A SOCIAL MEDIA CONTENT ANALYSIS OF ANXIETY-RELATED INFORMATION ON PINTEREST

by

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ABSTRACT

The Internet, including social media sites, is increasingly being used as a health resource for various health conditions. One of the social media sites being used as a source of health information is Pinterest, which uses primarily images to disseminate information. Anxiety disorders are the most common category of mental disorders in the general population and are also discussed on Pinterest. The present study examined the type of anxiety-related information on Pinterest, as well as its accuracy. Results of this study demonstrated that a large proportion of anxiety-related pins presented information on interventions for anxiety disorders, with over half of these referencing alternative or complementary treatments. Intervention-related pins were overwhelmingly positive in tone, regardless of whether the intervention cited was evidence-based. It was found that the sources of information for anxiety-related pins were most often blogs as opposed to more trusted sources of information. Infographics were the most used embedded visual communication tool in anxiety-related pins. The findings of the current study as well as implications for consumers and practitioners are discussed.

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CHAPTER ONE

A Social Media Content Analysis of Anxiety-Related Information on Pinterest

Literature Review

Purpose

The purpose of the current study was to examine anxiety-related information on Pinterest. No previous study (that we know of) has explored how Pinterest can be used as a health resource for information about anxiety disorders and their available treatments. It is important to investigate the type of information available on Pinterest related to anxiety disorders and its accuracy, because anxiety disorders are the most common category of mental disorders, and many individuals are reaching to social media to gain more information related to various health conditions and their available treatments. The current study aimed to answer the following research questions: Which anxiety disorders are referenced on Pinterest, are the interventions referenced on Pinterest evidence-based, which evidence-based and alternative or complementary treatments are referenced, does the tone of pin differ by the type of intervention, which categories of general health information are referenced, which embedded visual communication tools are used, and what are the sources of information for anxiety-related pins.

Epidemiology of Anxiety Disorders

Prevalence

Feeling anxious or worried is a normal reaction to stress and can be helpful in certain situations (e.g., feeling anxious when encountering a bear can prompt a hiker to run away for safety). Anxiety disorders, however, differ from normal feelings of nervousness or anxiousness. They involve excessive fear or anxiety that is out of proportion to the situation and interferes with an individual's functioning (American Psychiatric Association [APA], 2021). Anxiety

disorders are the most prevalent category of mental disorders in the general population (Baxter et al., 2014; Kessler et al., 2009). In the United States, an estimated 40 million adults have an anxiety disorder (Kessler et al., 2012), and in Canada, the 12-month prevalence rate (i.e., the proportion of people who have the disorder within a certain period of time) for an anxiety disorder is 12.2% (Health Canada, 2002). Globally, the estimated lifetime prevalence of any anxiety disorder ranges between 13.6 and 28.8%, and the estimated 12-month prevalence rates range between 5.6 and 19.3%, with a higher incidence of anxiety disorders seen in Western countries compared to in developing countries (Kessler et al., 2005; Kessler et al., 2009; Michael et al., 2007). Of the various anxiety disorders, specific phobia and social anxiety disorder (e.g., social phobia) are the most prevalent in the general population. In contrast, the least prevalent anxiety disorders include agoraphobia, separation anxiety disorder, panic disorder, and generalized anxiety disorder (Kessler et al., 1997; Kessler et al., 2005; Kessler et al., 2005). There are also gender differences in prevalence rates for the various anxiety disorders. Women are much more likely than men to be diagnosed with an anxiety disorder (Kessler et al., 1997; Kessler et al., 2005; Wittchen et al., 1998), with anxiety disorders being 1.5 to 2.5 times more prevalent in women than in men (McLean et al., 2011; Wittchen et al., 1998). The prevalence studies cited above by Kessler et al. utilized the National Comorbidity Survey (NCS), which was the first nationally representative mental health survey to use a structured diagnostic interview (i.e., a modified version of the Composite International Diagnostic Interview) to assess the presence of DSM mental health disorders in the general population of the United States (Kessler et al., 1997).

Age of Onset

Anxiety disorders often begin in adolescence or young adulthood and have a median age of onset of less than 15 years (Kessler & Greenberg, 2002), which is earlier than other types of mental disorders such as mood and substance use disorders (Kessler et al., 2005). In 80-90% of cases, anxiety disorders are present before the age of 35 (Michael et al., 2007), and individuals between the ages of 10 and 25 seem to be at a higher risk of developing an anxiety disorder (Kessler et al., 2009). Some anxiety disorders tend to be present from an earlier age than others. For example, social anxiety disorder, specific phobia, and separation anxiety disorder often begin in childhood and adolescence (Kessler et al., 2009). In comparison, generalized anxiety disorder, panic disorder, and agoraphobia typically develop during late adolescence and early adulthood, with an average onset between 25 and 30 years of age (Andrade et al., 2000).

Comorbidity

Anxiety disorders also commonly develop prior to other comorbid mental disorders; hence, they are considered as being temporally primary to these (Kessler et al., 2002). One study found that 82.8% of participants diagnosed with an anxiety disorder reported their anxiety disorder as being their first lifetime disorder (Kessler et al., 1997). It is very common for individuals with an anxiety disorder to have more than one anxiety disorder diagnosis or to have another mental disorder (Bandelow & Michaelis, 2015): approximately three out of four individuals with a lifetime anxiety disorder have at least one other lifetime mental disorder (Andrade et al., 2000). In one study, the overall rate of comorbidity in individuals with an anxiety disorder was 70%, with approximately one-third of individuals also meeting the criteria for either major depressive disorder or persistent depressive disorder (Sanderson et al., 1990). In addition to anxiety disorders being highly comorbid with each other and with affective disorders

(Kessler et al., 1997), they are often comorbid with substance use disorders (Grant et al., 2004), and with disruptive, impulse-control, and conduct disorders (Flessner & Piacentini, 2019). Comorbidity is often associated with poorer outcomes. Individuals who have both an anxiety disorder and one or more comorbid disorders tend to have more severe symptoms, more impaired functioning, and require more treatment than those with only one anxiety disorder (Hofmeijer-Sevink et al., 2012).

Course

The course of anxiety disorders has consistently been shown to be highly persistent and chronic (Kessler et al., 2012; Kessler & Greenberg, 2002; Yonkers et al., 2003), and it is common for individuals to have a recurring anxiety disorder after remission (Scholten et al., 2012). Some risk factors for an unfavourable course of anxiety disorders, defined as disorder persistence, a lower probability of remission, and an increased risk of recurrence, include a longer duration of illness, a higher severity of illness, more impairment associated with the anxiety disorder, and having a comorbid mental illness (Asselmann & Beesdo-Baum, 2015).

Risk Factors

There is not one cause of anxiety disorders. Generally, biological, psychological, and environmental or social factors interact to contribute to the development of anxiety disorders (Murray, 2009; Vanin, 2008). It has been found that individuals who have a parent, child, or sibling with an anxiety disorder are more likely to develop an anxiety disorder themselves, which suggests that a combination of environmental and genetic factors play a role in the development of these disorders (Shimada et al., 2015; Shri, 2010; Torgersen, 1983; Weissman, 1993). Individuals with a family history of major depressive disorder are also more at risk of developing an anxiety disorder (Blanco et al., 2014). Moreover, genetics may be linked to the development

of anxiety disorders (American Psychological Association, 2013; Meier & Deckert, 2019). Specifically, genetic epidemiological studies have found that the estimated heritability across the anxiety disorders is in the modest range between 30-40%, which is significantly lower than for some mental disorders such as schizophrenia and bipolar disorder (Hettema et al., 2001; Hettema et al., 2005; Shimada et al., 2015; Smoller et al., 2009). Other biological factors that are associated with anxiety disorders include variations in the serotonin transporter gene (Pérez-Edgar et al., 2010), and alterations in the set point of the hypothalamic-pituitary-adrenal (HPA) axis (Nolte et al., 2011).

Some psychological factors in youth are associated with the development of anxiety disorders, including various information-processing biases, such as having a selective attention to threat and tending to interpret ambiguous scenarios as threatening and of recalling threat-related memory content selectively (Barrett et al., 1996; Creswell & O'Connor, 2011; Field & Field, 2013). Behavioural inhibition (i.e., a temperament described as a fearful style of reacting to novelty) in childhood has also been associated with a heightened risk of developing anxiety disorders (Chronis-Tuscano et al., 2009; Michael et al., 2007; Rosenbaum et al., 1993).

Various environmental and/or social factors interact with psychological and biological risk factors. In children and youth, some of the factors associated with the development of anxiety disorders include the following: having an insecure attachment style with a parent (Colonnesi et al., 2011), especially an anxious attachment style, and experiencing parental overcontrol or overprotection (Borelli et al., 2015; Drake & Ginsburg, 2012). Other social and environmental factors that have been associated with anxiety disorders, although not as strongly as those above, include parental criticism and rejection, experiencing low parental warmth, high conflict between parents and children, and anxious modelling by parents (Drake & Ginsburg,

2012).

In adults, other social and/or environmental factors are positively associated with anxiety disorders. Some socioeconomic factors that are associated with an increased risk of developing anxiety disorders include low socioeconomic status (Kessler et al., 2005), lower educational attainment (Wittchen et al., 1998), and being unemployed (Michael et al., 2007). Anxiety disorders are also more common in individuals who are single (McEvoy et al., 2011), widowed, or divorced (Kessler et al., 2005). Lastly, having a disturbed family environment, having experienced childhood sexual abuse, and having low self-esteem are associated with anxiety disorders in adults (Blanco et al., 2014).

Effects of Anxiety Disorders

Anxiety disorders can be highly disabling (Baxter et al., 2014), and individuals with an anxiety disorder have been found to have higher disability levels than individuals without anxiety disorders, as measured by the World Health Organization Disability Assessment Schedule II, which looks at disability in six domains (i.e., cognition, mobility, self-care, social interaction, life activities, and participation; Hendricks et al., 2014). Further, anxiety disorders can have a negative effect on quality of life and functioning in various life domains (Mendlowicz & Stein, 2000; Wittchen, 2002). Having an anxiety disorder is associated with more missed days of work, impaired work functioning, psychiatric and physical comorbidity, and increases in medical service utilization (Kessler & Greenberg, 2002). Additionally, a meta-analytic study by Olatunji et al. (2007) found that patients with an anxiety disorder rated their overall quality of life (i.e., aspects of life that make it fulfilling and include individuals' perceptions of their mental health, physical health, social and family relationships, work functioning, and home functioning) more poorly than individuals without an anxiety disorder. Specifically, they reported a more

negative perception of their health, social relationships, occupation, and family life (Olatunji et al., 2007). Collectively, these findings demonstrate that anxiety disorders can be highly disabling and have a negative effect on various domains of daily life, making the early identification and treatment of these disorders essential.

Classification Systems

ICD-11 and DSM-5

There are two main diagnostic systems for mental disorders used globally, including in Canada: (1) the International Classification of Diseases - 11th Revision (ICD-11); and (2) the Diagnostic and Statistical Manual of Mental Disorders - 5th Edition (DSM-5). The ICD-11, developed by the World Health Organization (WHO), is free and accessible and is the most widely used classification system for medical diseases worldwide. It is meant to be used relatively easily by clinicians who do not necessarily specialize in mental health and who often work in general medical settings in low- and middle-income countries (Stein et al., 2013). Although the ICD-11 focuses also on medical diseases, it has a section for psychiatric disorders titled "Mental and Behavioral Disorders." This section is used to track the diagnoses of all individuals seen for psychiatric care where official statistics are collected (i.e., the 194 member states of the WHO), with each disorder being assigned a unique code (Tyrer, 2014; WHO, 2019). In contrast, the DSM-5 is the official classification system used in the United States for the diagnosis of psychiatric disorders and was created by a U.S.-based professional organization, the American Psychiatric Association (APA, 2013). The DSM-5 is also used in many other high-income countries by psychiatrists and psychologists (Tyrer, 2014).

In the ICD-11, the various anxiety disorders, which differ in their focus of apprehension (i.e., the stimulus or situation that triggers the fear or anxiety), are grouped under a section called

"Anxiety and Fear-Related Disorders" (WHO, 2019). In comparison, the DSM-5 has a section titled "Anxiety Disorders" and includes disorders that have characteristics of excessive fear and anxiety as well as related behavioural disturbances. The anxiety disorders listed in the DSM-5 differ in the types of objects or situations that induce fear, anxiety, avoidance behaviours, and the associated cognitive ideation in an individual (APA, 2013). The principal difference between the two classification systems is the specificity of their criteria for various mental disorders, including anxiety disorders. The DSM-5 employs specific criteria with cut-offs to indicate the number and duration of symptoms necessary to meet diagnostic criteria for that disorder. For example, to be diagnosed with generalized anxiety disorder, an individual must have three or more symptoms associated with anxiety and worry, and their anxiety and worry must last for at least six months (APA, 2013). In contrast, the ICD-11 does not state a fixed number of symptoms or a specific duration necessary to diagnose anxiety disorders. Instead, it provides clinicians with the essential features (i.e., describing the nature of the fear or anxiety in terms of its characteristic focus of apprehension) of each disorder, which are expected to be present in all individuals who have the disorder (WHO, 2019). The purpose of these essential features instead of strict cut-offs is to provide clinicians with more flexibility and the opportunity to use their clinical judgement when diagnosing individuals with an anxiety disorder (or another mental disorder), as well as leaving room for possible cultural variations in how the disorder presents itself (Kogan et al., 2016). For children, the criteria in the DSM-5 to meet the diagnosis of an anxiety disorder are adjusted to account for common differences in presentation between children and adults with the same disorder (e.g., fewer symptoms necessary or a shorter duration of illness for children; APA, 2013). The ICD-11 does not separate childhood and adult anxiety disorders, yet some disorders include information on developmental presentations that explains

how that disorder may present in children (e.g., separation anxiety disorder; WHO, 2019). In both the DSM-5 and the ICD-11, the majority of the anxiety disorders have the same title and similar descriptions, the symptoms of the anxiety disorder must have been present for at least several months (although the DSM is more specific about the duration), they must be associated with significant distress or impairment in functioning, and clinicians must rule out other health conditions that may better explain the symptoms presented (APA, 2013; Kogan et al., 2016; WHO, 2019).

Types of Anxiety Disorders

Although there are key differences between the ICD-11 and the DSM-5, there is much overlap in the description of the disorders mentioned in both classification systems. Below, a general description of each anxiety disorder outlined in both classification systems is given.

Generalized Anxiety Disorder

Individuals with generalized anxiety disorder (GAD) have marked symptoms of anxiety and worry about various everyday events or domains (e.g., often concerning work and school performance, family, finances, or health) for more days than not, lasting for at least several months. These individuals find their anxiety and worry difficult to control, and their anxiety is associated with physical symptoms (e.g., muscle tension, sleep disturbance, irritability, difficulty maintaining concentration, motor restlessness). The symptoms must also result in significant distress or impairment in important domains of functioning (e.g., personal, family, social, educational, or occupational), and cannot be the result of another health condition or the effects of a substance or medication (APA, 2013; WHO, 2019).

Panic Disorder

Those suffering from panic disorder (PD) experience recurrent unexpected panic attacks that are not in response to a specific stimulus or situation. Panic attacks are described as distinct episodes of intense fear or apprehension that are accompanied by physical symptoms (e.g., palpitations or increased heart rate, sweating, trembling, shortness of breath, chest pain, dizziness, chills, hot flushes, and fear of imminent death). Individuals with panic disorder are consistently concerned or worried about the recurrence of panic attacks and/or have a maladaptive change in behaviour because of their panic attacks. The symptoms must be associated with significant impairment in important areas of functioning and must not be the result of another medical condition or a substance or medication (APA, 2013; WHO, 2019).

Agoraphobia

Individuals with agoraphobia experience marked and excessive fear or anxiety about various situations in which escape may be difficult or in which help may not be available if they began having symptoms of panic or having incapacitating or embarrassing symptoms. The kinds of situations that individuals with agoraphobia would consistently actively avoid, enter only in specific circumstances, or endure with intense fear or anxiety include using public transportation, being in crowded spaces, being in open spaces, or being outside of the home by themselves. To meet the diagnosis, symptoms must last for at least several months, cause significant distress or impairment in important areas of functioning, and cannot be due to another medical condition or to a medication or substance (APA, 2013; WHO, 2019).

Specific Phobia

With specific phobia, individuals have marked and excessive fear or anxiety that persistently occurs when the individual is exposed or anticipates being exposed to one or more

specific objects or situations. The fear and anxiety are out of proportion to the actual danger or risk caused by the specific feared object or situation. Some examples of typical objects or situations that may be feared in individuals with specific phobia are animals, flying, heights, blood, or injuries. The phobic situations or objects are avoided or are endured with intense fear and anxiety. Symptoms must persist for several months, result in significant distress or impairment, and cannot be better explained by another health condition or by a substance or medication (APA, 2013; WHO, 2019).

Social Anxiety Disorder

Social anxiety disorder (often referred to as social phobia) involves marked and excessive fear or anxiety in response to one or more social situations that involve the possibility of being scrutinized. Some examples of situations that may be feared include social interactions such as having a conversation with someone or meeting new people, doing something while being observed such as eating or drinking in front of others, and performing in front of others, for example, giving a speech. Individuals with social anxiety disorder often believe their actions will be negatively viewed by others. The feared social situations are consistently avoided or are endured with intense fear or anxiety, and symptoms persist for over several months. This fear or anxiety also results in significant distress or impairment, and the symptoms are not better explained by another health condition or by the effects of a medication or substance (APA, 2013; WHO, 2019).

Separation Anxiety Disorder

Separation anxiety disorder is characterized by marked and excessive fear or anxiety about being separated from specific attachment figures. These symptoms are not developmentally appropriate (e.g., separation anxiety can be normal in very young children, but

in separation anxiety disorder, the fear and anxiety interfere with age-appropriate behaviour, for example, avoiding school or playdates) and often develop in childhood, but can also be seen in adults. In children and adolescents, the attachment figure is often caregivers, parents, or other family members, whereas, in adults, the attachment figure is often a romantic partner or their children. Individuals with separation anxiety disorder are persistently fearful that harm will come to their attachment figures or are fearful of events that could lead to losing or being separated from them. Individuals with this disorder may be reluctant to be away from attachment figures, may have recurrent nightmares about being separated, and/or experience physical symptoms when separation is anticipated or occurs. The anxiety must persist for at least several months, cause significant distress or impairment, and cannot be better explained by another disease or disorder, or by the effects of a medication or substance (APA, 2013; WHO, 2019).

Selective Mutism

Selective mutism, which is predominantly diagnosed in children, is characterized by a consistent failure to speak in social situations where speaking is expected (e.g., at school), but the individual speaks in other situations (e.g., at home). Their failure to speak is not a result of a lack of knowledge of or comfort with the spoken language required in the specific social situation(s). The failure to speak must last at least one month (excluding the first month of the school year) and negatively affect achievement in educational or occupational settings, and/or social communication. The disorder cannot be better explained by another condition, or by the effects of a substance or medication (APA, 2013; WHO, 2019).

Other Anxiety Disorder Categories

The seven anxiety disorders listed above are the most common. Both the DSM-5 and ICD-11 include other anxiety disorder categories that account for situations in which anxiety

disorder symptoms occur, for example, substance/medication-induced anxiety disorder (APA, 2013; WHO, 2019). The DSM-5 also includes an "Other Specified Anxiety Disorder" category, which applies to situations in which individuals have characteristic symptoms of an anxiety disorder but do not meet the full criteria for any of the anxiety disorders listed above (e.g., not enough symptoms to meet the full criteria). In this situation, a clinician would record "Other Specified Anxiety Disorder" and give the specific reason why the individual falls in this category (e.g., the generalized anxiety does not occur more days than not). There is also the "Unspecified Anxiety Disorder Category," in which the symptoms of a specific anxiety disorder are present and cause significant distress or impairment, but the individual does not meet the full criteria. This label is often used in situations where there is not enough information available for a clinician to make a specific diagnosis (e.g., in an emergency room setting; APA, 2013).

Criticisms of the Classification Systems

There have been several criticisms of both the DSM-5 and the ICD-11. The main criticism is that they are categorical systems in which each disorder is seen as distinct from others and is clearly defined. Categorical classification systems are often used so that individuals can have access to services based on their categorical diagnosis (Clark et al., 2017; Dalal & Sivakumar, 2009). The issue with these, however, is that mental disorders are not distinct disorders, but instead, a complex combination of psychological problems, which are dimensional (Clark et al., 2017). A criticism of the DSM-5 classification system specifically, is that it sets thresholds that individuals must meet to be diagnosed with a mental disorder. This is problematic for various reasons. First, there is not a strong empirical basis for establishing thresholds, thus, the decision about which cut-offs to use is somewhat arbitrary. Thresholds for classifying mental illness also have consequences because of the positive or negative social consequences of mental

disorder diagnoses (e.g., stigma, eligibility for services or third-party reimbursement for services; Clark et al., 2017). As a result of strict cut-offs, individuals below the threshold are not diagnosed and may not be eligible for mental health services (Maser et al., 2009). This is despite research indicating that individuals who are below the DSM threshold can also experience distress and have impaired psychosocial functioning and quality of life (Haller et al., 2014; Maier et al., 1997; Rai et al., 2010).

Another criticism of these classification systems is that individuals are often diagnosed with more than one psychiatric disorder (Kessler et al., 1997). This overlap calls into question whether the classification systems are accurate in separating psychiatric disorders, if these disorders are fully distinct from one another, and whether common dimensions underlying mental disorders are being studied sufficiently (Brown & Barlow, 2005; Clark et al., 2017; Dalal & Sivakumar, 2009). Some psychiatrists and other mental health professionals have critiqued these classification systems because they rely on clinical presentation and symptoms, not biomarkers and laboratory tests, as is the case with many medical disorders, which often have a biological basis that can confirm the disease (e.g., blood pressure in hypertension; Pickersgill, 2014; Stein et al., 2013). This makes some mental health professionals question the validity of these classification systems; however, the reason for the reliance on clinical presentation is that psychiatric disorders, unlike medical disorders, have many causes that interact with one another and act on multiple brain mechanisms (Stein et al., 2013). Additionally, there is an inadequate knowledge base of the underlying biological processes involved in many mental disorders (Carpenter, 2013; Tyrer, 2014), necessitating that diagnoses be made based on clinical presentation and observable symptoms.

