Changes in Suicide Rate Following Major Disasters in India

To the editor,

Disasters have a substantial effect on both the physical and mental health of the affected population.[1] Suicidal behaviors, including suicidal ideations and suicide attempts, are among the most common consequences of disasters.[2] A meta-analysis showed that post-disasters, 12.9% of people had suicide ideation and 8.8% attempted suicide.[2] Though disasters may increase the risk of suicide, the suicide rates tend to vary post-disasters.[3–5] Studies that examined the impact of disasters on the suicide rate in India are limited. In this study, we attempted to explore the changes in suicide rates following major disasters in India.

In India, the suicide rate is presented as annual reports by the National Crime Records Bureau (NCRB). To understand the changes in suicide rate following disasters in India, the available data on the major disasters was taken from the NCRB website. Since there is no standard definition for major disasters or national disasters in India (NDMA, 2019), disasters that have killed at least 500 people and have been reported to have overwhelmed the state's capacity to handle and where external help was sought were included.[6] The disasters taken for the study included natural and human-induced disasters such as floods, earthquakes, drought, economic recession, war, tsunami, pandemic, and industrial disasters. The suicide rates two years before and after the event were included for analysis. In previous studies, suicide rates 36-48 months before and after a disaster were analyzed to study the impact.[4] However, in India, suicidal deaths are reported annually, not monthly. So, to obtain and maintain uniformity in the acquired data, we used the following method: If the disaster had happened in the first six months of a year, the suicide rate of that particular year was included in computing the impact of the disaster. On the other hand, if the disaster happened in the last six months of the year, the suicide rate of that year was included in calculating the baseline before the disaster.

TABLE 1.

Suicide Rates Two Years Before and After Major Disasters in India.

S. No	Event	Suicide Rate (No. of Suicides per One Lakh Midyear Population)		t	P-value
		Before (Mean ± SD) (Data Retrieved from Years)	After (Mean ± SD) (Data Retrieved from Years)		
Natural Disasters					
1	Latur earthquake, 1993^	11.8 ± 0.9 (1992–1993)	13.3 ± 0.71 (1994–1995)	−10.03	0.63
2	Orissa super cyclone, 1999^	10.00 ± 0.27 (1998–1999)	10.98 ± 0.64 (2000–2001)	−6.20	0.102
3	Gujarat earthquake, 2001^	10.43 ± 0.01 (1999–2000)	9.21 ± 0.35 (2001–2002)	4.88	0.129
4	Tamil Nadu tsunami, 2004^	19.35 ± 0.92 (2003 -2004)	18.75± 0.21 (2005–2006)	1.20	0.442
5	Andaman & Nicobar, 2004^	31.25 ± 1.34 (2003–2004)	34.7 ± 1.6 (2005–2006)	−1.68	0.341
6	Kashmir earthquake, 2005^	1.8 ± 1.13 (2004–2005)	2.05 ± 0.21 (2006–2007)	−0.26	0.836
7	Bihar floods, 2007^	0.85 ± 0.21 (2006–2007)	1.1± 0 (2008–2009)	−1.67	0.344
8	Maharashtra drought, 2013	14.15 ± 0.20 (2012–2013)	14.05 ± 0.21 (2014–2015)	10	0.63
9	Uttarakhand floods, 2013^	3.9 ± 0.42 (2011–2013)	3.25 ± 1.76 (2014–2015)	0.42	0.747
10	Kerala floods, 2018^	23.05 ± 0.64 (2017–2018)	24.15 ± 0.21 (2019–2020)	−1.83	0.318
11	COVID-19 India^^	10.3 ± 0.14 (2018–2019)	11.65 ± 0.49 (2020–2021)	−5.40	0.117
Human-induced Disasters					
12	Bhopal gas tragedy, 1984^	5.65 ± 0.21 (1983–1984)	5.98 ± 0.49 (1985–1986)	−2.83	0.217
13	Kargil war 1999^^	10.99 ± 0.30 (1998–1999)	10.52 ± 0.56 (2000–2001)	2.71	0.225
14	Economic recession, 2000^^	11.02 ± 0.26 (1999–2000)	10.5 ± 0.35 (2001–2002)	3.06	0.201
15	Gujarat riots, 2002^	9.95 ± 0.69 (2000–2001)	8.8 ± 0.19 (2002–2003)	3.14	0.196
16	Economic recession, 2008^^	10.8 ± 0 (2007–2008)	11.15 ± 0.35 (2009–2010)	−1.40	0.395

^State level data, ^^Nationwide data.

The data retrieved from the NCRB website are summarized in **Table 1**.

We ran a paired t-test and found no significant differences in suicide rates following the disasters. However, a meta-analysis and other studies have shown an increase in the suicide rates post-disaster.[2,3,7,8] A study from the USA reported that the suicide rate increased after severe floods, hurricanes, and earthquakes, and the overall suicide rate increased by 13.8% during the four years

of disaster.[6] In contrast, a study on the effect of the 2004 tsunami on suicide rates showed no significant difference between the mean number of deaths by suicide in the years preceding the tsunami and the year that followed.[5] A study on US suicide rates post-major disaster indicated the sharpest decline in suicide rates post World War II and association of low suicide rate with terrorist attacks and other major catastrophes.[6] Suicide is a serious public health issue in India. Though there are many risk factors, studies in several countries showed that any disaster could lead to an increased suicide rate.[9] However, from the available data, we found that in India, major disasters had no significant impact on the suicide rate. The contributing factors for the results may be strong social support, that is, connectedness to individuals, family, community, and social institutions and cultural, religious, or personal beliefs, which may discourage suicide.

Data for the study was taken from the NCRB website, which had only annual reports; monthly and district-wise data would have helped get more accurate results.[10] There were no clear criteria for major disasters in India, and the assumed definition is with limitations. We combined natural and human-induced disasters. However, psychosocial trauma and its impact on mental health may vary for them. We took state-level data for a few and nationwide data for other disasters, which may limit the homogeneity of sampling. Comparing suicide trends before and after a specific disaster between state-wide and nationwide data may shed new insights. Further systematic studies on the changes in suicide rate following individual disasters within a defined population may help understand their psychosocial impact.

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