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## Disaster Media Coverage and Psychological Outcomes: Descriptive Findings in the Extant Research

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## Abstract

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### **Compliance with Ethics Guidelines**

### **Conflict of Interest**

Betty Pfefferbaum, Pascal Nitiéma, Rose L. Pfefferbaum, and Ambreen Rahman declare that they have no conflict of interest.

### **Human and Animal Rights and Informed Consent**

This article does not contain any studies with human or animal subjects performed by any of the authors.

This review of the literature on disaster media coverage describes the events, samples, and media formats studied and examines the association between media consumption and psychological outcomes. A total of 36 studies representing both natural and man-made events met criteria for review in this analysis. Most studies examined disaster television viewing in the context of terrorism and explored a range of outcomes including posttraumatic stress disorder (PTSD) caseness and posttraumatic stress (PTS), depression, anxiety, stress reactions, and substance use. There is good evidence establishing a relationship between disaster television viewing and various psychological outcomes, especially PTSD caseness and PTS, but studies are too few to draw definitive conclusions about the other media formats—newspapers, radio, and internet (including social media)—that have been examined. As media technology continues to advance, future research is needed to investigate these additional formats especially newer formats such as social media.

### Keywords

disaster; disaster media coverage; internet; mass media; media; media coverage; news; newspaper; posttraumatic stress; posttraumatic stress disorder; radio; social media; television; terrorism; traditional media

### Introduction

Several large-scale human-caused and natural disasters over the last two decades have been widely covered in the news and other media<sup>1</sup> and have compelled the attention of scholars as well as the public. For example, the 1995 Oklahoma City bombing forced a somewhat complacent nation into recognizing its vulnerability to terrorist attack, and the unimaginable September 11 attacks placed the world on notice that no place and no people are invincible. Acknowledging the importance of media in spreading the terrorist message as well as the powerful imagery of these attacks, scientific exploration has documented both the widespread penetration of media coverage of the September 11 attacks and reactions to it. Within a few short years, the brutality of nature also declared itself by unleashing a tidal wave of inconceivable proportion—the 2004 Indian Ocean Tsunami—that left hundreds of thousands dead, injured, and homeless. This, the deadliest disaster in modern time, was perhaps too easily dismissed as an event occurring in the less developed world until less than a year later Hurricane Katrina struck the Gulf Coast of the United States. Hurricane Katrina in 2005 was not only devastating to those involved, it also raised many questions about this country's infrastructure, policies, and political will. In 2011, the Great East Japan Earthquake and Tsunami killed over 15,000 people, swept millions of tons of debris offshore, and released radioactivity of unknown danger through unknown exposures, once again underscoring the vulnerability of people around the world. While fewer in number than studies of terrorist attacks, research addressing the psychological outcomes and media coverage of these natural events has further advanced our understanding of key issues associated with disaster media coverage. This review of the empirical literature describes the

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<sup>1</sup>The general term “media” is used rather than “mass media,” “news,” or “journalism” to reflect the general way in which studies included in this review phrased questions about disaster coverage.

events, samples, and media formats<sup>2</sup> studied and the association between media consumption and psychological outcomes.

## Search Methodology

Several approaches were used to identify the literature for review. Two systematic searches were conducted in August 2013. The first search used various terms to identify titles on the psychological outcomes associated with disaster media coverage in the following bibliographic databases: Communication and Mass Media Complete, MEDLINE, PILOTS, PsycINFO, and SocINDEX. The second search used the Dart Center for Journalism and Trauma's research database to identify articles coded as having primary content related to the "effects of coverage." The reference list of each article selected from the two searches was examined for additional relevant materials. References known to the authors that were not generated by the searches also were included. Seventy-four potentially relevant articles were identified through these approaches. Each of these 74 articles was then examined to determine if it met the inclusion criteria for this review including: 1) empirical research on adult disaster or terrorism samples (study participants 18 years of age or older); 2) assessment of disaster media consumption as a variable; 3) examination of the relationship between media consumption and a psychological outcome using bivariate (media consumption and outcome) or multivariable (media consumption, outcome, and other participant characteristics) statistical analyses. Excluded were experimental studies comparing reactions to video-taped clips of terrorism and non-terrorism coverage; studies of war and political conflict; studies focused on beliefs, attitudes, political views, religion, or racial/ethnic stereotyping; and those assessing exclusively children and adolescents.

