"It's Hard to Give Hope Sometimes": Climate Change, Mental Health, and the Challenges for Mental Health Professionals

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Abstract

Mental health professionals (MHPs) are on the frontlines of assisting clients with mental health impacts of climate change (CC), yet challenges to their practice and required resources have not been adequately explored. A cross-sectional online knowledge, attitudes and practice (KAP) survey was conducted with active, licensed MHPs across the State of Minnesota (n = 517). Fifty-four questions were divided into sections on socio-demographics, knowledge and attitudes, familiarity with emerging terminology, practice behaviors and experiences, and needs for professional resources and training. Most MHPs agreed that CC is an important problem impacting mental health (81.6%), with many (61.0%) already observing these impacts. More than half (51.8%) report that clients would consider discussing CC as part of their treatment. Yet fewer (32.9%) feel well-prepared to have this discussion. A small proportion of MHPs are familiar with resources to assist with assessment (15.0%) and treatment (18.3%), but only 10.2% have made use of these tools with their clients. Results from this comprehensive survey underscore the need for interdisciplinary research and practice communities to design and implement assessment, intervention, and evaluation tools that address the broad impacts of CC on help-seeking clients. Key Words: Climate change—Mental health—Mental health professionals—KAP survey—Ecoanxiety—Climate anxiety

Introduction

Climate change poses numerous threats to mental health. Studies have identified three pathways linking climate change to negative mental health impacts: (1) direct exposure to climate-related disasters (e.g., flooding, drought, or extreme heat events); (2) disruption to major determinants of health (e.g., loss of livelihood or cultural traditions); and (3) awareness of climate change as an existential threat (Charlson et al., 2021; Cianconi, Betro, & Janiri, 2020; Gibson, Barnett, Haslam, & Kaplan, 2020; Hayes, Berry, & Ebi, 2019; Panu, 2020; Thoma, Rohleder, & Rohner, 2021).

These pathways may overlap and lead to compounded impacts on an individual or even an entire community, such as farmers burdened with decadal drought (Ellis & Albrecht, 2017) or Inuit communities experiencing loss of sea ice and winter warmin\g (Dean & Stain, 2010). How these climate-related stressors manifest depends on the individual and their access to quality health care, social networks, coping resources, access to nature, and other health determinants, such as income and education. Existing research has identified some mental health conditions linked to climate change, such as psychological distress, grief reactions, depression, post-traumatic stress, interpersonal conflicts, drug or

alcohol abuse, loss of identity, and suicidal ideation (Dean & Stain, 2010; Ducy & Stough, 2021; Ellis & Albrecht, 2017; Gibson et al., 2020; Heo, Lee, & Bell, 2021; Liu et al., 2021; Matthews et al., 2019; Middleton et al., 2020; Reyes, Carmen, Luminarias, Mangulabnan, & Ogunbode, 2021).

It is widely recognized that climate-related mental health impacts are inequitably distributed across geographies, demographics, and cultures, and research in collaboration with affected populations is essential to develop effective interventions (Dean & Stain, 2010; Hayes, Blashki, Wiseman, Burke, & Reifels, 2018; Parry et al., 2019).

Mental health professionals (MHPs), such as psychologists, psychiatrists, licensed clinical social workers, family therapists, and advance practice nurses, are in a powerful position to mitigate climate change impacts on their clients and, depending on their engagement in the broader service community, on society. However, MHPs face several significant challenges.

First, climate change is not the only population-level mental health crisis facing the nation. The COVID-19 pandemic and resulting economic recession has contributed to a 30% increase in anxiety and depressive disorders (Panchal, Kamal, Cox, & Garfield, 2021). According to a 2020 American Psychological Association (APA) survey, 74% of responding psychologists said they were seeing more patients with anxiety disorders compared with pre-pandemic, and 60% said they were seeing more patients with depressive disorders (APA, 2020a).

However, the rising swell of mental health issues is being met with a shortage of MHPs. A 2009 study reported that 77% of U.S. counties are experiencing a severe shortage of MHPs, and two-thirds of primary care physicians report struggling to get psychiatric services for their patients (Thomas, Ellis, Konrad, Holzer, & Morrissey, 2009). The APA survey showed that more than 4 in 10 psychologists (41%) said that they felt burned out and 30% said that they have not been able to meet the demand for treatment from their patients (APA, 2020a).

Finally, though awareness of climate change-related impacts on mental health is increasing, outside of the small but growing number of MHPs taking an ecopsychological approach, it is still a relatively new issue. It is unknown to what extent the intersection of climate change and mental health is included in counseling curriculum or training programs, or what professional resources MHPs need to address climate-related impacts with their clients.

To address this challenge, the current study explored how MHPs are encountering climate change in their practices, how well prepared they feel to work with clients on climate-related mental health issues, and what resources they need to be effective. This study used the Knowledge, Attitude and Practices (KAP) survey design to collect both quantitative and qualitative information from MHPs licensed to practice in the State of Minnesota.

According to the World Health Organization (WHO), KAP studies are used to identify a person's thoughts and beliefs, skills, and practice behaviors regarding a specific topic (WHO, 2008). KAP studies also help to identify gaps or deficits in available information or professional resources, barriers to these resources, and opportunities for addressing the stated needs of respondents (Zhao et al., 2019).

Focusing on MHPs as a study population not only capitalizes on their position on the frontlines of addressing mental health impacts among help-seeking clients, but it also allows an assessment of the current knowledge base among a population of practitioners and their access to professional support and strategies related to client treatment. Findings of this study will help educational institutions, state agencies, licensing boards, and other mental health organizations with developing curriculum and other guidance materials to support professionals in their approach to addressing climate-related mental health impacts with their clients. Further, study results demonstrate that climate change is broadly impacting population-level mental health and therefore requires a robust exploration of mental health strategies to bolster community resilience.

