



Assessment Tools for the Mental Health of School-Aged Children and Adolescents Exposed to Disaster: A Systematic Review (1988–2015)

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Objectives: In this study, we aimed to conduct a systematic review of studies investigating psychosocial factors affecting children exposed to disasters.

Methods: In total, 140 studies were retrieved. The studies were published from 1988 to 2015. A systematic review was performed using the PRISMA guidelines. MEDLINE, EMBASE, Cochrane Central, Web of Science, PsycINFO, PubMed, and Google Scholar were searched. Each database was searched using the following terms: 'Child,' 'Adolescent,' 'Youth,' 'Disaster,' 'Posttraumatic,' 'Psychosocial,' 'Assessment,' 'Evaluation,' and 'Screening.' The identified studies were subjected to data extraction and appraisal.

Results: The database search identified 713 articles. Based on the titles and abstracts, the full texts of 118 articles were obtained. The findings of this review can be used as a basis for the design of a psychosocial evaluation tool for disaster preparedness.

Conclusion: Given the paramount importance of post-disaster evaluation and the weaknesses of current disaster evaluation tools, the need to develop valid and reliable tools and psychometric evaluations cannot be overstated. Our findings provide current evidence supporting various assessments in children, who are very vulnerable psychologically following disasters.

Key Words: Disaster; Mental health tool; Assessment; Children; Systematic review.

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INTRODUCTION

Disasters result in physical and psychosocial injuries and symptoms. A disaster management system focused primarily on medical needs was developed in the United States following the 9/11 terror attacks and Hurricane Katrina.¹ Disasters in particular lead to chronic mental health problems and have a profound impact on physical and mental health, ranging from mild injury to death.² In addition, disasters experienced by psychologically vulnerable children and adolescents lead to destructive behaviors and externalizing, which may result in numerous psychological, emotional, and behavioral disorders.^{3,4} Therefore, mental health professionals should conduct appropriate mental health assessments in children and adolescents exposed to disasters. These assessments should be followed by effective high-risk interventions.

In the event of a disaster, rapid and efficient mental health

assessments are needed to address emergencies. Effective disaster management is one of the main concerns of the World Health Organization (WHO)⁵ in its efforts to reduce and prevent post-traumatic stress disorder (PTSD). Nevertheless, research into the psychological responses of children and adolescents to disasters is still in the early stages.⁴

The National Child Traumatic Stress Network (NCTSN) in the United States recommends the assessment of two critical elements when screening traumatized children: 1) exposure to potentially traumatic events/experiences, including traumatic loss, and 2) traumatic stress symptoms/reactions. Trauma screening is used to assess a wide range of experiences and to identify common reactions and symptoms of trauma (PTSD or dissociation) and other commonly reported difficulties (anger, behavior problems, depression, and anxiety).⁶ Nevertheless, studies have shown the inadequacy of standard guidelines and reliable measures used to assess the mental health of children and adolescents after a disaster.⁷ Clinicians who conduct mental health assessments face many obstacles, as disaster environments are unpredictable and

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confusing in practice. Additionally, the post-disaster situation and diversity of research subjects complicate the selection of assessment tools.⁸⁾ Therefore, a comprehensive approach is needed.

We systematically reviewed the literature and here propose an appropriate set of directions for mental health evaluation in an emergency. The goal of this study was to provide methodological consistency and to perform a systematic literature review of mental health assessment tools for children and adolescents. The systematic literature review highlighted the need for a fair degree of accuracy and the development of standardized measures. Systematic reviews of research studies investigating mental health assessment following disasters represent major sources of psychological support for individuals and the society.³⁾ We sought to conduct an analysis of the standardized scales in order to develop evaluation resources for use in future large-scale disasters.

METHODS

We conducted a comprehensive search of online databases (Google Scholar, MEDLINE, Web of Science, ProQuest, Science Direct, Ovid, Scopus, Cochrane, and CINAHL) until 2015. We analyzed studies of disasters from 1988 to 2015 and reviewed research assessing the mental health of children and adolescents after disasters. We selected studies in English that included assessments related to disasters. We also selected reports of human medical research data. The Medical Subject Headings (MeSH) used in the search included the keywords 'Child,' 'Adolescent,' 'Youth,' 'Disaster,' 'Posttraumatic,' 'Psychosocial,' 'Assessment,' 'Evaluation,' and 'Screening.'

