Multifactorial Model of Dyspnea in Patients With Cancer

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PROBLEM IDENTIFICATION: Dyspnea is a common and distressing symptom for patients with cancer. Although the risk factors for dyspnea in patients with cancer are likely to be multifactorial, a comprehensive description of these risk factors and associated mechanisms is not available in the extant literature.

LITERATURE SEARCH: A search of all relevant databases, including Cochrane Library, PubMed®, Embase®, Web of Science, and CINAHL®, was done from January 2009 to May 2022. Case-control and cohort studies that had either a cross-sectional or longitudinal design, as well as randomized controlled trials, were included in the review. Peer-reviewed, full-text articles in English were included. Nineteen studies reported on risk factors for dyspnea.

DATA EVALUATION: The methodologic quality of each study was examined using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.

SYNTHESIS: A number of factors can influence the occurrence and severity of dyspnea. Using the Mismatch Theory of Dyspnea as the central core of this Multifactorial Model of Dyspnea in Patients With Cancer, the factors included in this conceptual model are person, clinical, and cancer-related factors, as well as respiratory muscle weakness, co-occurring symptoms, and stress.

IMPLICATIONS FOR PRACTICE: The Multifactorial Model of Dyspnea in Patients With Cancer can be used by clinicians to evaluate for multiple factors that contribute to dyspnea and to develop individualized and multilevel interventions for patients experiencing this symptom.

KEYWORDS breathlessness; cancer; conceptual model; dyspnea; risk factors

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Dyspnea is a common and distressing symptom that occurs in about 58% of patients with cancer (Shin et al., 2023). Despite its associated burden, dyspnea is underestimated in clinical practice (Iyer et al., 2014). The American Thoracic Society defined dyspnea as "a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity" (Parshall et al., 2012, p. 436). In addition, the American Thoracic Society noted that "the experience of dyspnea derives from interactions among multiple physiological, psychological, social, and environmental factors, and may induce secondary physiological and behavioral responses" (Parshall et al., 2012, pp. 436–437). Although the risk factors for the occurrence and/or severity of dyspnea in patients with cancer are likely to be multifactorial (Ban et al., 2016; Booth et al., 2008; McKenzie et al., 2018), a comprehensive description of these factors and associated mechanisms is not available in the extant literature.

A recent review on the mechanisms that underlie dyspnea focused on patients with terminal lung cancer (Fukushi et al., 2021). In this review, the authors suggested that the tumor mass, presence of a malignant pleural effusion, and/or respiratory muscle weakness contributed to a mismatch between afferent (i.e., intended respiratory motor output) and efferent (e.g., ventilatory outputs that were accomplished) signaling (Fukushi et al., 2021). Although many clinicians associate the occurrence of dyspnea exclusively with patients with lung cancer or patients at the end of life, findings from epidemiologic studies noted that patients with other types and stages of cancer report dyspnea (Bausewein et al., 2010; Damani et al., 2018; Dudgeon, Kristjanson, et al., 2001; McKenzie et al., 2018; Reddy et al., 2009; Rowbottom et al., 2017). For example, in a cross-sectional study of dyspnea in 923 patients with cancer (Dudgeon, Kristjanson, et al., 2001), only 9.4% had primary or metastatic lung cancer. The remaining 90.6% of patients with heterogeneous types of cancer