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Comparison of prevalence and associated factors of depressive disorder between patients with head and neck cancer and those with lung cancer at a tertiary hospital in Taiwan: a cross-sectional study

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ABSTRACT

Objective Depression is a common comorbidity in cancer patients. This study aimed to compare the prevalence and associated factors of depressive disorder between patients with head and neck cancer (HNC) and those with lung cancer (LC).

Design This study used a cross-sectional design with consecutive sampling.

Setting A medical centre (Kaohsiung Chang Gung Memorial Hospital, Taiwan).

Participants Patients for the study were recruited from the HNC and LC outpatient clinic and inpatient ward from March 2016 to February 2018. Patients with HNC and LC were enrolled and assessed using the Mini International Neuropsychiatric Interview (MINI).

Primary and secondary outcome measures The primary outcome was psychiatric diagnoses assessed using the MINI. The secondary outcomes were psychological well-being assessed using the Beck Anxiety Inventory, Taiwanese Depression Questionnaire, Brief Fatigue Inventory, Numeric Pain Rating Scale and the List of Threatening Experiences Questionnaire.

Results In total, 113 HNC patients and 104 LC patients were recruited for the study. The most common psychiatric comorbidity of HNC patients was alcohol use disorder (49.6%), followed by adjustment disorder (20.4%) and depressive disorder (11.5%). The most common psychiatric comorbidity of LC patients was depressive disorder (25.0%), followed by adjustment disorder (17.3%), alcohol use disorder (3.8%) and insomnia disorder (3.8%). Among HNC patients, a self-harm history was positively associated with depression (OR=11.91; 95% CI, 1.47 to 96.83), and a higher educational level was negatively associated with depression (OR=0.77; 95% CI, 0.66 to 0.91). Among LC patients, severity of stressor (OR=2.78; 95% CI, 1.50 to 5.15) and severity of anxiety (OR=1.18; 95% CI, 1.04 to 1.34) were two significant factors associated with depression.

Conclusion We reported the prevalence and associated factors of depression between patients with HNC

Strengths and limitations of this study

► We carried out a comprehensive study that compared depression and associated factors between patients with head and neck cancer and those with lung cancer.
► The high response rate and the use of a structured clinical interview by psychiatrists are two strengths of this study.
► The small sample size in our study limits the statistical power of the findings.
► We used a cross-sectional design; therefore, no causal relationships could be identified.

and those with LC. Clinicians should be aware of this comorbidity and the associated risk factors, and conduct intervention programmes to prevent these cancer patients from developing depression.

INTRODUCTION

Head and neck cancer (HNC) is the seventh most common cancer and the ninth most frequent cause of death from cancer worldwide, with an estimated more than 550 000 occurrences and 300 000 deaths annually.[1] Lung cancer (LC) is the leading cause of cancer mortality around the world.[2] In the US, LC had the second highest incidence of all cancers, and official data reported a total of 83 550 males and 70 500 females died from LC in the US in 2018.[3] The overall 5-year survival rate of patients with HNC, around 40% to 50%, is one of the lowest among all cancers and has not significantly changed during the last two decades.[4] The overall 5-year survival rate of LC varies globally, but is consistently low due to late-stage detection.[5]

Early LC and HNC detection for the sake of mortality reduction has become an important public health issue.

Depressive disorders include major depressive disorder (MDD), persistent depressive disorder, other specified depressive disorder, premenstrual dysphoric disorder and disruptive mood dysregulation disorder based on Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5) classification.[6] MDD, a common comorbidity in cancer patients, involves depressed mood, decreased interest, poor appetite, insomnia, cognitive impairment, pessimistic thinking or even suicidal ideas/attempts.[7][8] Depression significantly increases cancer patients' risk of noncompliance with treatment, and contributes to a poorer treatment response and increased rates of hospital admission; worst of all, it can lead to mortality and even suicide.[9–13] Both HNC and LC are known to be associated with an increased risk of depressive disorder.[14–16] Prior studies revealed that the incidence of depressive disorder in HNC patients was one of the highest among all cancer patients, with estimated prevalence rates ranging from 19% to 57%, and with a 25% occurrence rate prior to cancer treatment.[17] The discrepancy in rates is mainly due to differences in (1) method of investigation, (2) measurement, (3) samples, (4) follow-up period, and (5) degree of severity or staging of cancer.[14] In general, a higher rate of depression is estimated when using patient self-reported questionnaires than when there are structured interviews conducted by experienced psychiatrists.[14]

