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Predicting Participation in a Post-disaster Mental Health Program

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Abstract

Objectives: A retrospective naturalistic evaluation was undertaken to identify if pre- and post-disaster factors may predict the likelihood of those considered “at risk” of post-traumatic stress disorder (PTSD) entering a post-disaster clinical treatment program.

Methods: The intake data of 881 people referred to the program following the Queensland (Australia) natural disasters of 2010-11 was evaluated. Those referred scored >2 on the Primary Care PTSD scale. Assessment included the disaster exposure experience, demographic and clinical information, and measures of coping and resilience. Descriptive analyses and a Classification Tree Analysis (CTA) were undertaken to ascertain which factors may predict treatment participation.

Results: The treatment group (TG) in comparison to the non-treatment group (NTG) were more likely to perceive their life was threatened (85.1% vs 8.1%), less able to cope (67% vs 25.8%) and less resilient (4.2% vs 87.5%). The CTA using all the assessment variables found the Connor-Davidson (2-item scale) ($P < 0.001$), degree of property damage ($P < 0.001$), financial losses ($P < 0.001$), perception their life was threatened ($P < 0.001$) and insurance claims ($P < 0.003$) distinguished the TG from the NTG.

Conclusions: The study identified factors that distinguished the TG from the NTG and predicted the likelihood of participation in a post-disaster mental health treatment.

Australia’s vulnerability to natural disasters is a recurring theme in Australian communities,¹ with these events occurring more frequently since the 1970s.^{2,3} Disasters are accompanied by destruction of property and infrastructure, the loss of wildlife, and often loss of human lives. These were familiar occurrences following the bushfires and floods that plagued Australian communities between 2019 and 2022.^{3–5} Although climate variables have a role in the genesis of disasters, poverty, previous trauma experiences, building codes, and community and individual resilience are risk factors that influence the outcome of disasters.⁶ These risks are not static. The severity of events, greater urbanization, and an aging and growing population intensify the disaster risks through increased vulnerability and a reduced response capacity in disaster-affected communities.^{7–11} The worldwide trend towards urban living¹² is particularly evident in Australia where 89% reside in urban areas¹³ with 92% of Australians predicted to live in urban communities by 2050.¹⁴ The population drift towards major cities, established coastal centers, or regional centers exposes communities to an increased risk of disasters due to coastal or pluvial flooding or cyclonic activity.¹⁵

The adverse economic, social, family, and mental health outcomes for disaster-affected Australian communities are well described.^{16–18} Jurisdictions recognize the need for structured, planned, and integrated frameworks for responding to disasters. The frameworks include addressing immediate safety and infrastructure recovery and the provision of psychosocial support, although the impact of disasters on the health and well-being of communities is likely to be underestimated and may be cumulative.^{19–23} The Australian disaster management framework includes prevention and preparation strategies and mental health strategies to address identification of at-risk populations, service accessibility, and outreach programs.^{24–26}

However, there are gaps between the demand for services post-disaster and service availability: Post-Hurricane Katrina, those experiencing psychological problems described service access difficulties resulting in increased unmet mental health needs. The nature of the disaster and geographical factors influence service access. An Australian study demonstrated that exposure to bushfires increases the likelihood of seeking primary mental health care compared to those exposed to other disasters.²⁷ Ethnicity, income, job loss, and disability affect service access and help-seeking behavior.^{28–30}

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Like the flood events that affected New South Wales (NSW) and Victoria in 2022-2023, the Queensland floods and cyclones (2010-2011) were associated with significant infrastructure damage, human tragedy, and psychosocial distress. A third of Queensland's population was affected, 10 500 people were evacuated from their homes, and towns became isolated. The flood affected the capital, provincial cities and rural communities.³¹ An evaluation estimated 314 000 people were vulnerable to emotional distress, with a predicted 1% increase in severe mental disorders and a 5% increase in mild to moderate mental disorders.³²

The Queensland Mental Health Natural Disaster Recovery Plan 2011-13 (The Plan) was developed to address psychosocial recovery in the immediate and the medium to long-term.^{33,34} The Plan addressed the mental health challenges associated with evacuation, damaged homes, and infrastructure and aimed to link primary health care, the non-government sector (NGOs), community-based supports, and health services. A critical feature of the strategy was addressing the needs of vulnerable populations, providing evidence-informed treatment programs, and enhancing resilience.^{35,36} The Specialised Mental Health Program (SMHP) was a key element of the mental health response.²² Across Queensland, SMHP treatment teams were implemented in areas affected by floods and cyclones. The Centre for Trauma, Loss and Disaster Recovery undertook the implementation, oversight, and monitoring of the SMHP and established a database to support staff supervision and report on service activity.^{37,38}