## Results

Thirty-six peer-reviewed articles were selected for analysis. The characteristics of the studies (the events, samples, media formats, and outcomes) and the associations between various psychological outcomes and media consumption are presented.

### Characteristics of the Studies

Of the 36 studies, 29 (80.6%) addressed terrorist events and 7 (19.4%) addressed natural disasters. See Table 1.

The majority of studies assessed samples of individuals living within the United States (n=32; 88.9%). Two of these 32 studies included participants from Canada and France as well [1, 2]. Only 4 studies did not include respondents from the United States [3–6]. Table 1 presents the sources of study participants.

The most investigated media format was television, assessed in 35 (97.2%) of the 36 studies, either separately (n=28; 77.8%) or in combination with other media formats (n=7; 19.4%). Newspaper coverage was assessed as a distinct variable in 2 (5.6%) studies, internet was explored as a distinct variable in 3 (8.3%) studies, and radio was explored as a distinct

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<sup>2</sup>The terminology used in this report reflects the imprecise classifications of media formats described in the reviewed studies.

variable in 1(2.8%) study. In 7 (19.4%) studies, contact with two or more media formats (television, newspaper, radio, or internet) was measured and recorded as a single variable. See Table 1.

In the majority of the studies (n=24; 66.7%), respondents were asked about the duration or frequency of their contact with media coverage. For example, Bernstein and colleagues [7] asked respondents how many hours they spent watching television coverage of the first anniversary of the September 11 attacks. In contrast, other studies (n=11; 30.6%) inquired about specific scenes respondents viewed while watching coverage of a disaster as it was unfolding. For example, Ahern and colleagues [8] asked respondents how many times they saw television coverage of an airplane hitting the World Trade Center towers, buildings collapsing, people running away from a cloud of smoke, and/or people falling or jumping from the towers in the seven days following the September 11 attacks. One (2.8%) study assessed media contact by querying whether the respondent had learned about the event (Hurricane Sandy) on social media [9].

Posttraumatic stress disorder (PTSD) caseness and/or posttraumatic stress (PTS) were the most frequently measured outcomes (n=22; 61.1%), followed by stress reactions (n=6; 16.7%), depression (n=6; 16.7%), fear (n=5; 13.9%), and substance use (n=3; 8.3%). Other assessed outcomes (each assessed in only one study) included anxiety, anger, dreams, eating disorders, positive and negative emotions, and complicated grief. See Table 1.

### **Association between Contact with Media Coverage and Psychological Outcomes**

The predominance of studies that examined the relationship between disaster television viewing and psychological outcomes, using retrospective recall for media consumption, found a significant positive association. This was true for not only PTSD caseness and PTS, but also for depression, stress reactions, anger, substance use, negative emotion, and complicated grief. For instance, all of the 7 (100%) studies which assessed the relationship between television viewing and PTSD caseness (6 on the September 11 attacks and 1 on the Oklahoma City bombing) found the association to be statistically significant. See Table 2.

There is some evidence from this literature that event-related media consumption predicts PTSD caseness and/or PTS after adjusting for other exposures. In this review, 11 of the 15 (73.3%) studies which assessed the relationship between media contact and PTSD caseness and/or PTS and adjusted for direct and/or interpersonal exposure to the disaster reported a significant association between media contact and PTSD caseness and/or PTS. Other psychological outcomes found to be associated with disaster television viewing included depression [8, 10], stress reactions [11–13], anger [14], and complicated grief reactions [15].

Only five (13.9%) studies explored media formats other than, or in addition to, television [1, 9, 16–18], precluding any meaningful analysis of the effect of contact with coverage through these media formats. It is noteworthy, however, that after adjusting for all relevant variables, only one of these five studies reported a significant association between contact with other media formats and psychological outcome [9], but unlike the other four studies, this one did not adjust for television viewing in assessing the effect of media contact. In contrast, disaster

television viewing was found to be associated with psychological outcomes in many of the studies included in this review.