Previous studies of LC patients showed high rates of clinically significant depressive disorder shortly after diagnosis (21% to 44%),[18] and after treatment completion (29% to 44%).[19] A review paper from Massie found that the prevalence of depression in LC patients in prior studies ranged from 11% to 44%.[20] Higher rates of depression were estimated when using patient self-reported questionnaires; therefore, overrating might be seen in most items of somatic symptoms, particularly in patients suffering from physical illness.[21] It is important that structured diagnostic interviews by a senior psychiatrist are used to accurately detect psychiatric diagnoses of depressive disorder in cancer patients.

Understanding the risk factors of depression may be helpful in developing strategies for preventing depression among cancer patients. Literature reviews revealed that depression was more prevalent in HNC patients with the following characteristics: female, younger, having a previous history of depression, alcohol use, during the initial treatment, during advanced stages of cancer and among those with poor family support.[22] Previous studies have shown that the risk factors for depressive disorder in patients with LC include cancer stage,[23] health behaviours such as alcohol intake[24] or smoking[25]; physical symptoms such as pain[26] or fatigue[27]; and personal characteristics such as age,[27] sex (male),[28] employment status[29] or lower educational level.[30] There is a paucity of studies comparing associated factors between patients with HNC and those with LC.

Taken together, LC and HNC are two of the most prevalent cancers comorbid with depression. LC is the leading cause of cancer mortality, and HNC is the fifth most common cause of cancer mortality in Taiwan 2018.[31] Many oncologists see both LC and HNC patients in their clinical practice simultaneously. Moreover, the cancers in HNC and LC patients are commonly smoking-related, which warrants clarifying the differences between these two cancers in terms of depression and its associated factors. Therefore, this study aimed to compare the prevalence and associated factors of depressive disorder between patients with HNC and those with LC.

METHODS
Participants
All procedures performed in studies involving human participants were in accordance with the Declaration of Helsinki (1964) and its later amendments or comparable ethical standards. The Institutional Review Board at Chang Gung Memorial Hospital has approved this study (IRB No. 104-7000B).

According to previous epidemiological studies, comorbidity rates of depression among patients with HNC and those with LC are about 10% to 20% and 20% to 30%, respectively. With regard to the predictors of depression, the individual contribution of each factor may be modest. Given an effect size of 0.4, an alpha value of 0.05, power (1-Beta)=0.8, and three repeated measurements, a correlation of 0.5 to 0.6 and a non-sphericity correction of 1100 patients in each cancer group were needed to achieve enough statistical power to detect depression-associated factors. The above statistical power calculation used the Gpower V.3.17.[32]

This study used a cross-sectional design with consecutive sampling. Participants were recruited from the ear, nose and throat, chest and cardiovascular surgery outpatient/inpatient departments at a tertiary hospital from March 2016 to February 2018. This hospital has 2754 beds and provides services to 5000 cancer patients per year in southern Taiwan. Inclusion criteria were as follows: (1) patients with newly diagnosed HNC or LC; and (2) patients with the ability to understand the study procedure and complete the questionnaires. Exclusion criteria were as follows: (1) patients with a diagnosis of schizophrenia, schizoaffective disorder or bipolar I disorder; (2) patients with dementia or severe cognitive impairment; (3) patients whose depression was caused by another general medical condition (eg, thyroid disease) or induced by substances; and (4) patients who were too weak to complete the questionnaire or clinical interview.