After removal of duplicate articles, we selected 713 studies. Following a review of the titles and abstracts of the papers, 530 documents were excluded. We reviewed the entire contents of approximately 183 full articles and included stud-

ies based on the agreement of both authors. Finally, 118 papers were included in the final review (Fig. 1).

The systematic literature review was conducted according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guideline. PRISMA is an evidence-based minimum set of items for reporting systematic reviews, and is used as the basis for appraisal of published systematic reviews of different types of research.⁹⁾ In this study, we used the PRISMA flow diagram, which depicts the flow of information through the different phases of a systematic review. This information include the numbers of articles identified, included, and excluded, and the reasons for exclusion.

RESULTS

A systematic review was conducted by searching mental health and medical databases. The results of the review are presented below.

In this study, we divided articles into Type I and Type II categories based on a previous study.¹⁰⁾ The articles in each category are presented in Table 1. Type I articles included those discussing natural disasters such as earthquakes, tsunamis, hurricanes, cyclones, floods, typhoons, and tornadoes. Type II articles discussed man-made disasters such as fires, sinkings, terrorist attacks, and explosions.

A total of 118 studies assessed the symptoms of PTSD, anxiety, depression, behavior, coping, and daily life in children and adolescents exposed to disaster. Thirty-one scales were used to assess the symptoms associated with PTSD, and 10 or more of the various scales assessed the following domains: anxiety, depression, structured clinical interview, and general psychopathology. In addition, one or more of the measures used assessed social support, coping, family relationships, attention, stress, routines, quality of life, cognitive function, somatization, health, emotion, attachment, control, behavior, and substance abuse. The mental health assessment tools in children according to the rater characteristics (Table 2) or Type of Disaster (Table 3 and 4) and the full names for the abbreviations of the scales after a disaster reviewed in this article (Table 5) are described in Table 2 through Table 5. The assessment tools for the children's mental health used in the well-known type I and type II disaster, Hurricane Katrina (2005) and 9/11 terrorist attack (2001), respectively, were presented in Supplementary Table 1 and 2 (in the online-only Data Supplement). In addition, the mental health assessment tools used for each disaster event presented in Supplementary Table 3-15 (in the online-only Data Supplement) (type I disaster) and Supplementary Table 16-22 (in the online-only Data Supplement) (type II disaster).

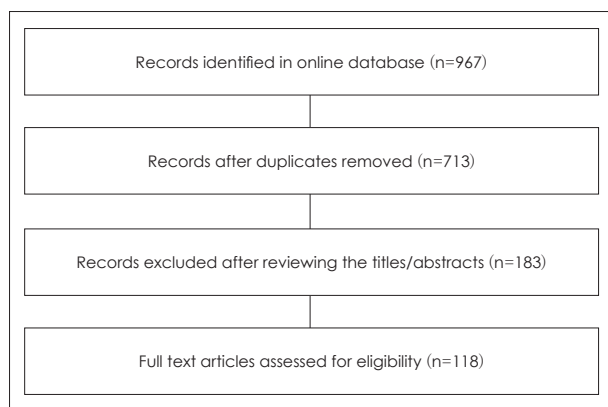


Fig. 1. Flowchart outlining the selection of studies.

DISCUSSION

Our review of the 118 selected studies revealed that 35 (29.67%) of the studies used single scales. All other studies used up to 8 scales to assess mental health.¹¹⁻¹⁴⁾

Depressive disorders are some of the most common psychological responses to trauma and stress. Depressive disorders in children and adolescents cause interpersonal problems and may affect developmental functions. Depressive symptoms should be monitored in children and adolescents