The SMHP multidisciplinary teams included mental health nurse, psychologists, social workers, occupational therapists, and psychiatrists. Clinical services were provided in community facilities, general practices, or homes. The Australian Government National Disaster Relief and Recovery Arrangements (NDRRA) funded the services. The clinicians were trained in Skills for Psychological Recovery (SPR) and Trauma-Focused Therapy.³⁹ The program included pre-referral assessment, standardized pre-post assessments, and clinical evaluation. The treatment sessions included psychoeducation and Cognitive Behavioral Therapy (CBT) to address anxiety and depression and trauma-focused CBT (TF-CBT).

Despite the extensive mental health response plan to the Queensland floods and cyclones of 2010-11, there were concerns regarding the program's capacity to meet the demands for specialist mental health care due to the size of the state and the number of people affected. These concerns reflect those of other studies. Following Hurricanes Katrina and Sandy, the demand for services and the delayed emergence of adverse psychological adversely exceeded the availability of trained clinicians.^{28,40-42}

The mismatch between service demand and clinician availability is not unique to disasters. The development of a capacity to predict who may participate in treatment is, therefore, likely to assist in determining resource allocation and treatment planning.^{43,44} Previous studies have highlighted witnessing injury or death as aspects of the disaster experience that increase the risk of adverse psychological outcomes, while noting indirect factors such as resilience potentially ameliorate the psychosocial effects.⁴⁵⁻⁴⁹ Similarly, studies have identified a relationship between optimism^{50,51}, perception of well-being⁵², and coping style⁵³⁻⁵⁵ and the psychosocial response to disasters. Other studies recognize that psychosocial outcomes are influenced by pre-and-post disaster experiences and pre-disaster physical and general health.⁵⁶⁻⁵⁸

This paper reports a retrospective evaluation of the relationship between perception of optimism and resilience, disaster-related factors, physical and mental health history, family history, pre-

event trauma experiences, demographics, post-disaster health, social changes, and the likelihood of participation in a specialist post-disaster mental health program (Figure 1). This study aimed to identify factors that may predict participation in a specialist program in those exposed to a natural disaster and assessed as at risk for post-traumatic stress disorder. A Classification Tree Analysis (CTA)⁵⁹ was utilized to identify which assessment measures predicted participation in the post-disaster SMHP.

Method

The study evaluates data from assessments of those referred to the SMHP treatment program ($n = 881$) during 2012. Ethics approval was granted by Metro South Health Human Centre for Health Research Ethics Committee (HREC/14/QPAH/472) and Queensland University of Technology (Ethics approval number 1500000016) – A retrospective evaluation of the outcomes of State-wide disaster mental health programs established and delivered following the Cyclones and Floods of 2010-2011.

A standardized process was used to assess all referrals (Figure 1). A panel of experts chose, by consensus and informed by the literature, the various assessment questionnaires used to evaluate those referred to the SMHP. The assessment measures reflected the known relationship between disaster exposure and psychosocial outcomes, such as Post-traumatic Stress Disorder (PTSD), alcohol use, and intimate partner violence (IPV), and aspects such as resilience, psychological coping strategies, life history, prior trauma experience, perception of self-efficacy, mental health history, and demographic and socioeconomic factors.⁶⁰⁻⁶⁷

Clinicians conducted the pre-treatment screening by telephone. The primary care post-traumatic stress disorder scale (PC-PTSD) was used to screen for PTSD. This measure has good test-retest reliability, with the 4 items reflective of the PTSD construct. A score of >2 on the scale indicates a person is at risk for PTSD.⁶⁸ Individuals who scored >2 on the PC-PTSD were further assessed (Figure 1) in relation to their experience of the natural disaster of 2010-11. The screening assessment included a narrative description of their disaster experience and measures that focused on their perception of wellbeing using a question from the public health computerized-assisted telephone interview program (CATI)⁶⁹, an individual's perception of optimism that Abdel-Khalek^{70,71} ascertained as identifying a relationship with coping and health outcomes and the Connor Davidson Resilience Scale (CR-2) that has been demonstrated to reliably discriminate for resilience.⁷²

