

Exploration of coping styles in male patients with head and neck cancer: a prospective cohort study

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ABSTRACT

Majority of head and neck cancer (HNC) patients are male, and more than 85% of patients with HNC have the habit of smoking and drinking. Due to the specific demographic characteristics, HNC patients are anticipated to have specific coping styles, affecting psychological distress, survival, and quality of life. We explored the subscales of the Mental Adjustment to Cancer (MAC) Scale in male patients with HNC, and then examined the correlation between revised subscales of the MAC scale and anxiety/depression. Participants were 150 male inpatients with HNC, and their demographic and medical data were obtained. Coping style was assessed by MAC scale. Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale. Out of 40 items in the original MAC scale, 19 items were excluded by factor analysis, and the remaining 21 items were divided into three factors: *Negative Adjustment*, *Positive Adjustment*, and *Abandonment*. *Negative* and *Positive Adjustments* were similar to the copings of mixed gender patients with heterogeneous cancers, and *Abandonment* was a new subscale specific to male patients with HNC. This subscale had a weak positive correlation with anxiety and depression. Male HNC patients revealed a specific coping style of *Abandonment*, related with psychological distress. We believe that an understanding of the *Abandonment* coping style revealed in our study will improve the psychological support offered to male patients with HNC.

Keywords: head and neck cancer, coping, anxiety, depression, oncology

Abbreviation:

HNC: head and neck cancer

MAC: the Mental Adjustment to Cancer

HAD: the Hospital Anxiety and Depression

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INTRODUCTION

Head and neck cancer (HNC) is a broad term that includes epithelial malignancies arising in the paranasal, nasal, or oral cavities, or the pharynx or larynx. A worldwide epidemiological study found that nearly three-quarters of HNC patients were male.¹ More than 85% of patients with HNC have a history of cigarette smoking and drinking alcohol (previous and current), suggesting that HNC is related to life style factors.² Regarding the penetration rate of cigarette smoking and drinking alcohol, male was higher than female.^{3,4} Similar results were obtained from Japanese public investigation.⁵ According to the general population, the previous large-scale studies have demonstrated the gender differences in coping style.⁶⁻⁸ Recently, this results was match the same in Japanese patients with lung cancer.⁹

The coping style of patients with HNC has been gained attention and has been shown to vary according to the patient's treatment phase and level of psychological distress.¹⁰⁻¹³ Arastad et al¹⁴ reported that level of distress predicts subsequent survival in successfully treated HNC patients. Furthermore, moderate - to - large associations between disengagement coping mechanisms (eg, avoidance) and psychological distress were observed the patients with HNC.¹⁵

In a recent systematic review, psychological distress has great effect on depression and anxiety.¹⁶ The prevalence of depression is estimated to be 46% in HNC patients,¹⁷ and the suicide rate is higher than that in patients with other types of cancer.^{18,19} Avoidance or negative coping is associated with depression among HNC patients¹³ and the Coping style of HNC patients is one of the risk factors related to depression.²⁰ Henry et al reported that the coping with the diagnosis by alcohol/drugs was a predictor of 1-year period prevalence of suicidal ideation in HNC.²¹ Through the background above, the head and neck cancer patients should cope with these distress appropriately. However, the higher risk of suicide in male compared with female HNC patients suggests that males do not cope with HNC as well as females.²² We needed to consider the investigation of coping style in male patients with HNC related to the depression and anxiety.

The Mental Adjustment to Cancer (MAC) scale is widely used to assess coping styles in cancer patients.¹⁵ The MAC scale consists of 40 items in five subscales: Fighting Spirit (FS), Hopeless/Helplessness (HH), Anxious Preoccupation (AP), Fatalistic (F), and Avoidance (A). The HH, AP, and F subscales are associated with anxiety and depression.²³⁻²⁵ Attempts to replicate the five MAC subscales in heterogeneous populations have yielded inconsistent results.²⁶⁻²⁹ Watson and Homewood³⁰ re-evaluated the original subscale structure in a large heterogeneous sample of cancer patients and proposed a structure: the Summary Positive Adjustment Scale and Summary Negative Adjustment Scale. However, it is not clear whether these summary scales are useful for patients with HNC because of their specific demographic characteristics and psychosocial circumstances. To prevent perseverative negative thinking with subsequent poor medical outcomes, we will re-examine the psychometric properties of the MAC scale in male patients with HNC.