Table 1. Type I and Type II disasters reviewed in this article

Disaster type	Year	Event
Type I		
Tsunami	2004	Tsunami in Sri Lanka
	2004	Tsunami in Thailand (Norwegian tourists)
	2004	Tsunami in South-east Asia
	2004	Tsunami in Aceh, Indonesia
	2011	Tsunami in Higashi-Matsushima, Japan
Earthquake	1988	Spitak earthquake in Armenia
	1988	Earthquake in Armenia
	1995	Earthquake in Kobe, Japan
	1999	Earthquake in Athens
	1999	Earthquake in Turkey
	1999	Chi-Chi earthquake in Taiwan
	1999	Parnitha earthquake in Greece
	1999	Earthquake in Ano Liosia, Greece
	2003	Earthquake in Bam, Iran
	2004	Earthquake in Southern India
	2005	Earthquake in Kashmir
	2009	L'Aquila earthquake in Italy
	2011	Earthquake in Yingjiang, China
	2011	Van earthquake in Turkey
	Hurricane	1989
1992		Hurricane Andrew, USA
1998		Hurricane Mitch in Nicaragua
2005		Hurricane Katrina, USA
Cyclone	1999	Super-cyclone in Orissa, India
	2006	Cyclone Larry in North Queensland, Australia
	–	Cyclone storms in Queensland, Australia
Flood	1998	Flood in Hunan, China
Typhoon	2009	Typhoon Morakot in Taiwan
Tornado	2011	Tornado in the USA
Type II		
Fire	1988	The discotheque fire in Göteborg, Sweden
	1994	Bushfire in South Wales, Australia
	2000	The explosion of a fireworks depot largely in the Netherlands
	2001	A fire in a café in Volendam, the Netherlands
	2005	Bushfires in South Australia
	2007	Wildfire in Greece
Sinking	1988	Jupiter sinking in Greece (on board were 391 British school children)
	2002	A boat sinking in Tehran's city park
Terrorist attack	2001	9/11 terrorist attack in New York
	2011	Oslo terror attacks in Norway
Bombing	1995	City bombing in Oklahoma, USA
	2013	Boston Marathon bombing

exposed to disaster.⁴⁾ None of the studies reviewed used a single scale to assess depression or anxiety. This is consistent with the findings of Wang et al.¹⁵⁾ A long-term follow-up study¹⁶⁾ investigated PTSD and depressive symptoms in children and adolescents over a period of about six and a half years after a disaster. Several studies have shown that mental health interventions during the early follow-up stages effectively reduce the prevalence of psychopathological problems in pediatric survivors.¹⁵⁾

Earthquakes were analyzed in a study¹⁶⁾ that used the Children's Post-Traumatic Stress Disorder-Reaction Index (CPTSD-RI), the Depression Self-Rating Scale (DSRS), and other sim-

ilar scales for follow-up. Of these scales, the University of California at Los Angeles PTSD Reaction Index (UCLA PTSD-RI) scale represents an appropriate tool for the assessment of children and adolescents in various disasters. Translated versions of this scale, which are available in many different languages, were shown to be cost-effective and user-friendly, and to facilitate effective management and rapid evaluation.⁴⁾

A comparison of the 9/11 terror attacks and Hurricane Katrina revealed that only the CPTSD-RI and UCLA PTSD-RI were used as common evaluation tools. Until now, there has been no gold standard assessment used after a disaster. At

Table 2. Mental health assessment tools after the disaster in children according to the rater (self report, parent, teacher, and clinician)

Symptoms/rater	Self-report scale	Parents' report scale	Teacher's report scale	Clinician's report scale
PTSD	AVE, CPSS, CPTSD-RI, CRIES, CRIES-13, CSDC, DIS, KID-SAVE, LEC, LES, LSC-R, NSA-R, NWS, PCL-C, PCL-S, PSPS, PSS, PTCI, PTG, PTSD-RI, PTSS, SAVE, SRS-PTSD, TESS, TSSC-CA, UCLA PTSD-RI, YPQ	IES, IES-R, WIP		CAPS
Diagnosis				C-DISC, ChIPS, CIDI, CSR, DISC, DISC-PS, Kiddie-SADS-L, MINI-KID, RECAP, SADS-L
Anxiety	ACQ-C, CASI, DASS, FSS-C, MASC-T, RCADS-C, RCMAS, SCARED, SCARED-R-CV, SCAS, STAI-C, TASC	RCADS-P, STAI		ADIS-IV
Depression	BDI, CDI, DASS, DPS, DSRS, NCTSN, RCADS-C, SDIC	CES-D, RCADS-P		DISC
General psychopathology	APSC, BSI-18, CBQ, LASC, SCL-90-R, SDQ, YSR	CBCL	C-TRF	PSC-II
Social support	ISEL, MSPSS, SSRS, SSSC, SSSCA, TRICA-S			
Type specific	EEQ, EES, ETQ, HURTE, PsySTART, WEQ			
Coping	CCAC, NCSS, SSRS, WCQ, YCITT			
Family	APGAR, CRPBI, FAD, FRM			
Cognitive function	MCQ-C			
Attention	COWAT	BRIEF		
ADHD		BRIEF		
Emotion	FMSS-EE			
Stress	DASS, SASRQ			
Routines	CRI, DLQ			
Sleep	PSQI, SQ			
Somatization	CSI			
Health	GHQ-12			
Attachment		IPPA		
Control	LCS			
Behavior	YRBS			
Quality of life	PedsQL, QoLQ			
Substance	CRAFFT			
Miscellaneous	ABI, IUBQ, WTC	RQ	TRF	

