

# Functional capacity, self-rated health status, and psychosocial characteristics of employed cancer survivors in Japan

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## Abstract

**Objectives:** This study investigated restrictions in functional capacity, self-rated health status (SRHS), and psychosocial characteristics of employed cancer survivors in Japan and examined differences in these characteristics between cancer survivors and employees without cancer history.

**Methods:** A cross-sectional survey was carried out. Subjects were local government employees in Japan in 2013 (n=5,474). Using a self-administered questionnaire, we evaluated restrictions in functional capacity, SRHS, and the following psychosocial characteristics: social support, perceived stress, social capital, positive reasons for living (ikigai), and happiness. We examined whether cancer history was associated with restrictions in functional capacity, SRHS, and psychosocial characteristics.

**Results:** A total of 112 employees were cancer survivors. Of these, males of all ages and comparatively younger females had restrictions in functional capacity more frequently than the corresponding subjects without cancer history (males of all ages: 14.5% vs. 2.9%, p<0.001; females <50 years: 15.2% vs. 1.1%, p<0.001). Among males of all ages, cancer survivors reported bad SRHS more frequently than employees without cancer history (8.1% vs. 1.5%, p=0.003). No significant differences were found in psychosocial characteristics by cancer history.

**Conclusions:** Male and comparatively young female employed cancer survivors frequently experienced restrictions in functional capacity. Male employed cancer survivors self-rated their health status as bad more frequently than male employees without cancer history.

**Keywords:** Cancer survivor, Return to work, Self-rated health status (SRHS), Restrictions in functional capacity, Psychosocial characteristics

## Introduction

In Japan, cancer has been the leading cause of death for more than 30 years.<sup>1</sup> The lifetime risk of developing cancer has been estimated as 62% for men and 46% for women.<sup>1</sup> Each year, around 0.8 million people newly develop cancer and approximately 30% of these are of working age (aged between 15 and 64 years).<sup>1</sup> Recently, cancer treatment and management have become so advanced that more employees can return to work. According to one previous study, 63.5% (range: 24–94%) of cancer survivors return to work.<sup>2</sup> Another recent study reported that 18% and 63% of employees in Japan who left work owing to cancer diagnosis returned to work fully and partially, respectively, within a year after the diagnosis.<sup>3</sup>

The aim of public health is to create a society in which all people can participate as they wish. Therefore, it is important to support cancer survivors to return to work. In 2012, the Japanese government drew up the Second Basic Plan to Promote Cancer

Control Programs based on the Cancer Control Act.<sup>1</sup> This plan lists support for employees to return to work as one of the goals the government should achieve. The Japanese Ministry of Health, Labour and Welfare (MHLW) announced a guideline in February 2016 to help cancer survivors return to work while receiving cancer treatment.<sup>4</sup>

Improvement of work-related factors plays an important role in helping cancer survivors return to work.<sup>2,4,5</sup> This requires information on restrictions in functional capacity, self-rated health status (SRHS), and psychosocial characteristics of employed cancer survivors. However, to our knowledge, there have been few relevant studies in Japan. The purpose of this study was to describe restrictions in functional capacity, SRHS, and psychosocial characteristics of employed cancer survivors in Japan.

## Methods

### Study design

We carried out a cross-sectional investigation, using a dataset derived from a prospective cohort study conducted to clarify the incidence of non-communicable diseases and their determinants among Japanese employees. Participants provided informed consent and have been followed since 1997. Information about their lifestyle (including diet, physical activity, work and

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psychological conditions, and other relevant information) has been updated approximately every 5 years (i.e., 2002, 2007, and 2013).<sup>6,7</sup> Participants were followed until retirement unless they provided us with their personal address so that we could contact them periodically. In addition, new participants were added at each new study wave. All data analyzed in the present study were collected using a questionnaire survey in 2013.

### *Subjects*

Eligible participants were employees working for local government in Japan on April 1, 2013 (n=10,748). A total of 5,630 (52.4%) employees gave their written consent to participate in the present investigation. After excluding those with any missing responses to questions necessary for the present study, we analyzed data from 5,474 employees (50.9% of the initially eligible participants).

### *Study variables*

#### *Cancer history/cancer survivor*

Those who had been diagnosed with cancer or had received any cancer treatment were regarded as cancer survivors. They were asked to specify the type of cancer by choosing all applicable options from the following: stomach, colon, lung, liver, breast, prostate, and others. Those who chose "others" were asked to state the type of cancer.

