The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 13, Issue 4, October- December, 2025
DIP: 18.01.172.20251304, DOI: 10.25215/1304.172
https://www.ijip.in

Research Paper

Green Victimology: Post-Traumatic Stress Disorder among Cyclone Victims with and without Family Loss in Odisha

Ronit Roshan Nayak[1], Prof. (Dr.) Mamta Patel[2]*

ABSTRACT

Natural disasters are among the most traumatic events that can have a variety of negative effects on one's physical and mental well-being. The negative effects may include loss of loved ones, damage to properties, intrusive memories, hyperarousal, anxiety, depression, nightmares, etc. The primary outcome from such a disaster is most commonly PTSD. This study investigates the differences in PTSD symptom severity among survivors of three major cyclones, i.e., 1999 Super-Cyclone, 2013 Phailin, and 2019 Fani Cyclone in Odisha, India. The study uses a comparative analysis of the differences in PTSD symptoms. A quantitative approach to study is used by the combination of structured interviews consisting of information related to their demographic information and a standardized test of PTSD, PCL, DSM-5. The findings indicate significantly higher PTSD scores among survivors who suffered family loss, and the ageing population who have survived the 1999 cyclone. This research enriches the focus on mental health support and psychological impact from such disasters and requires attention from policymakers, mental health professionals, and community leaders. The long-term consequences for survivors are crucial in creating effective disaster response strategies and fostering community resilience against future cyclones.

Keywords: *PTSD, Cyclones, Victims, Family Loss*

Natural disasters, such as floods, cyclones, tsunamis, forest fires, earthquakes, etc., can cause a deeply traumatizing impact, particularly if individuals lose their shelters or loved ones (Neria et al., 2008). Among these, cyclones are particularly devastating for coastal communities. Formed over warm ocean waters and intensified by the Coriolis Effect and climate changes (Anthes, 1982; Knutson et al., 2020). In addition to their physical toll, cyclones pose a major worldwide threat to mental health, causing a variety of psychological disorders, the most common of which is post-traumatic stress disorder (PTSD). The Bay of Bengal's body of water is notorious for spawning frequent and strong tropical cyclones due to its unique coastline geography and warm sea surface temperatures (Ipeglobal, 2023). The cyclones that are formed in this region have a significant effect on coastal communities, such as economic consequences that include damage to the crops and agricultural fields, which is a major contributor to the economy of the country, damage to

[1]M.A. Criminology, Department of Criminology & Forensic Science, Dr. Harisingh Gour University, Sagar, M.P.
[2]Professor, Department of Criminology & Forensic Science, Dr. Harisingh Gour University, Sagar, M.P.
*Corresponding Author

Received: August 28, 2025; Revision Received: December 01, 2025; Accepted: December 05, 2025

the aquaculture and fisheries, damage to the infrastructure and shelters, which requires a lot of time to rebuild, etc. The social consequences include loss of life, shifting to another place, breakdown of the communities, hunger, turmoil, increased chances of poverty, and societal disorganization. It is also a major contributor to psychological damage, such as the occurrence of intrusive thoughts like recalling memories, negative dreams, sleep disturbances, anxiety, depression, and the most common outcome, PTSD.

Odisha, an eastern coastal state in India, is one of the world's most cyclone-prone areas and has faced 260 cyclones within the time span of 100 years (Mishra, S. & Kar, D., 2016). It faces 1-2 cyclones annually on average and the reoccurrence of severe cyclones, which are categorized under the 3-5 scale, every 3-4 years (Indian Meteorological Department, 2023), because it shares approximately 480 kilometers with the Bay of Bengal (OSDMA, n.d.), which is highly vulnerable to tropical cyclones, storm-like situations, and flood erosions. The repeated cyclones cause a lot of fatalities and losses, including intrusion of saltwater into coastal farmlands, which makes the land infertile, severe damage to shelters, infrastructure, agriculture, and fisheries, biodiversity severity, connectivity (Revenue & Disaster Management Department, 2022), etc., which puts the state on hold to redevelop and faces massive financial losses.

Post-Traumatic Stress Disorder

The events such as wars, torture, rape, holocaust, atomic bombings, natural disasters (such as cyclones, earthquakes, and volcanic eruptions), as well as man-made disasters were all considered by those who created the original PTSD diagnosis. The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), defines PTSD as a trauma and stressor-related disorder having specific diagnostic criteria, while considering the associated ethical and cultural features (American Psychological Association [APA], 2013). The DSM-5 provides a detailed process for understanding PTSD, which covers the diagnostic criteria, associated characteristics, prevalence, risk factors, and cultural concerns. The application of this scale in this study on cyclone survivors in Odisha is crucial, especially how individuals affected with mental health consequences from the losses of their loved ones, socio-economic challenges, cultural limitations, etc., shape the results of PTSD.