Acronyms are given in Table 5

Table 3. Mental health assessment tools used after the Type I disaster in children

Scale	Tsunami	Earthquake	Hurricane and Others
APGAR			○ ^{23,24)}
APQ			○ ¹³⁾
APSC			○ ²⁵⁾
BDI (Beck)		○ ^{26,27)}	
BRIEF		○ ¹⁴⁾	
CAPS		○ ^{28,29)}	
CASI		○ ^{30,31)}	
CBCL		○ ^{32,33)}	
CBQ			○ ³⁴⁾
CDI	○ ³⁵⁻³⁷⁾	○ ^{26,30,31,38-41)}	
CES-D		○ ⁴²⁾	○ ²⁴⁾
ChIPS		○ ⁴³⁾	
COWAT		○ ¹⁴⁾	
CPSS		○ ^{42,44)}	
CPTSD-RI	○ ⁴⁵⁾	○ ^{16,26,27,30,31,38,40,46-48)}	○ ⁴⁹⁻⁵⁴⁾
CRAFFT			○ ³⁴⁾
CRI			○ ¹³⁾
CRIES	○ ³⁵⁻³⁷⁾	○ ⁵⁵⁻⁵⁷⁾	
CRIES-13		○ ³⁹⁾	
CRPBI			○ ⁵⁸⁾
CSDC	○ ⁵⁹⁾		
C-TRF			○ ²⁴⁾
C-WISC		○ ¹⁴⁾	
DASS		○ ^{44,60)}	
DIS		○ ⁶¹⁾	
DLQ		○ ⁶²⁾	
DSRS	○ ⁶³⁾	○ ^{16,39,46,64,65)}	○ ⁶⁶⁾
EEQ		○ ⁶⁷⁾	
EES		○ ¹⁴⁾	
ETQ		○ ³⁹⁾	
FAD		○ ²⁶⁾	
FRM			○ ⁵⁴⁾
GHQ-12	○ ⁶⁸⁾	○ ²⁶⁾	
HEQ			○ ¹³⁾
HRQoL		○ ⁴⁰⁾	
HURTE			○ ^{49,69)}
IES		○ ^{32,38)}	
IES-R	○ ^{59,70)}		○ ^{24,71)}
IPPA			○ ⁵⁸⁾
ISEL			○ ¹³⁾
Kiddie-SADS-L		○ ⁵⁶⁾	
KIDS-SAVE			○ ^{13,69)}
LASC			○ ⁷²⁾
LCS		○ ⁷³⁾	
LEC			○ ^{49,50)}
LSC-R			○ ²⁵⁾
MASC-T			○ ⁷¹⁾

Table 3. Mental health assessment tools used after the Type I disaster in children (continued)