The DSM-5 has also been critiqued for increasing the sensitivity of psychiatric diagnoses and reducing their specificity. Through the various editions of the DSM, thresholds were loosened for existing disorders and new disorders were introduced. This has led some researchers to criticize the DSM-5 for not having sufficient scientific research on the reliability, prevalence, validity, treatment response, and risk/benefit ratio of these new disorders (e.g., somatic symptom disorder), as well as arguing that the DSM-5 leads to an increase in false-positive rates (Wakefield, 2015). The DSM-5 has come under scrutiny by many who believe that adding disorders and loosening thresholds has over pathologized normal human reactions (e.g., removing the bereavement exclusion for major depressive disorder; Frances & Nardo, 2013).

It is also worthy of mention that although efforts have been made to increase the reliability of psychiatric diagnoses, reliability continues to be a significant issue (Aboraya, 2006). The results of initial field trials for the DSM-5 demonstrate that there is much variability in the kappa statistics for various disorders. For example, the kappa values were poor for major depressive disorder and generalized anxiety disorder compared to some other DSM-5 diagnoses (Lefere et al., 2016). There are various possible reasons behind poor reliability of psychiatric diagnoses. One study examined diagnostic differences between psychiatrists and found that the main reasons for a lack of reliability in psychiatric diagnoses were inconsistent reporting of a patient, inconsistency of clinician, and poor nomenclature (Ward et al., 1962). Some other explanations include patient factors, such as the patient's psychological state and how useful and reliable the information they provide to the clinician is, whether their psychiatric presentation is atypical, and the changing of symptoms over time (Aboraya, 2006). Some clinician factors can also have an impact on the reliability of psychiatric diagnoses, such as their interviewing methods, their work experience, their understanding of how symptoms are defined, time

constraints, and the reliance on proxy information and client observations. Some clinicians may also feel pressured to make a diagnosis because of financial reasons (e.g., providing the patient with more services or the need for a diagnosis to be reimbursed by certain insurance companies; Aboraya, 2007).

In light of some of the criticisms mentioned above, the National Institute of Mental Health (NIMH) initiated work on a research framework in 2009 named the NIMH Research Domain Criteria (RDoC) to investigate mental disorders. The RDoC, unlike the DSM-5 and the ICD-11, is not meant to be used as a diagnostic guide or to replace the current classification systems. Instead, the goal of this framework is to provide information about the biological and cognitive processes that lead to mental illness. The framework utilizes various sources of information to investigate six domains of functioning (i.e., negative valence, positive valence, cognitive systems, systems for social processes, arousal/regulatory systems, and sensorimotor systems). Within each of these domains, several behavioural constructs are studied dimensionally from normal to abnormal functioning and are seen as being affected by both environmental and neurodevelopmental contexts. These constructs are measured through genetic, physiological, behavioural, and self-report assessments. The main goals of the RDoC are for its findings to eventually help inform the creation of new mental health screening tools, diagnostic systems, and treatments for mental disorders (National Institute of Mental Health, 2021).

Therapeutic Interventions for Anxiety Disorders

Anxiety disorders are usually treated with psychotherapy, medication, or a combination of the two (National Institute of Mental Health, 2021). In this section, evidence-based interventions for anxiety disorders are described, including cognitive-behavioural therapy, pharmacotherapy, mindfulness-based interventions, and Internet and self-help interventions.

Non-evidence-based interventions, such as complementary and alternative treatments are also briefly outlined. Evidence-based interventions (EBIs) or evidence-based practice (EBP), are interventions that have been shown to be effective. The American Psychological Association defines EBP in psychology as "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (American Psychological Association, 2016, p. 273). Likewise, the Canadian Psychological Association (CPA) describes EBP as treatments and interventions that are effective based on research findings published in the peer-reviewed scientific literature (CPA, 2012), with meta-analyses or systematic clinical trials being considered the strongest evidence base (American Psychological Association, 2016).

While evidence-based interventions have been recommended, they are not always implemented in everyday clinical practice (Riemer et al., 2005). Some practitioners are not convinced that the samples used in EBP research, which often use narrow criteria for inclusion, can be generalized to less controlled settings, and to the general population of patients, who often have comorbid diagnoses and thus may be more complex to treat than those in controlled studies (Stewart et al., 2012). It can be challenging to draw conclusions from existing data to inform clinical practice, as research studies are done in such a rigid and controlled manner that they often don't resemble practice in the real world (Greenhalgh et al., 2014). As such, treatments are often less effective for individuals with comorbid conditions or those from sociodemographic groups for which treatments have not yet been tested (Cook et al., 2017). In addition, many clinicians believe there should be greater weight given to their clinical experience compared to EBP (Stewart et al., 2012). Some clinicians are hesitant to implement EBP because of its emphasis on manualized treatments, which they believe may stop them from being more flexible

and forming a strong therapeutic relationship with clients (Addis & Krasnow, 2000). Another difficulty is that many clinicians do not have access to the educational resources, training, and supervision that would enable them to fully implement EBP (Pagoto et al., 2007; Stewart et al., 2012).

Also of note, conducting and publishing research requires a large time commitment. Thus, there is often a delay between when research is completed and when it is published, as well as between when it is published and when it informs practice or policy. It is also important to mention that there is publication bias in evidence-based research, as with all types of research. There may be bias in terms of the sponsorship of research, the methodologies used, the subjects chosen, and which studies get published (Cook et al., 2017).

Cognitive-Behavioural Therapy

Cognitive-behavioural therapy (CBT) originates from the work of Aaron T. Beck and Albert Ellis in the 1960s, who proposed that maladaptive cognitions perpetuate emotional distress and behavioural difficulties. Maladaptive cognitions include general beliefs or schemas about the world, the self, and the future (Hofmann et al., 2012). Beck developed a tri-part model of emotion and posited that thoughts, feelings, and behaviours are interrelated. The main belief underpinning CBT is that, by changing maladaptive thoughts, an individual's maladaptive emotions and behaviours will also change (Kaczkurkin & Foa, 2015). As the name implies, CBT incorporates both cognitive therapy techniques and behavioural therapy techniques (Deacon & Abramowitz, 2004). Cognitive therapy refers to any verbal or behavioural strategy used to help individuals identify and change their maladaptive beliefs or assumptions related to their fears (e.g., Socratic questioning). In CBT, individuals are not asked to think more positively, but instead, are taught to think about situations more realistically and adaptively (Hofmann et al.,

2013). Behaviour therapy involves the use of behavioural techniques to help clients habituate to their feared stimuli or to diminish their fear responses (e.g., systematic exposure; Norton & Price, 2007). CBT is a time-limited treatment usually consisting of 20 one-hour sessions or fewer, and there are specific goals of CBT treatment based on the nature of the client's anxiety disorder (Kaczkurkin & Foa, 2015). In general, the goal of CBT for anxiety disorders is to help clients reduce their distress by changing how they respond to their anxiety both cognitively and behaviourally, and for clients to apply what they learned in treatment in their daily life (Arch & Craske, 2008).

There are six main components to CBT, although the number and intensity of each component included in treatment may vary depending on the issue to be resolved and the particular approach to CBT. The first component is psychoeducation, which involves teaching the client about the nature of fear and anxiety, and the relationship between thoughts, feelings, and behaviours. The second component is the self-monitoring of symptoms, which can be used to identify automatic thoughts and help the client understand the relationship between their thoughts, emotions, body sensations, and behaviours (Otte, 2011). The third component includes somatic exercises, where the client is taught relaxation and breathing techniques (e.g., progressive muscle relaxation; Arch & Craske, 2008; Otte, 2011) to decrease their immediate physiological arousal (Norton & Price, 2007). The fourth component is cognitive restructuring, through which the client learns to question the absolute truth of their anxious thoughts by evaluating the evidence for and against their anxious thoughts, identifying the cognitive error (e.g., all or nothing thinking) reflected by their thoughts, and developing alternative thoughts that are more accurate and adaptive descriptions of their experience (Arch & Craske, 2008). The fifth component of CBT is exposure, which has various forms including imaginal exposure (i.e., the

individual vividly imagines the feared situations/consequences), in vivo exposure (i.e., gradual exposure to places, objects, people, or situations that were previously avoided and that are intensely feared by the client), and interoceptive exposure (i.e., purposely inducing the physical sensations that individuals mistakenly interpret as the beginning of a panic attack), which is often used with clients who have panic disorder (Kaczkurkin & Foa, 2015). The exposures are repeated and prolonged and help to reduce the anxiety response in the client when faced with feared stimuli (Deacon & Abramowitz, 2004). The sixth and last component is relapse prevention, which is focused on helping the client prepare for any relapses and may include booster sessions after the termination of treatment (Otte, 2011).

CBT programs can consist of different combinations of the above components, with some including all six main components (Arch & Craske, 2008), some including only certain components (e.g., psychoeducation, cognitive restructuring, and exposure; Arch & Craske, 2008), and others including only one component (e.g., exposure; Olantuji et al., 2010). The components used in CBT treatment may be weighted differently during sessions depending on the anxiety disorder the client has (Otte, 2011). For instance, exposure is weighted most heavily in specific phobia (Farach et al., 2012), as CBT for specific phobia typically focuses on exposure to phobia-relevant stimuli (Bandelow et al., 2015; Olatunji et al., 2010). In contrast, CBT for panic disorder, for example, may include additional components such as psychoeducation about the nature and physiology of the panic, the cognitive restructuring of thoughts related to panic symptoms and their consequences, and interoceptive exposure (Olatunji et al., 2010).

CBT is widely used and is considered the first-line treatment for all anxiety disorders in adults (Hofmann et al., 2012) because its efficacy in reducing anxiety symptoms has been supported by numerous meta-analyses over the past decades, in both disorder-specific CBT and

transdiagnostic CBT. The effect sizes of CBT are generally in the moderate to large range (between 0.5 to larger than 1.0), depending on the specific study and the comparison group (e.g., Butler et al., 2006; Carpenter et al., 2018; Hans & Hiller, 2013; Hofmann & Smits, 2008; Olatunji et al., 2010). It has demonstrated effectiveness in both randomized controlled trials and naturalistic settings (Otte, 2011), with the effects of CBT generally persisting one year following the termination of treatment (DiMauro et al., 2013; van Dis et al., 2020). CBT can be delivered either in a one-to-one format or in groups of individuals with anxiety disorders, and both are effective (Barkowski et al., 2020; Hans & Hiller, 2013; Whitfield, 2010). Nevertheless, individual CBT has been studied more than have group approaches to CBT, and the evidence base supporting group CBT is less well developed compared to individual CBT (Whitfield, 2010).

Multiple meta-analyses have also supported the efficacy of CBT for the treatment of anxiety disorders in children and adolescents, with studies showing moderate to large effect sizes (e.g., Compton et al., 2004; Davis et al., 2011; James et al., 2020; Reynolds et al., 2012; Silverman et al., 2008). Treatment effects have also been demonstrated to last years after the cessation of treatment (Ishikawa et al., 2007). Individual CBT, group CBT, and group CBT with parental involvement for children and adolescents have all been found to be similarly efficacious (James et al., 2020; Silverman et al., 2008). Most CBT treatments for children and adolescents have a duration ranging from 12 to 15 sessions and generally target numerous anxiety disorders (e.g., separation anxiety disorder, social anxiety disorder, generalized anxiety disorder; Silverman et al., 2008). Albano & Kendall (2002) highlighted the five CBT components in child and adolescent CBT protocols, which are parallel to those used in adult CBT treatments: psychoeducation, somatic management skills training, cognitive restructuring, exposure methods,

and relapse prevention plans. One program, the Coping Cat Program, developed by Philip Kendall in 1990, includes the above components and is the most widely used and best-researched manual-based CBT protocol for individuals between the ages of 7 and 14 with an anxiety disorder (Connolly & Bernstein, 2007).

Pharmacotherapy

The other widely used treatment for anxiety disorders is pharmacotherapy, and there are various types of pharmacological interventions, each having their own risks and benefits. For adults, the choice to use medication or CBT, alone or in combination, is based on various variables such as the availability of a psychologist, the price of CBT and medications, and personal preference (Bystrisky et al., 2013). Pharmacological treatments for anxiety disorders do not cure the disorder itself but can help to relieve symptoms associated with the disorder. Further, individual medications may not be equally effective in all persons. Many people may need to try several medications before finding one that improves their symptoms while also having manageable side effects (National Institute of Mental Health, 2021).

Selective Serotonin Reuptake Inhibitors and Serotonin-Norepinephrine Reuptake Inhibitors

The pharmacological treatments for adult anxiety disorders that have the most favourable risk-benefit ratio are selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs; e.g., Bandelow et al., 2017). The two also have a similar efficacy (Farach et al., 2012), and some individual SNRIs and SSRIs have demonstrated large effect sizes (Bandelow et al., 2017). SSRIs produce their effects by blocking the reuptake of serotonin, which increases synaptic levels of 5-HT (i.e., serotonin) in the synapse and produces long-term neurochemical changes in the brain (Farach et al., 2012). Some of the possible side effects when taking SSRIs include nausea, headache, fatigue, dizziness, sexual

dysfunction, and weight gain. When stopped abruptly, SSRIs can produce a discontinuation syndrome (e.g., dizziness, insomnia, and flu-like symptoms; Baldwin et al., 2005; Bandelow et al., 2012). SSRIs usually take between two to four weeks before anxiolytic effects begin being experienced and can take up to six weeks in some cases (Bandelow et al., 2012). SSRIs have also been associated with increased suicidal ideation; therefore, the U.S. Food and Drug Administration (FDA) and Health Canada have added a "black box" warning for individuals taking SSRIs who are younger than 25 years of age. Additionally, it is recommended that individuals younger than 18 taking antidepressants be carefully monitored for behavioural and emotional changes, such as an increase in suicidal thoughts (Friedman et al., 2014; Kurdyak et al., 2007).

SSRIs are commonly used in the treatment of childhood and adolescent anxiety disorders (Ipser et al., 2009). The safety and efficacy of medications other than SSRIs for childhood anxiety disorders have not yet been established (Connoly & Bernstein, 2007). For children and youth with mild to moderate anxiety symptoms, CBT is the recommended treatment for anxiety disorders (with the addition of medication if CBT does not sufficiently reduce symptom severity or to promote treatment effectiveness). Conversely, for children and youth with moderate to severe anxiety symptoms, a multimodal treatment comprised of medication and CBT is recommended (Kodish et al., 2011).

SNRIs also block the reuptake of serotonin and additionally block the reuptake of norepinephrine, another neurotransmitter (Farach et al., 2012). As with SSRIs, SNRIs take two to four weeks to begin producing effects and at the beginning of treatment, they may cause similar side effects as SSRIs including restlessness, insomnia, or headaches (Bandelow et al., 2012;

Baldwin et al., 2005). SNRIs may also cause discontinuation syndrome when stopped abruptly and have been associated with increased blood pressure (Bandelow et al., 2012).

Tricyclic Antidepressants

Another class of antidepressants used to treat anxiety disorders are tricyclic antidepressants (TCAs), which block the reuptake of norepinephrine, and several also mediate the inhibition of serotonin reuptake (Bystrisky et al., 2013). Although some TCAs are as effective as SSRIs and SNRIs in treating the symptoms of anxiety disorders, TCAs have more adverse side effects and can be lethal in overdose due to their potential cardiac and central nervous system toxicity (Bandelow et al., 2012). Because of these risks, they are rarely used as initial pharmacological treatments for anxiety disorders (Bystrisky et al., 2013) and are often reserved for cases where other antidepressant classes have not been successful in alleviating symptoms (Sayed et al., 2014). Some of the side effects of TCAs include dry mouth, blurred vision, constipation, urinary retention, cardiac arrhythmia, tachycardia, sedation, postural hypotension, dizziness, and headache (Farach et al., 2012).

Monoamine Oxidase Inhibitors

A fourth class of antidepressants that are occasionally used to treat anxiety disorders are monoamine oxidase inhibitors (MAOIs). They are not usually given as a first pharmacological treatment for individuals with an anxiety disorder because of their less favourable risk/benefit ratio. MAOIs are effective for specific phobia and social anxiety disorder, but they pose the greatest danger and have the most adverse side effects of all antidepressant classes (Farach et al., 2012). Specifically, individuals taking MAOIs can have dangerous hypertensive reactions after consuming foods that contain tyramine (e.g., cheese, beer, wine) or if they use certain drugs (e.g., meperidine, decongestants, or certain energy drinks). MAOIs also interact with many other

drugs such as anesthetics, analgesics, other antidepressants, and anxiolytics (Sayed et al., 2014). Some of the common side effects of MAOIs include weight gain, sleep difficulties, and experiencing sedation during the day (Farach et al., 2012).

Benzodiazepines

Benzodiazepines are depressants that enhance the effect of the neurotransmitter gamma-aminobutyric acid (GABA) at the GABAA receptor, which produces anxiolytic sedating effects within minutes after ingestion (Bandelow et al., 2012). Benzodiazepines have shown high effect sizes (e.g., Bandelow et al., 2017). However, benzodiazepines have various side effects including sedation, dizziness, and prolonged reaction time due to central nervous system depression. Furthermore, after an individual is continuously treated with benzodiazepines for a few weeks or months, they may experience physiological and/or psychological dependence (Bandelow et al., 2017; Bandelow et al., 2012; Farah et al., 2012). Another risk of benzodiazepines is that they can cause lethal overdose when mixed with alcohol or opioids, and, therefore, should not be prescribed to individuals with a history of substance abuse (Bystrisky et al., 2013). Because of the short-term and potent effects of benzodiazepines, they are usually used for acute anxiety (e.g., flying on an airplane), to reduce anxiety before antidepressants begin producing noticeable effects, or in cases where an individual has not responded well to antidepressants (Farach et al., 2012). Although benzodiazepines are sometimes prescribed to children and adolescents with an anxiety disorder, their use with this population is not recommended as they have not shown efficacy in controlled trials and have more undesirable side effects (Connoly & Bernstein, 2007; Ipser et al., 2009).

Other Pharmacological Treatments

Few double-blind, placebo-controlled randomized clinical trials have examined the efficacy of other types of antidepressants and medications used to treat anxiety disorders. These other pharmacological treatments include the following: mirtazapine, trazodone (Garakani et al., 2020), bupropion, (Farach et al., 2012), pregabalin (Baldwin et al., 2005; Bandelow et al., 2012), antipsychotic drugs (Baldwin et al., 2005), antihistamines (Bandelow et al., 2012), and beta-blockers and azapirones (Farach et al., 2012; Garakani et al., 2020).

Mindfulness-Based Interventions

Mindfulness and acceptance-based approaches have been increasingly used in the treatment of anxiety disorders over the last two decades (Singh & Gorey, 2018). Mindfulness approaches are described as the "third wave" in CBT. The first wave was behavioural, and the second emphasized the cognitive approach (Bystrisky et al., 2013). Mindfulness practices originate from Buddhist traditions (Singh & Gorey, 2018), and one widely adopted definition of mindfulness is from Jon Kabat-Zinn, who defined mindfulness as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p.4). One goal of mindfulness is to help individuals purposely pay attention to the present moment with acceptance and without judgment instead of viewing anxious experiences with fear and criticism (Roemer et al., 2013). Bishop et al. (2004) proposed that there are two components of mindfulness: the self-regulation of attention and purposefully paying attention to the present moment with curiosity, openness, and acceptance.

Mindfulness-based cognitive therapy (MBCT), developed by Zindel Segal, Mark Williams, and John Teasdale, is one treatment that uses mindfulness practices and was initially used to prevent relapse in depression (Teasdale et al., 2000), but has since been applied to the

treatment of anxiety disorders (Evans et al., 2008; Morgan, 2003). MBCT incorporates both cognitive components found in CBT, as well as mindfulness principles and practice that are derived from Jon Kabat-Zinn's Mindfulness-Based Stress Reduction (MBSR) program (Sipe et al., 2012). The MBSR program was developed in the late 1970s and has been applied widely for physical health, mental health conditions, and non-clinical populations (Strauss et al., 2014). The components of MBSR, which are used in conjunction with components of CBT during MBCT, include sitting meditation, hatha yoga, and body scan. These techniques are meant to teach clients how to purposely pay attention to their bodily sensations and how to do this in everyday life (Hofmann et al., 2010). In MBCT specifically, there are eight weekly sessions of approximately two hours in length. These sessions focus on meditation practices (e.g., guided body scans, sitting and walking meditations, mindful movement, 3-minute breathing spaces, and focused awareness on everyday activities), with earlier sessions focusing mostly on guided meditation, and later sessions focusing more on independent practice. In MBCT, individuals are also encouraged to practice mindfulness activities for 45 minutes per day as homework (Sipe et al., 2012). Some of the elements of CBT that may be used in MBCT sessions include the following: psychoeducation about the relationship between thoughts, feelings, and behaviours, behavioural interventions (e.g., focused on developing present moment awareness), and distinguishing thoughts as thoughts rather than facts (Sipe et al., 2012; van der Valden et al., 2015). The aims of MBCT include the following: to help individuals recognize their dysfunctional cognitive processes, to disengage from these cognitive processes and to instead redirect their attention to the present moment, to view their thoughts and feelings as temporary and automatic events in the mind instead of as facts, and to be non-judgmental and compassionate towards their changing thoughts, feelings, and physical sensations (van der

Velden et al., 2015). Meta-analyses on the efficacy of mindfulness-based interventions (MBIs) have found that both MBSR and MBCT are effective in reducing anxiety symptom severity and are associated with consistently better outcomes than non-evidence-based treatments and active control conditions, for example, relaxation training, supportive psychotherapy, and health education (e.g., Fumero et al., 2020; Hofmann et al., 2010; Hofmann & Gómez, 2017; Singh & Gorey, 2018; Vøllestad, et al., 2012). One meta-analysis on mindfulness-based therapy found high effect sizes in improving anxiety in patients with an anxiety disorder (Hofmann et al., 2010).

Acceptance and commitment therapy (ACT) is a behavioural therapy that uses mindfulness, acceptance, and cognitive defusion techniques to increase psychological flexibility and promote behaviour change that aligns with the client's chosen values (Arch & Craske, 2008). Cognitive defusion techniques are used to change the effect of verbal or cognitive events by changing the literal and functional context in which they occur (Masuda et al., 2003). The main goal of cognitive defusion is not to alter the content of verbalizations, but instead to diminish their effect on behaviour by training individuals to view their thoughts with acceptance instead of viewing them as needing to be challenged or disputed (Assaz et al., 2018; Larsson et al., 2016). Psychological flexibility refers to an individual's ability to stay in the present moment regardless of unwanted thoughts, feelings, or somatic experiences, and to choose behaviours based on the present situation and personal values (Hayes et al., 2002). An important principle of ACT is that attempts to control unwanted subjective experiences, such as anxiety, are often not effective and may result in increased distress. Instead, clients in ACT are encouraged to defuse from distressing psychological experiences and to adopt an accepting stance towards their experience. Given that ACT was developed later than CBT, there is less evidence regarding its effectiveness.