The pre-treatment assessment included questions related to alcohol consumption, as detailed in questions 1 and 2 of the Alcohol Use Disorders Identification Test (AUDIT),⁷³ gambling behavior, and individual or family Intimate Partner Violence (IPV). An affirmative response to these questions at pre-treatment screening resulted in a more detailed evaluation during the initial assessment, which also included a clinical history (Figure 1). Alcohol use was assessed using the initial 6 questions of the Alcohol Use Disorders Identification Test⁷³, with the assessment of gambling behavior (NODS)^{74,75} and STaT measure for recent partner violence⁷⁶ measures sensitive to identification of problem gamblers (79%) and recent IPV (94.9%), respectively. The presence or absence of suicidal ideations was assessed during screening and further explored in the clinical history during the initial assessment.

Clinicians utilized an electronic clinical record. Deidentified data were collated and entered for analysis using IBM SPSS (v23). The data were grouped for analysis into 1) demographic variables (age, gender, income source, marital status, education,

Measures	Pre-treatment Screening Measures	Initial Assessment	Discharge Assessment
Screening Measure For referral score >2	Primary Care-PTSD scale (PC-PTSD)		
Flood/Cyclone affected	Yes/No and Narrative		
Fear of Dying	Yes/No and Narrative		
Losses: (Financial / Personal)	Yes/No and Narrative		
Core Bereavement Items (CBI) ^{a **}	1 item (yes = full CBI)	CBI (if indicated)	
PTSD Checklist – Civilian Version (PCL-C)		PCL-C (self-rated)	PCL-C (self-rated)
National Opinion Research Centre DSM Screen for Gambling Problems (NODS) ^b	1 Item 'In the last 2 weeks or longer have you spent time thinking about gambling or planning future gambling or betting'	NODS 4 Items (if indicated) (Self-rated)	
Kessler 10 ^c		Full Measure (Self-rated)	Full Measure (self-rated)
Resilience questionnaire 2 Items ^b	2 Items	Full Measure (Self-rated)	
OPTIMISM questionnaire 2 Items ^b	2 Items	Repeat measure (Self-rated)	
Single Item CATI question ^b	1 item	1 item	
Short Form 12 Health Survey (SF12) ^b		Full Measure (Self-rated)	Full Measure (self-rated)
Alcohol Use Disorders Identification Test (AUDIT 6) ^b	Items 1 & 2 (score > 4 complete Audit 6)	Full Measure if indicated (Self-rated)	Full Measure if indicated (self-rated)
Intimate Partners – STaT Violence for IPV questionnaire ^b	1 Item 'Have you been in a relationship where you have been pushed or slapped'	Full Measure if indicated (Self-rated)	Self-rated
Suicidal Ideation (current)	Yes/No and Narrative	Clinical assessment	
Global Assessment of Function (GAF) ^c		Full Measure (Clinician Rated)	Full Measure (Clinician Rated)
Health of the Nation Outcomes Scale (HoNOS / HoNOS 65+) Based on previous two weeks ^c		Full Measure (Clinician Rated)	Full Measure (Clinician Rated)

Figure 1. Triage, intake, and discharge assessment questions.

a) If the participant experienced bereavement due to the floods or cyclones, complete CBI, and if yes referred to bereavement service.

b) Clinicians should review if self-rated questions are not answered.

c) To be completed if a participant entered the treatment program.

**) If the answer was “yes” to this question, participants were referred to the Post-disaster Bereavement Service

accommodation), 2) exposure variables, 3) financial and property impact, 4) stress impact health, relationship, and behavior variables, 5) screening measures, 6) pre-disaster mental health, and 7) chronic disease variables (Tables 2-5).

