

Short Research Note

Depressive and Anxious Symptomatology After September 2001

Impact of Global and Local Disasters?

Bettina Krastel and Jürgen Margraf

University of Basel, Switzerland

Abstract. This study compares depressive and panic-related anxious symptomatology before the World Trade Center Disaster and two contemporaneous local disasters in Switzerland with data collected immediately afterward, and approximately 2 and 7 years later. Four cross-sectional surveys of representative samples of the Swiss population were conducted in March 2000 ($N = 1026$), October 2001 ($N = 1014$), October 2003 ($N = 1004$), and February 2008 ($N = 501$), using a standardized screening instrument. Immediately after the disasters, the mean depressive symptomatology score increased significantly and remained elevated but stable up to 2 years after the disasters, decreasing significantly from 2003 to 2008. However, anxious symptomatology rates did not change over time, neither immediately after the disasters nor 2 or 7 years later.

Keywords: depression, anxiety, disaster, terrorism

Introduction

After disasters, depressive disorders rank second only to posttraumatic stress disorders as mental health consequences (Norris, 2005). This is not surprising as stressful events play a major role in the onset and protraction of depression (e.g., Kendler, Karkowski, & Prescott, 1998; Surtees et al., 1986), and particularly stressful, uncontrollable, and unpredictable events increase the vulnerability of depression-prone individuals to depressive episodes (Surtees et al., 1986). Furthermore, the risk of depression increases significantly with increases in the number of stressful events experienced (Kendler et al., 1998).

Elevated self-reported symptoms of anxiety have also been observed following disasters. Norris (2005) reviewed 225 self-reports collected following different kinds of disasters and identified symptoms of anxiety in 46 of them (Norris, 2005). However, anxiety after disasters is less prevalent than PTSD or major depressive disorder. Moreover, very few studies have observed and assessed death anxiety, phobias, and panic disorder in disaster victims (Armenian et al., 2000; Bolton, O’Ryan, Udwin, Boyle, & Yule, 2000; Maes, Mylle, Delmeire, & Altamura, 2000). Brown, Fulton, Wilkeson, and Petty (2000) conducted a meta-analysis to determine what psychiatric disorders are most likely to occur after a severe civilian stressor (Brown et al., 2000). Their findings showed that PTSD, major depressive disorders, general anxiety disorder, substance use,

and phobia were significantly elevated following traumatic events, whereas panic disorder and dysthymic disorder were not.

Research has shown that human-made disasters are more psychologically pathogenic than are natural disasters (Norris, 2005). Particularly terrorism seems to be the most pathogenic of all because of its unpredictable and unrestrained nature. The terrorist attacks of September 11, 2001, constituted one of the most horrific human-made disasters to occur in a developed nation since the Second World War. Although there have been a number of other significant global disasters in the years since (Persian Gulf War 2003, Tsunami 2005, and others), none of these disasters were comparable to the World Trade Center Disaster (WTCDD) with respect to its global, far-reaching, and long-lasting consequences. Worldwide, the WTCDD had such profound consequences not only for the political and economic situation, but also for individuals’ feelings of safety and threat. Postdisaster studies have reported an elevated prevalence of depression and PTSD not only among populations in the area of the event (Galea et al., 2002; Schlenger et al., 2002), but also among those at great distances from the disaster site who had themselves experienced no direct losses (Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002).

Although numerous studies have been conducted to assess the impact of the WTCDD on mental health among American populations, little is known about mental health effects on representative populations outside of the United States. This

is probably because relatively few people outside the United States were directly affected by the attacks. However, as stated above, negative mental health outcomes are not limited to those directly exposed to a disaster (Dixon, Rehling, & Shiwach, 1993; Silver et al., 2002). The events of September 11, 2001, were of such great magnitude that people throughout the world were greatly shocked. The corresponding stress may have put vulnerable people at risk of developing mental health problems, regardless of their low objective exposure to or great geographic distance from the disaster site (Silver et al., 2002).