Randomized controlled trials of ACT for anxiety (Forman et al., 2007), as well as meta-analyses, have shown that it is an effective treatment for anxiety disorders (e.g., Bluett et al., 2014; Landy et al., 2015; Swain et al., 2013). For instance, in one study, the effect size for anxiety symptoms was medium to large for group ACT (Ferreira et al., 2022).

Internet and Self-Help Interventions

Internet and computer-based treatments (ICTs) and Internet-and-mobile-based interventions (IMIs) for anxiety disorders have also been developed. Their objectives are to deliver quality treatment while also reducing some of the common barriers to mental health care (e.g., stigma, the nature of the disorder limits travel outside of the home, time constraints, long waiting lists, the cost of services, and geographic and mobility limitations; Reger & Gahm, 2009). Most ICTs adopt evidence-based psychological treatment approaches, such as CBT, and they vary in the level of human support provided through text-based and asynchronous communication (Domhardt et al., 2019). For instance, ICTs may be self-guided and asynchronous, may be supported by reminders from a non-clinical technician or practice nurse, or may be guided by a therapist who communicates with individuals through phone calls, e-mails, texts, or makes comments on a private forum (Andrews et al., 2010). Self-help approaches involve individuals working through a guide to a particular treatment (e.g., CBT), with little to no therapist input. These interventions may be in the form of books, CDs, DVDs, websites, or other technologies (Cuijpers & Schuurmans, 2007; Lewis et al., 2012). Several meta-analyses have found that ICTs are effective treatments for anxiety disorders (Andrews et al., 2010; Domhardt et al., 2019; Newman et al., 2011; Peñate & Fumero, 2016; Reger & Gahm, 2009). A Cochrane review found that Internet-delivered cognitive-behavioral therapy (ICBT) is comparable in efficacy to face-to-face CBT and is an efficacious treatment for anxiety disorders

in adults (Olthuis et al. 2016). One meta-analysis on ICBT found moderate to large effect sizes (Reger & Gahm, 2009). The level of support given in ICTs may also influence treatment efficacy: ICTs that include more support are superior to unguided interventions in reducing symptom severity and increasing treatment adherence (Domhardt et al., 2019; Peñate & Fumero, 2016).

Alternative Treatments

Although psychotherapy and pharmacotherapy are the two evidence-based treatments for anxiety disorders, there are many alternative treatments that individuals use in an attempt to relieve their anxiety symptoms (van der Watt et al., 2008). These alternative treatments include: narcotics (e.g., psilocybin, LSD, cannabinoids), herbal and nutritional supplements or preparations (e.g., 5-HTP, kava, ashagwandha, passionflower, lavender, valerian, galphimia, echinacea, ginko, chamomile, licorice, saffron, lemon balm, peppermint, B vitamins, ginger, St. John's Wort, Vitamin C, magnesium; Garakani et al., 2020; Jorm et al., 2004), lifestyle changes (e.g., sleep, exercise, t'ai chi, yoga, pleasant activities, distraction techniques), dietary changes (e.g., avoiding certain foods such as rye, barley, wheat, dairy, avoiding nicotine, avoiding caffeine, special diets such as the ketogenic diet; Jorm et al., 2004), bibliotherapy, hypnosis, autogenic training, and biofeedback. Some complementary medicine and physical treatment methods (Bandelow et al., 2017) include: acupuncture, homeopathy, naturopathy, massage, chiropractic, osteopathy, and aromatherapy (Kessler et al., 2001).

The Role of the Internet as a Health Resource

Since the 1990s, there has been a global information revolution (Mathews, 2000), resulting in an abundance of information being available at any time and in any place where individuals have access to the Internet (Scantlebury et al., 2017). The increasing popularity and

availability of the Internet has given individuals an opportunity to search for and find health information that was previously unavailable to them unless they were seeking medical advice from a health practitioner or gathering information through other media such as books, magazines, or newspapers (Amante et al., 2015). The Internet is now commonly used by both general users and health practitioners to access health information, and the health research literature can now be accessed more easily online (Higgins et al., 2011; Phillips, 2020). In 2011, approximately 74% of adults in the United States used the Internet, with 80% of them looking for health information online (Fox, 2011). Some individuals use the Internet as a supplement or alternative to traditional methods of accessing health information, such as receiving information directly from a health practitioner (Amante et al., 2015). In a survey of online health seeking, four in ten individuals who used the Internet to find medical information reported that the information they found influenced their decisions regarding whether they should see a physician, which questions to ask their physician, and how to treat a medical condition (Fox et al., 2000).

There are various benefits of using the Internet to gather health-related information, including: convenience (e.g., being able to find information fast and at any time of day), anonymity, and the extensive amount of information that can be found online (Fox et al., 2000). Individuals report that they seek health information online to inform their decision-making, learn about their treatment options, verify medical information or advice they have already received (Scantlebury et al., 2017), play a more active role in their healthcare, and enable interactions between themselves and health practitioners (Powell et al., 2003).

On the other hand, some of the challenges associated with using the Internet as a health resource include individuals relying on inaccurate, unreliable, or out-of-date information that can lead them to make harmful health decisions or inappropriately self-diagnose (Powell et al.,

2011), having difficulty understanding health information online (Benigeri & Pluye 2003), and becoming confused or overwhelmed by the wealth of information (Powell et al., 2011). There is also a risk of individuals sharing private health information online.

The Role of Social Media

It is common for individuals to use general-purpose search engines, such as Google, Bing, or Yahoo to find health information online (Rice, 2006), but social media, which include various types of online platforms such as social media sites (e.g., Twitter, Facebook), blogs, personal websites, online communities, and discussion forums (De Choudhury et al., 2014; Zhao & Zhang, 2017), are becoming as popular as the Internet as sources for health-related information. Relying on social media sites for health information has similar challenges as to relying on the Internet. In addition, since social media sites are informal and unregulated, lay-users can upload any health-related information, which leads to information of varying quality (Moorhead et al., 2013).

Many social media sites provide intervention information for various physical or mental health disorders or conditions, such as anxiety disorders. It can be difficult for individuals who do not have a background in mental health to distinguish between evidence-based and non-evidence-based treatments. For example, many websites suggest interventions for anxiety disorders, with some suggesting non-evidence-based treatments such as acupuncture and massage (e.g., Fullscript, 2020) or herbal remedies (e.g., valerian, St. John's Wort; Reader's Digest, 2020) instead of evidence-based treatments such as CBT or antidepressants.

Some advantages of social media include that they are efficient platforms for individuals to access information from others, to ask for help and advice, to share their own experiences, to find support from or to connect with others with similar conditions, and to help others who are

having similar difficulties (Hausmann et al., 2017; Zhao & Zhang, 2017). Researchers have studied how individuals use social media sites including Facebook, Reddit, and Pinterest as sources of health information on conditions such as the Zika virus (e.g., Sharma et al., 2017), diabetes (e.g., Zhang et al., 2013), hypertension (e.g., Al Mamum et al., 2015), chronic obstructive pulmonary disease (e.g., Paige et al., 2015), breast cancer (e.g., Miller et al., 2019; Miller et al., 2020), and sexually transmitted diseases (e.g., Nobles et al., 2018). A study conducted by Hausmann et al. (2017) asked adolescents in the waiting room at the Boston Children's Hospital about their use of social media to access health information. Only 25% of the adolescents believed that social media were accurate and useful sources of health information. Most viewed social media as health resources for support, advice, and to connect with others with the same medical condition as them (Hausmann et al., 2017).

One systematic literature review on the spread of health-related misinformation on social media found that there is a large amount of misinformation on social media, especially related to infectious diseases and vaccines, and that, although less abundant than accurate information, misinformation regarding vaccines is often more popular on social media than accurate vaccine information (Wang et al., 2019). Johnson et al. (2021) reviewed 50 of the most popular social media articles about the four most common types of cancer and found that 32.5% of these articles contained misinformation (i.e., false information or information that is misleading or mischaracterized), and 30.5% contained harmful information (i.e., information that can lead to harmful inaction, action, or interactions, or economic harm). Even more troubling, popular articles on Facebook that contained misinformation and harmful information received significantly more online engagement compared to articles with accurate information (Johnson et al., 2021). A study by Tewfik et al. (2020) had physicians review the fifty most popular articles

related to the Covid-19 outbreak on Facebook between November 2019 and March 2020. The researchers found that only 32% of the articles were accurate, whereas 18% of the articles were inaccurate, and 50% were misleading (i.e., containing both accurate and inaccurate information), with these two types of articles (i.e., misleading and inaccurate) receiving more user engagement (Tewfik et al., 2020). Posts are commonly perceived by social media users as being more credible if they have higher user engagement, such as likes, regardless of the source of the post or the content of the post (Borah & Xiao, 2018). These studies highlight the need for individuals to confirm the information they read on social media by a more trusted source, such as a healthcare professional.

Health literacy (i.e., the ability to find, process, and understand basic health information and services and to use them to inform health-related decisions) may be related to the level of trust given to health-related information on social media. Research findings demonstrate that individuals with lower levels of health literacy are more likely to use and trust health-related information on social media sites, blogs, or celebrity webpages, which are of varying accuracy and quality. Additionally, these individuals are less likely to trust the information from specialist doctors and dentists (Chen et al., 2018). These results suggest that individuals with lower health literacy are less likely to evaluate the quality of the health-related information they read online, and there is a need to enhance the public's ability to evaluate the quality of health-related information.

Social media use can have a negative effect on mental health. Vannucci et al. (2017) examined the relationship between social media use and anxiety in emerging adults (i.e., ages 18-22) and found that more time spent on social media was associated with greater symptoms of dispositional anxiety and a greater risk of scoring above the anxiety severity clinical cut-off,

indicating a probable anxiety disorder (Vannucci et al., 2017). The use of social media is related to increased stress and can reinforce negative self-evaluation when receiving undesirable feedback or bullying from others (Nesi & Prinstein, 2015) or when engaging in negative social comparison (e.g., believing others are happier or have better lives; Chou & Edge, 2012; Nesi & Prinstein, 2015). The immersive and distracting nature of social media sites can also facilitate avoidant coping strategies and social isolation (Moreno & Whitehill, 2014). O'Reilly et al. (2018) asked adolescents how social media affect their mental health and found that adolescents perceived social media as negatively affecting mental health. The reasons given by adolescents included that social media cause mood and anxiety disorders for some adolescents, can be used for cyberbullying, and that using social media can become an addiction (O'Reilly et al., 2018). A systematic review examining the influence of social media on mental health in adolescents demonstrated that social media use is generally associated with depression, anxiety, and psychological distress. However, the results were not fully consistent, and the authors noted that the relationship between mental health and social media is complex and involves various moderating and mediating factors (Keles et al., 2020).

Pinterest

Social networking sites, such as Pinterest, which use photos, pictograms, and infographics as tools of health communication, are gaining popularity and are being used to communicate information about various health conditions, including mental health and substance abuse (Fung et al., 2020). Pinterest was launched in 2010 and is a publicly accessible and free social networking website (www.pinterest.com) that requires users to make an individual user profile. Pinterest users can search and virtually bookmark or "pin" images they choose from host webpages using an image placed on a "pinboard." Pinboards are topic-specific virtual bulletin

boards that allow users to post, save, and share pins related to a pinboard's specific topic or purpose. Pinterest users can find and repin (i.e., share) pins by using Pinterest's main search engine or by looking at other users' pinboards. When a user enters a keyword into Pinterest's main search bar, Pinterest provides lists of images associated with webpages that are relevant to the search term. Pins may contain a range of visual communication tools, such as videos, photographs, maps, infographics, graphs, or diagrams. There are also group pinboards, where individuals can collaborate and share pins with others who have joined a designated group pinboard. The only forms of user engagement are repins (which are no longer available to view by others), and comments on pins.

In 2012, Pinterest was ranked as the third most popular social networking site in the United States, behind Facebook and Twitter (Experian Marketing Services, 2012). Currently, it is the 14th largest social network in the world in terms of global active users, with 459 million monthly active users (Sehl, 2021). Pinterest is more popular among women than other genders, with 80% of Pinterest's user base identifying as a woman (Omnicore, 2019). Pinterest is also gaining popularity with other groups. For instance, from 2013 to 2014, there was an increase in the use of Pinterest from traditionally medically underserved and hard-to-reach populations, including rural residents, and those with an annual income of less than $30,000 (Duggan et al., 2015). There is some evidence that Pinterest is preferred over common search engines such as Google for individuals with lower health literacy, because they can gain information without needing to read and understand a large amount of text (Mackert et al., 2009).

Pinterest has taken steps to prevent the spread of harmful misinformation regarding vaccine safety and effectiveness. When individuals search for vaccine-related terms (e.g., measles, vaccine safety) on Pinterest, only results from reputable public health institutions, such

as the WHO, the Center for Disease Control (CDC), the American Academy of Pediatrics (AAP), and the WHO-established Vaccine Safety Net, are shown (Pinterest, 2019). During the Covid-19 pandemic, Pinterest expanded this policy to only show results from leading public health institutions related to Covid-19 (Pinterest, 2021).

Pinterest has also taken active measures and been proactive in trying to address mental health issues among its users. In 2019, Pinterest added "guided emotional well-being activities" that people can engage with when they are feeling stressed, anxious, or sad. These activities were developed with the help of mental health experts at Brainstorm, the Stanford Lab for Mental Health Innovation, Vibrant Emotional Health, and the National Suicide Prevention Lifeline. When users search for terms related to mental well-being such as "stress quotes" or "anxiety," they are directed to exercises and resources. Pinterest states that these activities are not meant to replace professional care, but instead are meant to help individuals who may be needing support (Pinterest, 2019). When individuals search terms related to self-harm, Pinterest directs them to the National Suicide Prevention Lifeline. Pinterest executives stated that the motivation for adding these resources was related to the high prevalence of mental illnesses in the U.S., as well as the millions of Pinterest searches related to emotional health. In 2018, Pinterest also began hiding content related to self-harm on the app, because they recognized that this kind of content could be "triggering" for some users. From 2018 to 2019, self-harm content from pinners decreased by 88 percent (Pinterest, 2019).

Numerous researchers have examined health-related content on Pinterest for various physical or mental health conditions. Paige et al. (2015) examined pins related to chronic pulmonary disease (COPD) and coded them into various general health information categories (e.g., signs/symptoms, diagnosis, causes, complications) and self-management categories. The

researchers found that infographics and photographs of real people were more likely to be liked and re-pinned, and that half of the pins were about self-help management for patients with COPD (Paige et al., 2015). Another study by Guidry and Benotsch (2019) examined pins related to chronic pain management and coded them for engagement variables, external website type, visual type, and pain-related variables. The study found that most pins mentioned the high severity of chronic pain, and one-third referenced self-efficacy related to self-care (Guidry & Benotsch, 2019). Other Pinterest studies have examined pins related to breast cancer (e.g., Miller et al., 2019; Miller et al., 2020), psychogenic nonepileptic seizures (e.g., Dagar & Falcone, 2019), and learning disabilities (Heymann, 2019). Studies focused on mental health content on Pinterest include analyses of coping-related pins shared by followers of the National Association of School Psychology (NASP; Breeden et al., 2018), internalizing disorders-related pins by followers of NASP (San Jose et al., 2019), depression-related pins (Guidry et al., 2016), and suicide-related pins (Guidry et al., 2020).

There have also been examinations of how educators and school psychologists use Pinterest. Educators use Pinterest to find free or low-cost strategies (Pham, 2014; Seaman & Tiniti-Kane, 2013) and ideas related to classroom activities, to share information with colleagues, and to support student research (Taylor, 2015). One study found that school psychologists use Pinterest to find intervention materials and handouts, especially for social-emotional and behavioural difficulties (Hall et al., 2018). In addition, psychological organizations, such as the American Psychological Association and the NASP host Pinterest accounts and share information with other professionals in psychology (Taylor, 2015).

It is important for researchers and clinicians to know what information is available on Pinterest regarding anxiety disorders in order to communicate more effectively with individuals

about evidence-based treatments. Understanding which interventions are being mentioned on Pinterest could help clinicians and researchers understand whether Pinterest can be used as a reliable resource for evidence-based anxiety treatment information. To our knowledge, no previous studies have examined how Pinterest may be used as a health resource for anxiety-related information. The current study will explore the availability and accuracy of anxiety-related pins on Pinterest with the goal of developing recommendations about how clinicians can educate individuals about anxiety disorders and their evidence-based treatments.

CHAPTER TWO

A Social Media Content Analysis of Anxiety-Related Information on Pinterest

Methodology

As outlined in the previous chapter, anxiety disorders are characterized by persistent excessive fear or anxiety that is out of proportion to the situation at hand or is not age appropriate and that interferes with an individual's functioning in daily activities (American Psychological Association, 2021). They are highly prevalent and the most diagnosed category of mental disorders in the general population (Baxter et al., 2014; Kessler et al., 2009). Anxiety disorders and their treatments have been extensively studied, and there is a strong evidence base for the following anxiety disorder treatments: cognitive-behavioural therapy (CBT; e.g., Carpenter et al., 2018; Davis et al., 2011), antidepressant medications (e.g., Bandelow et al., 2017; Farach et al., 2012), benzodiazepines (e.g., Bandelow et al., 2012; Farach et al., 2012), mindfulness-based cognitive therapy (MBCT), mindfulness-based stress reduction (MBSR; e.g., Hofmann et al., 2010; Hofmann & Gómez, 2017; Singh & Gorey, 2018), acceptance and commitment therapy (ACT; e.g., Bluett et al., 2014; Landy et al., 2015) and Internet and computer-based treatments (ICTs; e.g., Domhardt et al., 2019; Peñate & Fumero, 2016). Many individuals also attempt to alleviate their anxiety symptoms through a variety of alternative or complementary treatments that are not evidence-based (van der Watt et al., 2008).

The Internet, which includes social networking sites such as Pinterest, is a common source of health information for both general users and health practitioners (Fung et al., 2020; Higgins et al., 2011; Phillips, 2020). Several studies have found that the health information available on social media is of varying quality. As discussed in the previous chapter, while previous studies have examined the role of social media in the treatment and management of

various medical conditions, to date, no study has examined the availability and accuracy of information about anxiety disorders on Pinterest.

Current Study

The purpose of this exploratory study was to examine anxiety-related information that is posted on Pinterest, as no previous study (that we know of) has explored how Pinterest can be used as a health resource for information about anxiety disorders and their available treatments. Given that anxiety disorders are the most common category of mental disorders and individuals seek out health-related information on social media, it is important to understand what types of anxiety-related information are available on Pinterest and to assess the accuracy of the information.

The analysis was guided by the eight following research questions (RQs):

- **RQ 1:** Which anxiety disorders are referenced in anxiety-related pins?

  This question was chosen to discover if certain anxiety disorders outlined in the DSM-5 are more frequently mentioned on Pinterest than others, and if this is associated with the prevalence of these anxiety disorders in the real world.

- **RQ 2:** Are the interventions mentioned in anxiety-related pins evidence-based?

  This question informs us regarding whether Pinterest provides information on evidence-based interventions for anxiety disorders.

- **RQ 3:** Which evidence-based interventions are referenced in anxiety-related pins?

  If evidence-based interventions are mentioned in anxiety-related pins, it is important to know which ones are mentioned and how they are referred to in pins.

- **RQ 4:** Which alternative or complementary treatments are presented on anxiety-related pins?

As alternative or complementary treatments for anxiety disorders are not evidence-based, it is important to identify them and to determine which are mentioned the most often on Pinterest. It is especially important as research has shown that individuals use social media to inform their health-related decisions (Fox et al., 2000).

- **RQ 5:** Does pin tone differ by the type of intervention mentioned in the pins?

  This question was asked because it is important to know whether certain interventions are perceived more positively or more negatively than others and whether evidence-based interventions (e.g., CBT) are endorsed more frequently than non-evidence-based interventions (e.g., aromatherapy). The tone of pins has been examined in a past social media content analysis examining chronic pain management information on Pinterest by Guidry and Benotsch (2019). The present study utilized the same pin-tone categories that were developed by Guidry and Benotsch (2019). Pins with a positive tone were defined as pins who endorse a certain intervention for the treatment of anxiety disorders and those with a negative tone were defined as those that are critical or discourage the use of a certain intervention. Pins with a neutral tone nor endorse nor are critical of an intervention.

- **RQ 6:** Which categories of general health information are presented in anxiety-related pins?

  Specific categories of general health information have been used in a past social media content analysis examining chronic obstructive pulmonary disease (COPD) content on Pinterest by Paige et al. (2015). In the present study, the same general health information categories were used but applied instead to anxiety-related pins.

- **RQ 7:** Which embedded visual communication tools are used in anxiety-related pins?

Paige et al. (2015) examined which embedded visual communication tools were used in pins relating to COPD. The present study utilized the embedded visual communication tool categories used in the Paige et al. (2015) study to examine anxiety-related pins.

- **RQ 8:** What are the sources of information for anxiety-related pins?

  It is important to examine the sources of information of anxiety-related pins on Pinterest and to know how credible they are (e.g., a blog vs. a government website). A study by Guidry and Benotsch (2019) developed source of information categories to examine pins related to chronic pain management. These same categories were used in the present study to instead examine the sources of information of anxiety-related pins.

Initial Coding Rubric and Approach

The current study's initial coding rubric was developed based on categories used in past social media content analysis studies, as well as from the research literature on anxiety disorders and their evidence-based and non-evidence-based treatments. The research questions in this study were used as a frame for the variables included in the coding rubric. The coding rubric variables were chosen to gain information regarding which anxiety disorders are most often mentioned, whether the interventions mentioned are evidence-based, which complementary or alternative treatments are mentioned, which categories of general health information are included, which embedded visual communication tools are used, and the sources of information of anxiety-related pins on Pinterest. Table 1 lists the seven main pin variables (i.e., category of information on anxiety disorders, including general health and intervention information, type of support, embedded visual communication tools, tone of pin, source of information, anxiety disorder type, and engagement metrics) that were included in the initial coding rubric, as well as their components.

