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Research paper

Depression and insomnia as mediators of the relationship between distress and quality of life in cancer patients

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ABSTRACT

Background: Distress in cancer patients leads to poorer quality of life (QOL) and negatively impacts survival. For efficient management of a patient's disease course, the interrelationships among distress, depression, insomnia, and QOL must be understood. This study aimed to investigate whether depression and insomnia mediate the relationship between distress and QOL in cancer patients.

Methods: Cancer patients referred to a specialized psycho-oncology clinic (n = 208) participated in this study. Distress, depression, insomnia, and QOL were measured with the following questionnaires: Distress Thermometer, Hospital Anxiety and Depression Scale, Insomnia Severity Index, and Functional Assessment of Cancer Therapy-General. Structural equation modeling and path analysis were performed to analyze the mediating effects of depression and insomnia on the relationship between distress and QOL.

Results: Distress exerted nearly equal direct (ß = −0.291, p = 0.002) and indirect (mediated by depression and insomnia) (ß = −0.299, p = 0.003) negative effects on QOL. Depression exhibited the largest direct negative effect on QOL. The indirect effects of distress on QOL through depression alone, through insomnia alone, and through an insomnia to depression pathway were all significant (ß = −0.122, p = 0.011; ß = −0.102, p = 0.002; and ß = −0.075, $p < 0.001$, respectively).

Limitations: The cross-sectional analyses limit the measurement of causal relationships between each variable.

Conclusions: Depression and insomnia, both individually and as part of an interrelated pathway, partially mediate the relationship between distress and QOL. Appropriate interventions to alleviate insomnia and depression may mitigate the negative impacts of distress on QOL in cancer patients.

1. Introduction

In addition to physical discomfort related to the effects of cancer and its treatment, many patients with cancer also experience psychological problems of insomnia, depression, and other emotional distress (Salo et al., 2012). While the prevalence of psychological distress in cancer survivors varies by cancer type and stage, the overall prevalence is reported at 35.1% (Baglioni et al., 2011b). A meta-analysis further described that 30–40% of patients with various types of cancer experience some combination of mood disorders, including depression, anxiety, and adjustment disorders (Torre et al., 2015).

Distress in cancer patients has been shown to lead to poorer quality of life (QOL) and to negatively impact survival (Satin et al., 2009). Meanwhile, researchers have drawn an increasing number of links between mental health problems, such as depression and insomnia, and cancer outcomes: the underlying biological mechanisms thereof, potentially inflammation, are also being discovered (Irwin et al., 2013). The prevalence of depression in cancer patients is three- to five-fold that in the general population, reaching numbers as large as 15–29% (Irwin, 2013). If not managed properly, depression in cancer patients has been found to adversely affect health functioning and clinical treatment adherence (DiMatteo et al., 2000) and to have a substantial impact on morbid outcomes, including mortality risk (Pinquart and Duberstein, 2010; Satin et al., 2009). Insomnia is also an important issue to the mental health of cancer patients, and the prevalence of insomnia in cancer patients is about three times greater than that in healthy adults (Irwin et al., 2013). Research suggests that the presence of insomnia increases metabolic and psychiatric disease burden and has an effect on

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survival (Dew et al., 2003; Lee et al., 2013).

Accordingly, timely identification and appropriate treatment of cancer patients who require the help of mental health professionals is important. Thus, the National Comprehensive Cancer Network (NCCN) Guidelines for Distress Management were developed to guide clinicians in the assessment and management of distress among cancer patients (Ferlay et al., 2013). However, less than half of distressed patients with cancer are actually identified, and few cancer patients with psychiatric disorders receive professional mental health care early enough (Pinquart and Duberstein, 2010; Singer et al., 2013).

One of the most important aspects of treating cancer patients is managing symptoms that may adversely affect their QOL. A subjective, patient-oriented concept, QOL is a major patient outcome in cancer treatment, as well as in clinical research. Indeed, a positive relationship between QOL and cancer survival has been reported (Montazeri, 2009). Moreover, the literature suggests that patient distress and psychiatric morbidities are correlated with poor QOL. As distress and common mental health problems, such as depression and insomnia, occur at once and affect each other, one may play a mediating role on another. Nevertheless, to date, only a few studies have attempted to document the mediating effects of depression and insomnia on the relationship between distress and QOL, and of these, even fewer have included cancer patients who had visited a psycho-oncology clinic.

In the present study, we aimed to examine the associations among distress, depression, insomnia, and QOL and to explore whether depression and insomnia mediate the relationship between distress and QOL, particularly in cancer patients who have visited a psycho-oncology clinic.