Significance of the study

Odisha, a coastal state in eastern India, faces an average of 1-2 cyclones annually, where these disasters are destructive, affecting millions of lives directly or indirectly, making it a natural catastrophe. The extensive damages, human casualties, and long- term psychological stress among survivors are left behind from facing extremely severe cyclones such as the 1999 Super Cyclone, the 2013 Phailin Cyclone, and the 2019 Fani Cyclone. One primary consequence of such disasters is post-traumatic stress disorder (PTSD), but very little is known and a gap persists due to limitations in studies about how the death of a family member during a cyclone and how it would affect the intensity and persistence of PTSD symptoms. The collectivist culture, which is prevailing in Odisha, where support from the community and family relationships is essential to develop coping strategies among the survivors, this disparity is very significant. It might exacerbate the psychological impact of the loss.

This study will also focus on comparing the PTSD symptoms among the cyclone survivors who have lost family members and those who have not and had faced three major severely affected cyclones on the basis of the site where it made landfall in the severely affected

districts of Odisha and examining how the trauma of losing family members interacts with institutional, social, and cultural elements which influence PTSD outcomes by adopting a victimological perspective. The findings of the study will enhance victimological understanding of compounded trauma experienced by severely affected survivors and inform the recommendations for developing culturally sensitive mental health programs for the vulnerable population.

LITERATURE REVIEW

Natural disasters, as defined by Bessel van der Kolk, are "overwhelming events that shatter the sense of safety" (2014, p. 17), leaving lasting psychological scars on those who survive. Economist Amartya Sen describes them as "social calamities" in which vulnerability exacerbates human suffering (1999, p. 160). According to the United Nations Office for Disaster Risk Reduction, these are "serious disruptions" which result in widespread human and material losses that exceed community coping capacities (UNDRR, 2017). In Odisha, where the cyclones occur frequently due to its geographical conditions and a long coast facing the Bay of Bengal, it destroys not only the coastal community's physical resources but also their psychological trauma, particularly when family members lose their lives in such disasters. The primary outcomes from such disasters are PTSD, anxiety, depression, etc. The WHO describes "Natural disasters are catastrophic events with atmospheric, geological, or hydrological origins that can cause significant physical damage or destruction, loss of life, or drastic change to the environment, often leading to profound mental health consequences" (WHO, 2019).

According to population characteristics and the degree of exposure, the prevalence of PTSD following disasters varies greatly around the world, ranging from 10% to 50% (Galea et al., 2005). The previous studies post-Hurricane Katrina (2005, USA) found PTSD rates of 15-30% among survivors, with higher rates in places with extensive destruction (Galea et al., 2007). The 2004 Indian Ocean tsunami led to PTSD rates ranging from 14-38% in affected regions of Sri Lanka and Thailand, with trauma being exacerbated by grief over family loss (Hollifield et al., 2008). Similar to this, Typhoon Haiyan (2013, Philippines) saw PTSD prevalence was 20-25% a year later, which was associated with loss of life and property (Labarda et al., 2016). The conditions such as depression and anxiety arise due to secondary stressors, which make the situation worse, such as shifting of places, loss of livelihood, and disrupted social networks. The study by (Scaramutti et al., 2019) shows depression rates reached 20% due to prolonged recovery challenges after Hurricane Maria (2017) in Puerto Rico. The survivors who faced personal family loss are particularly vulnerable, as loss impairs social support, increasing PTSD severity (Labarda et al., 2016). It leaves a long-term impact as seen by the studies that 20% of disaster survivors experience chronic PTSD lasting longer than two years, especially those who have lost a loved one (Norris et al., 2002). Recovering from such a phase of life requires a lot of courage and strength. It requires psychological, social, and physical well-being, often through systematic family interventions and support (Norris et al., 2002). The symptoms such as re-experiencing, avoidance, negative alterations, and hyperarousal are common among cyclone survivors, with 42.9% of Odisha's Cyclone Fani survivors reporting PTSD and family loss the main objective of this study, may intensify guilt and intrusion, especially in the collectivist culture of Odisha (Kar et al., 2007; Ghosh, S., 2019). The PTSD prevalence rates in India align with global settings, with prevalence rates of 20-43% post-events like the 1999 Super Cyclone and 2019 Cyclone Fani (Kar et al., 2007). The Indian survivors of such disasters may hide symptoms or exhibit trauma somatically, requiring culturally sensitive diagnostics, which is

difficult to find among Western populations (Kar et al., 2007). Due to low-resource settings and systemic barriers such as limited health access, the conditions of mental health care in India were worse after Cyclone Fani, and only 10% of survivors sought psychological support due to a lack of resources, which prolonged the trauma.