The initial coding rubric was tested in June 2021 by analyzing the first 35 pins shown after searching the keyword "Anxiety" in the main Pinterest search bar using the researcher's cellphone. During this process, several interventions were identified that were not included in the initial rubric but were commonly referenced in the 35 pins. Specifically, four of the pins sampled mentioned grounding techniques, eight mentioned positive affirmations, and three mentioned social supports. As these three interventions came up frequently while the rubric was being tested, it was decided to add them into the coding rubric to better examine which interventions are mentioned on Pinterest. The subcategories that were added were grounding techniques, positive affirmations, and social supports, none of which are considered evidence-based treatments for anxiety. Grounding techniques and positive affirmations were added to the alternative or complementary treatment category, and social support was added to the type of support category.

It was also decided to re-format the coding rubric as a coding checklist (see Table 2). The main reason for using a coding checklist instead of a rubric was because the present study had a relatively large number of categories with various components. A checklist format was therefore easier to follow and made coding less time-consuming. With a checklist, the coders were able to examine each pin separately by checking off which of the checklist categories and subcomponents were included in the pin and noted this in an Excel spreadsheet.

Measures

Revised Coding Checklist

The coding checklist, which can be found in Table 2, was similar in content and included the same main sections as the initial coding rubric with a few differences. First, the type of support category was moved to a subsection of the intervention section. Second, the researchers

adjusted the intervention section by adding more detailed subsections for the various intervention types (e.g., CBT, mindfulness and acceptance, pharmacological intervention, complementary and alternative treatments, Internet and computer therapies, and type of support). The coding checklist had six main sections (i.e., general health information, intervention information, anxiety disorder type, tone of pin, embedded visual communication tool, and source of information) with various subsections and/or components within each section (see Table 2). To make the checklist more comprehensive, it included coding instructions for each section and its components, as well as descriptions and/or examples of certain pin elements. For each of the selected anxiety-related pins, the coders were asked to go through the checklist and note which categories and components were referenced in the pin. For some sections of the checklist, the coders were asked to choose which component was present in the pin (i.e., "choose one of the following"). For other sections, the coders were asked to note which components from that section were present in each of the pins and were able to choose more than one option when necessary (i.e., "yes vs. no"). For the last section (i.e., engagement metrics), the coders had to note the number of comments on the selected pin.

In addition to the quantitative data collection that was achieved using the checklist, field notes were made in a spreadsheet to document information in the pins that would not have been captured using solely the coding checklist. The field notes were specifically used for intervention-related information. The goal of using field notes was to gather information about other interventions that may be mentioned in pins but that were not included in the checklist.

Procedure

Pin Selection Procedure

The first 100 pins on Pinterest were sampled after entering in the keyword "Anxiety" using the main Pinterest search bar. Within each of these pins, the first two pins that Pinterest's algorithm suggested were similar to the initial pin were also sampled (i.e., "more like this"), for a total of 300 pins. The rationale for sampling the first 100 pins instead of every 5th pin for example, is that Pinterest's algorithm is not in chronological order but instead partly based in order of relevance to the search term. This pin selection procedure has also been used in past Pinterest content analyses (e.g., Heymann, 2019). Screenshots of all selected pins and their linked websites were taken. The URLs of each of the pins' linked websites were also noted, as well as the date the website was accessed by the researcher. To assure that the results shown on Pinterest were not based on the researcher's previous Internet searches and that a sample of pins was obtained that approximated the general user, a new Pinterest account was made for the purpose of this study, and the pins were sampled using a computer at Mount Saint Vincent University's library.

Inclusion/Exclusion Criteria

To meet inclusion criteria, pins were required to have active web links and the content on each pin had to reference either information on the factors that define and contribute to anxiety or information on interventions for managing anxiety. Pins were excluded if the text on a pin's image or user-generated caption was not written in English. Pins were also excluded if at least one of the following keywords was not included in the pin: "anxiety," "anxious," "phobia," "panic," "selective mutism," and "agoraphobia."

Interrater Reliability

The present study had two coders to establish interrater reliability. Using the coding checklist, the researcher first coded all of the pins (n = 300) and made field notes in the spreadsheet. Additionally, a second coder followed the coding checklist (Table 2) to code 10% of the initial sample of 300 pins (n = 30) without writing field notes. The pins coded by the second rater were the first 30 pins that met the inclusion criteria.

Analytic Approach

To analyze the data, frequency statistics were computed to calculate the number of pins in each of the general health information categories, the number of pins in each of the cognitive behavioural therapy categories, the number of pins in the mindfulness and acceptance categories, and the number of pins in each type of support category. Additionally, frequency statistics were computed to calculate the number of pins in each of the pharmacological categories and the number of pins in each of the alternative treatment categories. The number of pins with different embedded visual communication tools, the number of pins in each of the anxiety disorder categories, the number of pins with different tones, the number of pins with different external website types, and the number of comments on each pin were also calculated.

CHAPTER THREE

Results

On March 26, 2022, the researcher entered the keyword "Anxiety" in the main Pinterest search bar to collect the first 100 pins shown, as well as 200 additional pins generated by Pinterest's algorithm within the first 100 pins. Each of these pins was reviewed to collect the final sample of pins that met the inclusion criteria (N = 131). As shown in Figure 1, five pins were excluded because they were not written in English, five were excluded because they did not reference information on the factors that define and contribute to anxiety or information on interventions for managing anxiety, and 159 pins were excluded because they did not contain any of the key words.

Quantitative Findings

Types of Anxiety Disorders. Anxiety disorders were explicitly referenced in 14 pins. Panic disorder (n = 10) was the most frequently mentioned anxiety disorder, followed by social anxiety disorder (n = 7). Generalized anxiety disorder (n = 2), specific phobia (n = 1), and selective mutism (n = 1) were rarely mentioned. The other types of anxiety disorders were not mentioned in any of the pins. The percentage of pins referencing specific anxiety disorders can be found in Table 3.

Intervention Information. Over half of the pins presented interventions for anxiety disorders (n = 81): 23 included information related to CBT, with three referencing CBT explicitly. Somatic exercises were the most common type of CBT information referenced (n = 16), followed by cognitive restructuring (n = 5) and the self-monitoring of symptoms (n = 5). The least common CBT components mentioned were psychoeducation (n = 2) and exposure (n =

2). None of the pins referenced relapse prevention. Additionally, Internet and computer therapies were only mentioned in one pin.

Mindfulness and acceptance-related interventions were less commonly mentioned (*n* = 13). These pins often suggested practicing mindfulness, meditating, and focusing on the present moment, but did not provide details on how to achieve this (e.g., "practice mindfulness," "focus on the present moment," "meditate"). Distinguishing thoughts, acceptance, and acting in accordance with values were referenced in one pin each. Cognitive defusion techniques were not mentioned in any of the pins. Pharmacological interventions were rarely mentioned: only one pin referenced them. This pin mentioned SSRI's, benzodiazepines, and a medication in the "other" category of pharmacological interventions (i.e., beta blockers).

Alternative treatments were the most frequently cited category of treatment in the sampled pins (*n* = 62). The most common type of alternative treatment was lifestyle changes (*n* = 26). These lifestyle changes were journaling, getting adequate sleep, going outside, exercising (e.g., yoga, tai chi, aerobics), engaging in pleasant activities, engaging in self-care activities, and limiting social media usage. The second most referenced alternative treatment was positive affirmations (*n* = 19), followed by herbal or nutritional supplements (*n* = 15). The herbal and nutritional supplements mentioned were vitamins and supplements generally, lavender, lemon, ylang ylang, chamomile, rose oil, sage, valerian root, peppermint, patchouli, geranium, sandalwood, magnesium, bergamot, frankincense, orange, cedarwood, vetiver, black pepper, juniper berry, kava kava, omega-3, rhodiola rosea, passionflower, GABA, passionflower, zinc, probiotics, ashwagandha, L-theanine, B complex, and CBD. Some pins also mentioned teas made from herbal supplements or vitamins. The types of teas mentioned were chamomile, kava, lavender, tangerine, and valerian tea. Complementary medicines or physical treatment methods

was the fourth most referenced alternative treatment (*n* = 9). Specifically, massage, aromatherapy, acupuncture, Japanese shiatsu, reflexology, and acupressure were mentioned. Dietary changes (*n* = 6), grounding techniques (*n* = 5), mind-body techniques (*n* = 1), and bibliotherapy (*n* = 1) were mentioned less frequently. Narcotics were not referenced in any pins as a treatment for anxiety symptoms. The percentages of pins in each of the intervention categories can be found in Table 4.

Type of Support. The intervention-related pins were coded for whether they referenced one or more types of support. Almost all pins referencing a type of support (*n* = 52) were self-directed interventions (*n* = 51). Self-directed interventions were those that could be done without the help of another person. For example, somatic exercises, cognitive restructuring, journaling, meditation or mindfulness, engaging in self-care activities, and positive affirmations. Herbal or nutritional supplements and dietary changes were not considered as types of self-directed support. Social support was the second most common type of support mentioned (*n* = 9). These pins suggested phoning a friend, talking to someone you know, or reaching out to someone for support. Receiving support from a health professional (*n* = 3) was rarely mentioned in intervention-related pins. These pins referenced talk therapy, with one referencing both CBT and family therapy. Support from animals was mentioned once (i.e., spending time with a pet). The percentage of pins in each support category can be found in Table 5.

Tone of Pins. Most pins that included intervention-related information were primarily positive in tone (*n* = 67). Pins were positive in tone if they suggested that the intervention referenced would reduce or eliminate anxiety (e.g., “ways to calm your anxiety,” “ways to cope with anxiety,” “ways to reduce anxiety,” “anti-anxiety foods”). Only 14 pins were primarily neutral in tone, and none were primarily negative. Pins neutral in tone were those that described

an intervention without describing it as effective or ineffective. For example, pins presenting information related to psychoeducation or the self-monitoring of symptoms without describing them as treatments for anxiety disorders.

As most of the intervention-related pins were positive in tone and none were negative in tone, there was not enough variability within the tones of pins to conduct a planned chi-square analysis. The chi-square analysis was not performed because it would have been under-powered due to this lack of variability. In general, the tone was positive for interventions that were evidence-based and not evidence-based. The percentage of pins with different tones can be found in Table 6 and the number of pins in each intervention and tone category can be found in Table 7.

General Information. General information about anxiety disorders was presented in over one-third of pins (*n* = 46). Of these, most included information about the signs and symptoms of anxiety disorders (*n* = 29), followed by awareness (*n* = 4), and risks and causes (*n* = 4). Signs and symptoms of anxiety disorders were most frequently displayed using symptom lists or checklists. There were no pins that mentioned the diagnosis of anxiety disorders or complications associated with the disorders. Pins in the "other" category presented information about the triggers for anxiety, the "superpowers" (i.e., positive attributes) people with anxiety had or the types of anxiety disorders. Some of these were also quotes about living with an anxiety disorder. The percentage of pins in each general information category can be found in Table 8.

Embedded Visual Communication Tool. Infographics were the most frequent embedded visual communication tools within the pins (*n* = 36), followed by comics or drawings (*n* = 31). The third and fourth most used were photos of people (*n* = 13) and photos of objects (*n*

= 12). Some pins also used a checklist (*n* = 6), tables or charts (*n* = 5), diagrams (*n* = 3), or a video (*n* = 1). Over half of the pins used an embedded visual communication tool not included in the coding checklist (*n* = 76). Many of these were pins that only displayed a title of a webpage about anxiety or were lists of symptoms or treatments. Other types of embedded visual communication tools were quotes, a poem, herbal recipes, and an anxiety scale. It is also important to note that 31.30% of pins utilized more than one embedded visual communication tool (*n* = 41). The percentage of pins in each embedded visual communication tool category can be found in Table 9.

Linked Website Type. There were 75 pins that had a linked website. The most frequently used linked website type was a blog (*n* = 60) followed by commercial websites (*n* = 39). Some of the products sold on linked websites were coping cards, anxiety worksheets and workbooks, skills development books, journals, cookbooks, self-improvement courses, empowering mugs, hypnosis recordings, planners, weighted blankets, and homeopathy products and supplements. There were also several health-focused websites (*n* = 6) and a few linked social media sites (*n* = 3). The three linked health-focused websites were: WebMd, eMediHealth, and The Mighty. There was only one site in the "other" category, a yoga website. There were no advertisements, government websites, or official medical or other health professional (such as psychologists) websites linked in the pins. Although there were no advertisements in the present study, these would have been pins with linked websites that promoted a product (for example, a video advertisement) or had a link to a different website selling the product in the advertisement. In contrast, commercial websites were linked websites that sold products without presenting advertisements for them. Some linked websites also fell into more than one category. For instance, many blogs sold products as well. Therefore, these websites were grouped into both the

blog category and the commercial category. The percentage of pins in each website type category can be found in Table 10.

Pin Comments. Of the 131 pins, 72 of them had comments. The number of comments per pin ranged between 0 and 247. The average number of comments per pin was 5.45 and the median was 1.00. Often, the comments were statements in agreement with the information presented in the pin. For example, if a pin mentioned symptoms of anxiety, the comments would often be statements in agreement with the information presented (e.g., "I do these things all of the time," "This is so me"). Some comments also thanked the person who posted the pin or agreed that the interventions suggested were helpful (e.g., "Thank you for posting," "I love these suggestions").

Interrater Reliability. To calculate interrater reliability, the percentage of agreement between the two raters and Cohen's kappa were calculated. The percentage of agreement for the 30 pins coded by both raters was 99.03%. Cohen's kappa (κ; McHugh, 2012) is another measure of interrater reliability and considers the possibility of the agreement occurring by chance. The Cohen's kappa statistic was calculated to compare all the ratings made by the two raters and indicated near perfect agreement for these 30 pins ($\kappa = 0.95$; McHugh, 2012). The raters were very similar in choosing which pin elements were not present in pins. Some of the categories that the raters sometimes rated differently were embedded visual communication tools (e.g., one saying "yes" to both infographics and comics and drawings being present and the other only saying "yes" to infographics being present) or CBT information (e.g., one thinking that a pin presented information on the signs and symptoms of anxiety and the other thinking the pin fit in both the signs and symptoms category and the psychoeducation category).

Discussion

The purpose of this exploratory study was to examine anxiety-related information available on Pinterest, as no previous study (that we know of) has explored how Pinterest can be used as a health resource for information about anxiety disorders and their available treatments. The present study found that a large proportion of anxiety-related pins presented intervention-related information for anxiety disorders, with over half of these intervention-related pins referencing alternative or complementary treatments for anxiety disorders in contrast to evidence-based interventions. Another key finding was that the interventions presented on this social media site were overwhelmingly positive in tone, regardless of the intervention cited. None of the pins critiqued any intervention or its efficacy in treating anxiety disorders. Not only were most interventions suggested on Pinterest not evidence-based, but the sources of information for anxiety-related pins were most often blogs as opposed to more trusted sources of information, such as government websites or official health or medical websites. The findings of the present study are discussed in more detail below in relation to each research question.

RQ 1: Which anxiety disorders are referenced on Pinterest?

The most common types of anxiety disorders mentioned were panic disorder and social anxiety disorder, and they were referenced relatively infrequently. Social anxiety disorder is one of the most prevalent anxiety disorders in the general population alongside specific phobia (Bandelow & Michaelis, 2022). It is possible that social anxiety disorder was mentioned more frequently on Pinterest than most other anxiety disorders because more individuals are affected by it. It is therefore plausible that individuals are more familiar with the symptoms associated with social anxiety disorder compared to other less common anxiety disorders. Panic disorder was the type of anxiety disorder referenced most often in the pins, with some pins mentioning

panic (including panic attacks) instead of explicitly referring to a panic disorder. One possibility for the higher number of pins referencing panic or panic disorder, although it is not one of the most common anxiety disorders, is that panic attacks are associated with very intense symptoms, some being visible to others (e.g., chills, sweating, trembling, or shaking; APA, 2013). Because of this, individuals may be more familiar with panic disorder symptoms, like panic attacks, than they would be with the symptoms of other types of anxiety disorders. Panic attacks are distinct from general physical symptoms associated with anxiety and are accompanied by certain powerful symptoms (e.g., tingling, trembling, rapid heart rate) that last a few minutes and that can be confused with experiencing a heart attack (National Institute of Mental Health, 2022). Individuals may be motivated to post information about panic disorder and their symptoms on Pinterest to raise awareness and to help people better understand that although panic attacks feel very intense and are feared, they are temporary and cannot cause physical harm. Overall, specific types of anxiety disorders were not commonly cited in the pins. Aside from panic disorder and social anxiety disorder, three other types of anxiety disorders were mentioned (i.e., selective mutism, specific phobia, and generalized anxiety disorder).

RQ 2: Are the interventions mentioned on Pinterest evidence-based?

Although there were some evidence-based interventions presented in the pins, most were not evidence-based. The largest number of intervention-related pins suggested alternative or complementary treatments. This finding is in line with findings of past research studies. Previous research has demonstrated that there is a large amount of misinformation presented on social media sites (e.g., Johnson et al., 2021; Wang et al., 2019), including on Pinterest. Guidry et al. (2015) found that 74% of sampled vaccine-related pins presented antivaccine information. Similarly, a study by Dedrick et al. (2020) examined belly fat exercises on Pinterest and found

that the pins sampled were mostly inaccurate and misleading in the promotion of safe and sustained weight loss. Studies have also examined the treatments for health problems that are recommended on Pinterest. For example, a study examining the accuracy of breast cancer prevention and treatment on Pinterest found that 51.1% of the sampled pins contained misinformation (Wilner & Holton, 2020). Many of these were considered as containing misinformation because the claims were exaggerated (e.g., turmeric prevents cancer) or had no evidence to support them (e.g., antiperspirants cause cancer; Wilner & Holton, 2020). The findings of the present study are similar to those of past research demonstrating that there is a large amount of misinformation on social media sites, such as Pinterest, and that the treatments presented are often not evidence-based. This makes it very difficult for individuals to gather evidence-based information related to anxiety disorders on Pinterest, as they would need to filter out misinformation. This is likely unattainable for individuals searching for information on Pinterest who do not have previous knowledge on the topic.

RQ 3: Which evidence-based interventions are mentioned in anxiety-related pins?

The evidence-based intervention mentioned the most frequently in pins was CBT. Most of the pins that included CBT-related information mentioned relaxation techniques, with a few mentioning cognitive restructuring or the self-monitoring of symptoms. However, only three pins mentioned CBT explicitly. These results suggest that Pinterest may not be a helpful source to gather information about CBT and all its components, as well as how to access CBT treatment and what it may look like. Instead, Pinterest could provide individuals with ideas of simple relaxation exercises that can be tried in the moment without the help of a clinician. Although relaxation exercises are essential in CBT treatment, treatment usually involves other important components as well. The general goal of CBT is to change both how individuals respond to

anxiety behaviourally and cognitively (Arch & Craske, 2008). The relaxation exercises presented on Pinterest could be helpful for individuals experiencing stress in the moment, but individuals suffering from anxiety should be directed to a more thorough treatment.

Another type of evidence-based intervention presented on anxiety-related pins was mindfulness and acceptance-related interventions. Specifically, meditation was suggested in many of these mindfulness and acceptance-related pins. This finding coincides with research suggesting that the use of meditation is increasing and that it is often used to help with mental health problems, such as anxiety (Cramer et al., 2016). Mindfulness and relaxation exercises are both more accessible and less costly than psychotherapy or pharmacological interventions, as they can be practiced without the help of someone else, and at no cost. Additionally, there are many guided meditation videos available on YouTube or through other applications. The accessibility and availability of meditation and relaxation exercises is likely a key reason why these were mentioned more often than evidence-based psychotherapies.

Medications were only mentioned in one pin. This finding is unexpected given that there has been a rise in depressive and anxiety-related symptoms since the coronavirus disease (COVID-19) pandemic (Hirshtritt et al., 2021). With this increase, benzodiazepines have also been prescribed more frequently than they were prior to the pandemic. A Canadian study found that benzodiazepines were prescribed at higher rates in the first five months of 2020 compared to the first five months of 2019 (Yu et al., 2021). Likewise, there was a sharp increase in the number of antidepressant prescriptions in the United States from March 2019 to March 2020 (Petersen, 2020). Although prescription drug use for anxiety is increasing, this was not portrayed in anxiety-related pins. It is possible that many Pinterest users are seeking alternate ways to manage their anxiety symptoms and do not take prescription drugs for this. In turn, they may

have little knowledge on the types of medications available and do not post about these. Medications may also have been rarely mentioned because of the breadth of medications available and their complexities. Additionally, they require a prescription, can be costly, have many possible side effects, and individuals may need to try several before finding one that works for them (National Institute of Mental Health, 2021).

Psychotherapy and pharmacological interventions may have been seldom suggested compared to self-directed treatments because most individuals with an anxiety disorder do not receive treatment for their symptoms (Bandelow, 2022). For instance, one study found that only 20.6% of participants with an anxiety disorder sought professional treatment (Alonzo & Lépine, 2007). There are significant barriers to accessing mental health services, which can make it very difficult for individuals to seek treatment for their mental health conditions. There are numerous barriers to accessing mental health treatment and these can be classified into the following three categories: acceptability, availability, and accessibility barriers (Steele et al., 2007). Some of these barriers include long wait times for psychologists and psychiatrists, not knowing where to seek help, a limited number of available clinicians, the high cost of services, language barriers, geographic location, and concerns related to stigma around mental health (Moroz et al., 2020), Due to these barriers, it is possible that the individuals posting anxiety-related information on Pinterest are not knowledgeable on the evidence-based interventions for these disorders because they have not tried them themselves.

RQ 4: Which alternative or complementary treatments are presented on anxiety-related pins?

The most referenced alternative or complementary treatments were lifestyle changes, herbal and nutritional supplements, and positive affirmations. Although alternative treatments

such as lifestyle changes (e.g., exercising, getting enough sleep, pleasant activities) and positive affirmations may be helpful in a general wellbeing sense, they are not considered evidence-based treatments for anxiety disorders. Similarly, even though some alternative treatments, such as herbal and nutritional supplements may not be harmful to individuals with anxiety disorders, they have not been shown to be effective or sufficient in treating anxiety symptoms (Tabish, 2008).

