

[Original Articles]

Relationship between well-being and factors related to physical appearance changes among male cancer survivors

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Body image disturbance following changes in the physical appearance of cancer survivors leads to psychosocial problems. Although changes in physical appearance may occur in both women and men, relatively little is known about difficulties experienced by male patients. The purposes of this study were to investigate how male cancer patients perceive their physical changes, whether their self-assessment of these changes influences their psychological well-being, and whether their inherent values toward appearance and general beliefs about what men's appearance should be, unique to male patients, impact their psychological well-being. 823 male cancer patients who were medically examined while revisiting an oncology hospital were asked to fill out a questionnaire. This study indicated the relationship between the well-being of men with cancer and their self-evaluation of appearance change caused by cancer treatment. Health care professionals should consider not only objective appearance changes but also subjective appearance changes and the masculinity of patients.

Keywords: physical appearance; male cancer survivors; well-being; structural equation modeling

Introduction

Advances in medical technology have made it possible for many cancer patients to have a social life while receiving cancer treatment. Cancer survivors experience many physical appearance changes (e.g., loss of hair, weight changes, dermatologic changes, scarring) following cancer treatment (Brierley et al., 2019; Fingeret et al., 2014; Hilton et al., 2008). Previous studies reported that cancer survivors are concerned about their appearance change, even slight changes that are not noticeable by others (Moore et al., 2021; White & Hood, 2011). Other studies

reported that many cancer survivors experience dissatisfaction with their appearance changes after cancer treatment (Fauerbach et al., 2002; Heinberg et al., 2007; Tebble et al., 2004). Moreover, cancer treatment has a large impact on psychosocial factors as well as physical appearance. Body image disturbance following changes in physical appearance of cancer survivors may lead to serious psychosocial problems (Fingeret et al., 2014).

Changes in physical appearance can lead to not only higher distress, lower self-esteem, and psychological maladjustment but also social isolation. Cancer survivors who feel discomfort with their

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changes in physical appearance may avoid contact with others and experience a disadvantage in human relationships (Biordi & Nicholson, 2013; Hagedoorn & Molleman, 2006; Konradsen et al., 2009). This social isolation leads to social and economic problems and, additionally, lower quality of life and higher morbidity and mortality (Biordi & Nicholson, 2013).

Although changes in physical appearance after cancer treatment may occur in both women and men, many previous studies and support activities have targeted women. Relatively little is known about the actual changes in physical appearance of male patients, the difficulties they experience as a result of having physical appearance changes, and the support they need for their physical appearance changes (Hilton et al., 2008).

There are gender differences in how cancer patients evaluate their appearance change. Nozawa et al. (2013) reported that men were concerned about functional influences, while women were concerned about their appearance changes.

For example, male cancer patients' appearance changes have a negative impact on their place of work. One study on employment indicated that recruiters tended to have a negative attitude toward individuals with facial disfigurement (Stevenage & McKay, 1999). The labor force participation rate of men is higher than that of women (Japan Institute for Labour Policy and Training, 2019). As a result, it can also be said that support for men's changing appearance as a result of cancer treatment should be part of the employment support for men.

Several studies indicated the difficulty of urging men to seek support in general. One of these factors is traditional masculinity (Courtenay, 2000; Evans et al., 2011), such as the belief in male gender-role stereotypes that men are independent, self-reliant, strong, robust, and tough, and that they fear femininity (Courtenay, 2000; Martin, 1995). Men are taught to have a cultural belief that asking for help and caring for one's health are feminine (Chapple & McPherson, 2004; Courtenay, 2000; Handberg et al., 2015). It is predicted that men who have a high degree of traditional masculinity in which they believe that taking care of their own appearance is

feminine, tend to avoid appearance care and support even if they feel distressed about their appearance changes.

Little is known about how male patients perceive their own physical changes, how their subjective evaluations and sense of masculinity are related to the distress associated with their physical appearance changes, and what factors are associated with this distress. A more specific survey is needed to clarify unclear aspects of male patients' perception of their appearance changes and to develop more comprehensive support for male patients.