## Discussion

The research on disaster media coverage to date has focused largely on man-made events with an evolving literature on natural disasters including studies of several major natural events in the last decade. The most investigated disaster in the studies reviewed was the September 11 attacks. International samples (outside the United States) were poorly represented. Reflecting its predominance, at least historically, television was the most investigated media format. Television viewing was assessed in 35 of the 36 studies and was the only media format examined in two-thirds ( $n=24$ ; 66.7%) of the studies. PTSD caseness and/or PTS were the most frequently measured outcomes.

### Relationship between Media Consumption and Outcomes

Disaster television viewing was significantly associated with PTSD caseness and PTS in most of the studies that examined these outcomes. While the evidence is preliminary, studies suggest that disaster television viewing is related to PTSD and/or PTS above and beyond what is accounted for by other disaster exposures. For example, one study of New York City residents following September 11 found that the association between reported frequency of viewed televised images and probable PTSD remained even after controlling for lifetime history of traumatic events, death of a friend or family in the September 11 attacks, and direct involvement in the rescue efforts following the attacks [19]. After controlling for various exposure factors, among other variables, McLeish and Del Ben [20] found a significant association between Hurricane Katrina television viewing and PTSD symptoms in a sample of psychiatric outpatients who were directly exposed to the disaster. After controlling for demographics and other exposures, Nishi and colleagues [6] reported a significant association between television viewing of coverage of the 2011 Great East Japan Earthquake and Tsunami and PTSD symptoms in a sample of disaster medical assistance responders deployed to the disaster site.

While many studies revealed a relationship between viewing televised disaster coverage and a variety of psychological outcomes, there is insufficient evidence, at the present time, to implicate media coverage as the cause of enduring adverse emotional reactions. It is not clear that media consumption can yield reactions in the clinically significant range or provoke long-term reactions. Moreover, while disaster media consumption is likely to contribute to heightened reactions in some individuals, those who are distressed may be drawn to media coverage to obtain information or to maintain a heightened emotional state associated with arousal. In addition, the majority of the studies used retrospective recall of media consumption, sometimes requiring recall long after the event or contact with coverage.

PTSD caseness and PTS were among a wide range of psychological outcomes examined in the reviewed studies which included stress reactions, depression, fear, anxiety, anger, and substance use as well. PTSD caseness and PTS are the outcomes most commonly associated with disasters. Given that media coverage does not constitute exposure for the diagnosis of

PTSD and that media reaches diverse and distant populations that are only indirectly and remotely affected by disasters, these other outcomes may be especially important for study. While many of the reviewed studies and this analysis did not examine the clinical relevance of the outcomes investigated, it is not difficult to argue public health relevance with respect to emotions and behaviors or for additional studies to examine these other effects.

Consumption of disaster newspaper and radio coverage was not associated with the psychological outcomes in the few studies that assessed contact with these media formats. Contact with disaster internet coverage was significantly associated with psychological outcomes in only one study which did not control for contact with television and other media formats [9]. Moreover, few studies in this review compared media formats in association with psychological outcomes, and the associations between consumption of coverage and outcomes were significant only when television was included as media format. For example, in a national survey conducted in the six months after the September 11 attacks, reading newspaper coverage of the attacks was not associated with depression or fear [17]. Likewise, Cho and colleagues [16] reported no significant association between consumption of September 11 newspaper or internet coverage and positive or negative emotions. While Bui and colleagues [1] found a significant association between consumption of internet coverage of the 2011 Great East Japan Earthquake and Tsunami and PTSD reactions and disruptive nocturnal behavior, these associations were not significant after adjusting for peritraumatic distress and dissociation. Given the small number of studies on media formats other than television—newspapers, radio, and internet—no definitive conclusions can be reached about the association between consumption of coverage in these other formats and psychological outcomes. Future studies should explore these relationships more conclusively.

### **Terminology and Discrepancies in Methodology**

This analysis revealed a concern about terminology and methodology with respect to the media coverage examined. Few investigations carefully characterized the type of coverage consumed by study participants instead simply using terminology like “media” [e.g., 21] or “television” [7, 22] coverage. Two studies [9, 23] conceptualized two types of media—traditional and social—though Goodwin and colleagues [9] did not discuss traditional media in their paper and Holman and colleagues [23] combined traditional and social media into one variable when querying respondents. The communication literature typically studies “news” coverage [e.g., 24–27], but unless clearly specified, it is uncertain what study respondents consider when asked about “media” coverage. For example, respondents might have considered disaster-related conversations in chat rooms, disaster-related music, or fictionalized representations in electronic media or games as media coverage. The rapidly changing media landscape makes it essential that future studies provide clear guidance so that respondents know exactly what they are being asked.