In our study, we reassessed the original MAC subscales in male patients with HNC and examined the correlation between our revised MAC subscales and levels of anxiety and depression.

METHODS

Patients

We established a liaison psychiatry medical team for HNC patients in Nagoya University Hospital in 2005. Patients routinely received psychiatric liaison intervention by our liaison team, consist of otolaryngologists, dental surgeons, psychiatrists, psychologists, nurses, occupational therapists and social workers with monthly interprofessional conferences. Psychiatrists preoperatively

assessed the mental condition of the patients. If necessary, performed psychiatric intervention for patients with treated psychiatric disorders based on the evidence based guidelines in Japan.

Patients were enrolled between April 2006 and August 2012 at Nagoya University Hospital in Japan. We included the patients with head and neck cancer, who planned to undergo the radical surgery and need the reconstructive surgery for head and neck carcinoma. We excluded patients with cognitive disorders, schizophrenia, or a history of other psychotic disorders according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR).³¹

Variables and measures

Demographic and medical data were collected during the interview and obtained from patient medical records at baseline. Patients were classified as non-smoker, previous smoker, or current smoker. Non-smoker was defined as never having smoked. Previous smoker was defined as having quit smoking more than a year before the date of the psychiatrist interview. Current smoker was defined as smoking at the time of the psychiatrist interview or as having quit smoking within a year before the date of the interview. Patients were classified as non-drinker, previous drinker, or current drinker in the same manner.

Coping style was assessed using the Japanese version of the MAC scale.³² The MAC scale is a 40-item self-rating questionnaire with a four-point Likert scale ranging from 1 ('definitely does not apply to me') to 4 ('definitely applies to me'). The five original subscales are FS (16 items), HH (6 items), AP (9 items), F (8 items), and A (1 item).^{33,34} The proposed general subscales are the Summary Positive Adjustment Scale (17 items) and Summary Negative Adjustment Scale (16 items).³⁰

Anxiety and depression levels were assessed using the Japanese version of the Hospital Anxiety and Depression (HAD) scale,³⁵ an effective screening tool widely used in psycho-oncology clinical and research settings. The questionnaire contains 14 items (7 items each for the depression and anxiety subscales) rated on a four-point Likert scale ranging from 0 to 3. Subscale scores range from 0 (no distress) to 21 (maximum distress), and the total score ranges from 0 to 42.³⁶

As in the previous studies,^{21,37} the patients were assessed at four time-points by psychiatrists and psychologists. The first evaluation (Time 0: T0) was performed shortly after the interview with the psychiatrist, and the second (Time 1: T1), third (Time 2: T2), and fourth (Time 3: T3) evaluations were performed at 3, 6, and 12 months, respectively, after the first evaluation. At T0, we assessed coping style and the levels of anxiety and depression. At T1, T2 and T3, we assessed the levels of anxiety and depression.

Statistical analyses Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy were used. We performed an exploratory principal axis factor analysis with oblique rotation because it permits correlations among factors.³⁸ We identified the number of meaningful factors based on the scree plot, parallel analysis, and factor interpretability. Items were retained if loadings were equal to or greater than 0.45 and the value of the communalities was higher than 0.25. Reliability coefficients were calculated using Cronbach's alpha for each extracted factor.

Correlation coefficients were calculated between each extracted MAC subscale, which was assessed at T0, and each HAD subscale, which was assessed at T0–T4. P-values <0.05 were deemed to indicate statistical significance. Statistical tests were conducted using the Statistical Package for Social Sciences version 19.0 (SPSS Inc., Chicago, IL, USA) and R version 3.2.4.

