The Impact of Disasters on Youth: Implications for Prevention

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Acknowledgements
Key Collaborators Across Studies
– Wendy Silverman, Yale University
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Hurricane Andrew Approaching FL

Hurricane Andrew: August 24, 1992
– Category 5 Hurricane (sustained winds exceeding 160 mph)
– Devastated 400 square miles
– Over 150,000 homes severely damaged or destroyed; 55 people died
– Rebuilding costs exceeded $45 billion (2006 $$)
– Until Katrina, the most costly natural disaster in US history

Last Radar Image of Hurricane Andrew

Why Be Concerned About Disasters?
– Disasters occur worldwide, affecting millions of youth and adults annually
– For children alone….
  – Disasters affect > 66.5 million children annually1,2
  – This number is on the rise due to climate change
  – Estimates indicate that, in the next decade, 175 million children will be affected each year
– Children are a vulnerable population3

1 Bartlett, 2008; Peek, 2008
2 Penrose & Takaki, 2006
3 Norris et al., 2002
Overview of Presentation

• Nature of Disasters
• How Disasters Affect Children
• Key Risk and Resilience Factors
• Clinical Implications

Nature of Disasters

• Threaten one’s personal safety and security and/or that of loved ones
• Frightening, and outside the realm of usual experiences
• Disrupt everyday life in the short-term and often in the long-term

Hurricane Andrew: Saga Bay

Loss and Disruption May Ensue for a Year or More

Overview of Presentation

• How Disasters Affect Children
**Most Commonly Studied Disaster Reactions**

**Symptoms of Posttraumatic Stress Disorder**
- **Re-experiencing**
  - Recurrent thoughts or dreams about the event
- **Avoidance/Numbing**
  - Avoiding reminders of the event
  - Feeling emotionally distant from others
- **Hyperarousal**
  - Nervous, jittery
  - Trouble concentrating

**Advances in Understanding the Effects of Disasters on Youth**
- **Hurricane Andrew** (1992)
  - Significant % of youth who were exposed to the hurricane reported elevated PTSD symptoms

**PTSD Symptoms 9 and 21 Months after Hurricane Charley**

<table>
<thead>
<tr>
<th>Time</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Very Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Months</td>
<td>31%</td>
<td>26%</td>
<td>13%</td>
<td>7%</td>
</tr>
<tr>
<td>21 Months</td>
<td>31%</td>
<td>26%</td>
<td>21%</td>
<td>12%</td>
</tr>
</tbody>
</table>


**Youths’ Levels of PTS Symptoms: 44 Months Post Andrew (Time 4)**

<table>
<thead>
<tr>
<th>PTS Severity Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>No/Mild</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
</tr>
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<td>Very Severe</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>High PTS - Time 3</th>
<th>Low PTS - Time 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 Months</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Vincent and La Greca, 1997

**Other Common Anxiety-Related Reactions**
- Generalized anxiety
- Specific fears and avoidant behavior
  - Fears of flying, buildings, storms, bombs, fires, etc.
- Sleep difficulties
- Separation anxiety
  - Fear of separation from parents or loved ones; school refusal


**Mental Health Problems in NYC School Children After WTC Attacks of 9/11/2001**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Posttraumatic Stress Disorder</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Separation Anxiety Disorder</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Panic</td>
<td>1%</td>
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Mental Health Problems in NYC School Children After WTC Attacks of 9/11/2001

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<td>9%</td>
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<tr>
<td>Agoraphobia (fear of open spaces)</td>
<td>5%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Data collected 6 months after 9/11 from children in grades 4 - 12. Compared with earlier community estimates. Hoven and colleagues (2005), Archives of General Psychiatry

Other Types of Reactions

- Depression
- Bereavement
- Declines in Academic Performance/School
- Behavior Problems
- Security Concerns, Hypervigilance

See Vernberg & Vogel, 1993, J Clinical Child Psych

Recent Advances

- Comorbidity of Depression and PTSD
- Health issues
  - Somatic Complaints
  - Diet/Exercise/Sedentary Behavior

Hurricane Ike (2008): Comorbidity

Is Comorbidity Associated with Poorer Recovery?

Lai, La Greca, Auslander, & Short, 2013, Journal of Affective Disorders
What About Health Outcomes?

