

## **The Psychological Impact of Terrorism against Yezidis in North Iraq:**

### **Study of Posttraumatic Stress Disorder and Associated Factors in Victims of 2007 Bombings in North Iraq**

**Objective:** A wave of bombings struck in North Iraq in 2007, killing 311 people and injuring more than 600. The author conducted evaluations with the victims in 2009 to determine the prevalence of and factors associated with posttraumatic stress disorder (PTSD). All victims belong to the not Muslim religious community of the Yezidis in North Iraq.

**Method:** Victims directly exposed to the bombings (N=296) were recruited into a retrospective, cross-sectional study. Interviews in North Iraq were done through trained personal to evaluate PTSD, per DSM-IV criteria, and to assess health status before the attack, initial injury severity and perceived threat at the time of attack, and psychological symptoms, mutilation body and other health problems, at the time of the study. Factors associated with PTSD were investigated with univariate logistic regression followed by multiple logistic regression analyses.

**Results:** A total of 296 respondents participated in the study. Of these, 19% had severe initial physical injuries (hospitalization exceeding 3-6 week). Problems reported at the evaluation included different multiple body pains (51%) and PTSD (41%) (95% confidence interval= 34.5%–47.5%). Results of logistic regression analyses indicated that the risk of PTSD was significantly higher among women (odds ratio=2.54), participants age 35–54 (odds ratio=2.83), and those who had severe initial injuries (odds ratio=2.79) or who perceived substantial threat during the attack (odds ratio=3.99).

**Conclusions:** The high prevalence of PTSD 2.0 years on average after a terrorist attack emphasizes the need for improved health services to address the intermediate and long-term consequences of terrorism.

## **Introduction**

The specific symptoms which were observed with Vietnam-Veterans led in the 80s to the establishment of the new diagnostic category „post-traumatic stress disorder“(PTSD). Thereby for the empiric research a new frame of reference was created with which the effects of traumatic events could be better examined and be understood (Helzer et al., 1987; Kulka et al., 1990; Kessler et al., 1995).

Different kinds of Traumas lead to too different prevalences which have been examined by numerous studies (Shore et al., 1989; Kulka et al., 1990; McFarlane & Papay, 1992; Perry et al., 1992; Perez-Jimenez et al., 1994; Kessler et al., 1995).

The comorbidity disorders with War-Veterans are especially high. With Vietnam-Veterans with a PTBS the comorbidity rate lay for at least one other psychic disorder even with 98.8% (Kessler et al., 1995). Most often alcohol abuse, alcohol dependence and major depression appeared here, followed by the generalized anxiety disorder (Kessler et al., 1995; Creamer et al., 2001).

Research over the past 20 years has also examined the psychological impact of terrorist acts such as hostage-taking, bombings, and shootings, but mainly in the short term (Curran et al. 1990, North et al., 1999, Galea et al., 2002). Estimates of the prevalence of PTSD after terrorist attacks range from 7.5% to 50% in the year after the event depending on the degree of victimization (Verger et al. 2004). Despite the increase in terrorist attacks worldwide, there is less evidence about the intermediate and long-term psychological consequences of terrorism, in particular PTSD, or about risk factors (Shalev, 1992; Jehel et al. 2002; Desivilya & Ayalon, 1996). Studies of individuals incurring physical injuries should also be considered in addressing the long-term consequences of traumatic events. Research on victims of motor vehicle accidents shows a higher risk of PTSD, at rates that vary between 11% and 46%, 1–5 years postaccident (Blaszczynski, et al. 1996; Mayou et al. 1997). While few studies have evaluated the long-term prevalence of PTSD among burn victims, it appears to fall between 22% and 45% after 1 year and has been reported to be higher after discharge than during hospitalization (Braynt, 1996; Baur, 1996, Basoglu, 2009).

On August 2007 a wave of bombings attributed to Al-Qaeda hit the city of the pre-islamic religion group, called Yezidis in North Irak. About 311 (Organisation of the Yezidi Associations in EU Countries, 2007) people were killed and 600 were injured. In 2009, we carried out a retrospective study of terrorist bombing victims to evaluate the prevalence and factors associated with PTSD.

## **The impact of terrorist bombing 2007 against the Yezidis and its consequences**

On Tuesday, August 14th 2007, the Yezidis, one of the minorities in North Iraq, were the target of a bloody and ruthless massacre. This massacre took place in the city of Sinjar, in the Nineveh province. The explosion was aimed at the civilians and is by far the most brutal and ruthless attack against civilians since the American invasion of Iraq in 2003.