#### *Restrictions in functional capacity*

Restrictions in functional capacity were assessed using the Scale of Independence in Daily Living for the Disabled Elderly published by the MHLW.<sup>8</sup> Restrictions in functional capacity is a multidimensional concept that includes sensory loss, impaired mobility, vascular problems, gait impairments, difficulties with activities of daily living (ADLs), and disturbances in bodily systems.<sup>9</sup> The present scale evaluates restrictions in functional capacity in domains such as ADLs and instrumental ADLs.<sup>10</sup> The scale was originally developed for health professionals like nurses and public health nurses to evaluate whether elderly adults with disability require care to live independently.<sup>8</sup> However, in the present study, the subject self-assessed restrictions by choosing one of the following options: (1) "I have no disability in living independently," (2) "I have some disability, I do not need any care to live independently, and I can go out of my house alone using public transportation," (3) "I have some disability, I do not need any care to live independently, and I can go out by myself only within the neighborhood," (4) "I can live independently in my house without care, I need care to go out of my house, and I spend the daytime off the bed," (5) "I can live in my house without care, I need care to go out of my house, and I spend most of the daytime sleeping on and off in bed," (6) "I need care to live in my house, I can keep a sitting position by myself although I usually spend the daytime on the bed, and I can move to a wheelchair by myself," (7) "I need care to live in my house, I can keep a sitting position by myself although I usually spend the daytime on the bed, and I cannot move to a wheelchair by myself," (8) "I spend the whole day on the bed, I need care with excreting, eating, and dressing, and I can roll over in bed," and (9) "I spend the whole day on the bed, I need care for excreting, eating, and dressing, and I cannot roll over in bed by myself." Individuals who chose option (1) were regarded as having no restrictions in functional capacity; those who chose other options were regarded as having some restrictions in functional capacity.

#### *SRHS*

SRHS is a subjective perception of an individual's overall

health and a powerful predictor of all-cause mortality in general populations.<sup>11,12</sup> Subjects responded to the question "What do you think of your general health status during the last month?" by choosing one of the following options: "great," "pretty good," "good," "not so good," and "bad." Subjects were divided into two groups according to whether their SRHS was bad.

#### *Psychosocial characteristics*

The psychosocial characteristics measured were social support, perceived stress, social capital, positive reasons for living (ikigai), and happiness.

##### *Social support*

To assess social support, we used the ENRICH Social Support Instrument (ESSI),<sup>13-15</sup> which consists of the following items: (1) "Is there someone available you can count on to listen to you when you need to talk?," (2) "Is there someone available to you to give you good advice about a problem?," (3) "Is there someone available to you who shows you love and affection?," (4) "Is there someone available to help with daily chores?," (5) "Can you count on anyone to provide you with emotional support (for instance, talking over problems or helping you make a difficult decision)?," (6) "Do you have as much contact as you would like with someone you feel close to and you can trust and confide in?," and (7) "Are you living with your spouse or partner?" For items 1 through 6, subjects chose one of the following options: "none (score=1)," "a little (score=2)," "some (score=3)," "most (score=4)," and "all of the time (score=5)." For item 7, subjects who lived with their spouse or partner received a score of 4 and those who did not received a score of 2. The total ESSI score was the sum of each item score. Higher total scores indicate availability of more social support.

##### *Perceived stress*

Perceived stress during the last month was assessed with the four-item Perceived Stress Scale (PSS-4).<sup>16,17</sup> Subjects chose one of five options ("never," "almost never," "sometimes," "fairly often," and "very often") in response to the following items: (1) "How often have you felt that you were unable to control the important things in your life?," (2) "How often have you felt confident about your ability to handle your personal problems?," (3) "How often have you felt that things were going your way?," and (4) "How often have you felt difficulties were piling up so high that you could not overcome them?" For items 1 and 4, a score of between 0 and 4 was given in order of positive frequency rank: that is, a score of 0 was given to "never" and a score of 4 was given to "very often." For items 2 and 3, scores were assigned in reverse order. The total PSS-4 score was the sum of each item score. Higher total scores indicate perception of more severe stress.

##### *Social capital*

To evaluate social capital, we partly referred to the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ).<sup>18</sup> The SC-IQ comprises questions on various dimensions of social capital, which is usually defined in terms of resources such as social networks, social participation, trust, and reciprocity.<sup>19</sup> In the current study, we focused on trust and reciprocity using the following SC-IQ items: (1) "Can most people be trusted?," (2) "Does one have to be alert or is someone likely to take advantage of you?," and (3) "Are most people willing to help if you need it?" Response options were: "strongly disagree," "disagree," "agree," and "strongly agree."