- Little known about the health consequences of children’s exposure to disasters
  - Psychological stress plays a role in the development of disease and immune suppression
  - Stress can disrupt one’s diet, exercise, and daily routine

Hurricane Charley 2004

Hurricane Charley: Impact on Somatic Symptoms

- Exposure: Life Threat
- Stressors: Hurricane Related Major Life Events
- PTSD Symptoms Time 1 → Somatic Symptoms Time 2
- Hurricane Stressors and Life Events (at 9 Months) as Predictors of PTSD (9 months) and Somatic Symptoms (21 months) Postdisaster

Hurricane Impact: Final Model

- Exposure: Life Threat
- Stressors: Hurricane Related Major Life Events
- PTSD Symptoms → Somatic Symptoms
- Final model controlling for demographics and all other variables

Health Risks: Unhealthy Eating, Sedentary Activity

- Key health risk behaviors highlighted by CDC
  - Contribute to obesity and type 2 diabetes
- Disasters interfere with
  - Normal roles and routines
  - Eating – consume “comfort food”, emotional eating when stressed
  - Play areas in neighborhood, less activity in school

Health Risks: Unhealthy Eating, Sedentary Activity

Hurricane Ike: Ongoing Loss/Disruption

(8 months after Ike - May 2009)
Hurricane Exposure and Recovery Stress: Predictors of Sedentary Behavior?

$\text{n} = 204$, 51% females, $M$ age = 9.23 yrs; ethnically diverse

Lai, La Greca, & Llabre, in press.

Sedentary Activity: Initial Model

Structural Model, Controlling for Ethnicity, Gender, and Body Weight
Model fit: $\chi^2(17) = 9.32, p = 0.93$, CFI = 1.00, RMSEA = 0.001, SRMR = 0.02

PTS Symptoms as a Mediating Variable

Structural Model, Controlling for Ethnicity, Gender, and Body Weight
Model fit: $\chi^2(27) = 19.90, p = 0.83$, CFI = 1.00, RMSEA = 0.001, and SRMR = 0.02

Lai, La Greca, & Llabre, in press.

Key Findings: Child Disaster Outcomes

• PTS reactions are common the first months postdisaster
• Over time, PTS reactions dissipate in most youth, but remain high in a significant minority
• Youth who have not recovered by 9 – 10 months postdisaster are at risk for chronic PTS
• Multiple reactions may occur among affected youth
  – Comorbidit of PTS with depressive symptoms is related to more persistent mental health problems
  – Health problems (somatic symp., sedentary behavior) occur

Overview of Presentation

• Risk and resilience factors

Risk and Protective Factors

Predisaster Characteristics
Demographic
Psychological Functioning
Academic Functioning

Exposure: Life Threat
Loss/Disruption

Stress Reactions

Recovery Environment

Coping with Event

Family

Life Events

Social Support
Risk and Protective Factors

**Exposure: Life Threat and Loss/Disruption**

Stress Reactions

**Predisaster Characteristics**
- Demographic
- Psychological Function
- Academic Functioning

Elements of Exposure: Life Threat and Loss/Disruption

- **Life Threat**
  - Perception that one’s life is in danger
  - Injury to self or loved one
  - Death of loved one

- **Loss and Disruption of Everyday Life**
  - Loss of "way of life"
  - Loss of homes, jobs, personal property, friendships, pets, leisure time
  - Life disruption further complicated by loss of life (family, friends, loved ones)

Life Threat: Hurricane Andrew

- 60% of Children thought they might die during the storm
- 8% of Children were hurt or saw someone get hurt

Loss of Life is not necessary for children to perceive their lives are threatened

Loss and Disruption: Hurricane Andrew

- 568 Children
  - 61% = Home badly damaged or destroyed
  - 55% = Clothes or toys ruined
  - 44% = Hard to see friends because of moving
  - 37% = Trouble getting food or water
  - 26% = Had to move to a new place
  - 26% = Had to go to a new school

Vernberg, La Greca, Silverman & Prinstein, 1996, *Journal of Abnormal Psychology*

% Variance in PTS Symptoms Predicted by Exposure Across Samples

Vernberg, La Greca et al., 1996, *Journal of Abnormal Psychology*
Risk and Resilience Factors

Aspects of the Recovery Environment

- Intervening Life Events
  - Parental separation or divorce; illness in family, etc.
- Availability of Social Support
  - Family, friends, teachers, classmates
- Family Functioning
  - Parental adjustment; family conflict; cohesion
- Child’s Ability to Cope with Events
  - Emotion regulation strategies

Coping with Event

Life Events
Social Support
Family

Stress Reactions

Prospective Predictors of PTS Sx:
10 Months After Hurricane Andrew

Exposure
Demographics
- Black, Hispanic ($\beta$’s = .11, .16)

Life Events
Social Support
Coping (blame, anger)

Prospective Predictors of PTS Sx:
R² change = .12, p < .001
R² change = .02, p < .001
R² change = .03, p < .05
R² change = .02, p < .001
R² change = .04, p < .01
R² change = .03, p < .01