Scale	Tsunami	Earthquake	Hurricane and Others
MCQ-C		○ ³¹⁾	
MINI-KID		○ ¹⁴⁾	○ ^{23,24,71)}
MSPSS		○ ⁴¹⁾	
NCSS		○ ⁷³⁾	
NCTSN			○ ⁷⁴⁾
NSA-R			○ ³⁴⁾
PCL-C		○ ⁷³⁾	
PCL-S		○ ⁶⁰⁾	
PedsQL		○ ⁴⁰⁾	
PSC-II	○ ³⁷⁾		
PSPS		○ ⁶¹⁾	
PSQI		○ ⁶⁴⁾	
PsySTART	○ ⁶³⁾		
PTCI		○ ⁵⁶⁾	
PTG	○ ⁷⁵⁾		
PTSD-RI		○ ⁷⁶⁾	○ ^{77,78)}
PTSSC-15	○ ⁷⁹⁾	○ ^{62,80-82)}	
QoLQ		○ ⁸³⁾	
RCADS-C			○ ^{52,58)}
RCADS-P			○ ⁵⁸⁾
ROCFT		○ ¹⁴⁾	
RQ		○ ⁸⁴⁾	
SAVE			○ ^{13,69)}
SCARED		○ ³⁸⁾	
SCARED-R-CV		○ ³¹⁾	
SCAS		○ ³⁹⁾	
SCL-90-R		○ ^{43,84)}	○ ¹³⁾
SDQ	○ ⁸⁵⁾	○ ^{38,57)}	○ ^{54,86,87)}
SRS-PTSD		○ ²⁶⁾	
SSRS		○ ^{56,64)}	
SSSC			○ ⁶⁹⁾
SSSCA			○ ⁴⁹⁾
STAI		○ ^{27-29,38)}	
STAI-C		○ ^{26,30,31)}	
Stroop		○ ¹⁴⁾	
TASC			○ ⁵²⁾
TESS	○ ⁴⁵⁾		
TMT-A		○ ¹⁴⁾	
TRF			○ ⁷⁸⁾
TRICA-S		○ ⁸⁸⁾	
TSSC-CA		○ ⁶⁷⁾	
UCLA PTSD-RI	○ ^{63,70,89-91)}	○ ^{41,65,83,88)}	○ ^{13,69,92,93)}
WIP		○ ⁸⁴⁾	
YPQ		○ ⁸⁴⁾	
YRBS			○ ^{74,94)}
YSR		○ ³³⁾	

Acronyms are given in Table 5

Table 4. Mental health assessment tools used after the Type II disaster in children

Scale	Fire	Sinking	Terrorist attack	Bombing
ABI			○ ⁹⁵⁾	
ACQ-C	○ ¹¹⁾			
ADIS-IV	○ ¹¹⁾			
BDI (Berleson)	○ ^{11,96)}	○ ^{12,97-99)}		
BSI-18			○ ¹⁰⁰⁾	
C-DISC			○ ¹⁰¹⁾	
CAPS	○ ¹⁰²⁾	○ ¹²⁾		
CASI	○ ¹¹⁾			
CBCL			○ ¹⁰³⁾	
CCAC			○ ¹⁰¹⁾	
CDI			○ ¹⁰³⁾	
CES-D			○ ¹⁰¹⁾	
CIDI			○ ¹⁰⁴⁾	
CPSS			○ ¹⁰³⁾	
CPTSD-RI	○ ¹⁰⁵⁾		○ ¹⁰⁶⁾	
CRIES	○ ¹⁰⁷⁾			
CRIES-13	○ ¹⁰⁸⁾			
CSI	○ ¹⁰⁷⁾			
CSR	○ ¹¹⁾			
DASS				○ ¹⁰⁹⁾
DISC			○ ^{104,110-113)}	
DISC-PS	○ ¹¹⁾			
DPS			○ ^{110,112)}	
DSRS	○ ¹⁰⁸⁾			
FMSS-EE			○ ⁹⁵⁾	
FSS-C		○ ⁹⁷⁾		
HURTE	○ ¹⁰⁵⁾			
IES	○ ^{11,96,102)}	○ ^{12,98,99)}		
IES-R			○ ¹⁰⁰⁾	○ ¹¹⁴⁾
IUBQ			○ ¹⁰¹⁾	
Kiddie-SADS-L			○ ⁹⁵⁾	
LES		○ ¹²⁾		
NWS			○ ¹¹¹⁾	
PSS		○ ¹¹⁵⁾		
PTSS				○ ¹¹⁶⁾
RCMAS	○ ^{11,96)}	○ ^{12,97-99)}	○ ¹⁰³⁾	
RECAP		○ ¹²⁾		
SADS-L		○ ¹¹⁷⁾		
SASRQ			○ ¹⁰⁰⁾	
SCARED	○ ¹⁰⁷⁾			
SDIC	○ ¹⁰⁷⁾			
SDQ	○ ^{107,118)}			○ ^{109,119)}
SSRS			○ ¹⁰³⁾	
SSSC		○ ¹²⁾		
UCLA PTSD-RI	○ ^{102,118)}		○ ^{111,113,120)}	○ ^{109,119)}
WCQ		○ ¹²⁾		
WEQ	○ ¹⁰⁸⁾			
WTC			○ ¹²¹⁾	
YCIT			○ ¹²²⁾	
YSR	○ ¹²³⁾		○ ¹⁰³⁾	

Acronyms are given in Table 5

this time, it is necessary to create a consensus among specialists regarding the use of different approaches for specific disaster types or the use of domain scales in the event of a disaster in South Korea.⁷⁾ Specific disaster types and symptoms, as well as variables such as sleep, concentration, cognitive function, daily life, and quality of life, should be initially evaluated.

