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MENTAL HEALTH AND ADDICTION SERVICES

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The Impact of Wildfires on Mental Health



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Review

The Impact of Wildfires on Mental Health: A Scoping Review

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Abstract: One of the many consequences of climate change is an increase in the frequency, severity, and, thus, impact of wildfires across the globe. The destruction and loss of one's home, belongings, and surrounding community, and the threat to personal safety and the safety of loved ones can have significant consequences on survivors' mental health, which persist for years after. The objective of this scoping review was to identify primary studies examining the impact of wildfires on mental health and to summarize findings for PTSD, depression, anxiety, and substance use. Literature searches on Pubmed and Embase were conducted in February and April of 2021, respectively, with no date restrictions. A total of 254 studies were found in the two database searches, with 60 studies meeting the inclusion criteria. Three other studies were identified and included based on relevant in-text citations during data abstraction. The results show an increased rate of PTSD, depression, and generalized anxiety at several times of follow-up post-wildfire, from the subacute phase, to years after. An increased rate of mental health disorders post-wildfire has been found in both the adult and pediatric population, with a number of associated risk factors, the most significant being characteristics of the wildfire trauma itself. Several new terms have arisen in the literature secondary to an increased awareness and understanding of the impact of natural disasters on mental health, including ecological grief, solastalgia, and eco-anxiety. There are a number of patient factors and systemic changes that have been identified post-wildfire that can contribute to resilience and recovery.

Keywords: wildfire; bushfire; mental health; major depressive disorder; anxiety disorder; post-traumatic stress disorder; substance use; resilience



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Learning Objectives



Understand the scope and burden of wildfire-related mental health impacts on communities



Identify prevalence rates of PTSD, depression, anxiety, and substance use following wildfire disasters



Recognize key risk and protective factors for mental health outcomes post-wildfire



Apply evidence-informed strategies to support disaster mental health response and recovery

Climate Change & Wildfires

GLOBAL IMPACT

Approximately **440 million people** globally were directly exposed to wildfires during the first two decades of the 21st century.(WHO)

CANADIAN CONTEXT

Direct firefighting costs in Canada exceed **\$1 billion annually**, with indirect costs (e.g., property damage, business disruption) adding at least another **\$500 million** per year

CONTRIBUTING FACTORS

- Warmer temperatures, longer summers, changes in wind and rainfall patterns, human expansion into wildland-urban interface
- Human-induced climate change has made extreme fire weather (like that seen in recent South American blazes) up to **three times more likely**.

HEALTH IMPACTS

Wildfires affect health through multiple pathways:

- Acute mortality and injury risk
- Respiratory conditions (COPD, asthma)
- Cardiovascular effects
- Mental health disorders

Scoping Review Methods

SEARCH STRATEGY

DATABASES

PubMed & Embase (no date restrictions)

SEARCH TERMS

Mental health terms (PTSD, depression, anxiety) combined with wildfire/bushfire terms

OUTCOMES

PTSD, depression, anxiety, substance use, resilience

REVIEW RESULTS

63

studies included

26

Australia

14

Canada

11

USA

Other countries: Greece (8), Israel (2), Singapore, Spain

Post-Traumatic Stress Disorder in Adults

PREVALENCE RATES BY TIME POST-WILDFIRE



Key Finding: Higher rates of PTSD persist for years after wildfire exposure. The Victorian Black Saturday bushfire study followed survivors for 10 years.

ASSOCIATED OUTCOMES

Sleep disturbance, insomnia, anger, attachment difficulties, interpersonal violence

FORT MCMURRAY DATA

12.8% PTSD at 6 months; 14.9% in females vs 8.7% in males

PTSD in Children & Adolescents

PREVALENCE BY TIME POST-WILDFIRE

SUB-ACUTE PHASE

Significant PTSD symptoms

92%

6 MONTHS

Moderate-severe PTSD

9–29%

18 MONTHS

Probable PTSD (Grades 7–12)

37%

BEHAVIORAL CHANGES IN CHILDREN

- Increased irritability
- Changes in concentration
- Sleep disturbances
- Declining academic performance
- Regression in developmental milestones