The evaluation adopted a Classification Tree Analysis (CTA) model to evaluate which factors predict those most likely to enter the post-disaster specialist mental health treatment program. CTA optimally seeks to discriminate between 2 or more groups using data with discrete values. The sensitivity across groups will vary from 0% discrimination accuracy (chance) to 100% accuracy. The CTA model uses multiple discriminate analyses.⁷⁷ Several authors have highlighted that CTA not only lends itself to easy interpretation but

also provides evidence of causal mechanisms when assessing health care data. Additionally, CTA obtains *P* values at each node (study variables).^{78,79}

The chi-square automatic interaction detection (CHAID) algorithm was chosen to construct the classification tree^{80,81}. The CHAID method analyzes the relationship between the decision to enter treatment or not participate in the SMHP and variables that may influence the decision. CHAID technique uses the most significant factor to divide the study group into 2, and then subdivide it by the next most significant factor. The process continues stepwise until no more significant factors are identified. The method enables the identification of the most statistically significant factors that

Table 1. Pre-treatment screening assessment: narrative history of disaster exposure, CATI question, optimism, resilience, and thoughts of self-harm

Assessment	Treatment Group TG	Non-Treatment Group
Life was threatened by floods or cyclones	85.1%	8.1%
A fear of dying	78.6%	11.0%
Fear for the lives of others	81.9%	9.9%
CATI Question 'Life was good'	15.3%	62.5%
Reduced level of Optimism	74.2%	33.0%
CR-2 resilience: Perception of ability to bounce back.	66.0%	2.7%
CR-2 resilience: Less likely to look on the bright side	70.2%	6.9%
Thoughts of Self-harm	9.77%	Nil

divide, in the case of this study, those who enter treatment versus those who do not.⁸²

The study analysis aimed to ascertain if CTA can identify which questions may predict entry into the treatment program. The CTA was conducted using all variables (Figure 1 and Tables 2–5). The level of significance was set at $P < 0.05$. The minimum number of cases in the “parent,” or first, node was 100, and the second, or “child,” node was 50. The maximum depth of the tree was 3. Cross-validation and re-substitution

evaluations were undertaken to estimate the risk of misclassification of a classifier.^{83,84}

Results

Descriptive Analyses

In 2012, 881 people were assessed by the SMHP. The mean PC-PTSD was 2.14 (*SE* 0.029, 95%, *CI*: 2.08;2.20). The treatment group (TG) ($n = 215$), in contrast to the non-treatment group

Table 2. Property and financial intake (economic) variables

Measures	Response	Treatment		No Treatment	
		Frequency	Percentage	Frequency	Percentage
Property Damage	None	0	0	99	14.9
	Minor	58	27.0	357	53.6
	Medium	64	29.8	185	27.8
	Major	93	43.3	25	3.8
Relocation	No	145	67.4	611	91.7
	Yes	70	32.6	55	8.3
Homeless	No	201	93.5	666	100
	Yes	14	6.5	0	0
Personal Loss	No	100	46.5	504	75.7
	Yes	115	53.5	162	24.3
Financial Loss	No	120	55.8	631	94.7
	Yes	95	44.2	35	5.3
Insurance claims pending	No	160	74.4	582	87.4
	Yes	55	25.6	84	12.6
Post disaster litigation	No	193	89.8	660	99.1
	Yes	22	10.2	3	0.5
	Unrecorded	0	0	3	0.5

(NTG) ($n = 666$), were more likely to describe their life was threatened by floods or cyclones (85.1% vs 8.1%), a fear of dying (78.6% vs 11%), and fear for the lives of others (81.9% vs 9.9%).

The TG response to the CATI question differed from the NTG; 15.3% of the TG reported “Life was good,” whereas 62.5% of the NTG described life as “good.” The TG recorded an altered level of optimism (TG 74.2% vs NTG 33%). The CR-2 scores differed; 66% of the TG and 2.7% of the NTG perceived an inability to adapt to change and bounce back after adversity. The TG considered themselves as “less optimistic in uncertain times and less likely to look on the bright side of life” compared to the NTG (70.2% and 6.9%, respectively). Thoughts of self-harm were uncommon (TG 9.77% and NTG nil) (Table 1).

The majority of those assessed were aged 20–49 (76.6%). Queensland’s 2011 population data indicates 41.6% were aged 20–49.⁸⁵ Social security was the primary income source for the TG (63.3%). Almost 50% of the NTG had full-time employment. The marital status of those assessed differed from Queensland 2011 ABS: married/de-facto 19.5% vs 59.6%, divorced 23.7% vs 9.1%, and separated 31.6% vs 3.3%. Flooding affected the majority of those assessed (TG 83.3%, NTG 89.9%).