##### *Positive reasons for living (ikigai)*

Subjects replied to the question "Do you have any positive reasons for living?" by choosing one of the following options: "I

have a lot of positive reasons,” “I have some positive reasons,” “I have only a few positive reasons,” and “I have no positive reasons.” The Japanese term for positive reasons for living is “ikigai.” A large-scale prospective cohort study showed that middle-aged and elderly Japanese men and women with ikigai had a lower risk of death than those without.<sup>20</sup>

#### Happiness

Subjects replied to the question “How happy do you feel about your life?” by choosing one of the following options: “very happy,” “happy,” “neither happy nor unhappy,” and “unhappy.” A prospective cohort study in the United States revealed that individuals who felt pretty happy and unhappy had a higher risk of death than those who felt very happy.<sup>21</sup>

#### Statistical analysis

We described cancer history, restrictions in functional capacity, SRHS, and psychosocial characteristics. We also examined whether cancer history was associated with restrictions in functional capacity, SRHS, and psychosocial characteristics, using Fisher’s exact test, t-tests, and Mann–Whitney U tests. For significant associations, we repeated the analyses after stratifying the subjects by age (younger than 50 years, 50 years or older) to further examine whether age was a confounder. The analyses were performed separately by sex. Statistical calculations were conducted using IBM SPSS Statistics 22 for Windows, Japanese-version (IBM Japan, Tokyo, Japan). The level of significance was 0.05 (two-tailed) for all tests.

#### Ethics

The present study was approved by the Bioethics Review

Committees of Fujita Health University and Nagoya University School of Medicine.

## Results

Of the 5,474 subjects, 112 (2.0%) were cancer survivors (Table 1). Of 3,782 male and 1,692 female respondents, 62 (1.6%) and 50 (3.0%) reported cancer history, respectively. The older the subjects were, the more frequently they reported cancer history: prevalence of cancer was 0.5% among subjects aged less than 40 years, whereas it was 2.8% among those aged 40 years or older. Cancer types reported most frequently were colon (n=16, 25.8%), stomach (n=11, 17.7%), and prostate cancer (n=9, 14.5%) for males, and breast (n=23, 46.0%), stomach (n=5, 10.0%), and colon cancer (n=5, 10.0%) for females.

For both males and females of all ages, cancer survivors reported restrictions in functional capacity more frequently than employees without cancer history (Table 2). Among males, the associations between cancer history and restrictions in functional capacity remained significant even after age stratification. In contrast, for females, the association remained significant only in those younger than 50 years. The association was not significant among women aged 50 years or older.

Male cancer survivors of all ages self-rated their health status as bad more frequently than male employees without cancer history (Table 3). The association between cancer history and SRHS remained significant even when we repeated the same analysis after stratifying male subjects by age. Of five male cancer survivors who self-rated their health status as bad, two suffered from prostatic cancer and one from gastric cancer. No

Table 1 Subject characteristics according to cancer history, Aichi, Japan, 2013 (n=5,474)

Characteristics	Cancer history							
	Absent			Present				
	N (%)		Male	Female	N (%)		Male	Female
Total number	5,362	(98.0)	3,720	1,642	112	(2.0)	62	50
Age (years)								
18–29	930	(17.3)	479	451	5	(4.5)	1	4
30–39	885	(16.5)	549	336	5	(4.5)	2	3
40–49	1,858	(34.7)	1,317	541	45	(40.2)	19	26
50–59	1,655	(30.9)	1,348	307	55	(49.1)	38	17
60–69	34	(0.6)	27	7	2	(1.8)	2	0
Cancer type <sup>a</sup>								
Stomach					16	(14.3)	11	5
Colon					21	(18.8)	16	5
Lung					2	(1.8)	2	0
Liver					0	(0.0)	0	0
Breast					23	(20.5)	0	23
Prostate					9	(8.0)	9	—
Lymphoma					5	(4.5)	5	0
Thyroid					5	(4.5)	4	1
Cervix uteri					4	(3.6)	—	4
Skin					3	(2.7)	3	0
Sarcoma					3	(2.7)	1	2
Osteosarcoma					3	(2.7)	1	2
Oral cavity					3	(2.7)	2	1
Corpus uteri					3	(2.7)	—	3
Ovary					2	(1.8)	—	2
Leukemia					2	(1.8)	2	0
Others					11	(9.8)	7	4

<sup>a</sup> Some subjects reported two or more cancer types.