Although there have been many studies on women's appearance changes and few on men's appearance changes, Nozawa et al. (2013) have highlighted the necessity of appearance care for male cancer patients. Therefore, it is necessary to consider not only women's difficulties but also men's difficulties with their appearance changes. It is also necessary to develop a more effective support system for male cancer patients regarding their appearance changes.

Previously, we reported that cancer treatment induces changes in the physical appearance of male cancer patients, these changes affect their social activities, and support from medical staff is important for these patients (Nozawa et al., 2017). Based on these findings, this study seeks to promote a deeper understanding of the interaction between appearance change and psychological distress among male cancer patients. In the present study, we examined how male cancer patients perceive their changes in physical appearance, and how their self-evaluation of these changes affects their psychological well-being. The purposes of this study were to investigate how male cancer patients perceive the physical changes induced by treatment, whether their self-assessment of these changes influences their psychological well-being, and whether their inherent values toward appearance and general beliefs about what men's appearance should be, unique to male patients, impact their psychological well-being. We hypothesize that male patients who place a higher value on traditional masculinity may experience greater distress associated with appearance changes, and that tailored support addressing their subjective

perceptions of appearance changes and sense of masculinity will be essential for improving their psychological well-being.

Patients and methods

This was a cross-sectional study. We conducted an anonymous questionnaire survey of outpatients who were medically examined while revisiting the National Cancer Center Hospital in Japan over three days in January 2015.

The inclusion criteria were as follows: male cancer patients aged 20 years or older, who were physically and mentally able to complete the written questionnaire. No restrictions were made regarding upper age limit and cancer site.

Male patients who signed in at the reception desk for their medical examination were verbally requested to participate in this study. Patients who agreed were handed the questionnaire package and were informed in writing that their participation in the survey was anonymous and by their own free will, and that they would not experience any disadvantage in not participating. The patients were asked to place the completed questionnaires in the collection box at the hospital exit when they agreed to participate in the study. The survey states that returning a completed questionnaire to the collection box indicates the respondent's consent to participate in the study.

Of the 949 male patients who were handed a questionnaire package, we received 855 responses (90.1%). Patients who returned a blank questionnaire (N=11) and patients who did not have a clinical diagnosis yet (N=21) were excluded. Therefore, the number of valid questionnaires was 823 (86.7%). Table 1 summarizes the socio-demographic and clinical characteristics of the participants. The age of the participants was 65.3 ± 12.3 (mean \pm standard deviation) years old. The methods of this study are described in detail elsewhere (Nozawa et al., 2017). This study was approved by the Institutional Review Board and Ethics Committee of the National Cancer Center Hospital in Japan (No.2014-244) and was performed in accordance with the Declaration of Helsinki. According to the ethical guidelines for

Table 1. Characteristics of men with cancer in this study (N=823)

Characteristic	Mean	SD†
Age (years old)	65.30	12.32
	N	%
Marital status		
Unmarried	57	6.9%
Married	692	84.1%
Separated/widowed	66	8.0%
Unknown/unreported	8	1.0%
Educational status		
Junior high school	56	6.8%
High school	224	27.2%
Professional/vocational school	45	5.5%
College/technical college	27	3.3%
University/graduate school	464	56.4%
Other	1	0.1%
Unknown/unreported	6	0.7%
Present job		
Full-time	243	29.5%
Part-time	41	5.0%
Freelance	144	17.5%
Unemployed	358	43.5%
Other	33	4.0%
Unknown/unreported	4	0.5%
Diagnosis (Multiple answers)		
Lung cancer	147	17.9%
Prostate cancer	126	15.3%
Intestinal cancer	105	12.8%
Gastric cancer	102	12.4%
Esophageal cancer	69	8.4%
Liver, gallbladder, and pancreatic cancer	89	10.8%
Marginal lymphoma	65	7.9%
Head and neck cancer	56	6.8%
Bladder cancer	40	4.9%
Skin cancer	22	2.7%
Kidney cancer	22	2.7%
Acute leukemia	16	1.9%
Brain tumor	15	1.8%
Soft tissue sarcoma	14	1.7%
Chronic leukemia	11	1.3%
Unknown primary	5	0.6%
Other	70	8.5%
Unknown/unreported	56	6.8%

†SD, standard deviation

epidemiological studies developed by the Ministry of Health, Labour and Welfare of Japan, this anonymous, cross-sectional observational study did not require written informed consent.