The method of assessing media consumption differed across studies. While querying the duration of media contact was the most frequently used assessment, some studies incorporated specific media content in the media consumption variable. The extent to which these two, and other, approaches may affect the results reported by studies investigating the



association between media contact and disaster psychological outcomes should be examined.

## Conclusions

This review of the extant research on psychological effects associated with disaster media contact revealed a relationship between disaster television viewing and a number of outcomes including PTSD caseness and PTS. As media technology continues to advance, additional research is needed to investigate multiple media formats especially newer formats such as social media.

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**Table 1**

Characteristics of studies assessing contact with media coverage

	<b>Frequency n = 36 (%)</b>
<b>Terrorist event/Disaster covered</b>	
September 11 attacks, 2001	23 (63.9)
Oklahoma City bombing, 1995	3 (8.3)
The Great East Japan Earthquake and Tsunami, 2011	3 (8.3)
Loma Prieta Earthquake, 1989 (USA)	1 (2.8)
Anthrax attacks after the September 11 attacks	1 (2.8)
Indian Ocean Tsunami, 2004	1 (2.8)
Hurricane Katrina, 2005	1 (2.8)
Terror attacks in Israel (since 2000)	1 (2.8)
Hurricane Sandy, 2012	1 (2.8)
Boston Marathon bombings, 2013	1 (2.8)
<b>Sources of study participants</b>	
Only individuals at the disaster site	8 (22.2)
Only individuals from the disaster community but not at the site	5 (13.9)
Both individuals at the disaster site and those from the disaster community	6 (16.7)
National samples (United States)	6 (16.7)
Distant samples with no individuals from the disaster site or community	11 (30.6)
<b>Media Format</b>	
Television	28 (77.8)
Newspapers	2 (5.6)
Radio	1 (2.8)
Internet	3 (8.3)
Combined	7 (19.4)
<b>Method of assessment of media contact</b>	
Duration/Frequency of contact	24 (66.7)
Media content	11 (30.6)
Other	1 (2.8)
<b>Outcomes</b>	
PTSD caseness/PTS	22 (61.1)
Stress reactions	6 (16.7)
Depression	6 (16.7)
Fear	5 (13.9)
Substance use	3 (8.3)
Anxiety	1 (2.8)
Anger	1 (2.8)
Dreams	1 (2.8)

	<b>Frequency n = 36 (%)</b>
Eating disorders	1 (2.8)
Positive and negative emotions	1 (2.8)
Complicated grief	1 (2.8)

Table 2

Association between contact with media coverage and psychological outcomes

Media Format	Outcome	Total studies assessing association between media contact and outcome	Significant positive association	Adjusted for direct exposure to stressor	Adjusted for interpersonal exposure
Television	PTS	10	6	3	3
	PTSD caseness	7	7	4	2
	Depression	5	5	2	1
	Fear	5	2	1	2
	Stress reactions	3	3	0	1
	Cigarette smoking	2	1	2	0
	Anger	1	1	0	0
	Dreams	1	1	0	0
	Anxiety	1	0	0	0
	Alcohol drinking	1	1	1	0
	Positive emotion	1	0	0	0
	Negative emotion	1	1	0	0
	Complicated grief	1	1	1	1
	Disruptive nocturnal behavior	1	0	0	1
Newspapers	PTS	1	0	0	1
	Positive emotion	1	0	0	0
	Negative emotion	1	0	0	0
	Disruptive nocturnal behavior	1	0	0	1
Radio	Dreams	1	0	0	0
Internet	PTS	2	1	1	1
	Positive emotion	1	0	0	0
	Negative emotion	1	0	0	0
	Disruptive nocturnal behavior	1	0	0	1
Combined	PTS	4	2	3	3

Media Format	Outcome	Total studies assessing association between media contact and outcome	Significant positive association	Adjusted for direct exposure to stressor	Adjusted for interpersonal exposure
	Stress reactions	3	3	2	1
	PTSD caseness	1	1	0	1
	Depression	1	0	1	1
	Alcohol drinking	1	0	1	1
	Drug use	1	0	1	1
	Disordered eating	1	0	0	0