Study procedures
Study procedures were as follows: (1) newly-diagnosed patients visiting our collaborative care clinic or admitted to our ward were invited consecutively to take part in this study. Once our research assistant received a referral from the outpatient clinic or wards from in-charge doctors or

case managers, our research assistant went to the above settings to contact the patients. After explaining the study procedure and aims, those who agreed to sign an informed consent form were enrolled in the study; (2) a senior psychiatrist (YL) made the psychiatric diagnoses using the Mini International Neuropsychiatric Interview (MINI);[33] and (3) assessment tools, including the Brief Fatigue Inventory (BFI)[34] for measuring fatigue severity, the Numeric Pain Rating Scale (NPRS),[35] the Questionnaire Version of the List of Threatening Experiences (LTE-Q)[36] for social support and coping, the Connor–Davidson Resilience Scale (CD-RISC)[37] for the ability to cope with stress, the Taiwanese Depression Questionnaire (TDQ)[38] for screening depression, and the Beck Anxiety Inventory (BAI)[39] for the severity of anxiety, were used in the study. The BFI, NPRS, LTE-Q, CD-RISC, BAI, TDQ, and clinical and demographic data were collected by a trained research assistant.

Statistical analyses

Descriptive and inferential statistics were analysed using SPSS V.12.0 for Windows. Descriptive statistics (χ^2 and t-tests) were performed first to test the differences in demographic data and clinical characteristics between patients with and without depressive disorder. Logistic regression was used to test the factors associated with depressive disorder. Depression was set as dependent variable, and patients' characteristics were set as independent variables. We calculated both the adjusted OR and the 95% CI. Structural equation modelling (SEM) was used to establish models of potential mechanisms underlying the linkage of associated factors and depression in patients with LC and HNC. The SEM statistical programme was analysed using SPSS Amos 24.0.

RESULTS

Data collection was completed for 113 HNC patients and 104 LC patients (table 1). LC patients were more often female (46.2% vs 11.5%, p<0.001), elderly (61.3 y/o vs 52.6 y/o, p<0.001), receiving targeted therapy (40.6% vs 0%) and at an advanced stage (84.0% vs 63.3%, p<0.001) than HNC patients. HNC patients more often had a higher waist-to-hip ratio (0.94 vs 0.91, p<0.05), and were more often alcohol users (73.5% vs 26.0%, p<0.001), tobacco smokers (70.8% vs 41.3%, p<0.001), betel nut users (61.1% vs 16.3%, p<0.001), undergoing an operation (65.4% vs 22.8%) and receiving radiotherapy (33.7% vs 11.9%). Notably, all 113 HNC patients were recruited from the inpatient ward. Twenty-three LC patients were recruited from the inpatient ward, and 81 were recruited from the outpatient department. The comparisons of demographic data and psychiatric morbidity are listed in online supplementary table 1.

The psychiatric comorbidities at the pretreatment phase in patients are listed in table 2. The most common psychiatric diagnoses of the LC patients at the pretreatment phase were depressive disorders (25.0%), followed by adjustment disorder (17.3%), alcohol use disorder (3.8%) and insomnia disorder (3.8%). More HNC patients had alcohol use disorder (49.6% vs 3.8%, p<0.001) and a psychiatric diagnosis (63.7% vs 50.0%, p<0.05) compared with LC patients. More LC patients had depressive disorder (25.0% vs 11.5%, p<0.05) compared with HNC patients (table 2).

In the univariate analyses of the 113 HNC patients (online supplementary table 2), factors significantly associated with depressive disorders included a self-harm history (15.4 vs 3.0; t=4.17, p<0.05), being elderly (59.2 vs 51.7; t=2.38, p<0.05), having a lower educational level (6.9 vs 10.2; t=−3.17, p<0.05), severity of resilience (26.7 vs 31.4; t=−2.50, p<0.05) and severity of anxiety (10.8 vs 3.1; t=2.62, p<0.05). Using the stepwise forward model of logistic regression (table 3), we found that the independent risk factors for depression among HNC patients were a self-harm history (OR=11.91; 95% CI, 1.47 to 96.83; p<0.05), and that a higher educational level (OR=0.77; 95% CI, 0.66 to 0.91; p<0.05) was negatively associated with depression.