**Table 2** Associations of cancer history with restrictions in functional capacity, Aichi, Japan, 2013

Sex	Cancer history	Restrictions in functional capacity		P value <sup>a</sup>
		No	Yes	
All ages				
Male	Absent	3,612 (97.1)	108 (2.9)	<0.001
	Present	53 (85.5)	9 (14.5)	
Female	Absent	1,616 (98.4)	26 (1.6)	<0.001
	Present	43 (86.0)	7 (14.0)	
Age younger than 50 y				
Male	Absent	2,283 (97.4)	62 (2.6)	0.003
	Present	18 (81.8)	4 (18.2)	
Female	Absent	1,313 (98.9)	15 (1.1)	<0.001
	Present	28 (84.8)	5 (15.2)	
Age 50 y and older				
Male	Absent	1,329 (96.7)	46 (3.3)	0.013
	Present	35 (87.5)	5 (12.5)	
Female	Absent	303 (96.5)	11 (3.5)	0.139
	Present	15 (88.2)	2 (11.8)	

<sup>a</sup> P values were calculated using Fisher’s exact test.

**Table 3** Associations of cancer history with self-rated health status (SRHS), Aichi, Japan, 2013

Sex	Cancer history	SRHS		P value <sup>a</sup>
		“Great” to “Not so bad”	Bad	
All ages				
Male	Absent	3,663 (98.5)	57 (1.5)	0.003
	Present	57 (91.9)	5 (8.1)	
Female	Absent	1,623 (98.8)	19 (1.2)	1.000
	Present	50 (100.0)	0 (0.0)	
Age younger than 50 y				
Male	Absent	2,312 (98.6)	33 (1.4)	0.041
	Present	20 (90.9)	2 (9.1)	
Female	Absent	1,312 (98.8)	16 (1.2)	1.000
	Present	33 (100.0)	0 (0.0)	
Age 50 y and older				
Male	Absent	1,351 (98.3)	24 (1.7)	0.038
	Present	37 (92.5)	3 (7.5)	
Female	Absent	311 (99.0)	3 (1.0)	1.000
	Present	17 (100.0)	0 (0.0)	

<sup>a</sup> P values were calculated using Fisher’s exact test.

female cancer survivors self-rated their health status as bad.

We examined the association between cancer history and psychosocial characteristics—social support, perceived stress (Table 4), social capital, positive reasons for living, and happiness (Table 5)—but found no significant difference between cancer survivors and employees without cancer history.

**Discussion**

Cancer survivors more frequently experienced restrictions in functional capacity than did employees without cancer history. Male cancer survivors more frequently self-rated their health status as bad than did male employees without cancer history. However, no female cancer survivors self-rated their health status as bad. There was no difference by cancer history in psychosocial characteristics, (i.e., social support, perceived stress, social capital, positive reasons for living, and happiness).

The present subjects were full-time local government

**Table 4** Associations of cancer history with social support (ESSI score) and perceived stress (PSS-4 score), Aichi, Japan, 2013

Cancer history	N	Mean (standard deviation)	P value <sup>a</sup>
Male			
<i>ESSI score</i>			
Absent	3,720	24.2 (6.9)	0.595
Present	62	24.7 (7.4)	
<i>PSS-4 score</i>			
Absent	3,720	7.5 (2.4)	0.682
Present	62	7.4 (2.9)	
Female			
<i>ESSI score</i>			
Absent	1,642	25.7 (6.0)	0.659
Present	50	26.1 (6.0)	
<i>PSS-4 score</i>			
Absent	1,642	8.1 (2.6)	0.511
Present	50	7.9 (2.5)	

ESSI: the ENRICHD Social Support Instrument; PSS-4: four-item Perceived Stress Scale.

<sup>a</sup> P values were calculated using t-tests.

employees. This type of job is generally quite secure, so few employees would be forced to leave their jobs because of developing cancer. Roelen et al. reported that employees in large companies return to work earlier than those in small companies; the authors assumed that large companies can accommodate working conditions more easily than small companies.<sup>22</sup> The local government institution to which our subjects belonged was large. The present findings suggest that, even with restrictions in functional capacity, some cancer survivors could return to work owing to relatively good employment security. Similar studies should be conducted in small companies, as cancer survivors there may experience different work-related factors (and possibly disadvantages) compared with employees in large companies.