The protocol of this study was approved by the Ethics Review Committee of Nagoya University Graduate School of Medicine (approval no. 2007-0543; Nagoya University). This study was conducted in accordance with the Helsinki Declaration. Written informed consent was obtained from each subject by psychiatrists before the start of the study.

RESULTS

Patient characteristics

A total of 257 HNC patients planned to undergo the radical surgery and need the reconstructive surgery for head and neck carcinoma. Of the 212 HNC patients (82.5%) who agreed to participate in this study, 150 patients (58.4%) completed the MAC and HADS at the first evaluation (T0). Patient demographic characteristics and medical information are shown in Table 1. The mean age of the patients was 62.1 years (SD 11.2, range 20–82 years). Eighty percent of the participants were married, 81% of the participants had at least 10 years of education and about 43% were not working (retired or unemployed). In total, 81% of the patients were previous or current smokers and 78% were previous or current drinkers. The majority of patients had advanced cancer of the hypopharynx, oral cavity, or other areas. Surgical treatment was planned for 97% of the patients. At T1, 45 patients were excluded because of canceled appointments. At T2, 54 patients were excluded due to cancelled appointment (N = 48), transfer to another hospital (N = 1), or death (N = 5). At T3, 49 patients were excluded due to cancelled appointment (N = 32), transfer to another hospital (N = 5), or death (N = 12). Thus, the final analysis included 105, 96, and 101 patients at T1, T2 and T3, respectively, with 58 patients evaluated at all time points.

Factor analysis

The Kaiser-Meyer-Olkin statistic was 0.77 and Bartlett's test was significant ($\chi^2 = 2357.8$, $df = 780$; $p < 0.001$). The principal component analysis identified 12 factors with eigenvalues greater than one, which accumulatively accounted for 67.01% of the total variance. We identified a three-factor solution. The scree plot showed a steep drop from factor two to factor three, supporting a two-factor solution. Parallel analysis suggested a four-factor solution. Based on the results of these analyses and the interpretation of the factor solutions, we determined that a three-factor solution was the most appropriate. Therefore, the factor analysis was performed using the oblimin rotation to extract three factors. Based on our exclusion criteria, 16 items were excluded (Q1, Q3, Q4, Q5, Q8, Q12, Q14, Q15, Q18, Q19, Q24, Q28, Q29, Q34, Q35, Q38).

To obtain the best model, we performed a second factor analysis using the remaining 24 items. Three items (Q9, Q13, Q20) were excluded because they explained less variance than the others. Finally, a third factor analysis was performed using the remaining 21 items (Table 2). The final model included 21 items in three factors accounting for 48.71% of the variance. The factors were named "Negative Adjustment (NA)", "Positive Adjustment (PA)", and "Abandonment" according to Watson and Homewood²² and the content of the items. Cronbach's alpha values for NA, PA, and Abandonment were 0.85, 0.81, and 0.74, respectively.

Correlation

Table 3 shows the correlation coefficients between the revised MAC subscale scores and the HAD subscale scores at each time-point. NA was positively correlated with the HAD anxiety and depression subscales at all time points and PA was negatively correlated with the HAD anxiety and depression subscales at T0. Abandonment was positively correlated with the HAD anxiety subscale at T0 and T3 and positively correlated with the depression subscale at all time points.

Coping styles in male patients with head and neck cancer

Table 1 Patient demographic characteristics and medical information (n = 150)

		Frequency (%)
Age	Mean	62.1(SD=11.2)
	Range	20–82
Marital status	Married/cohabiting	120 (80)
	Divorced/separated	4 (3)
	Single	20 (13)
	Widowed	6 (4)
education	<10	29 (19)
	≥10	121(81)
Employment status	Retired	56 (37)
	Unemployed	9 (6)
	Full- or part-time	65 (43)
	Self employed	17 (11)
	Student	3 (2)
Smoking	Never	16 (11)
	Previous	54 (36)
	Current	67 (45)
	Unknown	13 (9)
Drinking	Never	19 (13)
	Previous	17 (11)
	Current	100 (67)
	Unknown	14 (9)
Stage	1	3 (2)
	2	11 (7)
	3	23 (15)
	4	112 (75)
	none (benign tumor)	1(0.6)
Site of cancer	Oral cavity	22 (15)
	Nasal/Paranasal cavity	28 (19)
	Oropharynx	19 (13)
	Hypopharynx	52 (35)
	Larynx	16 (11)
	Other	13 (9)
Treatment	Surgery only	35 (23)
	Radiotherapy only	2 (1)
	Surgery and radiation	26 (17)
	Surgery and chemotherapy	33 (22)
	Radiotherapy and chemotherapy	2 (1)
	Surgery, chemotherapy and Radiotherapy	52 (35)