Among the 104 LC patients (online supplementary table 3), factors significantly associated with depressive disorders included a self-harm history (15.4 vs 1.3; t=8.47, p<0.05), severity of a stressor (1.4 vs 0.5; t=4.93, p<0.001), severity of lack of resilience (26.6 vs 31.6; t=−3.43, p<0.05), severity of fatigue (3.8 vs 2.5; t=2.49, p<0.05) and severity of anxiety (6.7 vs 3.4; t=3.93, p<0.001). Using the stepwise forward model of logistic regression (table 3), severity of stressor (OR=2.78; 95% CI, 1.50 to 5.15; p<0.05) and severity of anxiety (OR=1.18; 95% CI, 1.04 to 1.34; p<0.05) were determined as independent factors of depression among LC patients.

Using SEM, we found that both anxiety severity (β=0.25, p=0.004) and severity of stress (β=0.36, p<0.001) were significantly linked with depressive disorder in patients with LC (figure 1A). Furthermore, we found that both years of education (β=−0.31, p<0.001) and a self-harm history (β=0.22, p=0.012) were significantly linked with depressive disorder in patients with HNC (figure 1B).

DISCUSSION

To our knowledge, this is the first study comparing the prevalence and associated factors of depressive disorder between patients with HNC and those with LC. In our study, alcohol use disorder (27.6%) was the most common psychiatric diagnosis, followed by adjustment disorder (18.9%) and depressive disorder (18.0%). Although alcohol use is common in patients with LC and HNC, in our study, alcohol use disorder was far more common in HNC patients than in LC patients.

LC patients were comorbid with depressive disorder more commonly than HNC patients (25% vs 11.5%). There were more female and elderly patients, more patients with an advanced stage and unemployed, and fewer users of tobacco, alcohol and betel nut among the LC patients than among the HNC patients. This

Table 1 Demographic and clinical characteristics of patients with lung cancer, and head and neck cancer

Characteristics	Lung cancer N (%), n=104	Head and neck cancer N (%), n=113	Total N (%), n=217	χ^2/ t-test	P value
Gender				32.17	<0.001
Male	56 (53.80)	100 (88.50)	156 (71.89)		
Female	48 (46.20)	13 (11.50)	61 (28.11)		
Age, years mean (SD)	61.26 (±10.30)	52.58 (±10.81)	56.74 (±11.40)	6.04	<0.001
Age demarcated				24.19	<0.001
≥50	93 (89.42)	68 (60.18)	161 (74.19)		
<50	11 (10.58)	45 (39.82)	56 (25.81)		
Marital status				4.68	<0.05
Unmarried	19 (18.27)	35 (30.97)	54 (24.88)		
Married	85 (81.73)	78 (69.03)	163 (75.12)		
Education, years mean (SD)	9.91 (±4.20)	9.80 (±3.71)	9.85 (±3.94)	0.22	0.83
Waist-to-hip ratio	0.91 (±0.07)	0.94 (±0.06)	0.92 (±0.07)	3.10	<0.05
Unemployment	73 (70.19)	55 (48.67)	128 (58.99)	10.37	<0.001
Comorbid with other diseases	50 (48.08)	50 (44.25)	100 (46.08)	0.32	0.57
Alcoholism	27 (25.96)	75 (66.37)	102 (47.00)	35.50	<0.001
Smoking	43 (41.35)	80 (70.80)	123 (56.68)	19.13	<0.001
Betel nut	17 (16.35)	69 (61.06)	86 (39.63)	45.26	<0.001
Operation	23 (22.77)	68 (65.38)	91 (44.39)		
Chemotherapy	51 (50.50)	52 (50.00)	103 (50.24)		
Radiotherapy	12 (11.88)	35 (33.65)	47 (22.93)		
Targeted drug	42 (41.58)	0	42 (20.49)		
Stage				10.99	<0.001
Early	16 (16.00)	36 (36.73)	52 (26.26)		
Advanced	84 (84.00)	62 (63.27)	146 (73.74)		
NPRS, mean (range)	1.81 (0 to 10)	1.50 (0 to 10)	1.65 (0 to 10)	1.06	0.29
TDQ, mean (SD)	7.92 (±5.27)	6.50 (±7.20)	7.18 (±6.37)	1.65	0.10
BAI, mean (SD)	4.22 (±3.96)	4.02 (±5.09)	4.12 (±4.57)	0.33	0.74
LTEQ, mean (range)	0.74 (0 to 4)	0.84 (0 to 6)	0.79 (0 to 6)	−0.76	0.45
CDRISC, mean (SD)	30.35 (±6.80)	30.86 (±6.53)	30.61 (±6.66)	−0.57	0.57
BFI-S, mean (SD)	2.82 (±2.29)	2.78 (±2.59)	2.80 (±2.44)	0.13	0.90
BFI-I, mean (range)	1.44 (0 to 0.85)	1.06 (0 to 10)	1.24 (0 to 10)	1.59	0.11