Both male and female cancer survivors experienced restrictions in functional capacity more frequently (nearly 15%) than employees without cancer history (2–3%). When female subjects were stratified by age, the association between cancer history and restrictions in functional capacity remained significant only among those aged younger than 50 years. The association was not significant among those aged 50 years or older. However, the association was independent of age in men. As male subjects were stratified in the same way, the association remained significant in both the two age groups. The International Classification of Functioning, Disability and Health,<sup>23</sup> a classification of health and health-related domains, considers that employed cancer survivors who continue to work are successfully involved in society. Nevertheless, the present findings suggest that some cancer survivors experience difficulty in completing activities to participate in society. Employers should take effective measures to identify reasons for this and to reduce the problem. Previous studies show that work ability decreases as fatigue or cognitive limitation become severe.<sup>5</sup> Cancer survivors often have work disabilities because of functional limitations, such as physical and psychological disabilities,<sup>24</sup> which could be an obstacle to returning to work.<sup>25</sup> We did not examine what kind of support the cancer survivors required. In February 2016, the MHLW announced a guideline to support workers receiving cancer treatment.<sup>4</sup> This guideline encourages employers to introduce hourly paid leave and flexible-time work schedules. It also recommends that employers



Table 5 Associations of cancer history with social capital, positive reasons for living, and happiness, Aichi, Japan, 2013

Male	Cancer history				P value <sup>a</sup>
	N (%)	N (%)	N (%)	N (%)	
<i>Most people can be trusted.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	96 (2.6)	1,026 (27.6)	2,526 (67.9)	72 (1.9)	0.787
Present	0 (0.0)	18 (29.0)	43 (69.4)	1 (1.6)	
<i>One has to be alert or someone is likely to take advantage of you.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	218 (5.9)	2,553 (68.6)	866 (23.3)	83 (2.2)	0.812
Present	5 (8.1)	39 (62.9)	17 (27.4)	1 (1.6)	
<i>Most people are willing to help if you need it.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	75 (2.0)	1,335 (35.9)	2,244 (60.3)	66 (1.8)	0.576
Present	0 (0.0)	21 (33.9)	41 (66.1)	0 (0.0)	
<i>Do you have any positive reasons for living?</i>					
	A lot of reasons	Some reasons	Only a few reasons	No reasons	
Absent	260 (7.0)	2,337 (62.8)	1,025 (27.6)	98 (2.6)	0.960
Present	6 (9.7)	36 (58.1)	19 (30.6)	1 (1.6)	
<i>How happy do you feel about your life?</i>					
	Very happy	Happy	Neither happy nor unhappy	Unhappy	
Absent	358 (9.6)	2,331 (62.7)	950 (25.5)	81 (2.2)	0.655
Present	6 (9.7)	37 (59.7)	17 (27.4)	2 (3.2)	
Female					
<i>Most people can be trusted.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	29 (1.8)	435 (26.5)	1,121 (68.3)	57 (3.5)	0.655
Present	0 (0.0)	13 (26.0)	35 (70.0)	2 (4.0)	
<i>One has to be alert or someone is likely to take advantage of you.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	121 (7.4)	1,189 (72.4)	305 (18.6)	27 (1.6)	0.123
Present	3 (6.0)	43 (86.0)	3 (6.0)	1 (2.0)	
<i>Most people are willing to help if you need it.</i>					
	Strongly disagree	Disagree	Agree	Strongly agree	
Absent	15 (0.9)	457 (27.8)	1,131 (68.9)	39 (2.4)	0.648
Present	0 (0.0)	15 (30.0)	31 (62.0)	4 (8.0)	
<i>Do you have any positive reasons for living?</i>					
	A lot of reasons	Some reasons	Only a few reasons	No reasons	
Absent	115 (7.0)	1,044 (63.6)	435 (26.5)	48 (2.9)	0.092
Present	4 (8.0)	37 (74.0)	9 (18.0)	0 (0.0)	
<i>How happy do you feel about your life?</i>					
	Very happy	Happy	Neither happy nor unhappy	Unhappy	
Absent	252 (15.3)	1,030 (62.7)	337 (20.5)	23 (1.4)	0.927
Present	9 (18.0)	29 (58.0)	12 (24.0)	0 (0.0)	

<sup>a</sup> P values were calculated using Mann-Whitney U tests.

ask medical doctors and occupational health doctors for advice on making working conditions suitable for cancer survivors. Such assistance may be effective in reducing restrictions in functional capacity experienced by cancer survivors.

