et al., 2013) were not significantly associated with employment, whereas liver (Park et al., 2009), pancreas (Park et al., 2009), lung (Schultz et al., 2002; Taskila and Lindbohm, 2007; Park et al., 2009), blood and lymph (Taskila and Lindbohm, 2007; Park et al., 2009), head and neck (Schultz et al., 2002), and central nervous system cancers (Taskila and Lindbohm, 2007; Park et al., 2009) were related to a lower chance of employment. The types of cancer that negatively affected chances of employment were associated with lower chances of survival, were more

focalized and had a higher chance of requiring systemic treatments. In particular, cancers of the central nervous system are more likely to cause problems with subjects' activities or cognitive abilities (Spelten et al., 2002). In contrast, Park et al., (2009) proved that all cancers, except thyroid cancer, were related to prolonged unemployment. This result is consistent with the results of the univariate logistic regression in our study, in which individuals with breast or cervical cancer were significantly more likely to be unemployed compared to those with thyroid cancer. In our study, the types of cancer were classified into stomach, colon, liver, lung, breast, uterus, thyroid, and other cancers. It is likely that the various types of cancer included in the 'other cancers' category could be composed of cancers with different severity levels. Future studies should divide cancer types in a more detailed manner to ensure that the relationship between the type of cancer and the employment status of the subjects can be identified. In addition, with regard to the current treatment status of our participants, in previous studies the chances of unemployment were reported as higher with systemic treatment compared to local treatment, such as chemical, radiation, and marrow transplant (Ahn et al., 2009; Short et al., 2005). It is necessary to consider what type of treatment is being treated, rather than simply asking whether the patient is being treated.

In our study, time elapsed since the diagnosis did not affect the employment situation. This finding is in line with previous studies (Ahn et al., 2009; Clarke et al., 2015). In earlier studies, the disease phase of the cancer (Choi et al., 2007), rather than the elapsed time, had been found to be negatively associated with the employment situation. This may be because the cancer survivors' condition is compromised and the life expectancy likely to be more limited with advanced stages (Choi et al., 2007). If the cancer survivors experience activity limitations, their chance of becoming employed is significantly lower. This result is in line with those of previous studies (Feuerstein, 2005; Lee et al., 2008; Short et al., 2008; Clarke et al., 2015). This notion is supported by the findings of this study, in which health issues accounted for 53.6% of the reasons for unemployment, and is in line with previous studies (Maunsell et al., 2004). Therefore, support programs for return to work such as a tailored multidisciplinary intervention (van Egmond et al., 2015) for cancer survivors needs to be developed.

As for the limitations of this study, as the participants only completed the survey once, it was not possible to identify the chronological order between employment situation and other factors, and it was not possible to determine causal relationships. As the researchers used secondary data, the operational definitions of the variables included in this study differed from those used in previous studies, thereby making further comparisons difficult.

Statement conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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