The TG, compared to the NTG, more often reported major property damage compared to none, minor, or moderate damage (43.3% vs 3.8%; $P < 0.05$), relocation from home (32.6% vs 8.3%; $P < 0.05$), personal loss (53.5% vs 24.3%; $P < 0.01$), protracted insurance claims (25.6% vs 12.6%; $P < 0.01$), or litigation 10.2% vs 0.5%; $P < 0.01$) (Table 2). Changes to physical health, relationships, tobacco and alcohol use, gambling, and the type of stresses individuals experienced experiencing are detailed in Table 3. The impact on physical health was similar for the TG and NTG (47.4% vs 41.6%); relationship deterioration was more common in the TG (28.4% vs 0%; $P < 0.01$) while increased alcohol and drug use, tobacco consumption, and gambling were apparent in the TG (20% vs 8.1%, 16.7% vs 4.2%, and 3.3% vs 0%, respectively; all significant $P < 0.01$). The TG reported more anxiety/depression (40.9% vs 16.2%; $P < 0.01$). Interestingly, the NTG more often reported increased social stressors (TG 4.7% vs NTG 27.5%; $P < 0.01$).

Personal and family history of physical and psychological health and previous disaster experience are detailed in Tables 4–5. The TG more frequently described a history of trauma. Family violence was reported in 16.7% of the TG compared to 11.9% in the NTG ($P < 0.01$). Childhood abuse occurred in 16.7% of the TG (NTG 5.7%,

Table 3. Stress impact variables

Measures	Response	Treatment		No Treatment	
		Frequency	Percentage	Frequency	Percentage
Physical health deterioration					
	No	113	52.6	351	52.7
	Yes	102	47.4	277	41.6
	Unrecorded	0	0	38	5.7
Relationship deterioration					
	No	154	71.6	532	79.9
	Yes	61	28.4	0	0
	Unrecorded	0	0	134	20.1
Increased alcohol and Drug use					
	No	172	80.0	558	83.8
	Yes	43	20.0	54	8.1
	Unrecorded	0	0	54	8.1
Increased Tobacco use					
	No	179	83.3	351	52.7
	Yes	36	16.7	28	4.2
	Unrecorded	0	0	287	43.1
Increased gambling					
	No	208	96.7	382	57.4
	Yes	7	3.3	0	0
	Unrecorded	0	0	284	42.6
Stressor types					
	Daily Living	110	51.2	300	45.0
	Anxiety/ Depression	88	40.9	108	16.2
	Social	10	4.7	183	27.5
	Physical Health	5	2.3	74	11.1
	Other	2	0.9	1	0.2

Table 4. Pre-disaster mental health variables

Measures	Response	Treatment		No Treatment	
		Frequency	Percentage	Frequency	Percentage
Family History of Mental Health					
	No	177	82.3	568	85.2
	Yes	38	17.7	75	11.3
	Unrecorded	0	0	23	3.5
Family history of Violence					
	No	179	83.3	273	41.0
	Yes	36	16.7	79	11.9
	Unrecorded	0	0	314	47.1
Family history of substance abuse					
	No	174	80.9	259	38.9
	Yes	41	19.1	72	10.8
	Unrecorded	0	0	335	50.3
History of Child Abuse					
	No	179	83.3	276	41.4
	Yes	36	16.7	38	5.7
	Unrecorded	0	0	352	52.9
History of Sexual Abuse					
	No	190	88.4	285	42.8
	Yes	25	11.6	43	6.5
	Unrecorded	0	0	338	50.88
History of Complex grief					
	No	184	85.6	277	41.6
	Yes	31	14.4	62	9.3
	Unrecorded	0	0	327	49.1
History of Suicidal thoughts					
	No	180	83.7	190	28.5
	Yes	35	16.3	16	2.4
	Unrecorded			460	69.1
Previous Mental health diagnosis					
	No	155	72.1	543	81.5
	Yes	60	27.9	44	6.6
	Unrecorded	0	0	79	11.9
History of being a Mental Health Outpatient					
	No	147	68.4	446	67.0
	Yes	68	31.6	13	2.0
	Unrecorded	0	0	207	31.1
Prior Disaster Experience					
	No	192	89.3	314	47.1
	Yes	23	10.7	45	6.8
	Unrecorded	0	0	307	46.1