Less than 1 month after the WTC/D, the people of Switzerland were exposed to two local disasters. On September 27, 2001, a gunman ran amok in a Swiss government building in the Canton of Zug, killing 14 people before committing suicide. This mass murder was one of the most horrendous political disasters Switzerland had ever experienced. Only 5 days later, an economic disaster followed: On October 2, 2001, Swissair planes were grounded due to insolvency, profoundly wounding Swiss national pride. Although the consequences of these local disasters were not comparable to those of the WTC/D, we propose that they aggravated the climate of uncertainty, uncontrollability, unpredictability, and general threat in Switzerland.

The current study compares depressive and anxious symptomatology in the Swiss population, measured before the WTC/D and the two local Swiss disasters, with data collected immediately afterward and approximately 2 and 7 years later. Data stem from four representative samples of the Swiss population, collected in March 2000, October 2001, October 2003, and February 2008. The original purpose of the initial assessment was to investigate the prevalence of depressive and anxious symptomatology in the Swiss population, using a short screening instrument developed for use in primary care. In addition, based on a representative sample of the Swiss population, it tested the instrument's psychometric properties. Because Switzerland was exposed in September 2001 and October 2001 to the impact of the WTC/D and the two local Swiss disasters, respectively, we decided to repeat the assessment in order to investigate whether, and if so in what ways, depressive and anxious symptomatology would change immediately following and about 2 and 7 years after these disasters. This study aims to increase our understanding of short- and long-term postdisaster changes in depressive and anxious symptomatology.

Method

Participants

We conducted cross-sectional surveys of French- and German-speaking Swiss residents in March 2000, October 2001, October 2003, and February 2008. People between 15 and 77 years of age were eligible to participate in the study. Sampling weights were developed and applied to our

data to adjust for oversampling and to correct for potential selection bias. In 2000, face-to-face in-home interviews had been carried out using a structured questionnaire. In 2001, 2003, and 2008, interviews were conducted by telephone, using random-digit dialing. Oral informed consent was obtained (potential participants were asked whether they agreed to participate in the study) at the beginning of each interview. The interviewers were professionals with experience in conducting face-to-face and telephone surveys. The assessment in 2001 and 2003 began with six questions concerning reactions to the WTC/D, the amok run, and the Swissair grounding. After these questions, depressive and anxious symptomatology were assessed. Altogether, 3545 individuals completed the surveys (1026 in 2000, 1014 in 2001, 1004 in 2003, and 501 in 2008).

Assessment of Depressive Symptomatology

Depressive symptomatology was measured using a short form of the Symptom Checklist 90–Revised depression scale (Margraf, 1998). Convergent validity between this 6-item screening questionnaire and the depression scale of the German version of the Symptom Checklist 90–Revised (Franke, 1995) is high ($r = .92$) (Margraf, 1998). Internal consistency of this short questionnaire, calculated using Cronbach's α , ranged in the samples from .74 to .83. Using a 4-point Likert-type scale with responses ranging from 0 (*not at all*) to 3 (*extremely*), participants were asked to rate their experiences over the past 7 days of six symptoms of depression: feeling low in energy or slowed down, feeling "blue", feeling no interest in things, feeling hopeless about the future, feeling everything was an effort, feeling worthless.

Assessment of Anxious Symptomatology

Anxious symptomatology was measured using a short form of the Beck Anxiety Inventory (BAI) (Margraf, 1994), the strongest quality of which is its ability to assess panic symptomatology (Leyfer, Ruberg, & Woodruff-Borden, 2006). Convergent validity between the 6-item screening questionnaire and the German version of the BAI (Margraf & Ehlers, 2007) was high ($r = .90$). The internal consistency of the samples (calculated using Cronbach's α) ranged from .68 to .84. On a 4-point Likert-type scale with responses ranging from 0 (*not at all*) to 3 (*extremely*), participants were asked to rate their experiences over the past 7 days of six symptoms of anxiety: wobbly legs, dizzy/light-headed, unsteady, shaky, scared, and faint.