Materials and Methods
Study design

A cross-sectional survey study was conducted among MHPs in Minnesota from October to November 2019. Participants were recruited through state-based professional organizations and licensing boards. The following organizations and boards agreed to share the survey with their membership: Minnesota Psychological Association, Minnesota Board of Psychology, Minnesota Board of Social Work, Minnesota Board of Marriage and Family Therapy, and the Minnesota Board of Nursing. Participation in the study was voluntary and anonymous.

Only professionals who were licensed or certified to provide mental health therapy or counseling services as defined under Minnesota Statute 245.462, Subdivision 18 were eligible to participate. Of those responding, only professionals currently seeing clients at the time of the study were included in the final analysis. The sample size was determined using 2019 estimates for the number of MHPs per Minnesota resident (MHA, 2021), an expected response rate of 80%, a margin of error of 5%, and a confidence interval of 95%. The minimum sample size estimated for the study was 371.

Survey tool

We utilized a KAP survey design to collect both quantitative and qualitative information from licensed MHPs. There are many

examples of KAP surveys used to collect information from health care providers on a range of topics, including climate change (May & Noel, 2019; Ryan, Dubrow, & Sherman, 2020; Shezi et al., 2019; WHO, 2008; Yang et al., 2018). For this study, KAP survey questions were developed by a panel with expertise in mental health, climate and health, and epidemiology. The survey was then piloted by six volunteers consisting of licensed mental health care providers and an epidemiologist.

The final survey had 54 items divided into sections related to socio-demographics, knowledge and attitudes regarding climate change and mental health impacts, practice behaviors and experience regarding climate impacts on client mental health, and access to professional resources (Supplementary Data).

The survey included a mix of 5-point Likert scales and multiple-choice questions. Free text questions gathered qualitative data to supplement several answer choices and to provide an opportunity for respondents to clarify or expand on their selections. These responses were reviewed and coded for common themes, using a modified thematic analysis approach. Two of the study authors separately reviewed the data for themes and came up with similar thematic groupings. The self-administered survey was provided online using Verint analytics software (Verint EFM Version 15.3 FP3) through the Minnesota Department of Health (MDH) website.

Results

Sample population

A total of 770 licensed MHPs responded to the survey. Of these, 517 were actively seeing clients at the time of the survey and therefore enrolled in the final sample. Answers from partially completed surveys were included in the analysis, particularly since descriptive analyses were conducted on each individual question, but the changes in sample size (i.e., change in *n*) are noted in the data tables. The majority (53.9%) of respondents were psychologists or social workers, and most (52.8%) had been practicing for at least 15 years (Table 1).

Almost half of the respondents (45.9%) saw on average 16–30 clients weekly (Supplementary Data). Most respondents concentrated their practice on adult clients (56.4%), whereas 42.2% noted that they see mainly children or a mix of both. Most respondents saw clients who live in urban (38.7%) or suburban (32.4%) areas, but 23.1% served clients from rural areas and 3.6% from tribal areas.
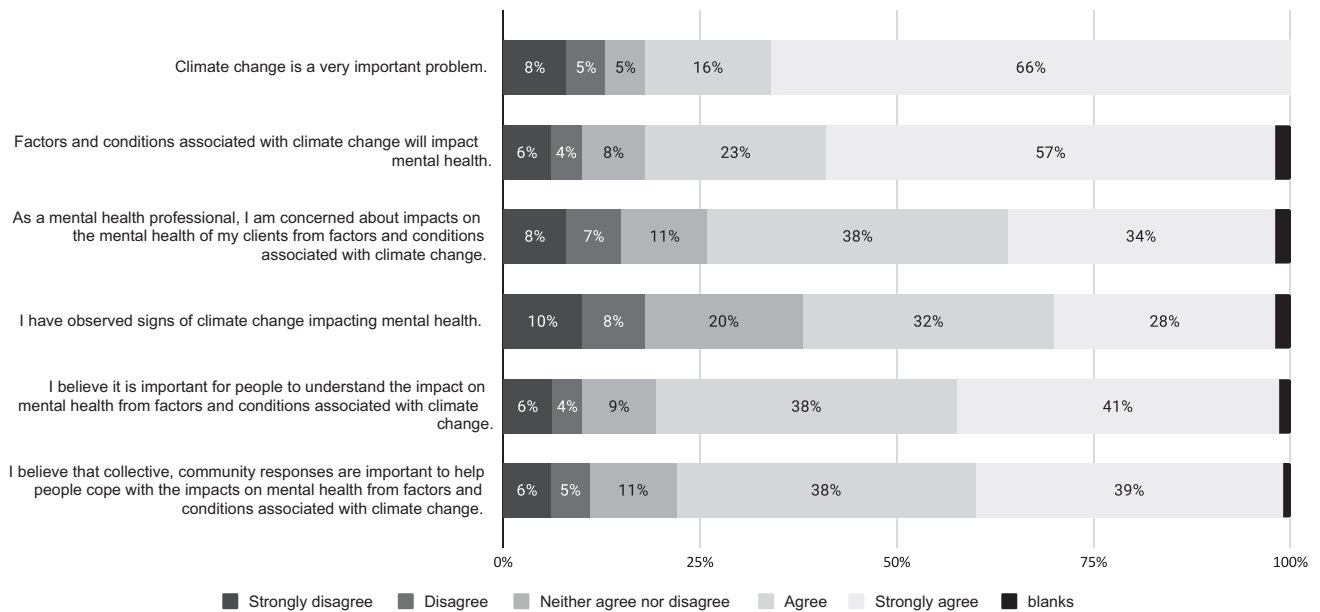
Survey responses on knowledge and attitudes