Table 2 Factor loading estimates for the exploratory factor analysis of the MAC subscales.

Items	Original subscales	Original items	FACTOR1	FACTOR2	FACTOR3
FACTOR1 : Negative Adjustment					
Q22	AP	Anxiety	0.86	-0.03	-0.14
Q36	HH	At a loss	0.79	-0.07	0.07
Q37	AP	Angry	0.75	0.00	-0.07
Q23	HH	Not hopeful	0.71	-0.07	0.11
Q21	AP	Difficult believing	0.66	0.14	-0.01
Q25	HH	Giving up	0.52	-0.05	0.15
Q33	F	Avoid information	0.46	0.09	0.06
Q2	HH	Can't cheer	0.45	-0.14	0.14
FACTOR2 : Positive Adjustment					
Q31	FS	Try positive attitude	-0.28	0.75	0.16
Q40	FS	Fight illness	0.00	0.65	0.00
Q6	FS	Get better	-0.07	0.65	-0.04
Q26	FS	Humour	-0.05	0.57	0.08
Q10	AP	Exercise	-0.04	0.55	-0.12
Q39	FS	Count blessings	0.10	0.52	0.03
Q27	FS	Others worry	-0.05	0.51	-0.01
Q32	FS	Keep busy	0.23	0.50	0.21
Q11	FS	Life precious	0.22	0.50	-0.13
Q16	FS	Mind makes difference	0.01	0.49	-0.16
FACTOR3 : Abandonment					
Q30	F	Can't control	-0.03	0.06	0.92
Q7	F	Nothing makes a difference	0.05	-0.02	0.61
Q17	HH	Nothing to help	0.15	-0.09	0.60
% Explained			22.95	40.98	48.71
Cronbach's alpha			0.853	0.809	0.741

Table 3 Correlation coefficients between the revised MAC subscale scores and the HAD anxiety and depression scores at the four time points (T0, T1, T2, and T3).

	Time0 HAD scale (N=150)		Time1 HAD scale (N=105)		Time2 HAD scale (N=96)		Time3 HAD scale (N=101)	
	Anxiety	Depression	Anxiety	Depression	Anxiety	Depression	Anxiety	Depression
Negative Adjustment	.576**	.564**	.262**	.337**	.460**	.490**	.447**	.401**
Positive Adjustment	-.222**	-.328**	-.050	-.181	-.058	-.166	-.081	-.123
Abandonment	.170*	.278**	.023	.241*	.183	.298**	.254**	.214**

* p<.05 ** p<.01

DISCUSSION

We reassessed the MAC scale in male patients with HNC. We excluded 19 of the original 40 items, and the remaining 21 items were incorporated into three subscales: NA, PA, and Abandonment.

NA included four items (Q2, Q23, Q25, Q36) of the original HH, three items (Q21, Q22, Q37) of the original AP, and one item (Q33) of the original F subscale. PA included nine items (Q6, Q11, Q16, Q26, Q27, Q31, Q32, Q39, Q40) of the original FS and one item (Q10) of the original AP subscale. Abandonment included one item (Q17) from the original HH and two items (Q7, Q30) from the original F subscale. In relation to the revised two-factor structure proposed by Watson and Homewood,³⁰ seven of the eight items in the NA factor (Q2, Q21, Q22, Q23, Q25, Q36, Q37) were common to the Summary Negative Adjustment scale (Q33 was excluded), indicating that NA was similar to the Summary Negative Adjustment scale. Nine of the 10 items in the PA subscale (Q6, Q11, Q16, Q26, Q27, Q31, Q32, Q39, Q40) were common to those in the Summary Positive Adjustment scale (Q10 was excluded), indicating that these two were also similar.