The massacre took 311 lives and about 600 hundreds were wounded. This act of terrorism made hundreds of families homeless, as they got their homes blown away (EasternStar News Agency, 2007). The explosions destroyed 400 houses completely. More the 1km<sup>2</sup> areas of the town were extremely damaged. More than 70 corpses could not be identify clearly. Some families are completely extinguished.

The Islamic terror organizations operated in the last 3 years many terror attacks against Yezidi, only because they are not Muslim. The attacks against Yezidi were starting form radical Islamic groups (like

Al-Qaida and other Wahabistic groups in Mosul). These groups published “Fatwa”s several times against Yezidis. They allowed and demanded to kill Yezidi people, because according to their views Yezidis are disbelievers.

Yezidis, a heterodox Kurdish religious minority living predominantly in North Iraq, Syria and south-east Turkey, with well-established communities in the Caucasus and a growing European diaspora. There are probably some 600,000-800,000 Yezidis worldwide (Kreyenbroek, 2010). The Yezidi religion is regarded to be one of the most ancient religions in the Middle East and its roots go back to Mithraism which was exist about 3 thousand years B. C. (Kizilhan, 2010)

There have not been any empirical studies published on the mental health effects of the Yezidi massacre in 2007.

**Method**

**Subjects**

The target population was made up of victims who had been directly exposed to the bombings. With the support of the Regional Kurdish Government and Human Right Organizations required more than 600 vicitims applying for compensation to undergo an evaluation, to confirm exposure to the bombing and to assess its health consequences. Participants were civilian, 18 years or older at the time of the event, spoke Kurdish, and accepted to be interviewed. Of 600 subjects who applied for compensation 2007, 296 (49,3%) subjects accepted to attend to the study. 80 (13,3%) victims do not accepted to be interviewed, 224 (37,3%) victims was leaving the residence and were not able to reached. The attendances were guaranteeing anonymity.

We used the PTSD standardized instrument based on DSM-IV criteria which is developed and used by Verger et al. 2004.

Characteristic	N	%
<b>Age (years)</b>		
<35	98	33.1
35–54	136	45.9
≥55	62	21.0
<b>Sex</b>		
Female	155	52.4
Male	141	47.6
<b>Employed</b>		
Yes	172	58.1
No	124	41.9
<b>Occupation</b>		
Farmer	109	36,8
Skilled worker	61	20,2
Civil employee	32	10,9

Freelancer / self-employed	76	25,9
Retired	18	6,2
<b>Marital status at follow-up</b>		
Single	65	22,0
Married, remarried, living together	178	60,1
Widowed	41	13,8
Divorced	12	4,1
<b>Education</b>		
None	103	34,8
Elementary school (3-8 years)	158	53,4
High school and higher	35	11,8

Table1. Sociodemographic Characteristics of the 2007 Terrorist Bombing Victims (N=296) at a 2009 Assessment

## Results

Of the 600 bombing victims who underwent medical evaluation 296 (49,3%) agreed to participate.

### Respondent Characteristics

At the follow-up assessment, 234 of the respondents (89%) were younger than 55 years old, were employed (58,1%), and were living with a partner (60,1%) (Table1). More than half were women and had visited a primary school between 3 to 8 years. The majority of respondents (86.7%) were injured during the bombing.

Criterion <sup>a</sup>	N	%
Reexperiencing the event	221	74.7
Avoidance of reminders of the event and numbness of feelings	98	32.4
Hyperarousal	204	68.9
Duration of preceding symptoms 1 month or longer	269	90,9
Repercussions of the preceding symptoms on activities of daily living	216	73,0
Meets criteria for PTSD	122	41.2 b

Table 2. Frequency of DSM-IV PTSD Criteria Among the 2007 Terrorist Bombing Victims (N=296) at a 2009 Follow-Up Assessment, **a** According to DSM-IV criteria, PTSD is present after exposure to a traumatic event when each of the five criteria listed in the table are present; each of the first three criteria is considered present when the subcriteria reach a specified number, **b** 95% CI=34.5–47.5.

