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ORIGINAL ARTICLE

Cognitive Processes in Anxiety and Comorbid Physical Illness and Health Behavior: Introduction to the Special Issue

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Abstract
Anxiety symptoms and disorders are the most common psychiatric problems world-wide and are vastly overrepresented among individuals with chronic illness and poor health behavior. The purpose of the current special series is to bolster attention and highlight new research on cognitive processes as a basic element that may undergird the association between anxiety and chronic illness and health behavior. Findings in this issue highlight cognitive-based risk and resilience factors related to anxiety in individuals with various chronic conditions and problematic health behavior.

Keywords Anxiety · Health · Cognitive vulnerability

Introduction

Burdon of Chronic Illness and Health Behaviors

Chronic health conditions/diseases are the leading causes of morbidity and mortality in the United States (Yoon et al. 2014) and are prevalent in approximately one in every two adults (Ward et al. 2014). Multimorbidity of chronic disease is also common in roughly one in four adults in the United States (Ward et al. 2014) and contributes to greater healthcare utilization and burden (Salisbury et al. 2011; U.S. Burden of Disease Collaborators 2013). Further, health behaviors are significant contributing factors to preventable forms of chronic illness, including nicotine and tobacco use, alcohol and drug use, poor sleep, and physical inactivity (Ford et al. 2011; Yoon et al. 2014). Living with chronic illness can be a stressful experience for a myriad of reasons, including but not limited to, medical management of symptoms, medication adherence, and greater levels of life impairment. In fact, persons with chronic illness and poor health behaviors experience an increased risk of mood disturbances (e.g., Teesson et al. 2011).

Anxiety Symptoms and Disorders

There have been decades of sustained scholarly attention on several psychological factors (e.g., personality types, depression) in the context of chronic illness and health behavior (Byrne 1983; Dembroski et al. 1985; Elliott and Eisdorfer 1982; Karren et al. 2013). Comparably less research has focused on anxiety and its disorders in relation to chronic illness and health behavior. The paucity of work on anxiety is alarming because anxiety symptoms and disorders are the most common psychiatric problems world-wide and account for significant social cost, disability, and morbidity (Greenberg et al. 1999; Lecrubier 2001; Lépine 2002; Stein et al. 2017; U.S. Burden of Disease Collaborators 2013). Anxiety and its disorders are also vastly overrepresented among individuals with chronic illness. For example, anxiety is commonly comorbid and independently implicated in the maintenance of various medical conditions (Sareen et al. 2005), including but not limited to pain disorders (Asmundson et al. 2008; Means-Christensen et al. 2008), pulmonary disease (Montserrat-Capdevila et al. 2018; Yohannes et al. 2000), irritable bowel syndrome (Fond et al. 2014; Lydiard 2001), cardiovascular disease (Celano et al. 2016; Tully et al. 2014), cancer (Slaughter et al. 2000; Yi and Syrjala 2017), metabolic conditions (Strine et al. 2008), and neurological

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conditions (Johnson et al. 2018; Minen et al. 2016). Moreover, the presence of anxiety is related to more severe symptom presentations, disability, and mortality risk (Sareen et al. 2005, 2006). Similarly, anxiety is highly prevalent among those engaging in poor health behavior (e.g., Goodwin 2003; Piper et al. 2011; Smith and Book 2010) and is robustly related to the maintenance of such behavior (e.g., Buckner et al. 2012; Moylan et al. 2012).

Theoretical Framework

Theoretically, anxiety symptoms and disorders may be related to the onset and maintenance of health behavior and chronic illness in different ways. Potential pathways supported, at least in part, by past work, include condition-specific fears (e.g., pain-related anxiety; Asmundson et al. 2008), avoidance behavior (e.g., Vlaeyen and Linton 2012), affect-based health habits (e.g., emotional eating; Hawkins and Clement 1984), and alteration of somatic processes (e.g., inflammation; Felger 2018; McEwen 2015). Each of these pathways can be highly influenced by cognitive-based factors implicated in the expression, etiology, and maintenance of anxiety (Asmundson et al. 2000; Horenstein et al. 2018; Otto et al. 2016). To this end, the purpose of the current special series is to bolster attention and highlight new research on cognitive processes as a basic element that may undergird the association between anxiety and chronic illness and health behavior.

Current Special Issue

We invited contributions from a diverse group of researchers to highlight recent work on cognitive processes involved with anxiety and their relation to chronic illness and health behavior. Findings in this issue highlight cognitive process related to anxiety in individuals with various chronic conditions, including epilepsy (Lidgard et al.), dermatological conditions (Dixon et al.), asthma (McLeish et al.), cancer (Gallagher et al.), and among cannabis-using veterans (Stewart et al.). This special issue also presents a series of studies that evaluate anxiety-related cognitive processes linked to health behaviors, including health care utilization (Horenstein et al.), sleep quality (Smith et al.), physical activity experiences (Farris et al.), and engagement in problematic health behaviors like non-suicidal self-injury (Hughes et al.), pain-motivated cigarette smoking (LaRowe et al.), and electronic cigarette use (Versella et al., Zvolensky et al.). These works identify cognitive-based risk and resilience factors related to emotional and physical health and functioning.