Questionnaire items

Demographic and clinical characteristics

Participants were asked about the following demographic and clinical characteristics: age (years), marital status, highest level of education (junior high school, high school, junior college, college or higher, other), current occupation (full-time, part-time, freelance, unemployed, other), cancer diagnosis, and age at diagnosis of cancer (years).

Self-rated degree of how much he feels his appearance has changed

Participants were asked "How much do you feel that your appearance has changed as a result of the cancer treatment?". This item was rated on a 4-point Likert scale (1= "not at all" to 4= "very much").

Self-rated degree of management of their appearance changes

Participants were asked, "Do you think you can cope with your appearance changes?" This item was rated on a 4-point Likert scale (1= "I can cope sufficiently" to 4= "I can't cope at all").

Attitudes toward the value of one's appearance: Value of appearance

The items that assessed general beliefs about physical appearance changes were established after careful examination and deliberation within the research group. Participants were asked to rate the following two statements on one's appearance: "Generally, I think that presenting to people a cheerful appearance helps them feel better." and "Generally, at the workplace, it is important for cancer patients to have a similar appearance as their appearance before the change occurred, even if there are some changes in appearance after the cancer treatment." Items were rated on a 4-point Likert scale (1= "I strongly disagree" to 4= "I strongly agree").

Attitudes toward traditional masculinity, which affects men's appearance care: Degree of traditional masculinity