Data Analysis

We calculated descriptive characteristics of depressive and anxious symptomatology for the years 2000, 2001, 2003,

Table 1
Demographic characteristics of participants by year

		Year							
		2000 (N = 1026)		2001 (N = 1014)		2003 (N = 1004)		2008 (N = 501)	
		N (Raw)	Weighted %	N (Raw)	Weighted %	N (Raw)	Weighted %	N (Raw)	Weighted %
Age	15–29	254	24.6	216	24.2	231	23.8	97	23.8
	30–49	431	41.6	437	41.8	415	41.0	215	41.8
	50–77	341	33.8	361	34.0	358	35.2	189	34.4
Gender	Male	515	49.4	487	49.4	490	49.4	236	49.4
	Female	511	50.6	527	50.6	514	50.6	265	50.6
Employment	Full-time	551	46.8	429	42.4	426	45.8	220	51.8
	Part-time	147	19.2	209	20.3	203	20.2	117	17.4
	Unemployed	328	34.0	376	37.3	375	34.0	164	30.8

and 2008. Differences in depressive and anxious symptomatology between these years were analyzed using Welch ANOVA *F*-tests (unequal variances). Posthoc Games-Howell tests were conducted to determine pairwise comparisons. All statistical analyses were carried out using SPSS (Version 11.0, Chicago, IL, USA).

Results

Of the 3545 participants, 77 did not respond to the questions related to depressive symptoms (36 in 2000, 17 in 2001, 13 in 2003, 11 in 2008), and 91 did not respond to the questions related to anxious symptoms (49 in 2000, 22 in 2001, 11 in 2003, 9 in 2008). Table 1 presents the demographic characteristics of the four samples; the four samples were representative of Swiss census data (Federal Statistical Office, 1990, 2000).

In March 2000, the mean score of depressive symptomatology was 1.49 ($SD = 2.52$; 95% CI = 1.33–1.65). Immediately after the WTC and the two local Swiss disasters, that score rose to 2.34 ($SD = 2.85$; 95% CI = 2.16–2.52). Then, 2 years after the disasters, it had fallen to 2.27 ($SD = 2.94$; 95% CI = 2.08–2.46), and 7 years later to 1.88 ($SD = 2.69$; 95% CI = 1.64–2.12). The Welch test showed that the four samples differed significantly in depressive symptomatology, $F(3, 3423) = 19.38$, $p < .001$. From March 2000 to October 2001, there was a significant overall increase in depressive symptomatology ($p < .001$, $\eta^2 = 0.32$), but no significant adjustment was observed between October 2001 and October 2003 ($p = .95$). However, measurements decreased significantly between October 2003 and February 2008 ($p \leq .05$, $\eta^2 = 0.14$). In 2000, 540 participants (55.9%) reported no depressive symptoms (total depression score was 0), whereas in 2001, only 340 participants (34.6%) had reported no depressive symptoms. In 2003, that number had not increased significantly ($\Delta = +34$

participants, or 3.3%). In 2008, the prevalence of participants reporting no depressive symptoms had increased to 44.6%.

In 2000, the mean score of anxious symptomatology was 1.42 ($SD = 2.50$; 95% CI = 1.26–1.58). Directly after the global and local disasters, the mean anxious symptomatology score was 1.32 ($SD = 2.24$; 95% CI = 1.18–1.46). In 2003 it had fallen to 1.28 ($SD = 2.21$; 95% CI = 1.14–1.42) and to 1.26 in 2008 ($SD = 2.13$; 95% CI = 1.07–1.45). The four samples did not differ significantly in anxious symptomatology, $F(3, 3409) = 0.84$, $p = .47$. No significant change in anxious symptomatology was observed either from March 2000 to October 2001 ($p = .81$), from October 2001 to October 2003 ($p = .97$), or from October 2003 to February 2008 ($p = .99$). In 2000, 543 participants (56.9%) reported no anxious symptoms. That prevalence rate did not change significantly, either in 2001 (55.1%), 2003 (56.5%) or in 2008 (58.9%).