Abandonment could be extracted independently as a subscale specific to male patients with HNC. Abandonment included one item from the original HH (Q17: I feel there is nothing I can do to help myself) and two items from the original F subscale (Q7: I feel that nothing I can do will make a difference, Q30: I feel that I can't control what is happening to me); all three were included in the Summary Negative Adjustment scale. These three items have not been extracted in previous exploratory factor analyses performed in heterogeneous samples of cancer patients.²⁶⁻²⁹ In a study of female patients with breast cancer, Osborne et al²⁹ revised the original F subscale into two factors: Fatalism-revised and Loss of Control. Loss of Control comprised four items (Q7, Q24, Q30, Q33), two of which (Q7, Q30) are included in our Abandonment subscale. Osborne et al²⁹ defined Loss of Control as a loss or lack of control over the cancer and little motivation for pursuing cancer treatment or making future plans. Breast cancer and HNC patients may experience similar psychological distress because both conditions involve body disfigurement.

Our participants were male, 81% were previous or current smokers, 78% were previous or current drinkers, and 71% were advanced-stage (stage IV) patients. These demographic characteristics may contribute to the Abandonment coping style. However, other studies have found contradictory results. Vidhubala et al³⁹ found that compared with females, male patients with HNC tended to show problem-oriented coping that led to better adjustment. Moreover, Aarstad et al⁴⁰ found no correlation between avoidance coping (denial, behavioral disengagement, mental disengagement) and smoking/drinking behaviors in mixed-sex patients with HNC. Ichikura et al⁴¹ reported that HNC patients often showed a dependent - coping style after completion of treatment. The disparity between our findings and those of Vidhubala et al,³⁹ Aarstad et al⁴⁰ and Ichikura et al⁴¹ may be explained by differences in cancer stages. The previous studies included patients at various stages of HNC, whereas our subjects were patients with advanced-stage HNC. Sherman et al¹⁰ reported that patients with advanced-stage HNC had poor coping responses (denial, behavioral disengagement, suppression of competing activities). Thus, cancer stage, sex, and drinking and smoking status may contribute to the likelihood that patients adopt the Abandonment coping style.

If Abandonment coping style of male patients with HNC were extracted, the Abandonment subscale was positively correlated with anxiety and depression, although the correlation coefficient was relatively small. Kugaya et al⁴² found an association between the original HH subscale and depressed mood. Hassanein et al⁴³ investigated psychological outcome and coping style in mixed-sex patients with oral cancer and found that the original HH, AP, and F subscales were

correlated with anxiety and depression. The Abandonment factor included one of the six items in the original HH and two of the eight items in the F subscale; this derivation may partly explain the weak correlation between Abandonment and anxiety/depression.

Our study has several limitations. Despite the exploratory nature of the study, we only investigated the male patients and our sample size was too small to conduct meaningful statistical tests. The cancellation rates were extremely high—nearly 30% at each evaluation point. Further study including female with a larger sample size is necessary to draw definitive conclusions. Furthermore, our findings are not generalizable to all patients with HNC because most of our patients were admitted to the Nagoya University Hospital Otorhinolaryngology Department for surgical treatment of advanced-stage cancer. However, we believe our findings have significant clinical implications for patients undergoing surgery for advanced-stage cancer.

CONCLUSION

We reassessed the MAC subscales in male patients with HNC and examined the correlations between these scores and levels of anxiety and depression. The factor analysis excluded 19 of the original 40 items on the MAC scale, and the remaining 21 items were re-grouped into three coping styles: Negative Adjustment, Positive Adjustment, and Abandonment. The Negative and Positive Adjustment styles were typical of mixed-sex patients with heterogeneous cancers, while Abandonment was specific to male patients with HNC and showed a weak positive correlation with anxiety and depression. We found that the Abandonment coping style was specific to male patients with HNC in response to psychological distress.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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