A large majority of respondents agreed that climate change is a very important problem (82.5%) that will impact mental health (81.6%) (Fig. 1). More than half (61.0%) have already observed these

Table 1. Characteristics of Survey Respondents and Their Clients, n (%)	
Current mental health provider license (*n*=534)	
LICSW, LSW (social work)	130 (24.3)
LMFT (marriage and family)	94 (17.6)
LPCC (clinical counselor)	8 (1.5)
LP psychologist	158 (29.6)
LP psychiatrist	7 (1.3)
Other (e.g., RN, NP, etc.)	137 (25.7)
Client base (*n*=509)	
Mainly adults	287 (56.4)
Mainly children	73 (14.3)
Both	142 (27.9)
Other	7 (1.4)
Years in practice (*n*=512)	
0–<5 years	77 (15.0)
+5–<15 years	165 (32.2)
15–<25 years	110 (21.5)
25 or more years	160 (31.3)
Practice setting (*n*=575)	
Outpatient clinic	262 (45.6)
Hospital	107 (18.6)
Office	61 (10.6)
School/university	64 (11.1)
Other (e.g., nursing home, virtual counseling, etc.)	81 (14.1)
Client residence (*n*=757)	
Tribal	27 (3.6)
Urban	293 (38.7)
Rural	175 (23.1)
Suburban	245 (32.4)
Other	17 (2.2)

LICSW, licensed independent clinical social worker; LMFT, licensed marriage and family therapist; LP, licensed psychologist; LPCC, licensed professional clinical counselor; LSW, licensed social worker; NP, nurse practitioner; RN, registered nurse.

Fig. 1. Knowledge and attitudes regarding climate change and mental health.

impacts. A large majority (80.4%) of respondents believe that it is important for people to understand the impact on mental health from climate change, and that community responses are important to help individuals cope with these impacts (78.0%).

Because the mental health impact from climate change is receiving increasing attention from a variety of research perspectives, different terms are used within both the popular press and the research literature. Survey participants indicated their level of familiarity with five of the terms most used to describe the mental/emotional distress caused by awareness of and/or experience with the changing climate. Participants indicated highest familiarity with "climate anxiety," with approximately 69% responding "familiar" or "very familiar" (Fig. 2).
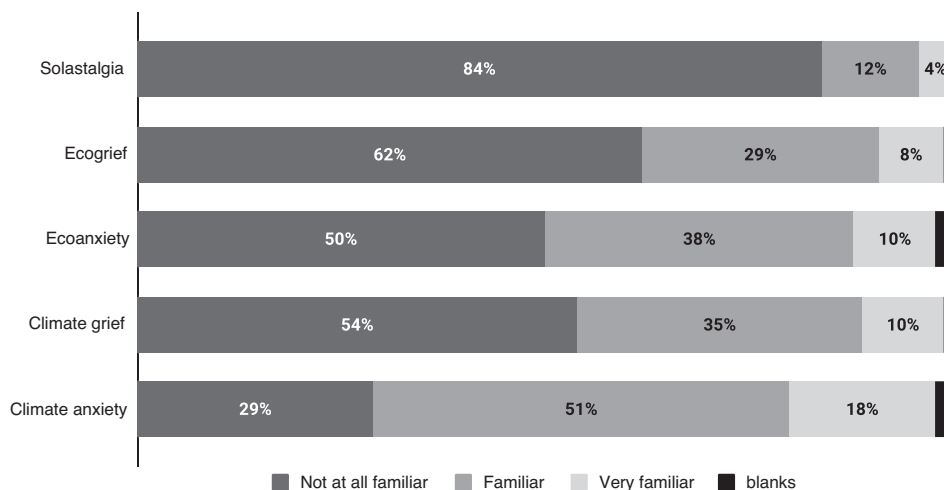
Fig. 2. Familiarity with terms describing climate-related mental health impacts.

Survey responses on practice

Approximately three-quarters (72.0%) of respondents report that they are concerned about climate-related impacts on the mental health of their clients (Fig. 1). More than half of the respondents report that some of their clients have expressed concerns about climate change, either directly (55.0%) (Fig. 3) or indirectly through conditions, such as flood or winter warming (57.1%) (Supplementary Data). A small majority (51.8%) of MHPs report that some of their clients would be open to discussing the impact of climate change on their mental health as part of their treatment.

However, less than a third (32.9%) report feeling well prepared to discuss mental impacts from climate change with their clients (Supplementary Data), even though a larger proportion (40.6%) have already had these discussions. Fewer practitioners report that they feel like they do a good job of discussing the issue with their clients (22.2%). Regarding efficacy and opportunity, most respondents agree that MHPs are positioned to help clients both understand (66.4%) (Supplementary Data) and cope (76.5%) with climate-related impacts on mental health. Slightly less, although still a majority, agree that MHPs are positioned to help the larger community with both understanding (57.9%) (Supplementary Data) and coping (61.7%) with climate-related impacts on population-level mental health.

A key objective of the survey was to assess the availability of climate-related practice resources for MHPs. A small proportion of respondents report being familiar with tools and resources that are intended to assist with client assessment (15.0%) and treatment (18.3%) (Fig. 4). Less are aware of community-level resources (13.5%), and only 10.2% have made use of these tools to help their clients address the mental impacts of climate change.