Table 5. Chronic disease variables

Measures	Response	Treatment		No Treatment	
		Frequency	Percentage	Frequency	Percentage
Estimated Weight					
	Normal weight	52	24.2	109	16.4
	Overweight	73	34.0	86	12.9
	Underweight	12	5.6	11	1.7
	Unrecorded	78	36.28	460	69.1
Prescription Drug use					
	No	142	66.0	142	21.3
	Yes	73	34.0	64	9.6
	Unrecorded	0	0	460	69.1
Chronic illness					
	No	172	80.0	163	24.5
	Yes	43	20.0	43	6.4
	Unrecorded	0	0	460	69.1

$P < 0.01$), and sexual abuse in 11.6% of the TG and 6.5% of the NTG ($P < 0.01$). Prior exposure to disasters was more common in the TG (10.7% vs NTG 6.8%, $P < 0.01$). The TG more often reported a family history of mental illness, a history of complex grief and suicidal thoughts, and personal history of mental illness and treatment (17.7% vs 11.3%, 14.4% vs 9.3%, 16.3% vs 2.4%, 27.9% vs 6.6%, and 31.6% vs 2.0%, respectively [all significant $P < 0.01$]) (Table 4). The TG in comparison with the NTG more often experienced chronic illness (20% vs 6.4%) and was more likely to take prescribed medications (34% vs 9.6%; $P < 0.01$) (Table 5).

The intake assessment was generally completed in full for demographic data and the impact of the disaster. In contrast, the family history, history of trauma, and personal history of mental and physical illness were often omitted, particularly for the NTG.

Classification Tree Analysis

The initial CTA (Tree 1) included all independent variables. The analysis identified the resilience measures as the initial (node 0) distinguishing feature ($P < 0.001$) between the TG and NTG, with property damage, financial losses, and threat to life (nodes 1, 2, and 3, respectively – all $P < 0.001$) as the next factors that distinguished between the TG and NTG. Insurance claims ($P < 0.001$) linked to the perception that one's life was threatened was the only other feature that distinctly predicted the decision to enter or not enter treatment (Figure 2 and Table 6). The CTA prediction accuracy for the TG was 90.3% and NTG 96.7%.

CHAID was separately used to assess the relevance of (a) demographic factors (Tree 2), (b) narrative questions and psychological measures (Tree 3), (c) property damage and insurance claims (Tree 4), (d) physical health, behavior changes and stressors (Tree 5), (e) previous mental health history and family history (Tree 6), and (e) and (f) chronic disease variables (Tree 7). The CTA prediction accuracy for the NTG varied from 91.9%–100%. In contrast, prediction was less accurate for the TG (28.6%–84.7%) (Table 7).

The CTA (Table 7) indicates that prior mental health factors, the post-disaster perception of stress, property damage and losses,

whether someone believed their life was threatened, coping, and the presence of chronic disease predicted non-participation (>90%). In contrast, the factors in Tree 3 (84.7%) were the only variables that predicted participation in treatment with greater than 80% accuracy.

The CHAID methodology identifies 5 items that distinguish between the TG and NTG. The resilience questions (TG vs NTG $P < 0.001$), severity of property damage (TG vs NTG $P < 0.001$), financial losses (TG vs NTG $P < 0.001$), the belief one's life was threatened (TG vs NTG $P < 0.001$), and ongoing insurance claims (TG vs NTG $P < 0.003$) identified those who entered treatment (90.3%) and the NTG (96.7%) (Table 6).

Discussion

Disasters place significant demands on responders and services. The need for services may extend beyond the timeframes adopted by governments and occur in an environment challenged by limited clinical resources and demand for services.^{86,87} The naturalistic study reported in this paper relates to people affected by floods or cyclones 9–22 months before assessment. Identifying those with psychological symptoms that may require treatment and those more likely to enter treatment aids in resource management and prioritizing services to those more likely to participate in a treatment program.