CRITICAL FINDING

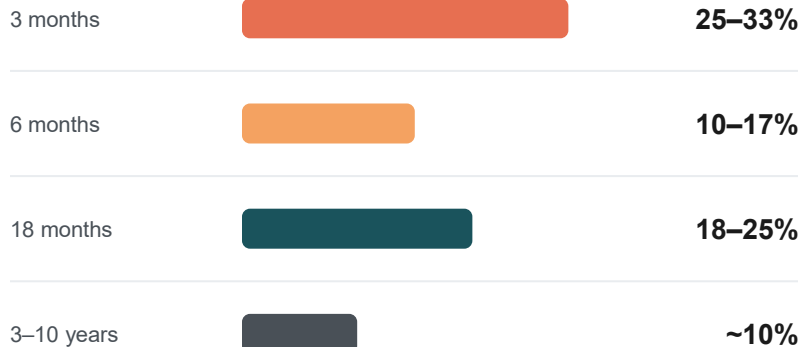
Fear for parents' lives was a greater predictor of emotional distress than fear for their own life.

LONG-TERM IMPACT

20-year follow-up: Higher lifetime rates of specific phobia in wildfire-exposed children.

Depression Post-Wildfire

ADULTS



CHILDREN & ADOLESCENTS



Fort McMurray: 31% of Grades 7–12 met criteria for probable depression vs 17% in controls

Co-occurrence: High correlation between PTSD and depression post-wildfire, with co-occurrence rate of 0.74 in adults.

Anxiety Disorders Post-Wildfire

GENERALIZED ANXIETY DISORDER

20%

at 6 months

16–19%

at 18 months

Pre-wildfire rates estimated: 8.6–14.5%

OTHER ANXIETY DISORDERS

- Panic disorder: 17.4% at 3 months
- Other anxiety disorders: 27% at 3 months

Long-term: Severe psychological distress decreased from 7.5% to 4.4% over 10 years post-wildfire

CHILDREN & ADOLESCENTS

14%

high anxiety at 6 months

27%

suspected anxiety at 18 months

IMPORTANT DISTINCTION

Anxiety post-wildfire may serve an adaptive function—motivating appropriate responses such as pursuing financial support, rebuilding, and identifying community resources.

Clinical distinction: Differentiate adaptive anxiety responses from functionally impairing anxiety disorders requiring intervention.

Substance Use Post-Wildfire

PREVALENCE RATES

ALCOHOL USE DISORDER / HEAVY DRINKING

17%

3 months

22%

3 years

19%

10 years

COLLEGE STUDENTS (18 MONTHS POST-FIRE)

15.5%

High-risk drinking

13%

Problematic drug use

4.4%

Nicotine dependence

MENTAL HEALTH CONNECTION

Key Finding

Adults with GAD at 6 months post-wildfire were **3× more likely** to present with drug-related problems.

BIDIRECTIONAL RELATIONSHIP

- Shared genetic and environmental risk factors
- Substance use as coping mechanism
- Substances impacting mood regulation
- ~50% of individuals with psychiatric illness have comorbid SUD

Risk Factors for Poor Mental Health Outcomes

PRE-TRAUMA FACTORS

- Female gender
- Younger age (≤ 25) or older (>40)
- Lower socioeconomic status
- Fewer years of education
- Prior psychiatric history
- Adverse childhood experiences

TRAUMA FACTORS

- Witnessing burning homes
- Fear for one's life
- Fear for safety of loved ones
- Significant property damage
- Evacuation experience
- Peritraumatic distress intensity

POST-TRAUMA FACTORS

- Perceived lack of support
- Ongoing life stressors
- Secondary adversities
- Financial strain
- Housing instability
- Cumulative stress burden

Resilience & Protective Factors

Resilience: Adapting to adversity without developing functionally impairing psychiatric conditions.

INDIVIDUAL

- Positive reappraisal coping
- Self-compassion
- Higher baseline self-esteem
- Adaptive emotion regulation

SOCIAL

- Strong social support network
- Family cohesion
- Group involvement
- Secure attachment style

COMMUNITY

- Environmental attachment
- Communal coping strategies
- Participation in rebuilding
- Government support validation

Evidence: High resilience scores associated with lower rates of PTSD, depression, anxiety, and higher quality of life.