Discussion

However pronounced the impact of the WTC and the two local Swiss disasters on symptoms of depression, they had no significant effects on anxious symptomatology, whether the data had been collected immediately after the disasters, 2, or 7 years later. Most previous disaster researchers found elevated symptoms of general anxiety disorder, though very few studies have assessed disaster-related increases in panic symptoms (Norris, 2005). It should be kept in mind that the assessment tool used in this study focused primarily on panic-related anxiety symptoms, general anxiety symptoms not being considered. These results agree with previous research that disasters have no impact on panic-related anxious symptomatology.

Regarding depressive symptomatology, the data tell a very different story. We observed a significant increase in

depressive symptomatology after the WTC and the two subsequent local disasters in Switzerland. Then, 2 years after the disasters, depressive symptomatology rates remained comparable to those found immediately after the disasters. However, a comparison of the data collected 2 years after the disasters with those collected 7 years afterward shows a significant decrease. Changes can also be observed when focusing on very low depression scores. From 2000 to 2001, the percentage of participants reporting no depressive symptoms decreased from 55.9% to 34.6%. From 2001 to 2003, that percentage increased to 37.9% and to 44.6% in 2008. These results support the assumption that the WTC and the two local disasters affected depressive symptomatology in Switzerland.

Our results also support the findings of Dixon et al. (1993), who showed that disasters can have an effect even on the mental health of people not directly exposed, including those living a great distance from the event itself (Dixon et al., 1993). Via media reports, people all over the world witnessed the sudden death of thousands of victims of the September 11 attacks, as the detailed live and taped reportage of the event repeatedly evoked strong emotional responses (Hamblen, 2002). The emotional stress this involved may have put vulnerable people at risk of developing depressive symptomatology, even in countries geographically distant from the disaster site.

In the weeks following the WTC, Switzerland was exposed to two further local disasters. We suppose that, among the Swiss population, these two local disasters aggravated perceptions of uncontrollability and uncertainty evoked by the New York attacks. This exacerbated sense of uncontrollability may explain the greater rates of depressive symptomatology observed immediately after and 2 years after the disasters, in contrast to the rates found in 2000 and 2008. The elevated rates found even 2 years after the disasters certainly suggest that the disasters had a long-lasting impact on the mental health of Swiss residents. This result is not surprising, inasmuch as past research has shown that disasters are most likely to trigger long-lasting and severe psychological problems when they are characterized by extreme and wide-spread damage to property, serious and ongoing economic difficulties, high loss of life or threat to life, and intentional human cause (Norris et al., 2002). The WTC exhibits all of these characteristics.

Limitations

One limitation of the present study lies in the methodological differences between the interviewing methods used in 2000 (face-to-face) and subsequent years (telephone). It is difficult to determine whether the increase in depressive symptomatology rates found between 2000 and 2001 occurred because of the psychological effect of the disasters or because of methodological differences between the interviewing modes. Moreover, we cannot rule out that the

observed changes in depressiveness simply reflected naturally occurring fluctuations in self-reported depression or a sampling bias. A further limitation is the fact that only a screening questionnaire was used to assess depressive and anxious symptomatology. In order to minimize the subject burden, we could not use a more detailed structured clinical interview. Finally, the data are cross-sectional and cannot be used to test causal relationships.

Yet these limitations should not overshadow the strengths of the study, which include the use of four large random representative samples of the Swiss population and the assessment of depressive and anxious symptomatology using identical screening questionnaires over all samples.

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Bettina Krastel

SNF sesam
Department of Clinical Psychology and Psychotherapy
Birmannsgasse 8
CH - 4009 Basel
bettina.krastel@t-online.de