BAI, Beck Anxiety Inventory; BFI-I, Brief Fatigue Inventory Interference subscale; BFI-S, Brief Fatigue Inventory Severity subscale; CD-RISC, Connor–Davidson Resilience Scale ; LTE-Q, Questionnaire Version of the List of Threatening Experiences ; NPRS, Numeric Pain Rating Scale; TDQ, Taiwanese Depression Questionnaire.

may partially explain why depressive disorder was more prevalent among patients with LC than among those with HNC; this finding was discussed in our previously published paper.[40]

Depressive disorder was the most frequent psychiatric diagnosis in LC patients. This result is compatible with that of previous studies, in which LC patients were commonly comorbid with depression, within a range of 11% to 44%.[20] A study from Thailand examined 104 LC patients using the MINI interview; 15 (14.4%) of them were diagnosed as having MDD.[41] In our study, 9.6% of patients were diagnosed as having MDD, and 15.4% of

patients had depressive disorder not otherwise specified. These two studies suggest that patients with LC are quite often comorbid with depressive disorder. In addition, depression morbidity in both studies was within the range of 14.4% to 25%, which was lower than that in some studies of LC patients with a depression morbidity up to 44%.[20] The possible explanation is that both studies used a structured diagnostic interview by a clinician, which would render a lower morbidity rate than the self-rated questionnaires used in other clinical studies. Notwithstanding the lower morbidity rate of depression found when the clinician uses a structured diagnostic

Table 2 Psychiatric diagnoses of patients with head and neck cancer and lung cancer

Items	Lung cancer N (%), n=104	Head and neck cancer N (%), n=113	Total N (%), n=217	χ^2	P value
Depressive disorders	26 (25.00)	13 (11.50)	39 (17.97)	6.69	0.01
Major depressive disorder	10 (9.62)	6 (5.31)	16 (7.37)	1.47	0.23
Depressive disorder NOS	16 (15.38)	7 (6.19)	23 (10.60)	4.83	0.03
Adjustment disorder	18 (17.31)	23 (20.35)	41 (18.89)	0.33	0.57
Alcohol use disorder	4 (3.85)	56 (49.56)	60 (27.65)	56.57	<0.001
PTSD	1 (0.96)	1 (0.88)	2 (0.92)	0.00	0.95
Insomnia disorder	4 (3.85)	8 (7.08)	12 (5.53)	1.09	0.30
REM sleep behaviour disorder	0	1 (0.88)	1 (0.46)	0.93	0.34
No diagnosis	52 (50.00)	41 (36.28)	93 (42.86)	4.16	0.04

NOS, not otherwise specified; PTSD, Post-traumatic stress disorder; REM, rapid eye movement.

interview, the MINI or Structured Clinical Interview for DSM-5 Disorders (SCID-5),[42] which are structured diagnostic interview instruments, are the gold standard for diagnosis, even beyond the psychiatric interview. Delayed diagnosis-related biological vulnerability and psychological impact can partially explain the high prevalence of depression in LC patients.