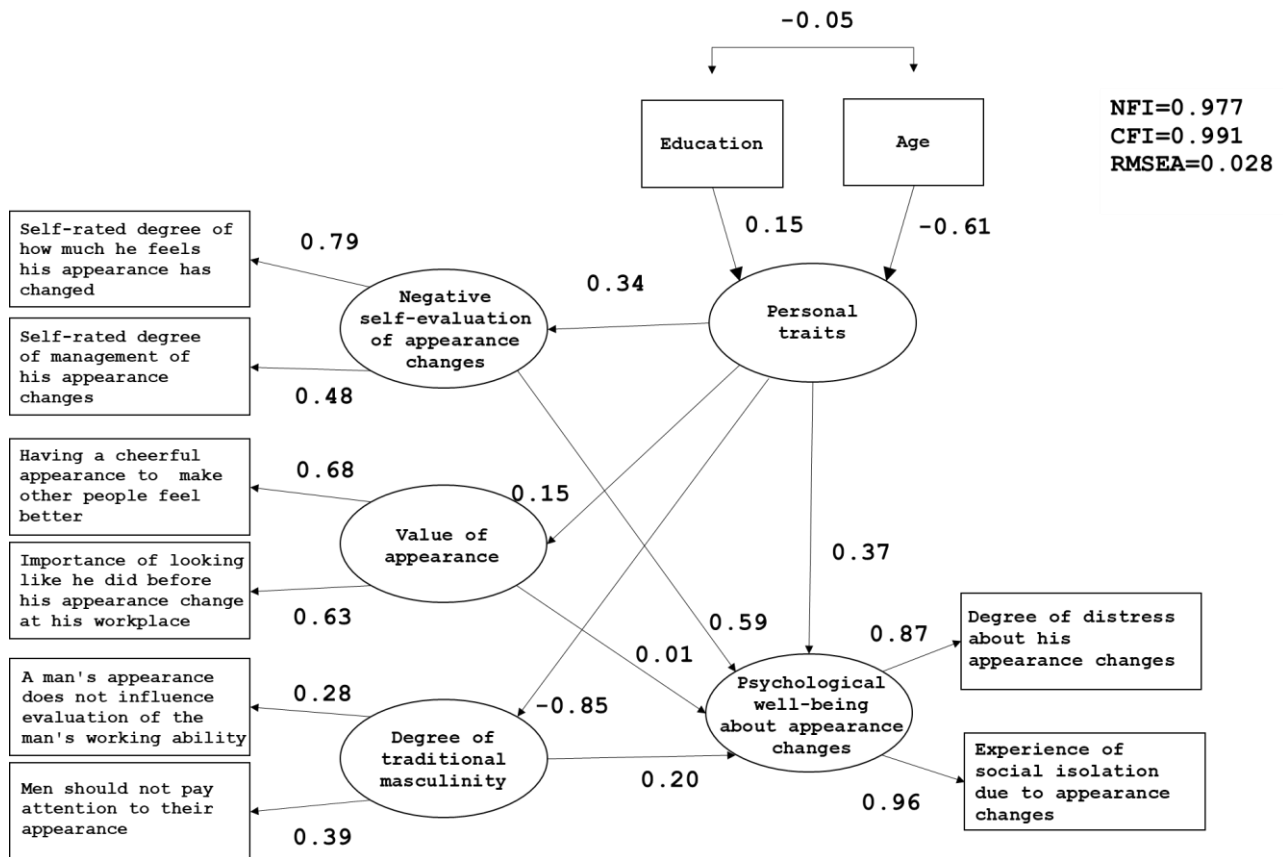
The research group carefully crafted items asking the degree to which the respondent feels that traditional masculinity, i.e., his appearance care, influences situations that he encounters, drawing upon previous studies (Chapple & McPherson, 2004; Courtenay, 2000; Evans et al., 2011; Handberg et al., 2015; Martin, 1995). Participants were asked to rate the following two statements related to traditional masculinity: "Generally, the appearance of a man influences how that man is evaluated by his business associates or customers." (1="I strongly agree" to 4= "I strongly disagree") and "Generally, men should not pay attention to their appearance." (1="I strongly disagree" to 4= "I strongly agree"). Higher scores indicated stronger adherence to traditional masculine norms, and it was assumed that men with a higher degree of traditional masculinity paid less attention to their appearance.

Psychological well-being about appearance changes

Psychological well-being regarding one's own appearance changes was assessed using the Japanese version of the Derriford Appearance Scale Short-Form (DAS-12) (Nozawa & Konno, 2011). It consists of 12 items in the following two subscales: the degree of distress about their appearance changes, and experience of social isolation due to appearance changes. The DAS-12 was developed based on the Derriford Appearance Scale 59 (DAS-59) (Harris & Carr, 2001). The DAS-12 has demonstrated validity and reliability (Cronbach's alpha = 0.82). Cronbach's alpha for the total score in the current study was 0.70. Participants were asked to indicate for each of the statements the degree of distress about their appearance changes and the experience of social isolation due to their appearance changes.

Items were rated on a 6-point Likert scale for items related to the degree of distress about their appearance changes (0 = "not at all distressed" to 5 = "extremely distressed") or a 5-point Likert scale for items related to the experience of social isolation due to their appearance changes (0= "almost never" to 4=

Figure 1 Structural equation model of the relationships among appearance changes and well-being in men with cancer.



Path coefficients are standardized. Residual covariances are omitted from the figure to reduce complexity. NFI, normed fit index; CFI, comparative fit index; RMSEA, root-mean-square error of approximation.

"almost always"). The score of the subscale of the degree of distress about their appearance changes was obtained by adding the scores of the 5 items in this subscale, and the score of the subscale of their experience of social isolation due to appearance changes was obtained by adding the scores of the 7 items in this subscale.

If participants responded that they had "no change in appearance", their DAS score was calculated as 0 and included in the analysis.

Statistical analysis

A structural equation model (SEM) was constructed in the analysis to comprehensively verify the relevance of each questionnaire item. Statistical analyses were conducted using IBM SPSS 23 (Armonk, NY) and IBM SPSS Amos 23 (Armonk, NY).