The finding that alternative and complementary treatments were often presented in the pins parallels research findings demonstrating that the use of complementary or alternative treatments among individuals with an anxiety disorder is high (Bystritsky et al., 2013). The barriers to accessing evidence-based mental health treatments mentioned above likely play a role in the proportion of individuals seeking alternative treatments. Individuals may also seek out alternative and complementary treatment methods because evidence-based treatments have not worked for them. Research suggests that only approximately 60% of individuals respond significantly to CBT or antidepressants (Bystritsky, 2006). This leaves many individuals who suffer from an anxiety disorder to seek other treatment methods that could potentially alleviate their anxiety symptoms. This study is also not the first to find that more alternative treatment methods are recommended on Pinterest compared to evidence-based medical treatments. A study by Tang and Park (2017) examined skin cancer information on Pinterest and similarly found that alternative treatments were mentioned more frequently on pins than prevention recommendations or traditional medical treatments.

Herbal and nutritional supplements were the second most mentioned alternative treatments. Due to the high cost associated with psychotherapy, as well as antidepressants and their potential unwanted side effects, there has been an increased interest in the use of

complementary and alternative medicines as a natural method for treating anxiety disorders (Lakhan & Vieira, 2010). Many individuals believe that because herbal and nutritional supplements are natural products, they must be safe; however, this is not always the case. A substantial problem with herbal and nutritional supplements is that they are not regulated by the Federal Drug Administration (FDA) to the same extent as medical drugs are (Abdel-Aziz et al., 2016). Instead, dietary supplements are regulated by the FDA as food rather than drugs. The FDA does not have the task to approve dietary supplements for safety and effectiveness before they are sold to the public. Instead, this is the responsibility of the manufacturing companies of these supplements (FDA, 2022). Some herbal supplements can cause adverse side effects or be dangerous if taken with other medications due to drug interactions. For example, St John's Wort limits the effectiveness of many medications and is dangerous when used in combination with antidepressants (National Center for Complementary and Integrative Health, 2020). Another example of an herbal supplement that poses risks is kava. Kava use can lead to liver damage, including liver failure with frequent or long-term use (Fu et al., 2008). Although a wide range of herbal and nutritional supplements were recommended on the pins as treatments for anxiety disorders, the risks associated with taking them were not listed. This is problematic because some individuals may try a combination of these or take them with other medications thinking they will help relieve their anxiety symptoms. They could be trying these herbal or nutritional supplements without knowing the risks associated with them and the lack of research supporting their effectiveness. People also often seek medical advice on the Internet prior to consulting with a doctor or another medical professional (Schulz et al., 2011). This means some individuals may be spending large amounts of money and time on alternative or complementary treatment

methods instead of using these resources to receive evidence-based interventions from a trusted health professional (Tabish, 2008).

RQ 5: Does pin tone differ by the type of intervention mentioned in the pins?

Most of the interventions referenced in the pins were presented with a positive tone, with some of these being described as effective in the treatment of anxiety disorders. In contrast, none of the interventions mentioned were described as ineffective or were critiqued. Individuals who are looking at Pinterest for suggestions of effective interventions could be led to believe that a particular intervention would be helpful and might assume there was a scientific evidence-base behind it when this may not be the case. There is related research suggesting that much of the information provided on Pinterest is presented in a positive light, regardless of whether it is supported by research. For instance, one study examined pins related to waterpipe smoking and found that 97% of the pins portrayed waterpipe smoking in a positive light (Guidry et al., 2016). Likewise, a study by Merten et al. (2020) examined homemade sunscreen recipes and found that most of the recipes did not offer enough UV radiation protection, yet the majority were portrayed positively. The present study and these past studies demonstrate that even though certain treatments are presented in a positive light on Pinterest, they may not be evidence-based.

RQ 6: Which categories of general health information are presented in anxiety-related pins?

Over one-third of anxiety-related pins contained general information about anxiety disorders. Most often, these pins provided symptoms of anxiety disorders using lists or checklists. This finding is in accordance with those of a previous study examining learning disability content on Pinterest that found that symptoms were the most common type of general information, and they were often displayed through checklists (Heymann, 2020). Unfortunately,

many websites and social media platforms are used by individuals to self-diagnose (e.g., Castillo, 2013; Lewis, 2016). It is possible that checklists make it easier for individuals to self-diagnose because they are more likely to resemble diagnostic tools than other forms of visual communication. Self-diagnosing may be appealing to individuals for a variety of reasons, such as feeling in charge of our own health, information being available instantly, not needing to pay to access the information online, and being able to gather information at any time of day (Farnood et al., 2020). Although Pinterest could be a first step in learning about the symptoms of a certain disorder or condition, there are risks in relying on it for self-diagnosis. The symptoms presented in the pins were not worded in the same way as they are in the DSM-V and were not an accurate representation of all the symptoms necessary to meet the criteria for an anxiety disorder. There are various risks associated with using social media to inform self-diagnosis or other health decisions. As mentioned previously, there are concerns regarding the credibility and trustworthiness of the information presented online (Silver, 2015). Other risks of self-diagnosis include self-treatment, misdiagnosis, or misinformation. Self-diagnosis could also lead some individuals to have reduced trust in health professionals (Lewis, 2016). Pinterest may provide an overview of anxiety disorder symptoms, but individuals are advised to seek further support and guidance from a mental health professional. A mental health professional, such as a psychologist or a psychiatrist, can provide accurate diagnosis and treatment to individuals suffering from mental health disorders such as anxiety disorders.

RQ 7: Which embedded visual communication tools were presented in anxiety-related pins?

The most used embedded visual communication tool on anxiety-related pins was an infographic. Infographics are useful to disseminate health information as they provide a large

amount of information in a concise visual manner that is easy to understand. Infographics are often used in healthcare to provide patients with simple information on complex diseases or disorders. For example, providing information about causes, prevention, and treatments for medical conditions (Balkac & Ergun, 2018). Research findings indicate that patients have difficulty understanding health information when doctors use technical terminology without proper explanation (Bourquin et al., 2015; Castro et al., 2007). Approximately 90% of adults in the United States have difficulty understanding and using new medical information (Centres for Disease Control and Prevention, 2021). When patients have difficulty understanding and remembering health information provided to them by healthcare professionals, they are less likely to follow intervention recommendations (Watson & McKinstry, 2009). The use of infographics on Pinterest may be helpful in providing patients with clear and simple information or act as a reminder of what a medical professional has said previously. It is essential, however, that the information found on infographics through Pinterest be checked with a medical professional, as the information varies in quality and accuracy.

The present study showed that comics and drawings were frequently used embedded visual communication tools for anxiety-related pins. Comics and drawings may help with understanding treatments or symptoms for anxiety disorders and are likely to capture users' attention. Comics could make people feel less alone with regards to the anxiety symptoms they are experiencing. Research has demonstrated that among the general population, images are the most desirable method to exchange information (Katz et al., 2006), which may be a reason why comics, drawings, and infographics are used frequently on Pinterest to convey information on complex health conditions, like anxiety.

RQ 8: What are the sources of information for anxiety-related pins?

The present study found that most linked websites were blogs, followed by commercial websites. None of the linked websites were government websites or official medical or other health professional's websites. These findings align with those of past research studies suggesting that few pins come from reputable sources. For instance, a study by Dedrick et al. (2020) examining belly fat loss exercises on Pinterest found that most linked websites were blogs, followed by commercial websites that sold weight loss products or services. Likewise, a study on skin cancer screening information on Pinterest by Merten et al. (2022) found that 58% of pins examined were linked to personal blogs. Guidry and Benotsch (2019) similarly found that most linked websites were blogs or social media sites. Results of Pinterest studies suggest that the information from many pins does not stem from evidence-based sources, and instead, is posted by individuals who are interested in selling products or have a personal blog. Users may assume that another person is posting information to help others when it may be posted with the intent of selling a product to Pinterest users who click on the linked website (Dedrick et al., 2020). It is impossible to know the intentions of the people posting pins, and for those who have linked blogs, if they are simply interested in gathering a larger follower base or are being paid to promote or sell a product on their blog. On social media sites, such as Pinterest, anyone can recommend treatments or provide general health information, regardless of whether they have knowledge on the topic. This suggests that individuals using Pinterest to access health information, including information on anxiety disorders, should be cautious and question the information being provided to them, as most pins do not stem from evidence-based sources. It is also important for Pinterest users to investigate the information found online through speaking to

health providers or fact checking the information through more trusted sources such as official medical or government sites.

Implications for Consumers and Practitioners

Many individuals seek health information on the Internet (Fox, 2011), and the use of social media to access health information is increasing (De Choudhury et al., 2014; Zhao & Zhang, 2017). The present study, along with others, has found that the health-related information presented on Pinterest is of varying quality. Specifically, many pins suggest non-evidence-based treatments for anxiety disorders. Practitioners should be aware that their patients may be seeking health-related information on social media sites. They should also have some knowledge of which interventions are frequently being suggested as effective treatments, and the risks and benefits of them. For example, it would be helpful to be aware of the herbal and nutritional supplements being suggested and to be prepared for patient questions. Practitioners may also want to have a list of websites that provide accurate health information on the health conditions they treat and diagnose to share with patients.

As this study and past studies have shown, it is very common for information to be presented on Pinterest through infographics. Practitioners may want to examine the information presented on Pinterest to help them better understand how to communicate simply and effectively with patients to enhance understanding of complex health conditions. Some major health organizations (e.g., American Cancer Society, American Diabetes Association) have already begun to disseminate health information on social media sites, such as Twitter (e.g., Park et al., 2016). Likewise, health practitioners have begun using social media sites to counter false information related to vaccines (Stukus & Patrick, 2020). Mental health clinicians may want to use social media sites such as Pinterest to reach various individuals and to provide them with

evidence-based information on mental disorders. Pinterest could be an especially useful site to provide health information because it is one of the most popular social networking sites (Experian Marketing Services, 2012) and is already used to share health-related information.

It is essential for consumers to be aware that there is a large amount of health-related misinformation on social media sites, including on Pinterest. The present study demonstrates that many pins present false or exaggerated claims about treatments for anxiety disorders (e.g., claiming that herbal supplements eliminate anxiety). Additionally, the present study and others demonstrate that the information presented on Pinterest is often linked to personal blogs or commercial websites. Even though Pinterest is trying to reduce misinformation related to vaccines (Pinterest, 2019), there is still a large amount of misinformation about treatments for health conditions, like anxiety, and this misinformation is often more popular than accurate information (Wang et al., 2019). Pinterest may want to expand their efforts to reduce misinformation related to other health conditions as well.

For many people, it is difficult to tease out the accurate from the inaccurate information. This is especially true because most intervention-related pins on anxiety are positive in tone. It has been shown that visuals have a more positive effect on attention and recall compared to text (Houts et al., 2006) and images have a larger effect on opinions and behaviours than text presented in isolation (Powell et al., 2015). These findings make Pinterest particularly dangerous in the spread of misinformation, as individuals may remember misinformation presented through images on Pinterest more than they would if they saw this misinformation through text on other sites. Individuals may also be more likely to try the interventions suggested on Pinterest than on other sites because of the visual nature of the site.

Lastly, it is important to note that Pinterest is often used by individuals or companies to

sell products to consumers and Pinterest users. It is frequently used by individuals who have personal blogs and who may also have affiliate links or sell products on them (e.g., Merten et al., 2020). The motivations of individuals posting on Pinterest are unknown, as well as their knowledge base about the topic. Because of these risks, gathering health-related information on social media sites, like Pinterest, should be done with caution and the information gathered should be carefully examined.

Limitations

There are some limitations to the present study. First, only the information presented on the pins was assessed, not the information in the linked websites of the sampled pins. Because of this, the accuracy of the information presented on these websites was not examined in the present study. Future studies may want to examine the content on pins' linked websites to gain more information on whether there is misinformation on linked websites as well, or if there is more evidence-based information than was present on the pins in this study. Some of the pins sampled only had the title of a webpage written on the pin with no other information. In cases like these, it would be even more important to assess the accuracy of the information posted on the linked website. Future researchers may want to examine the information posted on the linked websites of anxiety-related pins.

A second limitation of the present study was that the information gathered from pins was decontextualized. It was impossible to know who is consuming the anxiety-related information on Pinterest and what they are doing with this information. It would be helpful to know if many individuals are using the anxiety-related information they find on Pinterest to inform their healthcare decisions (e.g., the treatments they seek). The number of repins is no longer available to be viewed, and the number of individuals viewing a certain pin is also not known, which

makes it difficult to know which pins are more popular among users. Similarly, we do not know who is posting anxiety-related content on Pinterest and their motivations for doing so. As many linked websites were blogs or commercial websites, it is a possibility that some pinners are motivated to sell a product or to gather a larger following on their blog. This could influence the content they choose to post on Pinterest. Likewise, we do not know how knowledgeable the pinners are about anxiety disorders, neither do we know where they obtained the written or pictorial information they are providing on the site.

In addition, due to the exclusionary criteria chosen in the present study, over half of the pins sampled were excluded from the analysis. Most of these pins were excluded because they did not include at least one of the keywords. It is impossible to make conclusions about why so many pins did not include at least one of the keywords chosen. It is possible that many pins include relevant information to the search term without including these keywords to make the information easier to understand for Pinterest users. Future studies may want to alter the exclusionary criteria used to obtain a larger sample of pins to analyze. By doing this, researchers may have a sample of pins more similar to those Pinterest users are presented with when searching for anxiety-related information.

Future Directions

Future research may want to gain more information about the perceptions of Pinterest users seeking anxiety-related information on Pinterest. For example, Pinterest users could be asked why they are searching for anxiety-related information on Pinterest, what they are doing with the information they are finding, and whether they believe the information provided to them is accurate. As well, it would be of interest to know which embedded visual communication tool they are more drawn to and if this impacts their perception of the information presented on pins.

By knowing what Pinterest users are searching for, their motivations for doing so, and the characteristics of the pins they are interested in, it could inform healthcare practitioners on how to communicate scientific information more effectively to their patients.

The field notes written to capture intervention-related information that was not included in the checklist revealed a few treatments that were not included in the checklist. The following were included in the field notes and were described on Pinterest as being helpful in reducing anxiety levels: scriptures, engaging in sexual activity, practicing gratitude, and cleaning. Future research may want to investigate how some of these are used by individuals with anxiety and how they impact stress or anxiety levels.

Future researchers may also want to use a checklist similar to this one to further investigate the accuracy of anxiety-related information presented on Pinterest. The checklist was made for the present study and was effective in analyzing anxiety-related pins. Additionally, the interrater reliability was high, suggesting that the checklist is reliable and could be used in future studies. If using a similar checklist, researchers may want to add more detail about the embedded visual communication tools and their characteristics as well as the CBT components, especially if one of the coders is not very familiar with anxiety treatments. There are various possible reasons why the interrater reliability in the current study was so high. First, the coding checklist was concrete with specific coding instructions. The checklist did not allow for much subjectivity in deciding whether pin elements were present or not within the pins. Additionally, because of the large number of categories, many pin elements were clearly irrelevant for each pin. Therefore, frequently, both raters selected “no” to numerous pin elements being present in the specific pins, which increased the interrater reliability.

Conclusion

Research on how social media is used as a health resource is still scarce, despite social media sites, such as Pinterest, being increasingly used to gather health information on a variety of conditions and disorders (De Choudhury et al., 2014; Zhao & Zhang, 2017). The present study is the first to examine anxiety-related information presented on Pinterest, one of the most popular social networking sites (Sehl, 2021). The study sheds light on the misinformation contained on Pinterest in relation to anxiety disorders and their available treatments. Most of the interventions described on the pins were not evidence-based, and the interventions were described in a positive light regardless of whether they were evidence-based or not. The health information about symptoms of anxiety often did not reflect the symptomology found in diagnostic systems such as the DSM and was presented in a checklist format which may lead consumers to incorrectly self-diagnose. Finally, the sources for the information on the pins were generally not from evidence-based or reputable sites.

The present study has important implications for both consumers and practitioners. Future research may want to further examine the anxiety-related information presented on Pinterest as well as the information contained in linked websites. The findings of the present study may be used to inform clinicians on the types of information presented on Pinterest, including the misinformation related to anxiety disorders on the site. With this information, they may be better prepared for patient questions regarding anxiety treatments. For consumers, this study presents some of the risks of using Pinterest as a health resource, specifically in relation to anxiety disorders. Pinterest, like other social media sites, has information of varying accuracy, as anyone can post what they choose to on these sites, regardless of if it is factual or not (Moorhead et al., 2013). The present study sheds light on the misinformation on anxiety disorders presented

on Pinterest. Based on the findings of the present study, Pinterest should not be used as a health resource for anxiety disorders and their available treatments, and clinicians should not recommend this site to their patients.

Figure 1

Search Strategy for Included Pins

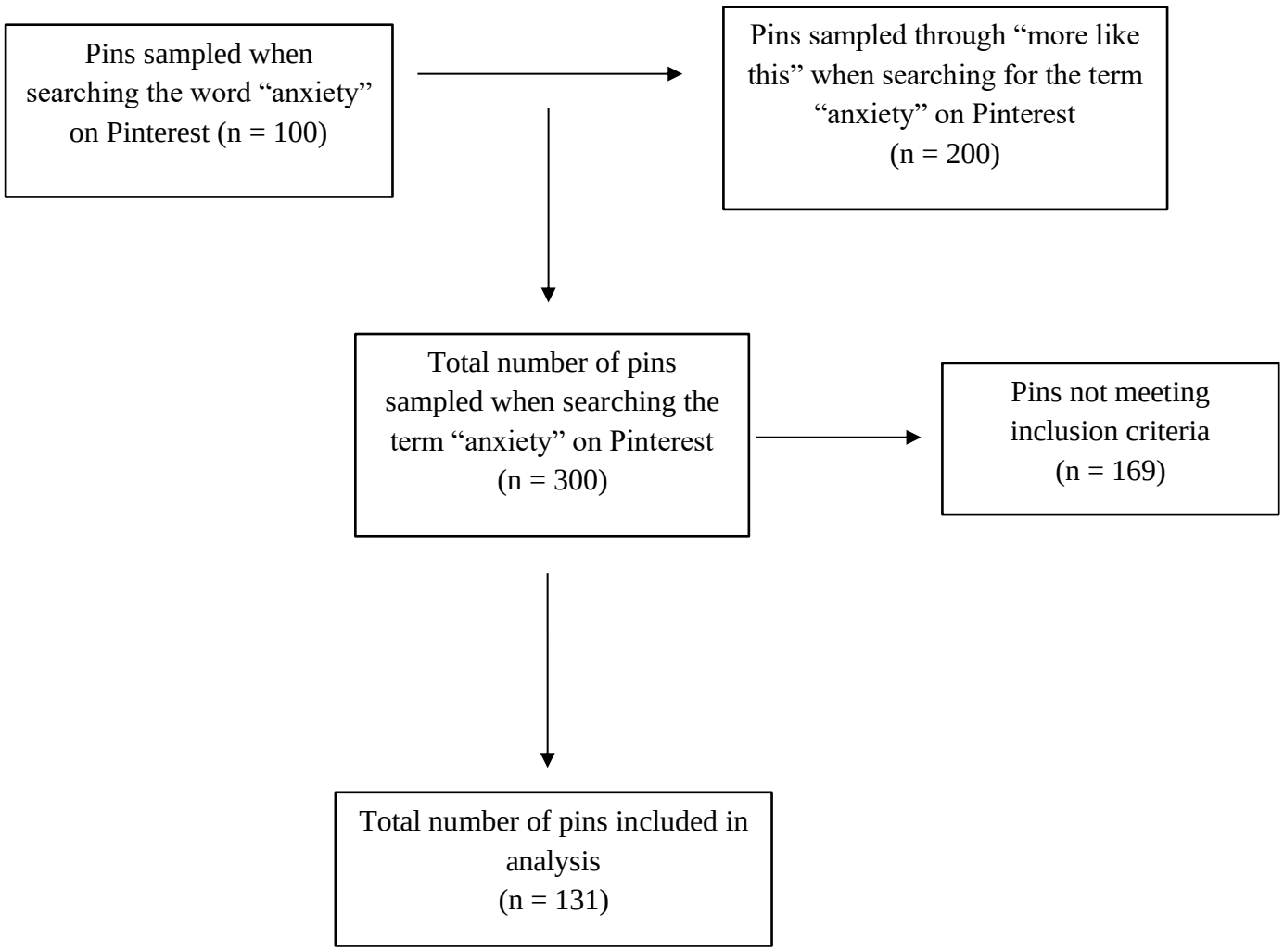

Table 1

Initial Coding Rubric

Pin Variable	Variable Components
Section 1: Category of information on anxiety disorders.	General health information or intervention information.
Section 1.1: General Health Information (Paige et al., 2015).	Causes or risk factors, signs/symptoms, diagnosis, complications, awareness, or other.
Section 1.2: Intervention Information.	Cognitive-behavioural therapy, mindfulness and acceptance, pharmacological interventions, or complementary/alternative treatments.
Section 2: Type of Support.	Self-directed, health-professional, or no support.
Section 3: Embedded Visual Communication Tools (Paige et al., 2015).	Video, graph, table/chart, infographic, photograph of real person or people, photograph of an item, comic/drawing, diagram, checklist, map, or other.
Section 4: Tone of Pins (Guidry & Benotsch, 2019).	Positive, negative, or neutral.
Section 5: Source of Information (Guidry & Benotsch, 2019).	Another social media platform, blog, health-focused website, commercial, official medical or psychological mental-health site, government, other, or broken link.
Section 6: Anxiety Disorder Type.	Separation anxiety disorder, selective mutism, specific phobia, social anxiety, panic, agoraphobia, generalized anxiety, substance/medication-induced anxiety, unspecified anxiety, or other specified anxiety.
Section 7: Engagement.	Number of comments on selected pin.

Table 2

Coding Criteria to Evaluate Anxiety-Related Pin Information

Analyze each pin using the following criteria:	
Pin Element.	Yes/No
Section 1: Pin includes general information about anxiety disorders.	
If yes, check as many of the following that are referenced in the pin:	
Causes or risk factors.	
Signs/symptoms.	
Diagnosis (e.g., the process of getting a diagnosis, and assessment).	
Complications (e.g., a medical problem that occurs during a disorder, or after a procedure or treatment, for example, high blood pressure, irritable bowel syndrome).	
Awareness (e.g., a teal ribbon, statistics, fundraiser, project).	
Other (e.g., prevalence, gender differences).	Please specify if other:
Section 2: Pin includes intervention information on anxiety disorders.	Yes/No
Section 2.1: Pin includes cognitive-behavioural therapy (CBT) information.	Yes/No
If you checked yes for Section 2.1, check as many of the following that are referenced in the pin:	
CBT is mentioned explicitly.	
Psychoeducation (e.g., education about the nature of anxiety, including identifying somatic reactions to anxiety and the relationship between thoughts, feelings, and behaviours).	
Self-monitoring of symptoms (which can be used to help individuals understand the relationship between their thoughts, emotions, body sensations, and behaviours, for example, a self-monitoring record).	
Pin references somatic exercises (e.g., relaxation skills such as deep breathing, progressive muscle relaxation, visual imagery).	
Pin references cognitive restructuring (e.g., identifying and challenging inaccurate or negative thoughts, identifying cognitive errors reflected by a thought, and/or developing alternative thoughts that are more accurate and adaptive).	