Prospective Predictors of PTS Sx:
La Greca et al., J Consulting and Clinical Psychology, 1996

Hurricane Charley:
Complex Changes Over Time

1. Major Life Stressors Contribute to Persistent PTS Symptoms

2. Stressors Lead to Deteriorations in Children’s Social Support


Risk and Resilience Factors

Pre-disaster Risk Factors

- Demographic Variables
  - Gender - Girls report more PTS, anxiety
  - Minorities - More stress reactions in some studies
  - Age - Younger children report more PTS symptoms
- Prior History of Trauma*
- Prior Psychological Characteristics*
  - Higher anxiety - More severe reactions
  - Poorer psychological and family functioning

*Difficult to study

Recent Advances: Patterns of Risk and Resilience

- Person-centered vs. a variable-centered approach
- Look at children’s patterns of recovery over time
- Examine risk and resilience variables that predict the patterns

Pre-disaster Predictors of PTS: 7 Months Post Andrew

<table>
<thead>
<tr>
<th>Factor</th>
<th>R² change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure</td>
<td>.20</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Demographics</td>
<td>.06 ns</td>
<td></td>
</tr>
<tr>
<td>- African American (B = .27, p &lt; .05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety Levels*</td>
<td>.12</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Inattention*</td>
<td>.01 ns</td>
<td></td>
</tr>
<tr>
<td>Academic Problems*</td>
<td>.01 ns</td>
<td></td>
</tr>
</tbody>
</table>

*Measured 15 months pre-disaster

Proposed Trajectories of Post Disaster Responses

Bonanno, 2004, American Psychologist
**Children’s Postdisaster Trajectories**

- No studies of children’s postdisaster functioning using a trajectory approach
  - Crucial for informing early intervention and screening
- Recent re-analysis of Hurricane Andrew cohort
  - Included all youth
  - Some new variables


**Comparing Trajectory Models**

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Resilient</th>
<th>Chronic (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovering (95% CI)</td>
<td>1.30 (1.11 - 1.51)</td>
<td>1.45 (1.18 - 1.80)</td>
</tr>
<tr>
<td>Chronic (95% CI)</td>
<td>1.30 (1.11 - 1.51)</td>
<td>1.45 (1.18 - 1.80)</td>
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<table>
<thead>
<tr>
<th>Predictors of PTS Trajectories: Hurricane Andrew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison Group</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Female Gender</td>
</tr>
<tr>
<td>Perceived Life Threat</td>
</tr>
<tr>
<td>Loss/Disruption</td>
</tr>
<tr>
<td>Blame/Anger Coping</td>
</tr>
<tr>
<td>Social Support</td>
</tr>
<tr>
<td>Major Life Events</td>
</tr>
<tr>
<td>General Anxiety</td>
</tr>
</tbody>
</table>


**Summary: Risk and Resilience**

Model identified factors that contribute to children’s PTS reactions
- Disaster exposure: a strong predictor of PTS early on, but less potent over time (as many youth recover)
- Life stress during the recovery period predicts persistent PTS, which undermines children’s support and magnifies later stressors
- Children’s PTS is also associated with poor health outcomes
  - More somatic complaints, more sedentary behaviors

**Overview of Presentation**

- Clinical Implications
  - Assessment
  - Screening
  - Intervention
Clinical Implications: Assessment

- Assess postdisaster symptoms/reactions broadly
  - Evaluate PTS, but also anxiety, depression
  - Assess somatic complaints and other health behaviors
  - Track what is going on during the recovery period, especially major stressors that occur
- Assess symptoms from the child’s perspective
  - Parents are not good informants of children’s postdisaster functioning

Screening & Identifying Distressed Youth

- Early on many children report distress, but most recover
  - Screen too early -> include youth who recover on their own
  - 9 – 10 months postdisaster -> those with elevations are likely to be chronically distressed (and need help)
- Focus early intensive interventions on youth with
  - Co-morbid PTS and depression
  - Major life events and stressors during the recovery period
  - Anxious youth

Interventions: How to Deliver?