The sources of information can be categorized as self-report, caregiver's report, teacher's report, and direct evaluation by a mental health professional. A self-report form is a type of questionnaire that is read by the respondents, who select their own responses.¹⁷⁾ Effective assessments should require the consideration of children's developmental issues and changes in cognitive capacity.¹⁸⁾ The Fear Survey Schedule for Children (FSS-C), the Hurricane-Related Traumatic Experience Questionnaire (HURTE), the Screen for Child Anxiety Related Emotional Disorders (SCARED), the Screen for Adolescent Violence Exposure (SAVE), and the State and Trait Anxiety Inventory for Children (STAI-C) are usually used in self-report questionnaires, which children and adolescents respond to by themselves. However, self-report questionnaires to which school-aged children respond themselves have the disadvantage of allowing the respondent to reduce his or her externalizing symptoms. In addition, cases wherein school-aged children or adolescents are not well aware of their psychiatric symptoms should be noted by clinicians, who should then conduct the evaluation.

Parent-reported questionnaires may be categorized as follows: those that assess the parents' psychological symptoms, and those that allow parents to respond by observing their child's behavior. Examples of questionnaires assessing the parents' symptoms are the Impact of Event Scale-Revised (IES-R), the Watson Interview for PTSD of adults (WIP), and the Center for Epidemiological Studies Depression Scale (CES-D). Parents and teachers are considered reliable observers for the evaluation of the behavior of children and adolescents.¹⁹⁾ In our review, many parents reported such observations using the Children's Report of Parent Behavior Inventory (CRPBI); the Revised Child Anxiety and Depression Scales, Parent Version (RCADS-P); Rutter's Questionnaire, parent's version (RQ); and the Inventory of Parent and Peer Attachment (IPPA).

In the present study, we found that Achenbach's Teacher's Report Form (TRF) and the Chinese version of the TRF (C-TRF) were used only as measures reported by the teacher. However, as reported previously,²⁰⁾ they might underestimate internalizing symptoms, pain, and anger in children and adolescents. This suggests the need for careful interpretation of such reports.

Direct evaluation by mental health professionals is highly

Table 5. Mental health assessment scales after a disaster reviewed in this article