Survey responses on client-centered impacts

MHPs were given a list of mental health outcomes linked to climate change in existing literature and asked to note how often they see evidence of these climate-related outcomes in their clients (Fig. 5). More than half of the respondents reported seeing evidence sometimes or often of generalized anxiety (66.6%), depression (62.5%), and chronic psychological distress (55.8%), and almost half (47.9%) noted grief reactions. More than a third (34.4%) of
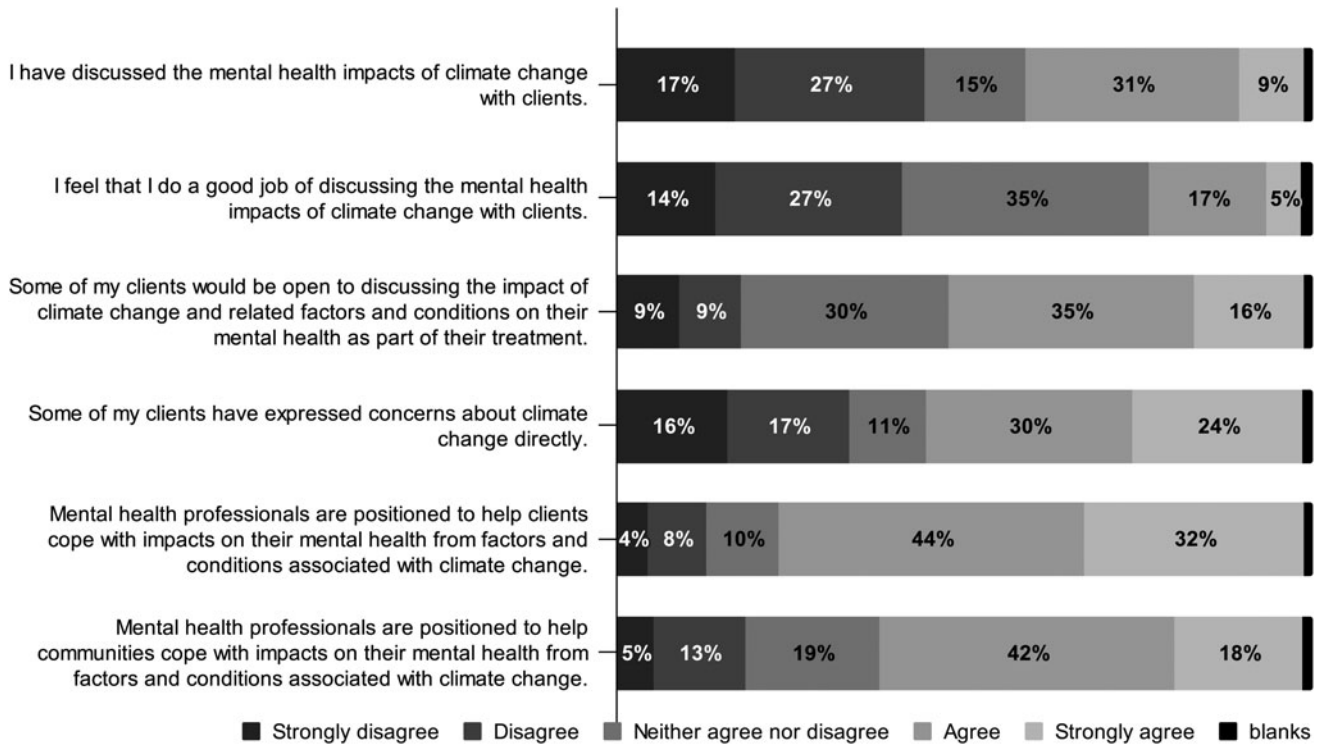