Pin references exposure (e.g., imaginal, in vivo or interoceptive exposure).	
Pin references relapse prevention (e.g., booster sessions).	
Section 2.2: Pin references Internet and computer therapies.	Yes/No
Section 2.3: Pin includes information related to mindfulness and acceptance.	Yes/No
If you checked yes to Section 2.3, check as many of the following that are referenced in the pin:	
Mindfulness and meditation practices (e.g., guided body scans, sitting and walking meditations, mindful movement, 3-minute breathing spaces, focused awareness on everyday activities).	
Distinguishing thoughts as thoughts rather than facts.	
Acceptance toward changing thoughts, feelings, and physical sensations.	
Cognitive defusion techniques (e.g., saying a word aloud repeatedly, saying a negative thought in the voice of a cartoon character or to the tune of happy birthday).	
Choosing and/or acting in accordance with values in various life domains (e.g., family, career, spirituality).	
Section 2.4: Pin includes pharmacological information.	Yes/No
If you checked yes to Section 2.4, check as many of the following that are referenced in the pin:	
Pharmacological treatments in general.	
Selective serotonin reuptake inhibitors (SSRIs).	
Serotonin-norepinephrine reuptake inhibitors.	
Other antidepressants (e.g., tricyclic antidepressants, monoamine oxidase inhibitors, mirtazapine, trazodone, bupropion).	
Benzodiazepines.	
Other medications (e.g., anticonvulsants, antipsychotics, antihistamines, beta blockers, azapirones).	Please specify if other:
Section 2.5: Pin includes information related to alternative treatments for anxiety.	Yes/No
If you checked yes for Section 2.5, check as many of the following that are referenced in the pin:	
Narcotics (e.g., psilocybin, lysergic acid diethylamide, cannabinoids).	

Herbal or nutritional supplements or preparations (e.g., 5-HTP, kava, ashagwandha, passionflower, lavender, valerian, galphimia, echinacea, ginko, chamomile, licorice, saffron, lemon balm, peppermints, B vitamins, ginger, St. John's Wort, Vitamin C, magnesium).	Please specify:
Lifestyle changes or self-care activities (e.g., sleep, exercise, limiting social media time, t'ai chi, yoga, pleasant activities, going outside, journaling).	Please specify:
Dietary changes (e.g., avoiding certain foods such as rye, barley, wheat, dairy, avoiding nicotine, avoiding caffeine, special diets, such as ketogenic diet).	
Bibliotherapy (e.g., use of literature to help people cope) or self-help books.	
Mind-body techniques (e.g., hypnosis, autogenic training, biofeedback).	
Grounding techniques (e.g., using your five senses to notice 5 things you can see, 4 things you can feel, 3 things you can hear, 2 things you can smell, and 1 thing you can taste).	
Positive affirmations, self-talk, mantras, and coping statements.	
Complementary medicine or physical treatment methods (e.g., acupuncture, homeopathy, naturopathy, massage, chiropractic, osteopathy, and aromatherapy).	Please specify:
Section 2.6: Pin references a type of support.	Yes/No
If you checked yes to Section 2.6, check as many of the following that are referenced in the pin:	
Seeking help from a health professional (e.g., a family physician, psychologist, or psychiatrist).	
Self-directed treatment(s).	
Social support (e.g., family member or friend).	
Animal support (e.g., pets).	
Section 3: Pin explicitly references a type of anxiety disorder.	Yes/No
If you checked yes to Section 3, check as many of the following that are referenced in the pin:	
Separation anxiety disorder (or separation anxiety).	
Selective mutism.	
Specific phobia.	
Social anxiety disorder (or social anxiety or social phobia).	

Panic disorder (or PD or panic).	
Agoraphobia.	
Generalized anxiety disorder (or GAD or generalized anxiety).	
Substance or medication induced anxiety.	
Other specified anxiety.	
Unspecified anxiety.	
Section 4: Tone of pin.	
Choose one of the following pin tones:	
Primarily positive (e.g., endorses a certain intervention or treatment).	
Primarily negative (e.g., critical of a certain intervention or treatment).	
Primarily neutral (e.g., neither endorses nor is critical of an intervention or treatment and is objective in its description).	
Section 5: Embedded visual communication tool	
Check as many of the following embedded visual communication tools that are included in the pin:	
Video (e.g., interactive image).	
Graph (e.g., line, bar or histogram used to depict data).	
Table or chart (e.g., series of columns and rows to organize and present data).	
Infographic (e.g., a combination of easily understood data that is represented by graphs, maps or tables/charts into one visual image).	
Photograph of a real person or people.	
Photograph of an item.	
Comic or drawing.	
Diagram (e.g., flowchart, Venn diagram, logic model).	
Checklist.	
Map.	
Other type of embedded visual communication tool.	Please specify:
Section 6: Source of information.	
Click on the pin's linked website and check one of the following website types:	
Social media platform.	
Blog.	
Health-focused.	
Official medical or psychological mental health site (e.g., hospital, clinic, or an official medical or psychological organization).	
Government website.	

Commercial.	
Advertisement.	
Other.	Please specify if other:
Broken link.	
Section 7: Engagement.	
Number of comments on the selected pin.	

Table 3

Percentage of Pins Referencing Specific Anxiety Disorders

Types of Anxiety Disorder	N (%)
References Type of Anxiety Disorder	14 (10.69)
Separation Anxiety	0 (0)
Selective Mutism	1 (0.76)
Specific Phobia	1 (0.76)
Social Anxiety	7 (5.34)
Panic Disorder	10 (7.63)
Agoraphobia	0 (0)
Generalized Anxiety Disorder	2 (1.53)
Substance or Medication-Induced Anxiety Disorder	0 (0)
Other Specified Anxiety	0 (0)
Unspecified Anxiety	0 (0)

Table 4

Percentage of Pins that Display Intervention Information on Anxiety Disorders

Categories of Intervention Information	N (%)
Intervention Information	81 (61)
CBT Information	23 (17.56)
CBT Explicitly Mentioned	3 (2.29)
Psychoeducation	2 (1.53)
Self-monitoring	5 (3.82)
Somatic Exercises	16 (12.21)
Cognitive Restructuring	5 (3.82)
Exposure	2 (1.53)
Relapse Prevention	0 (0)
Internet and Computer	1 (0.76)
Mindfulness and Acceptance	13 (9.92)
Mindfulness and Meditation	12 (9.16)
Distinguishing Thoughts	1 (0.76)
Acceptance	1 (0.76)
Cognitive Defusion	0 (0)
Values	1 (0.76)
Pharmacological Interventions	1 (0.76)
Generally	0 (0)
SSRIs	1 (0.76)
SNRIs	0 (0)

Other antidepressant	0 (0)
Benzodiazepines	1 (0.76)
Other	1 (0.76)
Alternative Treatments	62 (47. 33)
Narcotics	0 (0)
Herbal or Nutritional Supplements	15 (11.45)
Lifestyle Changes	26 (19.84)
Dietary Changes	6 (4.58)
Bibliotherapy	1 (0.76)
Mind-Body Techniques	1 (0.76)
Grounding	5 (3.82)
Positive Affirmations	19 (14. 50)
Complementary Medicine	9 (6.87)

Table 5

Percentage of Pins Referencing Type of Support

Types of Support	N (%)
References a Type of Support	52 (39.69)
Support from Health Professional	3 (2.29)
Self-Directed Support	51 (38.93)
Social Support	9 (6.87)
Animal Support	1 (0.76)

Table 6

Pin Tone of Intervention-Related Pins

Pin Tone	N (%)
Primarily Positive	67 (82.71)
Primarily Negative	0 (0)
Primarily Neutral	14 (17.28)

Table 7

Distribution of Pin Tone by Intervention Type

Intervention Type	Pin Tone		
	Positive	Neutral	Negative
	n	n	n
CBT	14	9	0
Mindfulness and Acceptance	12	1	0
Alternative	53	9	0
Pharmacological	1	0	0

Table 8

Percentage of Pins that Display General Health Information on Anxiety Disorders

Categories of Health Information	N (%)
General Health Information	46 (35.11)
Causes or risks	4 (3.05)
Signs/Symptoms	29 (22. 14)
Diagnosis	0 (0)
Complications	0 (0)
Awareness	4 (3.05)
Other	10 (7.63)

Table 9

Percentage of Embedded Visual Communication Tools

Embedded Visual Communication Tools	N (%)
Video	1 (0.76)
Graph	0 (0)
Table or Chart	5 (3.82)
Infographic	36 (27.48)
Photo of a Person	13 (9.92)
Photo of an Object	12 (9.16)
Comic or Drawing	31 (23.66)
Diagram	3 (2.29)
Checklist	6 (4.58)
Map	0 (0)
Other	76 (58.02)

Table 10

Percentage of Website Types

Website Type	N (%)
Social Media	3 (2.29)
Blog	60 (45. 80)
Health-Focused	6 (4.58)
Official Medical	0 (0)
Government Website	0 (0)
Commercial	39 (29.77)
Advertisement	0 (0)
Other	1 (0.76)
Broken Link	2 (1.53)

References

Abdel-Aziz, S. M., Aeron, A., & Kahil, T. A. (2016). Health benefits and possible risks of herbal medicine. In N. Garg, S. M., Abdel-Aziz, & A. Aeron (Eds.), *Microbes in Food and Health* (pp. 97-116). Springer.

Aboraya, A. (2007). The reliability of psychiatric diagnoses: Our psychiatric diagnoses are still unreliable. *Psychiatry (Edgmont), 4*(1), 22-5.

Addis, M. E., & Krasnow, A. D. (2000). A national survey of practicing psychologists' attitudes toward psychotherapy treatment manuals. *Journal of Consulting and Clinical Psychology, 68*(2), 331-339. https://doi-org.eproxy.msvu.ca/10.1037/0022-006X.68.2.331

Albano, A. M., & Kendall, P. C. (2002). Cognitive behavioural therapy for children and adolescents with anxiety disorders: Clinical research advances. *International Review of Psychiatry, 14*, 129-134. https://doi.org/10.1080/0954026022013264 4

Al Mamun, M., Ibrahim, H. M., & Turin, T. C. (2015). Social media in communicating health information: An analysis of Facebook groups related to hypertension. *Preventing Chronic Disease, 12*, 1-10. http://dx.doi.org/10.5888/pcd12.140265

Alonso, J., & Lépine, J.-P. (2007). Overview of key data from the European Study of the Epidemiology of Mental Disorders (ESEMeD). *Journal of Clinical Psychiatry, 68*(suppl 2), 3-9.

Amante, D. J., Hogan, T. P., Pagoto, S. L., English, T. M., & Lapante, K. L. (2015). Access to care and use of the Internet to search for health information: Results from the US national health interview survey. *Journal of Medical Internet Research, 14*(4), 1-10. https://doi.org/10.2196/jmir.4126

American Psychiatric Association (APA). (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.

American Psychiatric Association. (2021). *What are anxiety disorders?* https://www.psychiatry.org/patients-families/anxiety-disorders/what-are-anxiety-disorders

American Psychological Association. (2016). *Policy statement on evidence-based practice in psychology*. http://www.apa.org/pubs/journals/features/evidencebased- statement.pdf

Andrade, L., Caraveo-Anduaga, J. J., Berglund, P., Bijl, R., Kessler, R. C., Demler, O., Walters, E., Kylyc, C., Offord, D., Utsun, T., & Wittchen, H. (2013). Cross-national comparisons of the prevalence and correlates of mental disorders. *Bulletin of the World Health Organization, 78*(4), 413–426. https://doi.org/10.1590/S0042-96862000000400003

Andrews, G., Cuijpers, P., Craske, M. G., McEvoy, P., & Titov, N. (2010). Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: A meta-analysis. *PLoS one, 5*(10), e13196. https://doi.org/10.1371/journal.pone.0013196

Arch, J. J., & Craske, M. G. (2008). Acceptance and commitment therapy and cognitive behavioral therapy for anxiety disorders: Different treatments, similar mechanisms? *Clinical psychology: Science and Practice, 15*(4), 263-279. https://psycnet.apa.org/doi/10.1111/j.1468-2850.2008.00137.x

Assaz, D. A., Roche, B., Kanter, J. W., & Oshiro, C. K. (2018). Cognitive defusion in acceptance and commitment therapy: What are the basic processes of change? *The Psychological Record, 68*(4), 405-418. https://doi.org/10.1007/s40732-017-0254-z

Asselmann, E., & Beesdo-Baum, K. (2015). Predictors of the course of anxiety disorders in adolescents and young adults. *Current Psychiatry Reports*, *17*(2), 1-8. https://doi.org/10.1007/s11920-014-0543-z

Baldwin, D. S., Anderson, I. M., Nutt, D. J., Bandelow, B., Bond, A., Davidson, J. R., den Boer, J. A., Fineberg, N. A., Knapp, M., Scott, J., & Wittchen, H. U. (2005). Evidence-based guidelines for the pharmacological treatment of anxiety disorders: Recommendations from the British Association for Psychopharmacology. *Journal of Psychopharmacology*, *19*(6), 567-596. https://doi.org/ 10.1177/0269881105059253

Balkac, M., & Ergun, E. (2018). Role of infographics in healthcare. *Chinese Medical Journal, 131*(2), 2514-2517. https://doi.org/10.4103%2F0366-6999.243569

Bandelow, B., Lichte, T., Rudolf, S., Wiltink, J., & Beutel, M. E. (2015). The German guidelines for the treatment of anxiety disorders. *European Archives of Psychiatry and Clinical Neuroscience*, *265*(5), 363-373.

Bandelow, B., & Michaelis, S. (2022). Epidemiology of anxiety disorders in the 21st century. *Dialogues in Clinical Neuroscience, 17*(3), 327-335. https://doi.org/10.31887/DCNS.2015.17.3/bbandelow

Bandelow, B., Michaelis, S., & Wedekind, D. (2017). Treatment of anxiety disorders. *Dialogues in Clinical Neuroscience, 19*(2), 93-107. https://doi.org/10.31887/DCNS.2017.19.2/bbandelow

Bandelow, B., Reitt, M., Röver, C., Michaelis, S., Görlich, Y., & Wedekind, D. (2015). Efficacy of treatments for anxiety disorders: A meta-analysis. *International Clinical Psychopharmacology, 30*(4), 183-192. https://doi.org/10.1097/YIC.0000000000000078

Bandelow, B., Sher, L., Bunevicius, R., Hollander, E., Kasper, S., Zohar, J., & Möller, H. J. (2012). Guidelines for the pharmacological treatment of anxiety disorders, obsessive-compulsive disorder and posttraumatic stress disorder in primary care. *International Journal of Psychiatry in Clinical Practice, 16*(2), 77-84. https://doi.org/10.3109/13651501.2012.667114

Barkowski, S., Schwartze, D., Strauss, B., Burlingame, G. M., & Rosendahl, J. (2020). Efficacy of group psychotherapy for anxiety disorders: A systematic review and meta-analysis. *Psychotherapy Research, 30*(8), 965-982. https://doi.org/10.1080/10503307.2020.1729440

Barrett, P. M., Rapee, R. M., Dadds, M. M., & Ryan, S. M. (1996). Family enhancement of cognitive style in anxious and aggressive children. *Journal of Abnormal Child Psychology, 24*(2), 187-203. https://doi.org/10.1007/BF01441484

Baxter, A. J., Vos, T., Scott, K. M., Ferrari, A. J., & Whiteford, H. A. (2014). The global burden of anxiety disorders in 2010. *Psychological Medicine, 44*(11), 1-12. https://doi.org/10.1017/S0033291713003243

Benigeri, M., & Pluye, P. (2003). Shortcomings of health information on the Internet. *Health Promotion International, 18*(4), 381-386. https://doi.org/10.1093/heapro/dag409

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230–241. https://doi.org/ 0.1093/clipsy/bph077

Blanco, C., Rubio, J., Wall, M., Wang, S., Jiu, C. J., & Kendler, K. S. (2014). Risk factors for anxiety disorders: Common and specific effects in a national sample. *Depression and Anxiety, 31*(9), 756-764. https://doi.org/10.1002/da.22247

Bluett, E. J., Homan, K. J., Morrison, K. L., Levin, M. E., & Twohig, M. P. (2014). Acceptance and commitment therapy for anxiety and OCD spectrum disorders: An empirical review. *Journal of Anxiety Disorders, 28*(6), 612-624. https://doi.org/10.1016/j.janxdis.2014.06.008

Borah, P., & Xiao, X. (2018). The importance of 'likes': The interplay of message framing, source, and social endorsement on credibility perceptions of health information on Facebook. *Journal of Health Communication*, *23*(4), 399-411. https://doi.org/10.1080/10810730.2018.1455770

Borelli, J. L., Margolin, G., & Rasmussen, H. F. (2015). Parental overcontrol as a mechanism explaining the longitudinal association between parent and child anxiety. *Journal of Child and Family Studies, 24*(6), 1559-1574. https://doi.org/10.1007/s10826-014-9960-1

Bourquin, C., Stiefel, F., Mast, M. S., Bonvin, R., & Berney, A. (2015). Well, you have hepatic metastases: Use of technical language by medical students in simulated patient interviews. *Patient Education and Counseling*, *98*(3), 323–330. https://doi.org/10.1016/j.pec.2014.11.017

Breeden, N. C., Hall, C. M., & Giacobe, N. (2018). Component analysis and evidentiary basis of coping skills content on Pinterest. *Psychology in the Schools, 55*(7), 783– 800. https://doi.org/10.1002/pits.22141

Brown, T. A., & Barlow, D. H. (2005). Dimensional versus categorical classification of mental disorders in the fifth edition of the diagnostic and statistical manual of mental disorders

and beyond: Comment on the special section. *Journal of Abnormal Psychology, 114*(4), 551-556. https://doi-org.ezproxy.msvu.ca/10.1037/0021-843X.114.4.551

Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review, 26*(1), 17-31. https://doi.org/10.1016/j.cpr.2005.07.003

Bystritsky, A. (2006). Treatment resistant anxiety disorders. *Molecular Psychiatry, 11*(9), 805-814. https://doi.org/10.1038/sj.mp.4001852

Bystritsky, A., Khalsa, S. S., Cameron, M. E., & Schiffman, J. (2013). Current diagnosis and treatment of anxiety disorders. *P & T: A Peer-reviewed Journal for Formulary Management, 38*(1), 30–57.

Canadian Psychological Association (2012). *Evidence-based practice of psychological treatments: A Canadian perspective.* https://cpa.ca/docs/File/Practice/Report_of_the_EBP_Task_Force_FINAL_Board_Approved_2012.pdf

Carpenter, J. K., Andrews, L. A., Witcraft, S. M., Powers, M. B., Smits, J. A., & Hofmann, S. G. (2018). Cognitive behavioral therapy for anxiety and related disorders: A meta-analysis of randomized placebo-controlled trials. *Depression and Anxiety, 35*(6), 502-514. https://doi.org/10.1002/da.22728

Castillo, M. (January 15, 2013). More than one-third of U.S. adults use Internet to diagnose medical condition. *CBS News.* https://www.cbsnews.com/news/more-than-one-third-of-us-adults-use-internet-to-diagnose-medical-condition/

Castro, C. M., Wilson, C., Wang, F., & Schillinger, D. (2007). Babel babble: Physicians' use of unclarified medical jargon with patients. *American Journal of Health Behavior*, *31*(1), 85–95. https://doi.org/10.5993/AJHB.31.s1.11

Centre for Addiction and Mental Health. (2008). *Anxiety disorders: An information guide.* https://www.camh.ca/-/media/files/guides-and-publications/anxiety-guide-en.pdf

Centers for Disease Control and Prevention. (2021). *Talking points about health literacy*. https://www.cdc.gov/healthliteracy/shareinteract/TellOthers.html

Chen, X., Hay, J. L., Waters, E. A., Kiviniemi, M. T., Biddle, C., Schofield, E., Li, Y., Kaphingst, K., & Orom, H. (2018). Health literacy and use and trust in health information. *Journal of Health Communication*, *23*(8), 724-734. https://doi.org/10.1080/10810730.2018.1511658

Chou, H. T. G., & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking*, *15*(2), 117-121. https://doi.org/10.1089/cyber.2011.0324

Chronis-Tuscano, A., Degnan, K. A., Pine, D. S., Perez-Edgar, K., Henderson, H. A., Diaz, Y., Raggi, V. L., & Fox, N. A. (2009). Stable early maternal report of behavioral inhibition predicts lifetime social anxiety disorder in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, *48*(9), 928-935. https://doi.org/10.1097/CHI.0b013e3181ae09df

Clark, L. A., Cuthbert, B., Lewis-Fernández, R., Narrow, W. E., & Reed, G. M. (2017). Three approaches to understanding and classifying mental disorder: ICD-11, DSM-5, and the National Institute of Mental Health's Research Domain Criteria (RDoC). *Psychological Science in the Public Interest*, *18*(2), 72-145.

Colonnesi, C., Draijer, E. M., Jan, J. M., Stams, G., Van der Bruggen, C. O., Bögels, S. M., & Noom, M. J. (2011). The relation between insecure attachment and child anxiety: A meta-analytic review. *Journal of Clinical Child & Adolescent Psychology, 40*(4), 630-645.

Compton, S. N., March, J. S., Brent, D., Albano, A. M., Weersing, V. R., & Curry, J. (2004). Cognitive–behavioral psychotherapy for anxiety and depressive disorders in children and adolescents: An evidence-based medicine review. *Journal of the American Academy of Child and Adolescent Psychiatry, 43*(8), 930–959. https://doi.org/10.1097/01.chi.0000127589.57468.bf

Connolly, S. D., & Bernstein, G. A. (2007). Practice parameter for the assessment and treatment of children and adolescents with anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 46(*2), 267-283. https://doi.org/10.1097/01.chi.0000246070.23695.06

Cook, S. C., Schwartz, A. C., & Kaslow, N. J. (2017). Evidence-based psychotherapy: Advantages and challenges. *Neurotherapeutics*, *14*(3), 537-545.