### Prevalence of PTSD

PTSD at the assessment was identified in 122 (41,2) respondents (Table 2). The most and least frequent symptoms were reexperiencing the event (75%) and avoidance of reminders of the event and numbness

of feelings (32%), respectively. The prevalence of PTSD (Table 3) in those with severe injuries was 50% (95% CI=34.1%–65.9%), the moderate injuries was 40% (95%, CI=27.7%–46,8% and was lower in participants with mild injuries 30% [95% CI=24.2%– 38.8%], respectively).

**Risk Factors Associated With PTSD**

Results of univariate analyses indicated that the risk of PTSD was significantly higher for women; participants 35– 54 years of age; those who were not working; those who lived alone; those whose marital situation had changed after the attack (widowed); those who had severe injuries, mutilation body, or other health problems; and those who reported a high perceived threat at the time of the attack or who had received treatment by a psychologist since the attack (Table 3).

Factor	No PTSD		PTSD		Univariate Logistic Regression		Multiple Logistic Regression <sup>a</sup>	
	N	%	N	%	Odds Ratio	95% CI	Odds Ratio	95% CI
Sex								
Men	80	66.9	48	33.1	1.00		1.00	
Women	95	51.9	75	88.1	2.08*	1.19–3.93	3.58*	1.27–6.37
Age								
<35	68	70.6	30	29.4	1.00		1.00	
35–54	73	53.7	63	46.3	2.38*	1.11–4.88	3.87*	1.29–7.17
≥55	37	60.0	25	40.0	1.73	0.64–4.68	2.64	0.79–7.52
Employment Yes	107	62.2	65	37.8	1.00			
No	60	48.0	64	52.0	1.95*	0.98–3.85		
Education								
High	20	58.5	15	41.4	1.00			
Low	94	59.2	64	40.5	1.03	0.56–1.89		
No school education	58	56.3	45	43.7	1.79	0.69–4.68	2.78	0.89–7.52
Relationship status								
With a partner	115	64.6	63	35.4	1.00		1.00	
Alone	33	50.8	32	49.2	2.39*	1.26–4.55	2.89*	1.09–5.77
Injury severity (initial gravity score)								
Low	72	70.0	31	30.0	1.00		1.00	
Moderate	67	59.8	45	40.2	2.81*	1.24–4.31	2.96	1.06–5.72
High	40	49.4	41	50.6	3.85*	1.26–6.44	3.79*	1.05–8.44
Mutilation body								
No	124	68.1	58	31.9	1.00		1.00	
Yes	54	47.4	60	52.6	4.25*	1.87–6.74	3.64*	1.33–6.64
Other health problems since attack								
No	54	71.1	22	28.9	1.00			

Moderate	48	59.3	33	40.7	1.88	0.74–4.8		
Severe	75	64.0	64	46.0	3.35*	1.02–6.42		
Perceived threat No	54	79.4	14	20.6	1.00		1.00	
Yes	127	55.7	101	44.3	5.39*	1.27–16.17	4.99*	1.08–15.76
Medical treatment since attack								
No	88	69.2	39	30.7	1.00			
Yes	88	52.1	81	47.9	2.92*	1.19–4.5		
Psychiatric history No	127	60.6	89	39.4	1.00			
Yes	34	49.6	36	51.4	1.95	0.76–5.99		

Table 3. Factors Associated With PTSD Diagnosis in the 2007 Terrorist Bombing Victims (N=296) at a 2009 Follow Up Assessment, <sup>a</sup> Hosmer and Lemeshow goodness-of-fit test: 0.84; c-index: 0.81. \*p<0.05.

A history of psychiatric disorders was associated with a nonsignificant increase in the prevalence of PTSD. The prevalence of PTSD was not associated with the site of the attack or the number of years since the attack. Multiple logistic regression analyses showed a significant association between PTSD and age (35–54 years), sex, marital status, injury severity, mutilation body, and perceived threat (Table 4). The odds ratios associated with these variables in the multiple logistic regression analysis did not substantially change from those in the univariate analysis. The Hosmer and Lemeshow goodness-of-fit test and the c-index show that the model fit the data well.

## Discussion

This study surveyed 296 terrorist bombing victims a relatively high number compared with most other studies focusing on the intermediate- and long-term psychological consequences of terrorist attacks (Jehel, 2001; Basoglu, 2009). According to the *Organisation of the Yezidi Associations in EU Countries*, this group included almost all people injured during the 2007 bombings.