Fig. 3. Practice-related statements regarding climate change and mental health.
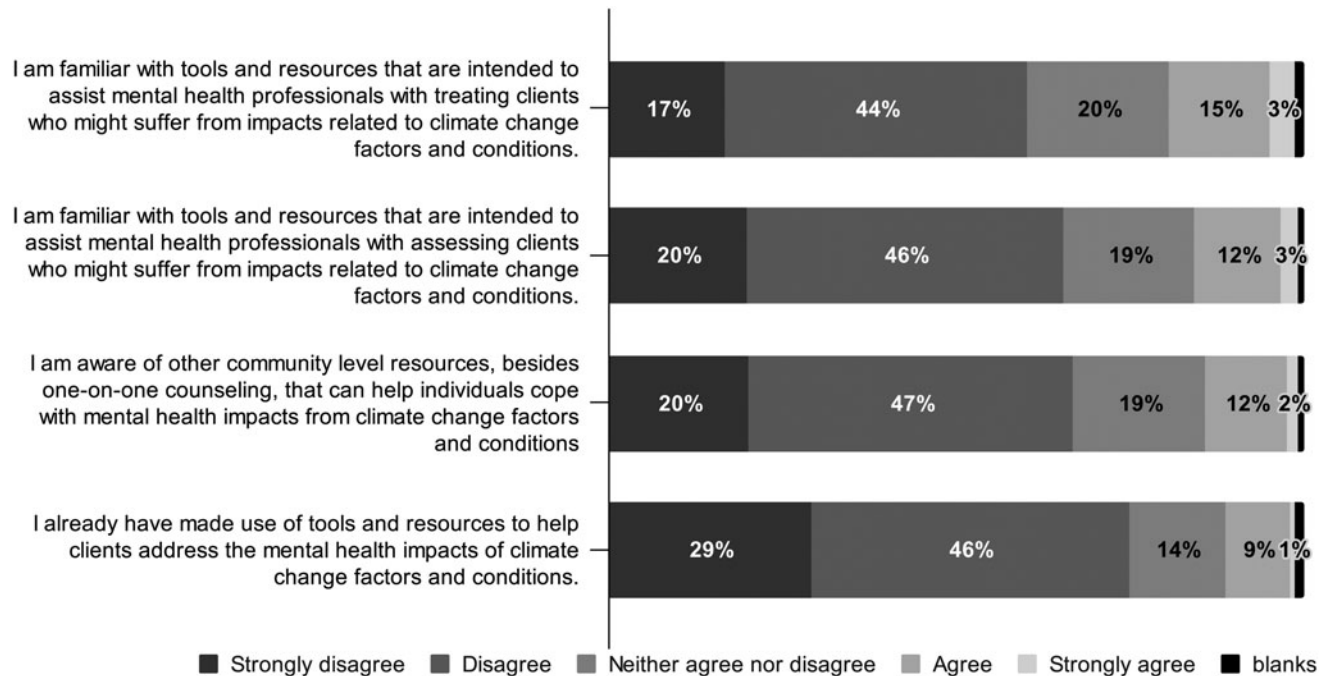
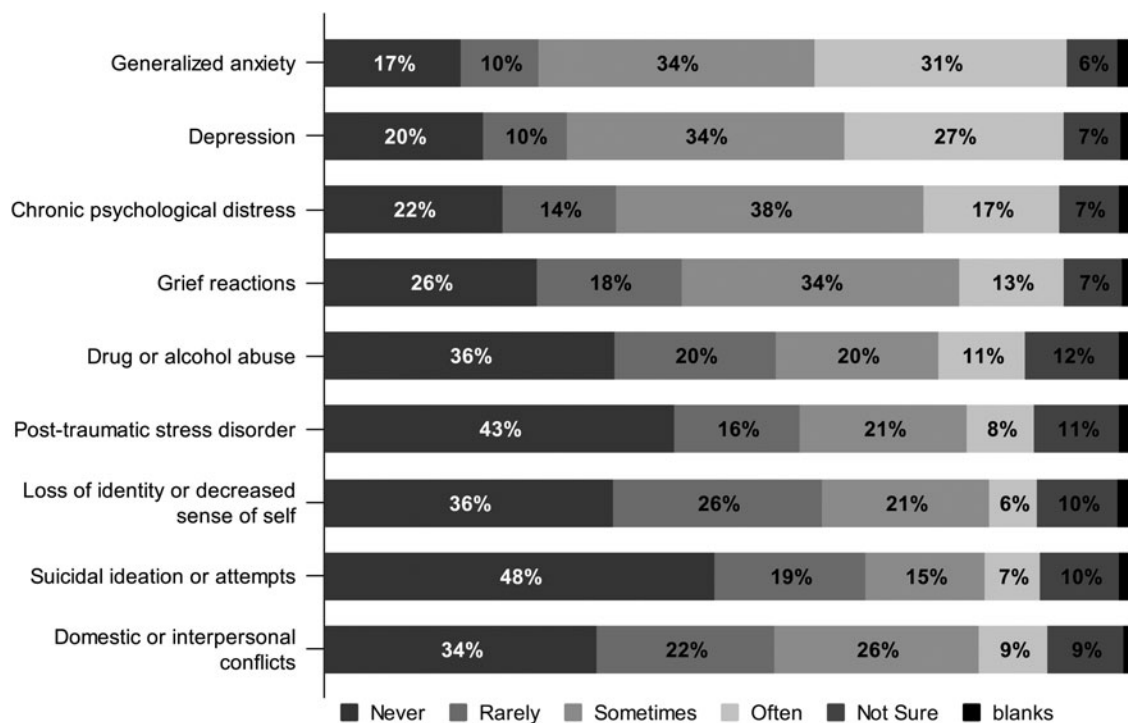**Fig. 4.** Statements regarding professional resources.

Fig. 5. Observed climate-related mental health impacts.

respondents reported seeing evidence of domestic or interpersonal conflicts, and almost a third (31.4%) saw evidence of drug and alcohol abuse. Slightly less saw evidence of post-traumatic stress disorder (29.4%). More than a quarter have seen evidence of loss of identity (27.2%), and more than one-fifth (22.0%) have seen evidence of suicidal ideation and attempts.

Survey responses on populations disproportionately impacted by climate change

As some populations are disproportionately impacted by climate change (Gamble et al., 2016), we posed the following statement to survey participants, "Some populations are more vulnerable to experiencing mental health impacts related to climate change." Of those responding ($n = 507$), the majority (78.7%) either agree or strongly agree with the statement (Supplementary Data). In addition, MHPs were asked to list populations they view as more vulnerable. These open-ended responses were grouped independently by two of the researchers. Supplementary Figure S1 displays those populations that were listed most often, including those with low income or limited access to resources (22%), followed by outdoor workers/farmers and those with existing mental health issues (each 10%).

Survey responses on professional resources

A major goal of this study was to gather information on the needs and barriers confronting MHPs regarding climate impacts on their clients. Participants were able to type their own response to the question, "What barriers do you face in assisting clients who might suffer from mental health impacts related to climate change?" Independent coding by two researchers resulted in nine categories that captured 88.6% of the responses, with 11% of responses falling into an "other" category (Supplementary Fig. S2).

Of those responding ($n = 390$), the most common answer was a lack of information and resources to assist with client treatment. Other commonly noted barriers included generalized complacency or hopelessness in the broader community and the client's own lack of awareness or resistance to climate change as an issue of concern (Supplementary Fig. S2).

Survey respondents were also asked to provide responses about the types of information they would like to receive related to mental health impacts of climate change, and through what delivery method they would like to receive this information. Seventy percent of responses ($n = 514$) indicated interest in receiving more information on the mental health impacts related to climate change (Supplementary Data), preferring published evidence in the literature followed closely by treatment and assessment options (Supplementary Fig. S3). With respect to delivery of the information, the top three preferred means of receiving this information was through continuing education courses, handouts or topic briefings targeted to MHPs, and free webinars (Supplementary Fig. S4).

Discussion

Our survey results provide compelling evidence that MHPs view climate change as a serious problem, are concerned for the impacts on mental health, and support collective, community-level responses to help with coping. In addition, our results demonstrate that MHPs need professional tools and resources to meet the rising demands placed upon them by climate change. The MHPs surveyed for this exploratory study represent a large professional cohort from across the State of Minnesota who are actively working with clients.