Cramer, H., Hall, H., Leach, M., Frawley, J., Zhang, Y., Leung, B., Adams, J., & Lauche, R. (2016). Prevalence, patterns, and predictors of meditation use among US adults: A nationally representative survey. *Scientific Reports*, *6*(1), 1-9. https://doi.org./10.1038/srep36760.

Creswell, C., & O'Connor, T. G. (2011). Interpretation bias and anxiety in childhood: Stability, specificity and longitudinal associations. *Behavioural and Cognitive Psychotherapy, 39*(2), 191-204. https://doi.org/10.1017/S1352465810000494

Cuijpers, P., & Schuurmans, J. (2007). Self-help interventions for anxiety disorders: An overview. *Current Psychiatry Reports, 9*(4), 284-290.

Dagar, A., & Falcone, T. (2019). Pins and PNES: Systematic content analysis of Pinterest for information on psychogenic nonepileptic seizures (PNES). *Epilepsy & Behavior (93),* 129-132. https://doi.org/10.1016/j.yebeh.2019.01.020

Dalal, P. K., & Sivakumar, T. (2009). Moving towards ICD-11 and DSM-V: Concept and evolution of psychiatric classification. *Indian Journal of Psychiatry, 51*(4), 310–319. https://doi.org/10.4103/0019-5545.58302

Davis, T. E., May, A., & Whiting, S. E. (2011). Evidence-based treatment of anxiety and phobia in children and adolescents: Current status and effects on the emotional response. *Clinical Psychology Review, 31*, 592–602. https://doi.org/10.1016/j.cpr.2011.01.001

Deacon, B. J., & Abramowitz, J. S. (2004). Cognitive and behavioral treatments for anxiety disorders: A review of meta-analytic findings. *Journal of Clinical Psychology, 60*(4), 429-441. https://doi.org/ 10.1002/jclp.10255

De Choudhury, M., Morris, M. R., & White, R. W. (2014). Seeking and sharing health information online: Comparing search engines and social media. *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1365-1376). https://doi.org/10.1145/2556288.2557214

Dedrick, A., Merten, J. W., Adams, T., Wheeler, M., Kassie, T., & King, J. L. (2020). A content analysis of Pinterest belly fat loss exercises: Unrealistic expectations and misinformation. *American Journal of Health Education, 51*(5), 328-337. https://doi.org/10.1080/19325037.2020.1795754.

DiMauro, J., Domingues, J., Fernandez, G., & Tolin, D. F. (2013). Long-term effectiveness of CBT for anxiety disorders in an adult outpatient clinic sample: A follow-up study. *Behaviour Research and Therapy, 51*(2), 82-86.

Domhardt, M., Geßlein, H., von Rezori, R. E., & Baumeister, H. (2019). Internet-and mobile-based interventions for anxiety disorders: A meta-analytic review of intervention components. *Depression and Anxiety, 36*(3), 213-224. https://doi.org/ 10.1002/da.22860

Drake, K. L., & Ginsburg, G. S. (2012). Family factors in the development, treatment, and prevention of childhood anxiety disorders. *Clinical Child and Family Psychology Review, 15*(2), 144-162. https://doi.org/ 10.1007/s10567-011-0109-0

Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015, January 9). *Demographics of key social networking platforms.* Pew Research Centre. http://www.pewinternet.org/2015/01/09/demographics-of-key-social-networkingplatforms-2/.

Evans, S., Ferrando, S., Findler, M., Stowell, C., Smart, C., & Haglin, D. (2008). Mindfulness-based cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders, 22*(4), 716-721.

Experian Marketing Services. (2012). *The 2012 Digital Marketer Trend and Benchmark Report.* http://go.experian.com/forms/experian-digital-marketer2012?WT.srch=PR_EMS_DigitalMarketer2012_040412_ Download

Farach, F. J., Pruitt, L. D., Jun, J. J., Jerud, A. B., Zoellner, L. A., & Roy-Byrne, P. P. (2012). Pharmacological treatment of anxiety disorders: Current treatments and future directions. *Journal of Anxiety Disorders, 26*(8), 833-843. https://doi.org/10.1016/j.janxdis.2012.07.009

Farnood, A., Johnston, B., & Mair, F. S. (2020). A mixed methods systematic review of the effects of patient online self-diagnosing in the "smart-phone society" on the healthcare professional-patient relationship and medical authority. *BMC Medical Informatics & Decision Making, 20*(1), https://doi.org/10.1186/s12911-020-01243-6

Federal Drug Administration. (2022, June 2). *FDA 101: Dietary Supplements.* https://www.fda.gov/consumers/consumer-updates/fda-101-dietary-supplements

Ferreira, M. G., Mariano, L. I., de Rezende, J. V., Caramelli, P., & Kishita, N. (2022). Effects of group Acceptance and Commitment Therapy (ACT) on anxiety and depressive symptoms in adults: A meta-analysis. *Journal of Affective Disorders, 309*, 297-308. landhttps://doi.org/10.1016/j.jad.2022.04.134

Field, Z. C., & Field, A. P. (2013). How trait anxiety, interpretation bias and memory affect acquired fear in children learning about new animals. *Emotion, 13*(3), 409-423.

Flessner, C. A., & Piacenti, J. C. (Eds.). (2019). *Clinical handbook of psychological disorders in children and adolescents: A step-by-step treatment manual*. The Guilford Press.

Fox, S. (2011). *Health topics: 80% of internet users look for health information online.* https://www.webcitation.org/6XlNxDa04

Fox, S., Horrigan, J., Lenhart, A., Spooner, T., Burke, M., Lewis, O. & Carter, C. (2000). *The online health care revolution: How the Web helps Americans take better care of themselves.* Pew Research Centre. https://www.pewresearch.org/internet/wp-content/uploads/sites/9/media/Files/Reports/2000/PIP_Health_Report.pdf.pdf

Forman, E. M., Herbert, J. D., Moitra, E., Yeomans, P. D., & Geller, P. A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive

therapy for anxiety and depression. *Behavior Modification, 31*(6), 772-799. https://doi.org/ 10.1177/0145445507302202

Frances, A. J., & Nardo, J. M. (2013). ICD-11 should not repeat the mistakes made by DSM-5. *The British Journal of Psychiatry, 203*(1), 1-2. https://doi.org/ 10.1192/bjp.bp.113.127647

Friedman, R. A. (2014). Antidepressants' black-box warning—10 years later. *New England Journal of Medicine, 371*(18), 1666-1668. https://doi.org/10.1056/NEJMp1408480

Fullscript. (2020, October 26). *Top natural ways to help anxiety.* https://fullscript.com/blog/remedies-for-anxiety?utm_source=Adwords&utm_medium=PaidSearch&utm_campaign=DSA_Homepage&gclid=CjwKCAjwlrqHBhByEiwAnLmYUJ4cUgMsr6ba34Gvytr2mY2VbL-Dhwr0feEdhNqi-WxcHJKfmrIPMBoCaW0QAvD_BwE

Fumero, A., Peñate, W., Oyanadel C., & Porter, B. (2020). The effectiveness of mindfulness-based interventions on anxiety disorders: A systematic meta-review. *European Journal of Investigation in Health, Psychology and Education, 10*(3), 704-719. https://doi.org/10.3390/ejihpe10030052

Fung, I. C. H., Blankenship, E. B., Ahweyevu, J. O., Cooper, L. K., Duke, C. H., Carswell, S. L., Carswell, S. L., Jackson, A. M., Jenkins, J. C., Duncan, E. A., Liang, H., Fu, K.-W., & Tse, Z. T. H. (2020). Public health implications of image-based social media: A systematic review of Instagram, Pinterest, Tumblr, and Flickr. *The Permanente Journal, 24*. https://doi.org/10.7812/TPP/18.307

Fu, P. P., Xia, Q., Guo, L., Yu, H., & Chan, P. C. (2008). Toxicity of kava kava. *Journal of Environmental Science and Health Part C, 26*(1), 89-112. https://doi.org/10.1080/10590500801907407

Garakani, A., Murrough, J. W., Freire, R. C., Thom, R. P., Larkin, K., Buono, F. D., & Iosifescu, D. V. (2020). Pharmacotherapy of anxiety disorders: Current and emerging treatment options. *Frontiers in Psychiatry, 11*, 1-21. https://doi.org/ 10.3389/fpsyt.2020.595584

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., Pickering, R. P., & Kaplan, K. (2006). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Alcohol Research & Health, 29*(2), 107. https://doi.org/10.1001/archpsyc.61.8.807

Greenberg, P. E., Sisitsky, T., Kessler, R. C., Finkelstein, S. N., Berndt, E. R., Davidson, J. R., & Fyer, A. J. (1999). The economic burden of anxiety disorders in the 1990s. *The Journal of Clinical Psychiatry, 60*(7), 427-435.

Greenhalgh, T., Howick, J., & Maskrey, N. (2014). Evidence-based medicine: A movement in crisis? *BMJ, 348*. https://doi.org/10.1136%2Fbmj.g3725

Guidry, J., Jin, Y., Haddad, L., Zhang, Y., & Smith, J. (2016). How health risks are pinpointed (or not) on social media: The portrayal of waterpipe smoking on Pinterest. *Health Communication, 31*(6), 659-667. https://doi.org/10.1080/10410236.2014.987468

Guidry, J. P., & Benotsch, E. G. (2019). Pinning to cope: Using Pinterest for chronic pain management. *Health Education & Behavior*, *46*(4), 700-709. https://doi.org/10.117/109019811824399

Guidry, J. P. D., O'Donnell, N., Miller, C. A., Perrin, P. B., & Carlyle, K. E. (2020). Pinning despair and distress- suicide-related content on visual social media platform Pinterest. *The Journal of Crisis Intervention and Suicide Prevention*, *42*(4), 1-8. https://doi.org/10.1027/0227-5910/a000719 http://dx.doi.org/10.1027/0227-5910/a000719

Guidry, J., Zhang, Y., Jin, Y., & Parrish, C. (2016). Portrayals of depression on Pinterest and why public relations practitioners should care. *Public Relations Review*, *42*(1), 232-236. https://doi.org/10.1016/j.pubrev.2015.09.002

Hall, C. M., Breeden, N. C., & Giacobe, N. (2018). I found it on Pinterest: An exploration of Pinterest content for followers of the National Association of School Psychologists. *Contemporary School Psychology*, *22*(4), 413-423. https://doi-org.ezproxy.msvu.ca/10.1007/s40688-018-0174-1

Haller, H., Cramer, H., Lauche, R., Gass, F., & Dobos, G. J. (2014). The prevalence and burden of subthreshold generalized anxiety disorder: A systematic review. *BMC psychiatry*, *14*(1), 1-13. https://doi.org/10.1186/1471-244X-14-128

Hans, E., & Hiller, W. (2013). A meta-analysis of nonrandomized effectiveness studies on outpatient cognitive behavioral therapy for adult anxiety disorders. *Clinical Psychology Review*, *33*(8), 954-964. https://doi.org/10.1016/j.cpr.2013.07.003

Hausmann, J. S., Touloumtzis, C., White, M. T., Colbert, J. A., & Gooding, H. C. (2017). Adolescent and young adult use of social media for health and its implications. *Journal of Adolescent Health*, *60*(6), 714-719. https://doi.org/10.1016/j.jadohealth.2016.12.025

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2002). Review of acceptance and commitment therapy: An experiential approach to behavior change. *Cognitive and Behavioral Practice, 9,* 164-166.

Health Canada. (2002, October). *A report on mental illnesses in Canada.* https://www.phac-aspc.gc.ca/publicat/miic-mmac/pdf/men_ill_e.pdf

Hendriks, S. M., Spijker, J., Licht, C. M. M., Beekman, A. T. F., Hardeveld, F., de Graaf, R., Batelaan, N. M., and Penninx, B. W. J. H. (2014). Disability in anxiety disorders. *Journal of Affective Disorders, 166,* 227-233. https://doi.org/10.1016/j.jad.2014.05.006

Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *American Journal of Psychiatry, 158*(10), 1568-1578. https://doi.org/10.1176/appi.ajp.158.10.1568

Hettema, J. M., Prescott, C. A., Myers, J. M., Neale, M. C., & Kendler, K. S. (2005). The structure of genetic and environmental risk factors for anxiety disorders in men and women. *Archives of General Psychiatry, 62*(2), 182-189. https://doi.org/10.1001/archpsyc.62.2.182

Heymann, C. (2020). *Pinterest as a resource for health information on learning disabilities (LD): A social media content analysis.* [Unpublished master's thesis]. Mount Saint Vincent University.

Higgins, O., Sixsmith, J., Barry, M. M., & Domegan, C. A. (2011). A literature review on health information-seeking behaviour on the web: A health consumer and health professional perspective. *European Centre for Disease Prevention and Control.* http://dx.doi.org/10.2900/5788

Hirschtritt, M. E., Slama, N., Sterling, S. A., Olfson, M., & Iturralde, E. (2021). Psychotropic medication prescribing during the COVID-19 pandemic. *Medicine, 100*(43), 1-7. http://dx.doi.org/10.1097/MD.0000000000027664

Hofmann, S. G., Asmundson, G. J., & Beck, A. T. (2013). The science of cognitive therapy. *Behavior Therapy, 44*, 199–212. https://doi.org/10.1016/j.beth.2009.01.007

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research, 36*(5), 427-440. https://doi.org/10.1007/s10608-012-9476-1

Hofmann, S. G., & Gómez, A. F. (2017). Mindfulness-based interventions for anxiety and depression. *Psychiatric Clinics, 40*(4), 739-749.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*(2),169–183. https://doi.org/10.1037/a0018555

Hofmann, S. G., & Smits, J. A. J. (2008). Cognitive-behavioral therapy for adult anxiety disorders: A meta-analysis of randomized placebo-controlled trials. *Journal of Clinical Psychiatry*, *69*(4), 621– 663.

Hofmeijer-Sevink, M. K., Batelaan, N. M., van Megen, H. J., Penninx, B. W., Cath, D. C., van den Hout, M. A., & van Balkom, A. J. (2012). Clinical relevance of comorbidity in anxiety disorders: A report from the Netherlands Study of Depression and Anxiety (NESDA). *Journal of Affective Disorders*, *137*(1-3), 106-112. https://doi.org/10.1016/j.jad.2011.12.008

Houts, P. S., Doak, C. C., Doak, L. G., & Loscalzo, M. J. (2006). The role of pictures in improving health communication: A review of research on attention, comprehension,

recall, and adherence. *Patient Education and Counseling, 61*(2), 173–190. https://doi.org/10.1016/j.pec.2005.05.004

Ipser, J. C., Stein, D. J., Hawkridge, S., & Hoppe, L. (2009). Pharmacotherapy for anxiety disorders in children and adolescents. *Cochrane Database of Systematic Reviews.* https://doi.org/10.1002/14651858.CD005170.pub2

Ishikawa, S., Okajima, I., Matsuoka, H., & Sakano, Y. (2007). Cognitive behavioural therapy for anxiety disorders in children and adolescents: A meta-analysis. *Child and Adolescent Mental Health, 12,* 164–172. https://doi.org/10.1111/j.1475-3588.2006.00433.x

James, A. C., Reardon, T., Soler, A., James, G., & Creswell, C. (2020). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane Database of Systematic Reviews.* https://doi.org/10.1002/14651858.CD013162.pub2

Johnson, S. B., Parsons, M., Dorff, T., Moran, M. S., Ward, J. H., Cohen, S. A., Akerley, W., Bauman, J., Hubbard, J., Spratt, D. E., Bylund, C. L., Swire-Thompson, B., Onega, T., Scherer, L. D., Tward, J., & Fagerlin, A. (2021). Cancer Misinformation and Harmful Information on Facebook and Other Social Media: A Brief Report. *Journal of the National Cancer Institute*, *114*(17), 1036-1039. https://doi.org/10.1093/jnci/djab141

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life.* New York: Hyperion Books.

Kaczkurkin, A. N., & Foa, E. B. (2015). Cognitive-behavioral therapy for anxiety disorders: An update on the empirical evidence. *Dialogues in Clinical Neuroscience, 17*(3), 337. https://doi.org/10.31887/DCNS.2015.17.3/akaczkurkin

Katz, M. G., Kripalani, S., & Weiss, B. D. (2006). Use of pictorial aids in medication instructions: A review of the literature. *American Journal of Health-System Pharmacy*, *63*(23), 2391-2397.

Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, *25*(1), 79-93.

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Ustün, T. B., & Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) surveys. *Epidemiologia e Psichiatria Sociale*, *18*(1), 23–33. https://doi.org/10.1017/s1121189x00001421

Kessler, R. C., Anthony, J. C., Blazer, D., Bromet, E., Eaton, W., Kendler, K., Swartz, M., Wittchen, H., & Zhao, S. (1997). The US national comorbidity survey: Overview and future directions. *Epidemiologia e Psichiatria Sociale*, *6*, 4–16. https://doi.org/10.1017/s1121189x00008575

Kessler, R. C., Avenevoli, S., Costello, E. J., Georgiades, K., Green, J. G., Gruber, M. J., He, J., Koretz, D., McLaughlin, K. A., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Merikangas, K. R. (2012). Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the National Comorbidity Survey Replication Adolescent Supplement. *Archives of General Psychiatry*, *69*(4), 372-380. https://doi.org/10.1001/archgenpsychiatry.2011.160

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National

Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 593-602. https://doi.org/10.1001/archpsyc.62.6.593

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617-627. https://doi.org/10.1001/archpsyc.62.6.593

Kessler, R. C., Crum, R. M., Warner, L. A., Nelson, C. B., Schulenberg, J., & Anthony, J. C. (1997). Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry, 54*(4), 313-321. https://doi.org/10.1001/archpsyc.1997.01830160031005

Kessler, R. C., & Greenberg, P. E. (2002). The economic burden of anxiety and stress disorders. *Neuropsychopharmacology: The Fifth Generation of Progress, 67*, 982-92.

Kessler, R. C., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Wittchen, H. U. (2012). Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. *International Journal of Methods in Psychiatric Research, 21*(3), 169-184. https://doi.org/10.1002/mpr.1359

Kessler, R. C., Soukup, J., Davis, R. B., Foster, D. F., Wilkey, S. A., Van Rompay, M. I., & Eisenberg, D. M. (2001). The use of complementary and alternative therapies to treat anxiety and depression in the United States. *American Journal of Psychiatry, 158*(2), 289-294.

Kodish, I., Rockhill, C., & Varley, C. (2011). Pharmacotherapy for anxiety disorders in children and adolescents. *Dialogues in Clinical Neuroscience, 13*(4), 439–452. https://doi.org/10.31887/DCNS.2011.13.4/ikodish

Kogan, C. S., Stein, D. J., Maj, M., First, M. B., Emmelkamp, P. M., & Reed, G. M. (2016). The classification of anxiety and fear-related disorders in the ICD-11. *Depression and Anxiety, 33*(12), 1141-1154. https://doi.org/ 10.1002/da.22530

Kurdyak, P. A., Juurlink, D. N., & Mamdani, M. M. (2007). The effect of antidepressant warnings on prescribing trends in Ontario, Canada. *American Journal of Public Health*, *97*(4), 750-754.

Lakhan, S. E., & Vieira, K. F. (2010). Nutritional and herbal supplements for anxiety and anxiety-related disorders: systematic review. *Nutrition Journal*, *9*(42), 1-14. https://doi.org/10.1186/1475-2891-9-42

Landy, L. N., Schneider, R. L., & Arch, J. J. (2015). Acceptance and commitment therapy for the treatment of anxiety disorders: a concise review. *Current Opinion in Psychology, 2*, 70-74. https://doi.org/10.1016/j.copsyc.2014.11.004

Larsson, A., Hooper, N., Osborne, L. A., Bennett, P., & McHugh, L. (2016). Using brief cognitive restructuring and cognitive defusion techniques to cope with negative thoughts. *Behavior Modification, 40*(3), 452-482. https://doi.org/ 10.1177/0145445515621488

Lefere, S., De Rouck, R., & De Vreese, L. (2017). What to expect from reliability and validity claims? A pragmatic conception of psychiatric nosology. *Journal of Evaluation in Clinical Practice, 23*(5), 981-987. https://doi.org/10.1111/jep.12686

Lewis, C., Pearce, J., & Bisson, J. I. (2012). Efficacy, cost-effectiveness and acceptability of self-help interventions for anxiety disorders: Systematic review. *The British Journal of Psychiatry, 200*(1), 15-21. https://doi.org/10.1192/bjp.bp.110.084756

Lewis, L. F. (2016). Exploring the experience of self-diagnosis of autism spectrum disorder in adults. *Archives of Psychiatric Nursing*, *30*(5), 575-580. https://doi.org/10.1016/j.apnu.2016.03.009

Mackert, M., Kahlor, L., Tyler, D., & Gustafson, J. (2009). Designing e-Health interventions for low-health-literate culturally diverse parents: Addressing the obesity epidemic. *Telemedicine & E-Health*, *15*(7), 672-677. https://doi-org.ezproxy.msvu.ca/10.1089/tmj.2009.0012

Maier, W., Gänsicke, M., & Weiffenbach, O. (1997). The relationship between major and subthreshold variants of unipolar depression. *Journal of Affective Disorders*, *45*(1-2), 41-51. https://doi.org/10.1016/S0165-0327(97)00058-X

Maser, J. D., Norman, S. B., Zisook, S., Everall, I. P., Stein, M. B., Schettler, P. J., & Judd, L. L. (2009). Psychiatric nosology is ready for a paradigm shift in DSM-V. *Clinical Psychology: Science and Practice*, *16*(1), 24-40. https://psycnet.apa.org/doi/10.1111/j.1468-2850.2009.01140.x

Masuda, A., Hayes, S. C., Sackett, C. F., & Twohig, M. P. (2004). Cognitive defusion and self-relevant negative thoughts: Examining the impact of a ninety-year-old technique. *Behaviour Research and Therapy*, *42*(4), 477-485. https://doi.org/10.1016/j.brat.2003.10.008

Mathews, J. T. (2000). The information revolution. *Foreign Policy*, *119*, 63-65.

McEvoy, P. M., Grove, R., & Slade, T. (2011). Epidemiology of anxiety disorders in the Australian general population: Findings of the 2007 Australian National Survey of Mental Health and Wellbeing. *Australian & New Zealand Journal of Psychiatry*, *45*(11), 957-967. https://doi.org/10.3109/00048674.2011.624083

McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica, 22*(3), 276-282.