In our study, depressive disorder (11.5%) was the third most common psychiatric diagnosis in HNC patients, following alcohol use disorder (49.6%) and adjustment disorder (20.4%). The morbidity of depressive disorder in our HNC patients was compatible with that of a meta-analysis study from Krebber *et al*, who reported that the prevalence of depression in HNC patients was 11% on the basis of diagnostic interviews, and 20% on the basis of self-reported questionnaires.[43]

The associated factors for depression in HNC patients were lower educational level and self-harm history, and in LC patients, the associated factors were severity of stressor and severity of anxiety. The possible explanations for the discrepancies in associated factors between HNC and LC patients are: (1) LC patients were at a more advanced stage than HNC patients when diagnosed, which contributed to the associated factors of severity of stressor and severity of anxiety; and (2) HNC patients included more male labourer patients, possibly with an impulsive personality, than LC patients, which contributed to the associated factors of lower educational level

and self-harm history. To our knowledge, this is the first study to compare the associated factors of depression between LC and HNC patients. More prospective studies including different cancer types should be conducted to confirm these findings.

Prior studies showed that a high severity of suicide ideation in patients was associated with severity of depression and with having depressive disorder.[44] Although very few studies have mentioned that patients with a self-harm history are at risk of developing depressive disorder, it can be speculated that patients with a self-harm history are vulnerable to stressors and tend to develop depressive disorder. HNC patients have a high morbidity of depression and a high risk of suicide.[11] Up to now, few studies have found that HNC patients with a self-harm history are at risk of developing depression. Large-scale studies should be conducted to test this hypothesis, with the aim of preventing the co-occurrence of depression and suicide in HNC patients.

We found that lower educational level was one of the significant associated factors for depression among HNC patients. Our result was supported by those of previous studies, which have shown that a lower educational level correlated with depression in cancer patients.[19] In studies focussing on depression in HNC patients, researchers found that patients with fewer than 9 or 12 years of education seemed to have more depression than patients with a college education.[45]

Table 3 Associated factors for depressive disorder at the pretreatment phase among patients with lung cancer and head and neck cancer: logistic regression analysis

	Lung cancer						Head and neck cancer					
Item	β	SE	Walds	OR	CI	P	Item	β	SE	Walds	OR	CI	P value
BAI	0.16	0.07	6.14	1.18	1.04 to 1.34	0.01	Education years	−0.26	0.08	9.64	0.77	0.66 to 0.91	0.002
LTEQ	1.02	0.31	10.62	2.78	1.50 to 5.15	0.001	Self-harm history	2.48	1.07	5.37	11.91	1.47 to 96.83	0.020

BAI, Beck Anxiety InventoryLTE-Q, Questionnaire Version of the List of Threatening Experiences .
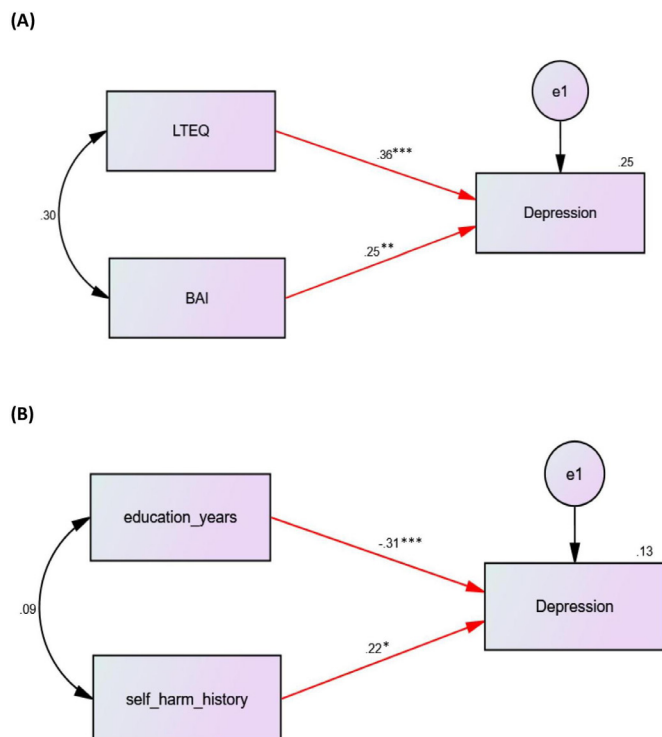
(A)