Given their current licensure, required education, years of practice experience, and trusted interactions with numerous clients, their collective input provides a critical perspective. Meeting their needs and responding to their input will advance response and resiliency to these threats. The following discussion highlights key lessons learned from survey respondents.

Impacts are happening now

> "As I type this, I think that anyone who cares about our planet is vulnerable to the mental health impact of changing climate."
>
> "I work mainly with adolescents—who often express a sense of hopelessness about their future due to the overwhelming and seemingly 'unfixable' climate crisis."
>
> "I feel the same despair and anxiety that they do."

MHPs agree that climate change is a threat to mental health, with nearly three-quarters expressing concern about climate-related mental health impacts among their own clients. More than half report that they have already observed signs of these impacts. As noted by Berry, Waite, Dear, Capon, & Murray (2018), "climate change is unlikely to generate new classifications of psychiatric disorder, instead aggravating well-known risk factors for already-existing disorders." Surveyed MHPs confirm a link between climate change and several common mental health disorders and conditions, such as generalized anxiety, depression, chronic distress, and grief reactions. Numerous studies that directly assess affected populations confirm a link between climate change and these specific mental health outcomes (Cruz, White, Bell, & Coventry, 2020; Gibson et al., 2020; Hrabok, Delorme, & Agyapong, 2020; Mulchandani et al., 2020; Temte,

Holzhauer, & Kushner, 2019; Woodhall-Melnik & Grogan, 2019). However, most of these studies are focused on a limited population of individuals directly impacted by climate-related disasters, particularly floods.

An evidence-based pathway linking negative mental health impacts to the direct experience of acute climate-related disasters and extreme events appears firmly established in the literature (Charlson et al., 2021; Cianconi et al., 2020). Less studied is the pathway linking mental health impacts to more generalized, chronic exposure to climate changes, which could impact a far greater number of people. This pathway is not grounded in the direct experience of a specific climate hazard. Instead, it is mediated by factors such as an "overarching awareness of climate change and the risks it poses" (Hayes et al., 2019), "abstract knowledge of future climate change threats" (Gibson et al., 2020), or "recognition of a changing climate, frustration over the lack of action on global warming, and a sense of remorse or dread about the future" (Temte et al., 2019).

The Yale series "Climate Change in the American Mind" (April 2020) surveys the general population on climate-related knowledge, attitudes, and beliefs. Recent surveys include questions on the association between climate change and psychological harm, such as "How strongly do you feel each of the following emotions when you think about the issue of global warming?" Americans report feeling the following negative emotions very to moderately strong: angry (40%), helpless (39%), afraid (35%), anxious (34%), hopeless (28%), and depression (24%) (Leiserowitz et al., 2020).

A 2020 public opinion poll by the American Psychiatric Association showed that more than two-thirds (68%) of Americans are somewhat or extremely anxious about climate change, and it is most prevalent among those aged 18–34 (APA, 2020b). At least 47% of young adults report that their concerns about climate change are serious enough to impact their daily lives (APA, 2021). These results provide insight into the less acute, event-specific impact of climate change on mental wellness in the general population and corroborate MHPs in our survey that report observing negative mental health impacts in many of their treatment-seeking clients.

A potential challenge to studying the more abstract, "existential" pathway between climate change and mental health is terminology (Panu, 2020). As awareness of this pathway grows among researchers and practitioners, so do the number of terms to describe these mental health impacts and the need to differentiate their experience from other potential causes (Comtesse, Ertl, Hengst, Rosner, & Smid, 2021; Galway, Beery, Jones-Casey, & Tasala, 2019; Panu, 2020).

MHPs in this study vary considerably on familiarity with terms associated with climate change, which may create confusion when it comes to assessment, intervention, and evaluation (Stanley, Hogg, Leviston, & Walker, 2021). Further, a majority were not at all familiar with terms, such as "climate grief," "ecogrief," and "solastalgia." Solastalgia is a relatively new concept that refers to distress caused by the transformation and degradation of one's home environment and is gaining traction among researchers exploring the emotional dimensions of climatic and environmental change (Albrecht, 2005; Galway et al., 2019).

However, given that researchers often rely on assessment tools and practitioner feedback for determining mental health impacts, the utility of this term, and the others, is limited if it does not make it into the clinical lexicon. Some have called for the development of more clinical tools to measure these concepts to facilitate consistency in understanding of such terms in clinical practice and allow for empirical differentiation between them, for example, ecogrief versus eco-anxiety (Comtesse et al., 2021; Stanley et al., 2021).

Further, language facilitates the expression of observations, thoughts, feelings, and needs (Lindquist, MacCormack, & Shablack, 2015). Language is relational and as such can bring people together by articulating a shared reality. Terms that capture mental and emotional responses to climate change help coalesce understanding between individuals, such as between MHPs and their clients, facilitate discussion with others in dedicated group settings (e.g., the Good Grief Network [GGN]) and, by making the abstract more concrete, advance the scrutiny of contributing factors and interventions by researchers and journalists (GGN, 2021).

By becoming informed about these key terms and using them when relevant in their practice, MHPs help facilitate coping conversations within their own practice and advance use of these terms across broader society.

Lack of resources and plenty of barriers

> "I do not have adequate training in how to assess for mental health impacts related to climate change."
>
> "It feels overwhelming and scary to me, too. I'm unaware of specific interventions other than general grief and trauma-related interventions."