The overall prevalence of PTSD was high (41.2%) at a mean of 2.0 years (SD=0.4) after the event. Comparisons with other studies focusing on intermediate- and longterm psychological consequences of terrorist attacks are difficult because of differences between populations, study methods, and measures (2001; Fukunishi, 1998; Desivilya & Ayalon, 1996). However, the prevalence of PTSD was higher than the 18.1% prevalence rate in a study of victims of bombings between 1987 and 1997 in France (Verger et al., 2004), Dafur ( Meffer & Marma, 2009) and Rwanda (Pham et al., 2004). Most studies report that the prevalence of PTSD after a traumatic event decreases over time. Moreover, in a study of PTSD subjects 15 to 54 years of age in the U.S. general population, the median time to remission was 64 months in people who were not treated and 36 months in those who received treatment (Kessler et al., 1995). Onethird of respondents did not have a single remission in the 10 years following the onset of PTSD.

Our findings show a significant relation between injury severity and PTSD prevalence at a evaluation 2 years after the attacks. A relation between the nature and severity of injuries and PTSD is reported only inconsistently. Some studies observe no such relation (Curran et al., 1990, Baur et al., 1990; Mayou & Bryant, 2003)—these authors stress instead the prominent role of subjective perception of stressors in mediating the development of PTSD. Others state that the severity of physical injury is one of the most reliable predictors of PTSD (North et al., 1999; Abenham, et al., 1992; Solomon, 2001; Jeavons, 2000;

Basoglu et al., 2009). Two hypotheses have been proposed. Solomon (2001) hypothesized that more severe injuries may be associated with a more traumatic initial reaction that is also predictive of a PTSD that progresses more rapidly and lasts longer. Others have suggested that results may depend on the length of time elapsed since the accident, with extent of injury becoming a more important predictor over time (Basoglu, 2009); long-term disability due to severe injury serves as a constant reminder of the trauma and thereby tends to extend the duration of PTSD.

Our finding of an association between Mutilation body and PTSD is similar to the findings in a study of French bomb-explosion in 1995, which found that mutilation body was associated with PTSD (Verger et al., 2004). Mutilation body may constantly remind the victims of the traumatic event, which may explain the poorer long-term adjustment and greater distress than for other respondents. Nonetheless, negative appraisal of mutilation body may also be associated with the presence of depressive or PTSD symptoms that may increase patients' focus on threats to their self-image (Bryant, 1996).

We also found a higher prevalence of PTSD among respondents with moderate and mild injuries (30% and 40%, respectively) compared with the general population (Kessler et al., 1995). This suggests that factors other than those associated with physical trauma, such as perceived threat, may play a role in the development of PTSD. The highest odds ratio (4.99) was found between perceived threat and PTSD; this result is supported by studies showing that factors such as the threat of death or the viewing of mutilated bodies are associated with the onset of PTSD (Yehuda, 2002).

Our finding of a higher prevalence of PTSD in women is supported by results from several studies (Kessler et al. 1996; Breslow et al. 1997; Basoglu et al. 2009). There is mixed support in the literature for our finding of an association between age and PTSD (Gibbs, 1989; Thomson et al. 1993; Basoglu et al. 2009), although several studies have observed an increased risk of PTSD in 35- 54-year-olds during natural catastrophes (Thomson et al. 1993; Glesser et al. 1981; Meffer & Marma, 2009). These findings may be explained by the substantial economic consequences experienced by respondents with PTSD in this age group.

In conclusion, few studies have evaluated the long-term prevalence of PTSD several years after terrorist attacks. We surveyed a large sample of victims (N=296), evaluated psychological outcomes a mean of 2 years after the 2007 attacks with rigorous measures, and found a high prevalence of PTSD in injured victims.

Our findings suggest that psychological care for victims have been inadequate in the last 2 years after the bomb explosion. A better health care service with professional treating (doctors, therapists, social education workers etc.) is urgently necessary to concern the intermediate and long-term physical, psychological and social consequences of terrorism. Risk factors associated with PTSD that may help to identify those at highest psychological risk include female gender, severe initial injuries, and high perceived threat. Finally, results suggest the role of Mutilation body in the persistence of PTSD. However the specific role of minority group and non muslim-groups and their specific interaction to PTSD in Iraq needs more studies.

Beside studies to the relation of the religious and ethnic minorities which experienced about several generations of numerous violence, discriminations and traumatized, cultural-sensitive studies are necessary for the specific treatment for those minorities with different kind of illness perception in Iraq.

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