SPOTLIGHT: FORT MCMURRAY WILDFIRE

Fort McMurray Research Series

Longitudinal evidence from the 2016 wildfire | Published 2022

RESILIENCE

5-year follow-up: prevalence and predictors of low resilience among survivors

Adu, Eboreime et al. Behav. Sci. 2022

CUMULATIVE TRAUMA

Impact of wildfire, flooding, and COVID-19 on mental health burden

Agyapong, Eboreime et al. Eur J Psychotraumatol. 2022

5-YEAR PTSD & MDD

Post-disaster evaluation of PTSD and major depression five years on

Mao, Eboreime et al. Int J Environ Res Public Health. 2022

Five-Year Follow-Up: Resilience Post-Wildfire

ADU, EBOREIME ET AL. | BEHAVIORAL SCIENCES 2022 | N=186 RESIDENTS | 5 YEARS POST-WILDFIRE

37.4%

Low Resilience
5 years post-wildfire

2.85x

Higher odds of low resilience
with PTSD symptoms (OR=2.85)

74.7%

Study Response Rate
186 of 249 respondents

KEY FINDINGS

- PTSD symptoms and older age were the only independent significant predictors of low resilience
- 89.8% were present in Fort McMurray during the mass evacuation; 83.6% witnessed houses burning
- 89.3% reported fear for their lives or their family members' lives during the wildfire

CLINICAL IMPLICATION

Screening for PTSD should be a priority in post-disaster care to identify those at greatest risk for compromised resilience. Targeted interventions are needed for older survivors with elevated PTSD burden, even years after the event.

Cumulative Trauma: Compounding Mental Health Burden

AGYAPONG, EBOREIME ET AL. | EUR J PSYCHOTRAUMATOL 2022 | WILDFIRE + FLOODING + COVID-19

2016

Wildfire

90,000 residents evacuated

2020

Flooding + COVID-19

Second major disaster within 4 years

2021

Study Survey

April-June: cross-sectional online survey

KEY FINDINGS: CUMULATIVE MENTAL HEALTH BURDEN

18x more likely GAD

Those exposed to all 3 disasters vs. COVID-only group (OR: 18.30; 95% CI: 2.20–152.45)

11x more likely PTSD

Those exposed to all 3 disasters vs. COVID-only group (OR: 11.41; 95% CI: 1.34–97.37)

Key Implication: Each additional disaster compounded the mental health burden. Communities facing multiple climate-related disasters require sustained, multi-layered mental health support and more robust mobilization of mental health resources.

Emerging Concepts in Climate-Related Distress

Ecological Grief

Mourning and emotional response to the loss of natural environments, species, and ecosystems.

Solastalgia

The feeling of homesickness while still at home—distress caused by environmental change in one's home environment.

Eco-Anxiety

Worry or distress regarding the negative consequences of environmental changes and climate change.

Implications for Practice

SCREENING & ASSESSMENT

- Screen for PTSD, depression, anxiety, substance use
- Include children using appropriate tools
- Assess trauma exposure and ongoing stressors

VULNERABLE POPULATIONS

- Prioritize those with high trauma exposure
- Target those with prior psychiatric history
- Support lower socioeconomic groups

SUSTAINED SUPPORT

Government aid should not be time-limited—ongoing stressors contribute to chronic impacts

INNOVATIVE INTERVENTIONS

- Supportive text messaging (Text4Hope model)
- Resilience-building interventions
- Sleep-focused treatments

COMMUNITY-LEVEL RESPONSE

- Foster social connections and group involvement
- Support environmental restoration
- Validate trauma through visible response

FUTURE DIRECTIONS

Longer follow-up studies, effective communication, scalable digital interventions

Key Takeaways

- Wildfires significantly increase rates of **PTSD, depression, anxiety, and substance use** in both adults and children, with effects persisting for years
- **Trauma-related factors** (fire exposure intensity, perceived threat) are more predictive of outcomes than demographic factors alone
- **Social support and resilience** are protective—community connections and government validation of trauma are critical
- Emerging concepts like **ecological grief, solastalgia, and eco-anxiety** capture important responses beyond traditional diagnoses
- **Sustained, comprehensive response** is needed—public health approaches must be adaptive and extend beyond the acute phase

THANK YOU

Questions?

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