The CHAID evaluation identified 5 variables that predict entry and non-entry into the SMHP in over 90% of people. The most parsimonious questions to predict program participation and, conversely, non-participation, were questions regarding resilience, severity of property damage, financial losses, ongoing insurance claims, and the perception one's life was threatened. These findings reflect those of other studies that evaluated factors linked to adverse psychological outcomes after a disaster. Several authors have identified links between psychological distress, a person's coping strategies, sociodemographic characteristics, health status, proximity to and disaster severity, risk to life, and difficulties with housing reconstruction.^{63,88–90}

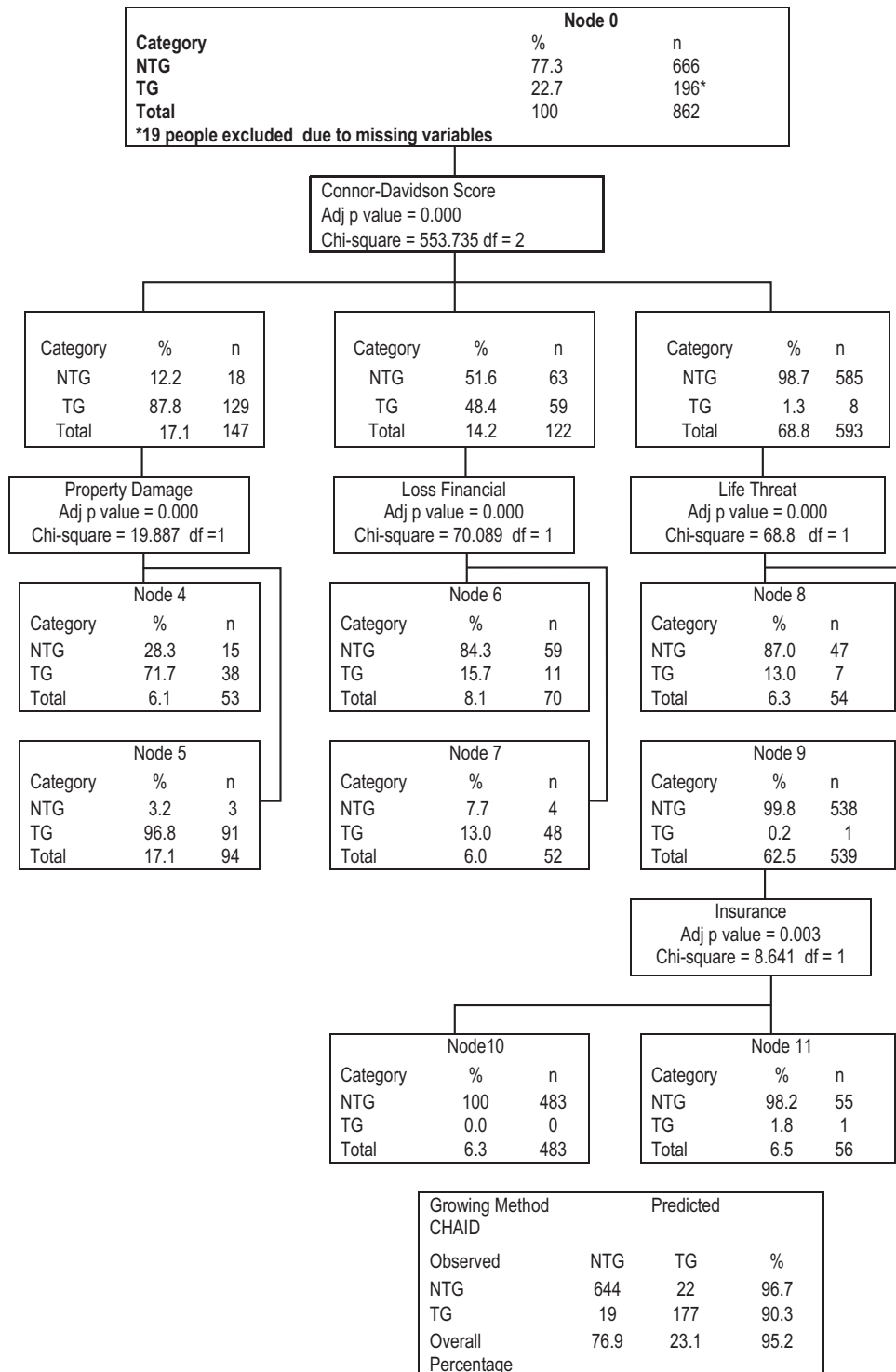


Figure 2. Classification Tree Analysis (CTA); treatment group (TG) vs non-treatment group (NTG).