Anxiety Sensitivity

Anxiety sensitivity, the fear of anxiety-related arousal sensations (Reiss et al. 1986), is a cognitive construct of anxiety that appears to be associated with disease-related impairment. In this series, Lidgard et al. present findings that indicate anxiety sensitivity is significantly associated with greater functional impairment in adults with epilepsy, but not seizure likelihood. Dixon et al. also document anxiety sensitivity's link to anxiety symptoms and skin-related disability among individuals with skin disease. Stewart et al. document anxiety sensitivity's association with poorer perceived physical health and health-related functional impairment in cannabis-using veterans, particularly among frequent cannabis users. In terms of health behaviors, LaRowe et al. present a theoretical model of cognitive factors related to pain and cigarette smoking, which posits a feedback-loop wherein pain-smoking is maintained by anxious interpretations and responses to pain, particularly in the context of elevated anxiety sensitivity, which may motivate use of cigarettes to escape pain and anxiety. Anxiety sensitivity is also related to the negative affective experience of health-promoting behaviors, such as exercise. In this special issue, Farris et al. present findings linking anxiety sensitivity to lower enjoyment of physical activity, higher levels of anxiety and negative mood immediately prior to engaging in exercise, and an anxiogenic response to exercise.

Distress Intolerance

One's perceived or actual inability to tolerate distress states (Leyro et al. 2010) is an anxiety-relevant cognitive process that is linked to chronic illness and health behavior. In this special issue, intolerance of various distress states is examined, including physical discomfort, broad psychological distress, and specific psychological distress states (i.e., uncertainty). Specifically, McLeish et al. present findings that link intolerance of physical discomfort with poorer lung functioning, asthma control, and asthma-related quality of life in adults with asthma. Regarding intolerance of psychological distress, findings from Smith et al. indicate that one's perceived intolerance of psychological distress, in the context of problematic alcohol use, is associated with greater sleep disturbances in firefighters. Additionally, Horenstein et al. present evidence linking both intolerance of uncertainty, anxiety sensitivity, and their interplay with health anxiety and greater likelihood of emergency care utilization in young adults.

Difficulties with Emotion Regulation

Deficits in one's ability to use situationally appropriate regulation strategies flexibility to modulate emotional responses (Gratz and Roemer 2004) is related to anxiety and has also

been linked to various problem health behaviors, including cigarette smoking. As an extension of this line of research, in the current issue Versella et al. evaluate anxiety and cognitive-affective vulnerability factors related to electronic cigarette use. Their findings indicate that individuals who use electronic cigarettes have higher levels of anxiety compared to those who use electronic cigarettes and combustible cigarettes (i.e., dual-users), and difficulties with emotion regulation specifically, but not other cognitive vulnerabilities, may be related to elevated anxiety in electronic cigarettes users.

Repetitive Negative Thinking

The tendency to ruminate on the past or worry about the future (Ehring and Watkins 2008) is a transdiagnostic cognitive factor linked to anxiety and health behaviors. In this special issue, Hughes et al. present findings linking repetitive negative thinking to non-suicidal self-injury, a behavior associated with high physical risk and healthcare utilization. Findings indicate anxiety and feeling overwhelmed were affective antecedents to non-suicidal self-injury, particularly in the context of repetitive negative thinking, which suggests that this cognitive vulnerability may increase risk for maladaptive coping via non-suicidal self-injury in the context of acute anxious states.

Health Literacy

One's understanding and use of health information to make health behavior decisions (Institute of Medicine Committee on Health Literacy 2004) is generally associated with positive health outcomes and adaptive health behaviors. However, in the context of anxiety, higher health literacy has been linked to maladaptive behaviors like reassurance-seeking. In this issue, Zvolensky et al. evaluate anxiety and health literacy as it relates to electronic cigarette beliefs and behavior. They present findings that indicate higher health literacy about electronic cigarettes is associated with stronger beliefs about the risk and benefits of electronic cigarettes and higher dependence, and these associations are amplified in individuals with elevated anxiety sensitivity.

Positive Expectancy Factors

Certain cognitive factors may be protective against anxiety, and in turn, related to better physical health outcomes. In this issue, Gallagher et al. present an evaluation of two positive expectancy processes in cancer survivors: optimism (i.e., the tendency to expect positive outcomes in the future; Scheier and Carver 1992) and mastery (i.e., one's perceived control over outcomes; Pearlin et al. 1981). The findings indicate that both optimism and mastery are linked with adaptive coping, and greater emotional and physical health in cancer survivors.

Summary

Our goal with this special issue is to present recent research focused on (a) identifying cognitive vulnerabilities that are candidate treatment 'targets' and (b) understanding how identified targets influence emotional and physical health in individuals with chronic illness and poor health behavior. This type of approach is consistent with research initiatives in precision medicine (Ma et al. 2016), NIH's Science of Behavior Change (Riley 2017), and experimental therapeutics (Lewandowski et al. 2018)—all which aim to systematically identify potential mechanisms that can be targeted in tailored treatment with the ultimate goal of improving symptom management, quality of life, and reducing healthcare burden. We believe that this special series will (1) inform readers of the significance of this work at a variety of different levels of analysis; (2) illustrate current research questions being explored across a range of clinical populations through diverse approaches; and (3) identify promising areas for future research and clinical advances.

Compliance with Ethical Standards

Conflict of Interest Drs. Samantha G. Farris and Michael J. Zvolensky declare that they have no conflict of interest.

Informed Consent This article does not contain any studies with human participants.

Research Involving Human and Animal Participants This article does not contain any studies with human participants or animals performed by any of the authors.

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