More than 80% of MHPs in this study believe that it is important for people to understand climate-related impacts on mental health. Further, a majority agree that MHPs have a key role in helping both individuals and communities understand and cope with these impacts. However, less than one-third report feeling well prepared to

discuss these impacts with their clients, and a consistent majority lack familiarity with any professional tools and resources to address these impacts. Although 41% of MHPs have discussed climate-related mental impacts with their clients, only 22% feel that they do a good job with this discussion.

One of the most compelling messages taken from this survey is that although MHPs are open to addressing climate-related impacts on client mental health, they do not feel that they have the training or resources necessary to empower them professionally. The need to prepare the mental health workforce to address impacts from climate change and related hazards has been recognized by several trusted organizations over the years, including the Intergovernmental Panel on Climate Change (Pachauri & Reisinger, 2007), the APA (Swim et al., 2009), and the National Wildlife Federation (Coyle & Van Susteren, 2012).

Recent literature reviews on the link between climate change and mental health further strengthen the call for more professional resources for mental health providers (Bourque & Cunsolo Willox, 2014; Hayes et al., 2019; Palinkas, O'Donnell, Lau, & Wong, 2020).

MHPs in this study indicate a need for more published, professionally relevant literature on climate-related mental health impacts, followed by assessment and treatment options. Though a strong research literature exists on the emotional toll of environmental degradation, it has, by and large, not reached practitioners. They prefer receiving this information through continuing education courses, followed by a topic brief targeted specifically for MHPs.

This is valuable feedback that state and local public health agencies, universities, and other organizations providing mental health courses and professional guidance can act upon immediately to address the needs gap among MHPs and reflects the call for more evidence in the published literature. Exactly what categories of evidence MHPs are seeking was not explored in this study. However, an extensive literature review by Charlson et al. (2021) suggests that although climate change and mental health is a rapidly growing area of study, there is a need to accelerate research identifying specific interventions and policies that have been proven effective at mitigating negative impacts.

The lack of information and professional resources was by far the most frequently identified barrier MHPs report being faced when assisting clients with climate-related mental impacts. Other frequently identified barriers are intrinsic to clients themselves or the broader community, including generalized complacency, hopelessness, lack of knowledge, or awareness or outright resistance to climate change as an issue of concern. Notably, more than half of the MHPs report that their clients have expressed concerns about climate change, whereas fewer report that their clients would be open to discussing the impact of climate change on their mental health during treatment.

Results from the Yale study indicate that two out of three Americans (66%) say they are at least "somewhat worried" about global warming (Leiserowitz et al., 2020), suggesting a growing trend toward awareness, and perhaps openness, toward acknowledging climate change and mental health impacts. Further, although there is a large body of research and guidance aimed at facilitating communications around climate change (CRED, 2014; Stanley et al., 2021; van der Linden, 2015), results from this survey suggest that this information is not finding its way to practicing MHPs where it could facilitate provider-client dialogue.

MHPs are part of a broader approach to mental health and climate resiliency

"There needs to be more community education around how people can advocate for themselves and their communities so that they can feel empowered."

"We need collective ways to fight drivers of climate change, protect as much as we can and adapt to our changing environment."

MHPs have an important role in supporting their clients' experiences of climate-related mental health issues, and in creating a more diverse array of strategies and responses required for the growing number of impacted people. More than 75% of survey respondents agree that "collective, community responses are important to help people cope" with climate-related impacts on mental health. A majority also agree that MHPs are in a unique position to help communities understand and cope with these impacts. Unfortunately, few respondents (13.5%) are aware of community-level resources, besides one-on-one counseling, that can help people cope with these impacts.

Cultivating climate resiliency at the individual level, including mental and emotional resiliency, requires a systems-level approach (Berry et al., 2018). Although the primary goal of this study was to identify the current needs of MHPs to advance their ability to address climate-related mental health impacts with their clients, it is important to put these needs in context of the intersecting "micro-mezzo-macro" domains inherent in frameworks such as Person-In-Environment (Kondrat, 2002) or Social Determinants of Health (WHO, 2021), given that factors in each domain can determine an individual's ability to achieve and maintain mental wellness.

MHPs maintain an influential role within that system, but it is often limited to the interpersonal "micro" domain. In advocating for a systems approach to climate change and mental health, Berry et al. (2018) argue that current research puts too much emphasis on "inflating the importance of individuals, proximate factors, symptoms and illness" and underemphasizing the power of "opportunity structures, social determinants, and service access" to determine a person's capacity to respond to therapeutic advice.

Climate change is disrupting norms across major areas of influence over human health and well-being. This has led many researchers to argue in favor of scrutinizing contributing factors to mental health at the societal level, particularly because these factors are often disproportionately distributed across geographies, demographics, and culture (Hayes et al., 2019; Palinkas et al., 2020; Parry et al., 2019).

Climate-related mental health outcomes also disproportionately impact those individuals and groups made more vulnerable by societal inequities and marginalization (Clayton, Manning, Speiser, & Hill, 2021). More than 78% of MHPs in this study agree that some populations are more vulnerable to experiencing climate-related mental impacts. The population most frequently identified as vulnerable to these impacts by survey respondents included those with low income or limited access to resources, followed by outdoor workers/farmers, and those with existing mental health issues.

Several recent studies support these observations by MHPs in this study (Clayton et al., 2021; Daghagh Yazd, Wheeler, & Zuo, 2019; Liu, Liu, Fan, Liu, & Ding, 2018; Matthews et al., 2019). Qualitative research by Middleton et al. (2020), Gibson et al. (2020), and Polain, Berry, & Hoskin (2011) that center direct input by impacted communities point to the need for population-specific mental health adaptations and are pivotal for targeting effective response interventions for these groups.

Besides identifying factors and determinants contributing to mental impacts, the type of community-based, qualitative approach used by these authors has been successful at identifying protective factors intrinsic to the community, such as strong social networks and independence (Williams et al., 2013). These protective factors signal opportunities to further bolster resiliency in the community and consequently for affected individuals.