The present study revealed that SRHS of male cancer survivors was worse than that of male employees without cancer history, independent of age. Although investigating the association between cancer type and SRHS was beyond the scope of the present study, of five male cancer survivors who self-rated their health status as bad, two had prostatic cancer and one had gastric cancer. Prostatic cancer occurs only in men and gastric cancer occurs more often in men than in women.<sup>1</sup> The lack of an association between cancer history and SRHS in older women may be related to these points. Previous reports indicate that

cancer survivors who underrate their health status experience a poorer life prognosis.<sup>26,27</sup> Therefore, employers should ensure a reasonable environment to enable employees to feel healthy.

We did not find any significant associations between cancer history and psychosocial characteristics. Existing evidence indicates a high prevalence of major depressive disorders and adjustment disorders as psychiatric comorbidity among cancer patients.<sup>28,29</sup> Resilience in cancer survivors has been reported in terms of psychosocial adjustment.<sup>30</sup> Research shows that cancer survivors' work performance improves over time.<sup>31</sup> In the present study, most cancer survivors probably experienced a time lag between cancer diagnosis and participation to the present investigation, although we had no information on when the cancer diagnoses were made. This might have diluted the

possible associations between cancer history and psychosocial characteristics.

The following study limitations must be considered in interpreting the present findings. First, regarding cancer history, we only asked subjects whether they had been diagnosed with cancer. Thus, there may have been heterogeneities among cancer survivors in the type and clinical stages of the cancer, what kind of treatments they received, and how long they had received cancer treatment. Further research is required to investigate whether these factors affect restrictions in functional capacity, SRHS, and psychosocial characteristics of employed cancer survivors. Second, regarding the accuracy of self-reported cancer history, the possibility of false negative self-report could not be ruled out completely. Studies in the United States<sup>32</sup> and Australia<sup>33</sup> have shown that the validity of self-reported cancer diagnoses is high. However, low validity was found for self-reported cancer diagnoses in a Japanese general population.<sup>34</sup> Possible misclassification might have resulted in weaker associations between cancer history and psychosocial characteristics. Third, only about half of the eligible participants were enrolled in the present study, which could have caused selection biases. Although sex (male: 65.4% vs. 69.1%) and age (mean: 42.8 vs. 42.9 years) were not substantially different between those who did and did not participate, we had no data to compare other characteristics between the two groups. Generally, those who participate in surveys are healthier than those who do not.<sup>35</sup> Therefore, the representation of cancer survivors, especially those with worse health status, in the present study might not reflect their true prevalence. The present observed associations of cancer history with restrictions in functional capacity, deterioration in SRHS, and worse psychosocial characteristics might be weaker than they really are. Future studies should use measures to increase participation, such as changing consent method<sup>36</sup> or questionnaire length.<sup>37</sup> In addition, we were not able to include cancer survivors who were unable to work and left the job. Work conditions and regulations may vary among employers; this would affect the severity of restriction in functional capacity and thus influence continuous employment. The present findings might apply only to cancer survivors employed by local government. Finally, as there are few precedents, there may be methodological limitations regarding assessment of functional capacity and social capital. The Scale of Independence in Daily Living for the Disabled Elderly, which we used to assess functional capacity, was originally developed for health professionals to evaluate whether older adults need care to live independently.<sup>8</sup> We have no evidence for the reliability and validity of this scale when used as a self-rating scale (as in the present study). However, the questionnaire items are considered to measure functions objectively, and our subjects (even those with cancer history) were young to middle-aged individuals with normal cognitive ability. Therefore, we assumed that they appropriately self-rated their functions. Regarding assessment of social capital, we focused on trust and reciprocity because they are considered the core components of social capital.<sup>19</sup> It is possible that our method neither assessed other components of social capital, such as social networks or social participation, nor was able to specify the level of social capital (country/state, neighborhood/community, or individual level). In addition, scholars across various study areas have proposed different definitions of social capital according to their own background disciplines.<sup>38</sup>

## Conclusion

Although the generalization of the present findings is limited, we found that employed cancer survivors in a large workplace experienced restrictions in functional capacity and male cancer survivors underrated their health status.

## Conflict of Interest

The authors declare no competing financial interests.

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