Studies also show a relationship between resilience and psychological outcomes.^{91,92}

This study emphasizes that the disaster experience is not the only factor influencing participation in treatment. Clinical assessment should inquire about the degree of property damage, financial impacts, if insurance claims are resolved,⁹³ previous trauma exposure, and the personal and family history of mental health care and chronic illness. Other relevant factors noted in this study include

changes in physical health and demographic factors such as age, gender, marital status, and employment.

Mental health screening in primary care has focused on case finding, with the sensitivity and specificity of the questions relevant to case identification and the provision of treatment.⁹⁴ This study used a well-recognized screening measure (PC-PTSD scale) and sought to identify factors that predicted participation in an SMHP. The results suggest that a limited number of screening questions

Table 6. CHAID treatment group (TG) vs non-treatment group (NTG) model predicts 90.3% entering TG and 96.7% of NTG

Variable	P value	Chi-square
Connor-Davidson	$P < 0.001$	553.74
Property Damage	$P < 0.001$	19.89
Financial Loss	$P < 0.001$	70.09
Life Threatened	$P < 0.001$	60.21
Insurance	$P < 0.003$	8.64

may provide a guide regarding acceptance or non-acceptance of treatment. A screening strategy will enable clinicians to focus on those more likely to enter therapy while bearing in mind the need for alternative approaches to assist people screened as “at-risk” of psychological disorders such as PTSD but deciding not to participate in a treatment program. The questions identified by the CTA may also guide public health communications with “simple” media messages, like advertisements regarding driving and flood waters⁹⁵ and changing health behaviors.⁹⁶

The importance of post-disaster screening and informing the public was noted by Vardoulakis et al. (2022), who reported the key role of mental health services following disasters. However, the demand for mental health care may also exceed service capacity. Identifying and addressing individual and community mental health needs post-disaster is well recognized and supported by recommendations of the NSW Flood Inquiry (2022).^{97,98} However, there remains a risk that the learnings from the recent floods and those from the 2010-11 disasters may go unheeded.⁹⁹

The findings of this study point to the importance of clinicians assessing factors such as resilience, the disaster experience, personal and property losses, and ongoing stressors such as insurance claims. The analysis also highlights the importance of clinicians assessing

the post-disaster impact on physical health and the effect on relationships, substance use, and behavioral changes, such as increased gambling.

Further evaluation is required to assess the utility of these measures in other disaster settings (e.g., fires) and other countries, their potential for use in media campaigns that focus on encouraging help-seeking behavior, and how they may be used in post-disaster resource planning and training and as a strategy to screen those who present for psychological assistance following a disaster.

Limitations

Missing data imposed limitations on the study findings and raised questions regarding a clinician’s decision to ask (or not) what may be a difficult question, particularly if a person has decided not to progress with treatment. The study does not explore why questions such as those related to abuse are not asked or answered.

Strengths

The study evaluates data from disaster-affected people across a State with an area of 1.72 million km².¹⁰⁰ Those assessed had experienced symptoms for over 6 months. The data relates to 881 people aged 18 and over referred for assessment because of their psychological symptoms following the 2010-11 floods and cyclones. The data consisted of self-report and narrative questions about the disasters and addressed demographics, coping styles, personal history, physical health, and psychosocial impact factors.

Conclusion

This retrospective naturalistic study identified 5 factors that predicted the likelihood of participation in a Specialist Mental Health

Table 7. CHAID treatment group (TG) vs non-treatment group (NTG) model prediction CTA

Variable using CHAID algorithm	Identified Predictors	Accuracy TG	Accuracy NTG
Tree 2 Demographic	Marital status: Divorced/separated/widow		
	living alone,	57.1%	87.1%
	income source: social security/employed		
Tree 3 All scores and intake narrative questions	Life threatened		
	PC-PTSD>2	84.7%	91.9%
	Coping/not coping		
	CATIE scores		
Tree 4 Property	Property damage		
	Personal losses	41.8%	96.2%
	Financial Losses		
Tree 5 Stress	Relationship changes		
	Gambling	28.6%	100%
	Stressor type		
Tree 6 Previous mental health	History suicidal thoughts		
	Previous outpatient mental health care	30.6%	98%
Tree 7 Chronic Disease	Prescription drug use	37.5%	100%
	Weight changes		

Program for those affected by the natural disasters that affected Queensland in 2010–11 (1. whether you perceived your life was threatened; 2. self-perception of resilience; 3. the degree of property damage; 4. the level of financial loss; 5. ongoing insurance claims).

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