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *Journal of Psychiatric Research, 45*(8), 1027-1035. https://doi.org/10.1016/j.jpsychires.2011.03.006

Meier, S. M., & Deckert, J. (2019). Genetics of Anxiety Disorders. *Current Psychiatry Reports, 21*(3), 1-8.

Mendlowicz, M. V., & Stein, M. B. (2000). Quality of life in individuals with anxiety disorders. *American Journal of Psychiatry, 157*(5), 669-682.

Merten, J. W., Roberts, K. J., King, J. L., McKenzie, L. B. (2020). Pinterest homemade sunscreens: A recipe for sunburn. *Health Communication, 35*(9), 1123-1128, https://doi.org/10.1080/10410236.2019.1616442

Michael, T., Zetsche, U., & Margraf, J. (2007). Epidemiology of anxiety disorders. *Psychiatry, 6*(4), 136-142. https://doi.org/10.1016/j.mppsy.2007.01.007

Miller, C. A., Henderson, A. N., Guidry, J. P. D., McGuire, K. P., & Fummeler, B. F. (2020). Pinning pink: Messages about hereditary breast cancer risk on Pinterest. *Journal of Cancer Education,* 1-7. https://doi.org/10.1007/s13187-020-01842-x

Miller, C., Guidry, J. P. D., & Fuemmeler, B. (2019) Breast cancer voices on Pinterest: Raising awareness or just an inspirational image? *Health Education & Behaviour, 46*(25), 49-58. https://doi.org/10.1177/1090198119863774

Mittal, S., Gupta, N., Dewan, P., & Kumaraguru, P. (2014). *Pinned it! A large scale study of the Pinterest network.* Paper presented at the Proceedings of the 1st IKDD Conference on Data Sciences. New Delhi, India.

Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2013). A new dimension of health care: Systematic review of the uses, benefits, and limitations of social media for health communication. *Journal of Medical Internet Research, 15*(4). https://doi.org/ https://doi.org/10.2196/jmir.1933

Moreno, M. A., & Whitehill, J. M. (2014). Influence of social media on alcohol use in adolescents and young adults. *Alcohol Research: Current Reviews, 36*(1), 91-100.

Morgan, D. (2003). Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse. *Psychotherapy Research, 13*(1), 123-125. https://doi.org/10.1080/713869628

Moroz, N., Moroz, I., & D'Angelo, M. S. (2020). Mental health services in Canada: Barriers and cost-effective solutions to increase access. *Healthcare Management Forum, 33*(6), 282-287. https://doi.org/10.1177%2F0840470420933911

Murray, L., Creswell, C., & Cooper, P. J. (2009). The development of anxiety disorders in childhood: An integrative review. *Psychological Medicine, 39*(9), 1413-1423.

National Center for Complementary and Integrative Health. (2020). *St. John's Wort.* https://www.nccih.nih.gov/health/st-johns-wort.

National Institute of Mental Health (2021). *About RDoC.* https://www.nimh.nih.gov/research/research-funded-by-nimh/rdoc/about-rdoc

National Institute of Mental Health (2021). *Anxiety Disorders.* https://www.nimh.nih.gov/health/topics/anxiety-disorders/

National Institute of Mental Health (2022). *Panic Disorder: When Fear Overwhelms.* https://www.nimh.nih.gov/sites/default/files/documents/health/publications/panic-disorder-when-fear-overwhelms/22-MH-8077_PanicDisorder.pdf

Nesi, J., & Prinstein, M. J. (2015). Using social media for social comparison and feedback-seeking: Gender and popularity moderate associations with depressive symptoms. *Journal of Abnormal Child Psychology, 43*(8), 1427-1438. https://doi.org/ 10.1007/s10802-015-0020-0.

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review, 31*(1), 89-103. https://doi.org/10.1016/j.cpr.2010.09.008

Nobles, A. L., Dreisbach, C. N., Keim-Malpass, J., & Barnes, L. E. (2018). " Is this an STD? Please help!": Online information seeking for sexually transmitted diseases on Reddit. In *Twelfth International AAAI Conference on Web and Social Media*. https://www.aaai.org/ocs/index.php/ICWSM/ICWSM18/paper/view/17822/17075

Nolte, T., Guiney, J., Fonagy, P., Mayes, L. C., & Luyten, P. (2011). Interpersonal stress regulation and the development of anxiety disorders: An attachment-based developmental framework. *Frontiers in Behavioral Neuroscience, 5*(55), 1-21. https://doi.org/10.3389/fnbeh.2011.00055

Norton, P. J., & Price, E. C. (2007). A meta-analytic review of adult cognitive-behavioral treatment outcome across the anxiety disorders. *The Journal of Nervous and Mental Disease, 195*(6), 521-531. https://doi.org/ 10.1097/01.nmd.0000253843.70149.9a

Olatunji, B. O., Cisler, J. M., & Deacon, B. J. (2010). Efficacy of cognitive behavioral therapy for anxiety disorders: A review of meta-analytic findings. *Psychiatric Clinics, 33*(3), 557-577. https://doi.org/10.1016/j.psc.2010.04.002

Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review, 27*(5), 572-581. https://doi.org/10.1016/j.cpr.2007.01.015

Olthuis, J. V., Watt, M. C., Bailey, K., Hayden, J. A., & Stewart, S. H. (2016). Therapist-supported Internet cognitive behavioural therapy for anxiety disorders in adults. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.CD011565. pub2

Omnicore. (2019). *Pinterest by the numbers: Stats, demographics & fun facts*. https://www.omnicoreagency. com/pinterest-statistics/

O'Reilly, M., Dogra, N., Whiteman, N., Hughes, J., Eruyar, S., & Reilly, P. (2018). Is social media bad for mental health and wellbeing? Exploring the perspectives of adolescents. *Clinical Child Psychology and Psychiatry, 23*(4), 601-613.

Otte, C. (2011). Cognitive behavioral therapy in anxiety disorders: Current state of the evidence. *Dialogues in Clinical Neuroscience, 13*(4), 413. https://doi.org/ 10.31887/DCNS.2011.13.4/cotte

Pagoto, S. L., Spring, B., Coups, E. J., Mulvaney, S., Coutu, M. F., & Ozakinci, G. (2007). Barriers and facilitators of evidence-based practice perceived by behavioral science health professionals. *Journal of Clinical Psychology, 63*(7), 695-705.

Paige, S., Stellefson, M., Chaney, B. & Alber, J. (2015) Pinterest as a Resource for Health Information on Chronic Obstructive Pulmonary Disease (COPD): A Social Media Content Analysis. *American Journal of Health Education, 46*(4), 241-251, doi: 10.1080/19325037.2015.1044586.

Park, H., Reber, B. H., & Chon, M.-G. (2016). Tweeting as health communication: Health organizations' use of Twitter for health promotion and public engagement. *Journal of Health Communication, 21*(2), 188-198, https://doi.org/10.1080/10810730.2015.1058435

Peñate, W., & Fumero, A. (2016). A meta-review of Internet computer-based psychological treatments for anxiety disorders. *Journal of Telemedicine and Telecare, 22*(1), 3-11.

Pérez-Edgar, K., Bar-Haim, Y., McDermott, J. M., Gorodetsky, E., Hodgkinson, C. A., Goldman, D., Ernst, M., Pine, D. S., & Fox, N. A. (2010). Variations in the serotonin-transporter gene are associated with attention bias patterns to positive and negative emotion faces. *Biological Psychology, 83*(3), 269-271. https://doi.org/10.1016/j.biopsycho.2009.08.009

Petersen, A. (May 25, 2020). More people are taking drugs for anxiety and insomnia, and doctors are worried. *The Wall Street Journal*. https://www.wsj.com/articles/more-people-are-taking-drugs-for-anxiety-and-insomnia-and-doctors-are-worried-11590411600

Pham, A. (2014). Navigating social networking and social media in school psychology: Ethical and professional considerations in training programs. *Psychology in the Schools, 51*, 767–778.

Phillips, K. (2020). No, bananas don't cure HIV, nor will garlic cure COVID-19: Searching for, assessing, and consuming health information online. *Journal of Consumer Health on the Internet, 24*(2), 175-185. https://doi-org.ezproxy.msvu.ca/10.1080/15398285.2020.1755149

Pickersgill, M. D. (2014). Debating DSM-5: Diagnosis and the sociology of critique. *Journal of Medical Ethics, 40*(8), 521-525.

Pinterest (2019, August 28). *Bringing authoritative vaccine results to Pinterest search*. https://newsroom.pinterest.com/en/post/bringing-authoritative-vaccine-results-to-pinterest-search

Pinterest (2021, March 2021). *Pinterest announces new initiatives to fight against COVID-19 vaccine misinformation.* https://newsroom.pinterest.com/en/post/pinterest-announces-new-initiatives-to-fight-against-covid-19-vaccine-misinformation

Pinterest (2019, November 14). *New tools for managing difficult emotions.* https://newsroom.pinterest.com/en/post/new-tools-for-managing-difficult-emotions

Powell, J., Darvell, M. & Gray, J. (2003). The doctor, the patient and the world-wide web: How the Internet is changing healthcare. *Journal of the Royal Society of Medicine, 96*(2), 74-76. https://journals.sagepub.com/doi/pdf/10.1177/014107680309600206

Powell, J., Inglis, N., Ronnie, J. & Large, S. (2011). The characteristics and motivations of online health information seekers: Cross-sectional survey and qualitative interview study. *Journal of Medical Internet Research, 13*(1). https://doi.org/10.2196/jmir.1600

Powell, T. E., Boomgaarden, H. G., De Swert, K., & de Vreese, C. H. (2015). A clearer picture: The contribution of visuals and text to framing effects. *Journal of Communications, 65*(6), 997–1017. https://doi.org/10.1111/jcom.12184

Rai, D., Skapinakis, P., Wiles, N., Lewis, G., & Araya, R. (2010). Common mental disorders, subthreshold symptoms and disability: Longitudinal study. *The British Journal of Psychiatry, 197*(5), 411-412. https://doi.org/10.1192/bjp.bp.110.079244

Reader's Digest. (2020, November 11). *6 natural remedies for anxiety worth trying.* https://www.readersdigest.ca/health/conditions/6-natural-remedies-anxiety/

Reger, M. A., & Gahm, G. A. (2009). A meta-analysis of the effects of Internet- and computer-based cognitive-behavioral treatments for anxiety. *Journal of Clinical Psychology, 4*(4), 53-75. https://doi-org.ezproxy.msvu.ca/10.1002/jclp.20536

Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 32*(4), 251-262. https://doi.org/10.1016/j.cpr.2012.01.005

Rice, R. E. (2006). Influences, usage, and outcomes of Internet health information searching: Multivariate results from the Pew surveys. *International Journal of Medical Informatics, 75*(1), 8-28. https://doi.org/10.1016/j.ijmedinf.2005.07.032

Riemer, M., Rosof-Williams, J., & Bickman, L. (2005). Theories related to changing clinician practice. *Child and Adolescent Psychiatric Clinics, 14*(2), 241-254.

Roemer, L., Williston, S. K., Eustis, E. H., & Orsillo, S. M. (2013). Mindfulness and acceptance-based behavioral therapies for anxiety disorders. *Current Psychiatry Reports, 15*(11), 1-10.

Rosenbaum, J. F., Biederman, J., Bolduc-Murphy, E. A., Faraone, S. V., Chaloff, J., Hirshfeld, D. R., & Kagan, J. (1993). Behavioral inhibition in childhood: A risk factor for anxiety disorders. *Harvard Review of Psychiatry, 1*(1), 2-16.

Sanderson, W. C., DiNardo, P. A., Rapee, R. M., & Barlow, D. H. (1990). Syndrome comorbidity in patients diagnosed with a DSM-III—R anxiety disorder. *Journal of Abnormal Psychology, 99*(3), 308-312. https://psycnet.apa.org/doi/10.1037/0021-843X.99.3.308

San Jose, A. L., Hall, C. M., Schaefer, B. A., & Breeden N. C. (2019). How pinteresting: An analysis of social media resources for internalizing disorders. *Journal of Educational Technology Systems, 48*(1), 155-185.

Sayed, S., Horn, S. R., & Murrough, J. W. (2014). Current treatments for anxiety and obsessive-compulsive disorders. *Current Treatment Options in Psychiatry, 1*(3), 248-262. https://doi.org/10.1007/s40501-014-0020-7

Scantlebury, A., Booth, A., & Hanley, B. (2017). Experiences, practices and barriers to accessing health information: A qualitative study. *International Journal of Medical Informatics, 103,* 103-108. http://dx.doi.org/10.1016/j.ijmedinf.2017.04.018

Scholten, W. D., Batelaan, N. M., van Balkom, A. J., Penninx, B. W., Smit, J. H., & van Oppen, P. (2013). Recurrence of anxiety disorders and its predictors. *Journal of Affective Disorders, 147*(1-3), 180-185. https://doi.org/10.1016/j.jad.2012.10.031

Seaman, J., & Tinti-Kane, H. (2013). Soc*ial media for teaching and learning.* Boston, MA: Pearson Learning Solutions. http://www.onlinelearningsurvey.com./

Sehl, K. (2021, March 25). 28 Pinterest statistics marketers should know in 2020. Hootsuite. https://blog.hootsuite.com/pinterest-statistics-for-business/

Sharma, M., Yadav, K., Yadav, N., & Ferdinand, K. C. (2017). Zika virus pandemic—Analysis of Facebook as a social media health information platform. *American Journal of Infection Control, 45*(3), 301-302. https://doi.org/10.1016/j.ajic.2016.08.022

Shimada, S. M., Otowa, T., & Hettema, J. M. (2015). Genetics of anxiety disorders: Genetic epidemiological and molecular studies in humans. *Psychiatry & Clinical Neurosciences, 69*(7), 388-401.

Shri, R. (2010). Anxiety: Causes and management. *The Journal of Behavioral Science, 5*(1), 100-118.

Schulz, P. J., Zufferey, M. C., & Hartung, U. (2011). First check the Internet, then see the doctor: How many patients do it, and who are they. *Studies in Communication Sciences, 11*(2), 99-130.

Silver, M. P. (2015). Patient perspectives on online health information and communication with doctors: A qualitative study of patients 50 years old and over. *Journal of Medical Internet Research, 17*(1). http://dx.doi.org/10.2196/jmir.3588

Silverman, W. K., Pina, A. A., & Viswesvaran, C. (2008). Evidence-based psychosocial treatments for phobic and anxiety disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 37*(1), 105–130. https://doi.org/10.1080/15374410701817907

Singh, S. K., & Gorey, K. M. (2018). Relative effectiveness of mindfulness and cognitive behavioral interventions for anxiety disorders: meta-analytic review. *Social Work in Mental Health, 16*(2), 238-251. https://doi.org/10.1080/15332985.2017.1373266

Sipe, W. E., & Eisendrath, S. J. (2012). Mindfulness-based cognitive therapy: Theory and practice. *Canadian Journal of Psychiatry, 57*(2), 63-9. https://doi.org/10.1177/070674371205700202.

Smoller, J. W., Block, S. R., & Young, M. M. (2009). Genetics of anxiety disorders: the complex road from DSM to DNA. *Depression and Anxiety, 26*(11), 965-975. https://doi.org/10.1002/da.20623

Steele, L., Dewa, C., & Lee, K. (2007). Socioeconomic status and self-reported barriers to mental health service use. *The Canadian Journal of Psychiatry, 52*(3), 201-206.

Stein, D. J., Lund, C., & Nesse, R. M. (2013). Classification systems in psychiatry: Diagnosis and global mental health in the era of DSM-5 and ICD-11. *Current Opinion in Psychiatry, 26*(5), 493.

Stewart, R. E., Stirman, S. W., & Chambless, D. L. (2012). A qualitative investigation of practicing psychologists' attitudes toward research-informed practice: Implications for dissemination strategies. *Professional Psychology: Research and Practice*, *43*(2), 100.

Strauss, C., Cavanagh, K., Oliver, A., & Pettman, D. (2014) Mindfulness-based interventions for people diagnosed with a current episode of an anxiety or depressive disorder: A meta-analysis of randomised controlled trials. *PLoS ONE 9*(4). https://doi.org/10.1371/journal.pone.0096110

Stukus, D. R., & Patrick, M. (2020). How allergists can use social media to counter false information on vaccines. *Annals of Allergy, Asthma & Immunology*, *125*(1), 10-11. https://doi.org/10.1016/j.anai.2020.04.015

Swain, J., Hancock, K., Hainsworth, C., & Bowman, J. (2013). Acceptance and commitment therapy in the treatment of anxiety: a systematic review. *Clinical Psychology Review, 33*(8), 965-978. https://doi.org/10.1016/j.cpr.2013.07.002

Tabish, S. A. (2008). Complementary and alternative healthcare: Is it evidence-based? *International Journal of Health Sciences, 2*(1), 1-5.

Tang, L., & Park, S. E. (2017). Sun exposure, tanning beds, and herbs that cure: An examination of skin cancer on Pinterest. *Health Communication*, *32*(10), 1192-1200.

Taylor, A. (2015). Flipping great or flipping useless? A review of the flipped classroom experiment at Coventry University London Campus. *Journal of Pedagogic Development, 5*(3), 57–65.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical psychology, 68*(4), 615-623. https://doi.org/ 10.1037//0022-006X.68.4.615

Tewfik, G., Aziz, R., Shulman, S., Naftalovich, R., & Gilels, S. (2020). *Shared content on Facebook often propagates inaccurate or misleading information regarding Covid-19.* Research Square. https://doi.org/10.21203/rs.3.rs-31047/v1

Torgersen, S. (1983). Genetic factors in anxiety disorders. *Archives of General Psychiatry, 40*(10), 1085-1089. https://doi.org/10.1001/archpsyc.1983.01790090047007

Tyrer, P. (2014). A comparison of DSM and ICD classifications of mental disorder. *Advances in Psychiatric Treatment, 20*(4), 280-285. https://doi.org/10.1192/apt.bp.113.011296

van der Velden, A. M., Kuyken, W., Wattar, U., Crane, C., Pallesen, K. J., Dahlgaard, J., Fjorback, L. O. & Piet, J. (2015). A systematic review of mechanisms of change in mindfulness-based cognitive therapy in the treatment of recurrent major depressive disorder. *Clinical Psychology Review*, *37*, 26-39. https://doi.org/10.1016/j.cpr.2015.02.001

van der Watt, G., Laugharne, J., & Janca, A. (2008). Complementary and alternative medicine in the treatment of anxiety and depression. *Current Opinion in Psychiatry*, *21*(1), 37-42.

van Dis, E. A. M., van Veen, S. C., Hagenaars, M. A., Batelaan, N. M., Bockting, C. L. H., van den Heuvel, R. M., Cuijpers, P., & Engelhard, I. M. (2020). Long-term outcomes of cognitive behavioral therapy for anxiety-related disorders: A systematic review and meta-analysis. *JAMA Psychiatry, 77*(3), 265–273. https://doi.org/10.1001/jamapsychiatry.2019.3986

Vanin, J. R (2008). Overview of anxiety and the anxiety disorders. In J. R. Vanin & J. D. Helsley (Eds.), *Anxiety disorders: A pocket guide to primary care* (pp. 1-18). Humana Press. https://psycnet.apa.org/doi/10.1007/978-1-59745-263-2_1

Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders*, *207*, 163-166. https://doi.org/10.1016/j.jad.2016.08.040

Vøllestad, J., Nielsen, M. B., & Nielsen, G. H. (2012). Mindfulness-and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. *British Journal of Clinical Psychology, 51*(3), 239-260.

Wilner, T., & Holton, A. (2020). Breast cancer prevention and treatment: Misinformation on Pinterest. *American Journal of Public Health*, *110*(S3), S300-S304. https://doi.org/10.2105/AJPH.2020.305812

Wittchen, H. U., Nelson, C. B., & Lachner, G. (1998). Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. *Psychological Medicine, 28*(1), 109-126.

Wang, Y., McKee, M., Torbica, A., & Stuckler, D. (2019). Systematic literature review on the spread of health-related misinformation on social media. *Social Science & Medicine, 240*. https://doi.org/10.1016/j.socscimed.2019.112552

Wakefield, J. C. (2015). DSM-5, psychiatric epidemiology and the false positives problem. *Epidemiology and Psychiatric Sciences*, *24*(3), 188-196.

Ward, C. H., Beck, A. T., Mendelson, M., Mock, J. E., & Erbaugh, J. K. (1962). The psychiatric nomenclature: Reasons for diagnostic disagreement. *Archives of General Psychiatry*, *7*(3), 198-205. https://doi.org/ 10.1001/archpsyc.1962.01720030044006

Watson, P. W. B., & McKinstry, B. (2009). A systematic review of interventions to improve medical advice in health consultations. *Journal of the Royal Society of Medicine*, *102*(6), 235–243. https://doi.org/10.1258/jrsm.2009.090013

Weissman, M. M. (1993). Family genetic studies of panic disorder. *Journal of Psychiatric Research, 27,* 69-78. https://doi.org/10.1016/0022-3956(93)90018-W

Whitfield, G. (2010). Group cognitive–behavioural therapy for anxiety and depression. *Advances in Psychiatric Treatment, 16*(3), 219-227. https://doi.org/10.1192/apt.bp.108.005744

World Health Organization. (2018). *International classification of diseases for mortality and morbidity statistics (11th Revision).* https://icd.who.int/browse11/l-m/en

Yonkers, K. A., Bruce, S. E., Dyck, I. R., & Keller, M. B. (2003). Chronicity, relapse, and illness—course of panic disorder, social phobia, and generalized anxiety disorder: Findings in men and women from 8 years of follow-up. *Depression and Anxiety*, *17*(3), 173-179. https://doi.org/10.1002/da.10106

Yu, C., Boone, C., Askarian-Monavvari, R., Brown, T. (2021). The trends in pharmacotherapy for anxiety and depression during COVID- 19: A North York area pilot study. *University of Toronto Medical Journal, 98(*1), 41-46.

Zhang, Y., He, D., & Sang, Y. (2013). Facebook as a platform for health information and communication: A case study of a diabetes group. *Journal of Medical Systems*, *37*(3), 1-12.

Zhao, Y., & Zhang, J. (2017). Consumer health information seeking in social media: A literature review. *Health Information & Libraries Journal*, *34*(4), 268-283.