Mental health assessment scales

ABI=Assessment of Behavioral Inhibition
 ACQ-C=the Anxiety Control Questionnaire for Children
 ADIS-IV=the Anxiety Disorders Interview Schedule for DSM-IV (child and parent versions)
 APGAR=Family APGAR Index-measures subjects' satisfaction with family support
 APQ=Alabama Parenting Questionnaire
 APSC=the Adolescent Psychopathology Scale-Short Form
 AVE=the Screen for Adolescent Violence Exposure
 BDI=Birleson Depression Inventory
 BDI=Beck Depression Inventory
 BRIEF=the Behavior Rating Scale of Executive Function, Parent Form for School Age Children
 BSI-18=the Brief Symptom Inventory-18
 C-DISC=Computer Diagnostic Interview Schedule for Children-IV
 CAPS=Clinician Administered Posttraumatic Stress Disorder Scale
 CASI=Childhood Anxiety Sensitivity Index
 CBCL=Child Behavior Checklist
 CBQ=Conflict Behavior Questionnaire Short Form
 CCAC=the version of the Children's Coping Assistance Checklist
 CDI=Children's Depression Inventory
 CES-D=the Center for Epidemiological Studies Depression Scale
 ChIPS=Children's Interview for Psychiatric Syndromes
 CIDI=the Composite International Diagnostic Interview
 COWAT=the Animal Naming Test of the Controlled Oral Word Association Test
 CPSS=Child PTSD Symptom Scale
 CPTSD-RI=Children's Post-Traumatic Stress Disorder-Reaction Index
 CRAFFT=a standardized and valid 6-item self-report screen for adolescent substance-related problems and disorders
 CRI=Child Routines Inventory
 CRIES=Children's Impact of Events Scale
 CRIES-13=Children's Revised Impact of Event Scale
 CRPBI=the Children's Report of Parent Behavior Inventory
 CSDC=the Child Stress Disorder Checklist
 CSI=Children's Somatization Inventory
 CSR=Clinical Severity Rating
 C-TRF=the Chinese version of the Teacher's Report Form
 C-WISC=Chinese Wechsler Intelligence Scale for Children
 DASS=Depression Anxiety and Stress Scales
 DIS=Disaster Impact Scale
 DISC=Diagnostic Interview Schedule for Children
 DISC=the depression scale of the Diagnostic Predictive Scales derived from the NIMH Diagnostic Interview Scale for Children
 DISC-PS=the Diagnostic Interview Schedule for Children-Predictive Scales
 DLQ=the Daily Life Questionnaire
 DPS=Depression Predictive Scales
 DSRS=Depression Self-Rating Scale
 EEQ=the Earthquake Experience questionnaire
 EES=Earthquake-related Experience Scale
 ETQ=Earthquake Trauma Questionnaire
 FAD=McMaster Family Assessment Device
 FMSS-EE=Five-Minute-Speech Sample Measure of Expressed Emotion
 FRM=the Family Resilience Measure

Table 5. Mental health assessment scales after a disaster reviewed in this article (continued)

Mental health assessment scales

FSS-C=Fear Survey Schedule for Children (revised form)
 GHQ-12=General Health Questionnaire
 HEQ=Hurricane Exposure Questionnaire
 HRQoL=Health-related Quality of Life
 HURTE=Hurricane-Related Traumatic Experience Questionnaire
 IES=Impact of Events Scale
 IES-R=the Impact of Event Scale Revised
 IPPA=the Inventory of Parent and Peer Attachment
 ISEL=Interpersonal Support and Evaluation List
 IUBQ=the Inter-group Understanding or Bias Questionnaire
 Kiddie-SADS-L=Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children Lifetime version
 KID-SAVE=Screen for Adolescent Violence Exposure (8–10 year)
 LASC=the Los Angeles Symptom Checklist, adolescent version
 LCS=Locus of Control Scale
 LEC=Life Events Checklist
 LES=Life Events Scale
 LSC-R=the Life Stressor Checklist-Revised
 MASC-T=Taiwanese version of the Multi-dimensional Anxiety Scale for Children
 MCQ-C=Meta cognitions Questionnaire for Children
 MINI-KID=the Mini-International Neuropsychiatric Interview for Children and Adolescents
 MSPSS=Multidimensional Scale of Perceived Social Support
 NCSS=a native Coping Styles Scale
 NCTSN assessment scale=the validated UCLA PTSD Index and includes a number of questions regarding depressive symptoms
 NSA-R=The National Survey of Adolescents-Replication PTSD module
 NWS=National Women's Study PTSD module
 PCL-C=the PTSD Checklist-Civilian Chinese Version
 PCL-S=PTSD Checklist-Specific Stressor Version
 PedsQL=Pediatric Quality of Life Inventory TM 4.0 of the Chinese version
 PSC-II=Pediatric Symptom Checklists part II
 PSPS=the children's Perceived Stress Performance Scale
 PSQI=Pittsburgh Sleep Quality Index
 PSS=Post-Traumatic Stress Disorder Symptom Scale
 PsySTART=a tsunami-modified version of the PsySTART Rapid Triage System
 PTCI=Post-traumatic Cognitions Inventory
 PTG=Post Traumatic Growth
 PTSD-RI=Posttraumatic Stress Disorder Reaction Index
 PTSS=the Posttraumatic Stress Symptom Scale
 QoLQ=Quality of Life Questionnaire
 RCADS-C=the Revised Child Anxiety and Depression Scales, Child Version
 RCADS-P=the Revised Child Anxiety and Depression Scales, Parent Version
 RCMAS=Revised Children's Manifest Anxiety Scale
 RECAP=the Retrospective Experiences and Child and Adolescent Psychopathology interview
 ROCFT=the Rey-Osterrieth Complex Figure Test
 RQ=Rutter's questionnaire, parent's version
 SADS-L=the Schedule for Affective Disorders and Schizophrenia Lifetime Version
 SASRQ=Stanford Acute Stress Reaction Questionnaire
 SAVE=Screen for Adolescent Violence Exposure (11–16 year)
 SCARED=Screen for Child Anxiety Related Emotional Disorders