(B)

Figure 1 Structural equation modelling of factors linked to depressive disorder in patients with lung cancer (A) and head and neck cancer (B). BAI, Beck Anxiety Inventory; LTE-Q, Questionnaire Version of the List of Threatening Experiences, *p < 0.05; **p < 0.01; ***p < 0.001

In this study, depressive cancer patients had a more than 18% severity of anxiety compared with non-depressive LC patients. Many patients with MDD suffer from subsyndromal anxiety symptoms or comorbid anxiety disorder.[46] This comorbidity might support our finding that anxiety is an associated factor for depressive disorder. Possible explanations for why depressive cancer patients more commonly have anxiety symptoms are that cancer patients have to deal with the adverse effects of treatment, being abandoned, loss of self-control and even a survival crisis.[47] To date, several studies have found that depression and anxiety are comorbid in cancer patients.[14] However, very few studies have reported anxiety symptoms as an associated factor in cancer patients comorbid with depressive disorder. More studies are needed to confirm this finding.

Severity of stressor is the most robust associated factor for depressive disorder in LC patients. It is not unusual that a stressful life event is correlated with depression.[48] However, only a few studies have detected a relationship between depressive disorder and severity of stressor in cancer patients.[47] One study explored life events and depressive symptoms after breast cancer surgery, and found that a cancer-related traumatic stressor, financial problems and a tendency toward negativity may worsen depressive symptoms.[49] The above-mentioned study can partially support our finding that a stressful life event is associated with depressive disorder in LC patients. Previous studies have shown that anxiety, fatigue or pain were associated with patients with HNC and LC.[16 50 51] The

univariate analysis in our study revealed that fatigue and a lower level of resilience were correlated with depression in LC patients, and a lower level of resilience and older age were correlated with depression in HNC patients. However, these factors became non-significant when using a logistic regression analysis model. This result indicates that these factors might not independently affect depression in HNC patients or LC patients. SEM analysis showed that anxiety and stress might contribute to the development of depression in LC patients, whereas years of education and a self-harm history might contribute to the development of depression in HNC patients. It is very crucial that clinicians are aware of, and manage these contributing factors in LC and HLC patients so as to prevent these two groups from developing depression.

The high response rate and use of a structured clinical interview by the psychiatrists are two strengths of this study. Still, some limitations should be mentioned: (1) Our study design involved consecutive sampling, which may lead to sampling bias. However, a response rate of over 80% of the newly diagnosed cancer patients reduced the effect of this limitation; (2) our samples were from a general hospital, and may not be representative of the general population; and (3) this was a cross-sectional study, which does not allow investigation of the cancer patients' psychiatric disorder in the course of their cancer disease. So, further follow-up studies should be conducted to understand more precisely the depression morbidity of cancer patients and the risk factors involved.

CONCLUSION
We found that depression was more prevalent in LC patients than in HNC patients. Furthermore, the associated factors for depressive disorder in HNC patients were a self-harm history and lower educational level, and those in LC patients were severity of stressor and severity of anxiety. These findings give us a new insight into the importance of conducting intervention programmes directed toward aforementioned links to prevent these two patient groups from developing depression.

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