Both Palinkas et al. (2020) and Hayes et al. (2019) identify current response interventions that are relevant across the micro-mezzo-macro domains, such as policy responses to enhance funding and access to mental health care, integration of mental health care into disaster management plans, and mental health care training. Inherent in these interventions is the notion of expanding the range of trained professionals that can provide mental health care, particularly as societies are grappling with additional population-level mental stressors, for example, the Covid pandemic. This concept of "task-shifting," where trained non-specialists, such as nurses, first responders, teachers, or spiritual leaders steward low intensity mental health interventions, is effective in increasing access to services and treating a range of mental health disorders, particularly in settings with a shortage of MHPs (Palinkas et al., 2020).

Ecotherapy as a promising intervention approach

A majority of MHPs participating in this study said they lack familiarity with professional tools and resources to address climate-related impacts on their clients. Fortunately, promising interventions already exist, and many more are in development. Ecotherapy is a psychotherapeutic approach involving nature-based interventions, and it likely has strong relevance for addressing climate impacts (Baudon & Jachens, 2021; Hasbach 2012; Palinkas et al., 2020). Hasbach (2015) and others have described practices from ecotherapy that help address climate change impacts on mental health, such as broadening the scope of treatment to enhance an individual's connection with the natural world and "rewilding therapy" by taking therapeutic work outdoors.

Numerous research studies document the multiple and profound well-being benefits of spending time in nature. For example, it calms anxiety and improves cognition (Bratman, Daily, Levy, & Gross, 2015), lowers stress (Shuda, Bougoulias, & Kass, 2020), and increases positive affect (Yao, Chen, Wang, & Zhang, 2021). Ecotherapeautic practices that promote deep connections to the natural world are an immediate treatment option for MHPs working with climate-impacted clients. Ecotherapy offers practical strategies for MHPs to help clients overcome noted barriers to treatment and achieve "active hope" (Hayes et al., 2018).

In addition, MHPs themselves are not immune from anxiety about climate change or grief over ecological degradation, and ecotherapy methods can be an important form of self-care for those who provide care for others (Powers & Engstrom, 2020).

Strengths and limitations

To the best of our knowledge, this is the first study to assess MHPs for their knowledge, attitudes, and practice experiences regarding mental health impacts from climate change. A major strength of this work is the large number of licensed, currently practicing MHPs who participated in the study. Surveying experienced MHPs for their direct observations of climate-related impacts among treatment-

seeking clients is one way to estimate population-level burden, since mining medical records for diagnostic codes will not capture these impacts (Hayes & Poland, 2018).

A limitation of this approach is that the results of the survey are not representative of the general population, only those seeking care. This client population may come to treatment with pre-existing mental health disorders or concerns, positioning them to be more vulnerable to additional negative impacts from climate-related pressures. However, it appears that estimates of population burden among treatment-seeking clients reported by our MHP cohort are similar to those reported by the Yale (Leiserowitz et al., 2020) and APA (APA, 2020b) surveys of the general population with regard to prevalence of climate-related mental impacts.

Another strength of surveying MHPs is to assess their professional needs and gaps in resources. Universities, state agencies, and professional organizations can use the results of this study to respond to these needs immediately. However, there is still a lack of understanding of how the role of MHPs connects to other community-based mental health strategies. This study did not aim at characterizing community-based strategies that may exist across the "micro-mezzo-macro" domains, although surveyed MHPs recognized their importance for addressing climate-related mental impacts. There is a need for more publicized examples of these community-based strategies, especially those that have been evaluated for efficacy and are targeted to disproportionately impacted populations.

Another limitation of this study is that most respondents work in urban or suburban areas and mainly treat adult clients. Further research is needed to characterize climate-related mental impacts among rural and tribal populations, as well as among youth clients, particularly to inform the development of mental health care approaches and services for these groups.

Finally, this study included only Minnesota-based MHPs. Although it is clear that climate change is already affecting Minnesota through higher winter and nighttime temperatures and more extreme rainfall events (Minnesota DNR, n.d.), these impacts are arguably less likely to evoke the kinds of widespread anxiety and other negative emotions than the impacts being felt in other areas of the country. MHPs in states such as California experiencing severe and ongoing drought may have a longer history of hearing climate worries from patients and clients. These MHPs may have responded to our survey quite differently than our Minnesota sample.

Conclusions

Climate change is no longer a psychologically distant, future problem. More than half of the MHPs responding to our survey have already observed signs of mental health impacts from climate change on their clients. Despite this awareness, MHPs face several barriers to adequately addressing their clients' needs, with the foremost being a lack of resources, tools, and training. Efforts are needed to identify and develop effective intervention methods and other tools at both the individual and community levels, as well as to train professionals in related care-giving fields in assisting with mental health care. Expanding interventions beyond individual-level treatment and the types of professionals able to steward care may be especially important to meet the growing need of people suffering from the mental health impacts of climate change.

Authors' Contributions

Conceptualization, B.O.H., L.P., C.M., and K.K.R.; methodology, B.O.H., L.P., C.M., and K.K.R.; formal analysis, B.O.H., L.P., and C.M.; investigation, B.O.H., L.P., C.M., and K.K.R.; resources, B.O.H., L.P., C.M., and K.K.R.; data curation, B.O.H., L.P., and C.M.; writing—original draft preparation, B.O.H., L.P., C.M., K.V.J.-C., and K.K.R.; writing—review and editing, B.O.H., L.P., C.M., K.V.J.-C., and K.K.R.; visualization, B.O.H.; supervision, B.O.H., K.K.R.; project administration, B.O.H., K.K.R. All authors have read and agreed to the published version of the article.

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