2. Methods

2.1. Participants

A total of 208 cancer patients who visited a specialized psycho-oncology clinic at Ajou University Hospital in Korea between March 2014 and May 2016 participated in the study. Participants were included if they were older than 18 years. We excluded patients with a primary psychotic diagnosis or cognitive impairment sufficient to interfere with their understanding of the questionnaires. The study was approved by the Institutional Review Board of Ajou University Hospital.

2.2. Measures

Demographic and medical data were collected from participants via questionnaires and from their hospital charts. For the primary tumor, we obtained detailed information on tumor site, stage of disease, presence of metastasis, time since diagnosis, types of treatment, and any family history of cancer. Two experienced psychiatrists also recorded primary reasons for referral to the psycho-oncology clinic, past psychiatric history, and psychiatric diagnosis by the Diagnostic Manual of Mental Disorder-Fifth Edition (DSM-5). Finally, participants were asked to complete four self-reported questionnaires, including the Distress Thermometer (DT), Hospital Anxiety and Depression Scale (HADS), Insomnia Severity Index (ISI), and Functional Assessment of Cancer Therapy-General (FACT-G).

2.2.1. Distress

Distress was measured with the NCCN DT (Holland et al., 2013). The DT is a one-item, self-reported screening measure designed to assess distress during the previous week, with scores ranging from 0 (no distress) to 10 (extreme distress). A cut-off of 4 or more has been accepted by the NCCN to screen for distress. The DT has been globally validated (Donovan et al., 2014), and we used the Korean version with good sensitivity and specificity (Shim et al., 2008).

2.2.2. Depression

Depression was measured with HADS-Depression (HADS-D) (Zigmond and Snaith, 1983). The HADS scale is a 14-item self-measure that was specifically developed for assessing anxiety and depression in people with medical illnesses. The screening measure has been widely used in cancer patients (Vodermaier and Millman, 2011). The scale is divided into a seven-question anxiety subscale (HADS-A) and a seven-question depression subscale (HADS-D). We used the Korean version of the HADS-D with a cut off score of 8, which has previously been shown to offer good sensitivity and specificity in cancer patients (Shim et al., 2008).

2.2.3. Insomnia

Insomnia was measured with ISI (Morin, 1993). The ISI is a seven-item self-measure targeting sleep severity, sleep-related satisfaction, degree of daytime functional impairment, impairment in perception, and distress related to sleeping problems. Each item is rated on a five-point Likert scale (0 = not at all, 4 = very much) and summed to provide a total score ranging from 0 to 28. A higher score indicates greater insomnia severity, and clinically significant insomnia was defined as a score greater than 15 (Bastien et al., 2001). The measure has been found to show good reliability and validity in cancer patients (Savard et al., 2005b), and we used the Korean version, which also shows good sensitivity and specificity (Cho et al., 2014).

2.2.4. QOL

The FACT-G scale was used to assess multidimensional QOL in patients with cancer (Cella et al., 1993). The FACT-G consists of 27 items in four subscales: physical well-being, social/family well-being, emotional well-being, and functional well-being. Each item is rated on a five-point Likert scale (0 = not at all, 4 = very much) and summed for a total score, with greater scores indicating higher QOL. We used the Korean version of FACT-G, which shows good sensitivity and specificity (Lee et al., 2004).

2.3. Statistical analysis

Path analysis and structural equation modeling were applied to estimate the relationships between distress, depression, insomnia, and QOL. QOL comprised four indicator variables: physical well-being, social/family well-being, emotional well-being, and functional well-being.

First, the direct effects between distress and depression, distress and insomnia, distress and QOL, depression and QOL, and insomnia and QOL were estimated. Thereafter, the overall indirect effects of distress on QOL through depression and insomnia were computed from a bootstrap of 10000 samples (Shrout and Bolger, 2002). We then used the Sobel test to calculate the indirect effects of distress on QOL separately through depression, through insomnia, and through insomnia to depression (Taylor et al., 2008). To test the model, four different goodness-of-fit indices were used: Q-statistics, the comparative fit index (CFI), the goodness-of-fit statistic (GFI), and the root mean square error of approximation (RMSEA). Additionally, the model was modified to improve the fit thereof using modification indices. A Q statistic value of 3.00 or lower, CFI and GFI values of 0.90 or higher, and a RMSEA value of 0.06 or lower are indicative of good model fit (Hooper et al., 2008).

All p-values less than 0.05 were considered statistically significant. All statistical analyses were conducted using SPSS, version 21.0 and AMOS 21.0 (SPSS Inc., Chicago, USA).

3. Results

3.1. Demographic, clinical, and psychosocial characteristics

Demographic, clinical, and psychosocial data are presented in Table 1. The mean age of the patients was 50.72 ± 11.49 years (range