- Contextual factors (schools, homes, field settings)
- Who is the focus (child, parent, teacher, counselor)
- Training of professionals/paraprofessionals
- Type of intervention model
  - Universal; Selected; Targeted (already have disorder)
  - Stepped Care
- Time frame postdisaster
  - Immediate; Early Recovery; Long Term Recovery

Phase I. Immediate Post-Impact
(Event through first few weeks)

Most affected youth show stress reactions
- Attention to safety/security issues
- Attention to food, shelter, basic needs
- Psychological interventions
  - Brief, present-focused
  - To prevent long-term problems

Phase I: Interventions

- Psychological First Aid: www.nctsn.org
- Psychoeducational – Fact Sheets, Websites
  - National Child Traumatic Stress Network (www.nctsn.org)
  - National Center for Posttraumatic Stress Disorder (www.ncptsd.va.gov)
  - NIMH (www.nimh.nih.gov/publicat/violence.cfm)
- American Academy of Child and Adolescent Psychiatry (www.aacap.org)

Psychological First Aid: www.nctsn.org
Psychological First Aid

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Chapter 2: Preparing to Deliver Psychological First Aid
Chapter 3: Core Actions
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2. Safety and Contact
3. Stabilization
4. Information Gathering: Current Needs
5. Practical Solutions
6. Linkages with Collaborators
Appendices: Psychological First Aid Manual

Evidence for Phase I Interventions
• Evidence - not well studied.
• Possible Concerns
  – Possible iatrogenic effects (e.g., re-traumatizing children)
  – Requires sophistication to adapt to current circumstances (but may be useful to MH professionals)
  – Psych First Aid requires training to implement
Phase II: Short Term Recovery/Reconstruction
(first few weeks/months postdisaster)

- Persistent/chronic stress reactions begin to emerge
- Ongoing life stressors interfere with recovery
- Disruption of school, routines, and social ties
- Relocation

Child surveys home damage

Preventive Interventions

- Preventive Interventions are needed that
  - Enhance resilience factors
  - Social Support
  - Stress management (to enhance coping with multiple stressors)
  - Promote adaptive coping
- Reduce risk factors
  - Reduce anxiety, feelings of depression
  - Reduce poor emotion regulation

A guide to help parents and children cope with hurricanes and their aftermath
www.7-dippity.com

After the Storm

- Evidence-informed
- Designed for use in a supportive setting (child and adult)
- Intended to reduce stress reactions and promote adaptive coping
- Widely used after Katrina and Rita in State of Louisiana
- Japanese translation (After the Earth Shakes) in use

www.7-dippity.com

Special Projects Section

Japan Tsunami Effective Thinking Strategies

After the Earth Shakes: Effective Thinking Strategies

A guide to help children cope with the psychological effects of a hurricane.

After the Storm

Things that Help Most Children

- Maintain normal roles and routines
- Focus on positive/avoid unhelpful coping
- Keep healthy and fit (diet, exercise, sleep)
- Reduce/limit TV and media exposure
**Focus on helpful/avoid unhelpful coping**

- Maintain normal routines.
- Talk with trusted adults.
- Take up a new hobby.
- Exercise regularly and eat healthily.
- Get enough rest and sleep.
- Reduce exposure to media.
- Write about thoughts and emotions.
- Listen to soothing, calming music.
- Volunteer in the community at large.
- Look at the positive side of things.
- Talk to a counselor or a support group.

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**Reduce TV time and Media Exposure**

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**Keep Healthy and Fit**

**After the Storm**

- Dealing with Change
- Fears and Worries
- Intrusive Thoughts and Dreams
- Anger
- Sadness and Loss

**Prepared vs. Scared**

Many news stations report on hurricanes and other natural disasters in a dramatic and sometimes scary way, to make sure that people prepare. However, once you and your family have the information you need (e.g., updates from the National Hurricane Center, which are delivered once every five hours), turn the television off. Too much viewing will scare, rather than prepare.

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**Coping with Special Situations or Reactions**

- Evidence-informed
- Easy to use, non stigmatizing, engaging materials

**Possible Concerns**

- Requires computer/internet connections to download
- 8th grade reading level
- May need adaptation to fit the specifics of a particular disaster

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**III. Long-term Recovery Period**

(a year or more postdisaster)

- Most children have recovered but a significant minority have persistent/chronic stress reactions
- Youths’ reactions complicated by secondary stressors
- **Best Evidence**
  - Trauma-focused CBT
Trauma-Focused CBT

- 12 sessions - individual or conjoint (child and parent)
- Delivered in clinic settings for youth with PTSD
- Multiple randomized trials demonstrate improvements in PTSD among children experiencing sexual abuse and/or multiple traumas
- Recent work suggests it is effective in the aftermath of 9/11 among clinic-referred children.

Developed by J. Cohen, A. Mannarino, E. Deblinger


South Florida one of the highest risk areas in US for hurricanes

South Florida is most vulnerable to the strongest hurricanes (Category 3 – 5)

Even in a “low activity” season, one storm could be devastating

2013 Hurricane Season

Children living in a tent city after Hurricane Andrew

Boy drawing Hurricane Sandy

Thank You!