Results

Valid questionnaires were returned from 823 male patients who had undergone cancer treatment. Figure 1 shows the results of the SEM. This model was an adequate fit of the data with normed fit index of 0.977, comparative fit index of 0.991, and root-mean-square error of approximation of 0.045.

The latent variable "negative self-evaluation of appearance changes" was represented by two items: "self-rated degree of how much he feels his appearance has changed" (beta=0.79) and "self-rated degree of management of his appearance changes" (beta=0.48).

The latent variable "value of appearance" was represented by two items: "having a cheerful appearance to make other people feel better" (beta=0.68) and "importance of looking like he did

before his appearance change at his workplace" (beta=0.63).

The latent variable "degree of traditional masculinity" was represented by two items: "a man's appearance does not influence evaluation of the man's working ability" (beta=0.28) and "men should not pay attention to their appearance" (beta=0.39).

The latent variable "psychological well-being about appearance changes" was represented by two DAS subscales: "degree of distress about his appearance changes" (beta=0.87) and "experience of social isolation due to appearance changes" (beta=0.96).

In the model, "age" (younger age; beta=-0.61) and "education" (high education; beta=0.15) made up "personal traits". "Personal traits" was directly related to "negative self-evaluation of appearance changes" (beta=0.34), "value of appearance" (beta=0.15), and "degree of traditional masculinity" (beta=-0.85). The younger the age and the higher the education level, the more "negative self-evaluation of appearance changes" and the "value of appearance" were enhanced, and the more "degree of traditional masculinity" was decreased. Younger age had a larger impact than higher education.

"Psychological well-being about appearance changes" was directly affected by "personal traits" (beta=0.37), "negative self-evaluation of appearance changes" (beta=0.59), "value of appearance" (beta=0.01), and "degree of traditional masculinity" (beta=0.20). Especially, the more "negative self-evaluation of appearance changes" and "degree of traditional masculinity" were enhanced, the more "psychological well-being about appearance changes" was decreased.

Discussion

This study explored the relationships among elements such as how male cancer patients perceive changes in their appearance and how their self-evaluation of such changes impacts their psychological well-being. It also considered how the patients' inherent values toward appearance, as well as their gender-specific beliefs regarding the appearance of men, affect their psychological well-

being.

This study revealed that the more 'negative self-evaluation of appearance changes' and 'degree of traditional masculinity' were enhanced, the more 'psychological well-being about appearance changes' was decreased. This result underscores the importance of appearance care for male cancer patients. It suggests the possibility that their gender-specific role perceptions may deter them from seeking support for appearance care, even while experiencing distress regarding changes in their appearance.

The SEM revealed that the well-being of men with cancer was affected by their perceived appearance change. Therefore, a support system for men regarding their appearance changes is needed.

The level of distress caused by their appearance changes depended on how participants felt about their appearance changes (Hagedoorn & Molleman, 2006), and whether they adapted to their appearance changes or not (Frith et al., 2007). It is considered that they had little distress if they adapted to their appearance changes even if their appearance changes were significant. On the other hand, their distress might be enhanced if they did not adapt to their appearance changes.

Considering ways of supporting male cancer patients regarding their appearance changes, health care professionals should understand how their patients think about the degree of their appearance changes, and whether the patients think they can cope well with their appearance changes.

Even if the appearance changes look small to health care professionals, there might be a risk that men's distress will increase when they worry about their appearance changes or they feel that they cannot cope with their appearance changes.

The degree of traditional masculinity reflects the traditional gender stereotype that men taking care of their own appearance are feminine. It is considered that men who have high traditional masculinity would think that "Men should not care about their own appearance", and men should display masculine behavior. Even when men with high masculinity really want to do something about their changed appearance, high masculinity keeps them from taking

care of their appearance. This ambivalent condition leads to male gender role conflict, and then the conflict increases men's distress (Bowie et al., 2022). A man who really thinks that "The appearance of a man would not influence evaluation of that man" or "Men should not pay attention to his own appearance" should not have distress when he experiences appearance changes. This implies that if a man experiences distress due to changes in appearance, he may not truly believe that men's appearance is inconsequential.