Table 5. Mental health assessment scales after a disaster reviewed in this article (continued)

Mental health assessment scales

SCARED-R-CV=Screen for Child Anxiety Related Emotional Disorders Revised–Child Self-Report
 SCAS=Spence Children's Anxiety Scale
 SCL-90-R=Symptom Checklist-90-Revised
 SDIC=Short Depression Inventory for Children
 SDQ=The Strengths and Difficulties Questionnaire
 SQ=the Sleep Questionnaire
 SRS-PTSD=Self-rating Scale for Posttraumatic Stress Disorder
 SSRS=Social Skills Rating Scale
 SSRS=Social Support Rating Scale
 SSSC=the Social Support Scale for Children
 SSSCA=Social Support Scale for Children and Adolescents
 STAI=the State-Trait Anxiety Inventory
 STAI-C=State and Trait Anxiety Inventory for Children
 Stroop=The Stroop Colored Word Test
 TASC=a shortened version of the Test Anxiety Scale for Children
 TESS=Traumatic Exposure Severity Scale
 TMT-A=part of the Trail Making Test
 TRF=Achenbach's Teacher's Report Form
 TRICA-S=The Taiwan Relationship Inventory for Children and Adolescents, Short version
 TSSC-CA=the Traumatic Stress Symptom Checklist for children and adolescents
 UCLA PTSD-RI=UCLA PTSD Reaction Index
 WCQ=Ways of Coping Questionnaire, Short Form
 WEQ=Wildfire Experience Questionnaire
 WIP=Watson Interview for PTSD of adults
 WTC=the WTC Questionnaire
 YCITT=Youth Coping In Traumatic Times
 YPQ=Yule PTSD questionnaire
 YRBS=Youth Risk Behavior Survey
 YSR=Youth Self Report

reliable. For instance, the Clinician-Administered Posttraumatic Stress Disorder Scale (CAPS), the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children Lifetime version (Kiddie-SADS-L), the Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI-KID), and the Retrospective Experiences and Child and Adolescent Psychopathology interview (RECAP) are used as assessment scales by clinicians. Nevertheless, direct evaluations by mental health professionals were available in only a few studies.

For children and adolescents exposed to disasters, monitoring is based on the evaluation used, and subsequent intervention promotes recovery. Effective provision of mental health services and an integrated system facilitate the management of psychosocial challenges in children and adolescents.²¹⁾ Appropriate and timely interventions in communities may result in positive developmental impacts in young patients. Therefore, it is important to use an evaluation tool

with high reliability and validity. A brief screening test followed by an in-depth assessment to select high-risk groups should be systematized. In addition, the cost of intervention following an emergency should be reduced. Mental health-related assessments are affected by the numbers of research designs and subjects. The scale that is used should be selected carefully to provide appropriate and critical feedback regarding the functional status and diagnosis of the subject.⁸⁾

The limitations of this study are as follows. The systematic literature review included an extensive search only for articles written in English. This means that some important research results may have been omitted. In addition, analysis of the scales used for different types of disasters may have been restricted due to the limited number of relevant studies. Furthermore, the final selection of articles included only those pertaining to school-aged children and adolescents. As such, evaluation items and tools used to assess individuals in early childhood were not analyzed. Therefore, a system-

atic review of the literature on infants and preschoolers should be conducted in a subsequent study. Nevertheless, our study discusses mental health assessment tools for potential application following disasters and suggests recommendations for clinical settings.²²⁾

CONCLUSION

Studies involving disaster evaluation highlight the behavioral and mental health impacts of the disaster. The results of this study have major implications for systematic mental health assessments and interventions administered to children and adolescents, as well as survivors of disasters in the future. It may thus serve as a basis for subsequent studies and for responses to policy measures.

Supplementary Materials

The online-only Data Supplement is available with this article at <https://doi.org/10.5765/jkacap.180002>.

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Conflicts of Interest

The authors have no financial conflicts of interest.

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