For this reason, it is considered that the results of this study indicate that the higher the masculinity, the higher the distress about his own appearance changes. Our results indicated that a high degree of traditional masculinity, which affects men's appearance care, reduces their well-being ($\beta = 0.20$). It is considered that men with high masculinity would not be able to consult with others about their appearance changes because of shame. As a result, they carry worries or distress all on themselves alone (Hilton et al., 2008).

Younger men tended to place a higher value on their appearance, and their appearance changes may have led to high distress. On the other hand, older men tended to have higher masculinity, and high masculinity prevented them from coping with their appearance changes or consulting with others. As a result, it is conceivable that their distress escalated became larger.

However, there may be younger men who have high masculinity and older men who place a high value on their appearance (Williamson et al., 2010). These results suggest that health care professionals should consider not only male patients' objective appearance changes but also their subjective appearance changes, the subjective value of their appearance (Fingeret et al., 2010; Rhoten, 2016), and the masculinity of male patients when discussing the appearance support system for these patients.

Our results suggested that male cancer patients might, at times, find it difficult to seek help due to their gender role orientations. Therefore, support systems that can be readily accepted by male cancer patients are needed. Furthermore, it is necessary to hold public health campaigns or provide information

that would enable male cancer patients with high masculinity to think that worrying about appearance changes or receiving support is normal (Chapple & McPherson, 2004). For example, when using a make-up foundation, it may be effective not to refer to it as "make-up foundation", but to refer to it as "something like an ointment to hide your scar."

Expanding our perspective from these results, it becomes clear that healthcare providers need to have a shared understanding that it is not merely the objective medical condition of the patient but, more importantly, how the patient feels and thinks that should be the basis for providing support. The same symptoms, conditions, or test results do not imply that the same care should be provided to everyone. Understanding and applying this differentiation are vital aspects of a healthcare provider's interaction with patients.

Furthermore, it can also be assumed that individual differences exist as to whether a man would ask for help or willingly accept the support offered by those around him. Even if men are concerned about changes in their appearance, traditional gender roles might inhibit them from expressing these concerns or seeking and receiving support, potentially leading to distress. Healthcare providers who are aware of such viewpoints and strive to understand their patients can aid in advancing the care for appearance changes in male cancer patients.

It is important for healthcare providers not merely to provide the same care uniformly to everyone. Instead, considering the patients' social background, culture, and values and tailoring their approach to these factors are critical in their engagement with patients.

Study limitations

There are several limitations to our study. First, it included patients with restricted types of cancer and limited variations in appearance changes due to the study population comprising outpatient hospital visitors. Second, our study may be biased because the survey was conducted at a single hospital in a large city. The results may have been influenced by biases due to the characteristics or regional factors specific

to the hospital. Third, since the participants of this study were patients who signed in at the reception desk for their medical examination, we were obliged to use simple questionnaires to reduce the burden on respondents as much as possible. For this reason, we could not use validated measures and could not use items about patients' details, such as treatment status. Future research will need to consider the problem of these biases. Finally, as a cross-sectional study, it was not possible to assess changes over time in subjective evaluation about their appearance changes, the value of appearance, masculinity, and well-being of participants. Although our model demonstrated the direction of the relationship between variables, further longitudinal studies are needed to assess the change in men's well-being related to their appearance changes.

Conclusions

This study indicated the relationship between the well-being of men with cancer and their perceived appearance change caused by cancer treatment. Furthermore, it was revealed that the more negative self-evaluation of appearance changes and degree of traditional masculinity were enhanced, the lower their well-being. These results suggest that health care professionals should consider not only their patients' objective appearance changes but also their subjective appearance changes and the masculinity of male patients when providing support to male cancer patients.

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Conflict of Interest

M. Tomita is an employee of SMS Co., Ltd. No other author has a potential conflict of interest relevant to this article.

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