Research Gap

The studies on a broader perspective globally showed symptoms of PTSD in 15-40% of survivors who faced events like Hurricane Katrina (2005, USA) and Typhoon Haiyan (2013, Philippines) (Galea et al., 2007; Labarda et al., 2016). Whereas in India, the events like 1999 Super Cyclone and 2019 Cyclone Fani showed similar rates of 30.6% and 42.9% respectively, where the survivors have faced family loss, lack of social support (Kar et al., 2007), but the present study will highlight the long-term PTSD consequences by the help of PCL-5 scale & frequent exposure to cyclones and its impact on survivors of three major cyclones (Super Cyclone (1999), Phailin Cyclone (2013), and Cyclone Fani (2019) with and without family loss in different coastal districts of Odisha, and will identify the most vulnerable and affected group. Significantly, studies from Odisha highlight family loss as a stressor post Cyclone Fani (2019), but its precise influence on PTSD remains underexplored in Odisha, where family ties are centralized due to its collectivist culture, and how it would impact the survivors in day-to-day life lacks in the Indian context. The socio-demographic vulnerabilities (such as poverty, gender inequality, occupation) and systemic barriers (such as lack of resources and restricted access to mental health care & support) heighten PTSD in Odisha, where only 10% of survivors sought psychological support after Cyclone Fani (2019). These coincide with the objective of the victimological approach, like most affected vulnerable groups, and the process of coping mechanisms developed and recovery. The PTSD tool for diagnosis (e.g., PCL-5) is widely used, but its usage in Odisha is limited because of somatic symptom expression and underlying trauma in collectivist societies.

The present study addresses these gaps by comparing PTSD symptoms among Odisha's cyclone survivors with and without family loss, by using the PCL-5 scale, through a victimological approach, and culturally adapted methods to analyse the most vulnerable group from frequent exposure to tropical cyclones and to inform coping mechanisms developed and practices of mental health well-being.

Objectives

1. To compare the severity of post-traumatic stress disorder (PTSD) symptoms between cyclone survivors who experienced family loss and those who did not.
2. To assess the influence of age and gender on PTSD symptom severity, with a focus on identifying the most vulnerable age and gender group among the survivors.
3. To understand how factors such as family loss, gender, age, and disaster severity intersect to exacerbate psychological trauma in the context of limited mental health access and socio-economic vulnerability.

Hypotheses

- **H_1:** The prevalence of PTSD score will be highest among survivors who have experienced family loss during the cyclone.
- **H_2:** The prevalence of PTSD will be significantly higher among the ageing population (commonly for the people between the age group of 50-75) as compared to prime adulthood (commonly for the people between the age group of 25-49).

- **H_3:** The prevalence of PTSD will be significantly higher among the female population as compared to the male population from the overall cyclones.
- **H_4:** The prevalence of PTSD symptoms overall should be higher among the survivors of the 1999 Super-cyclone as compared to the 2013 and 2019 Cyclone.

RESEARCH METHODOLOGY

Research Design: The study uses a comparative quantitative research design to analyze the differences in PTSD symptom severity among cyclone survivors with and without family loss. A structured interview schedule and a standardized PTSD diagnostic tool (PCL-5) were used to collect both demographic information and the PTSD related responses. The research design emphasizes a victimological approach, considering the ethics, socio-cultural, and emotional beliefs of the participants.

Area of study: The study was conducted in the coastal villages of Jagatsinghpur, Ganjam, and Puri districts in the state of Odisha. These areas were selected based on their exposure to the three major cyclones: the 1999 Super-Cyclone (Jagatsinghpur), the 2013 Cyclone Phailin (Ganjam), and the 2019 Cyclone Fani (Puri). These areas experienced the most severe impact due to the direct landfall of each cyclone.

Sampling technique: Purposive snowball sampling is used for the study (which is a combination of two non-probability sampling design: purposive sampling and snowball sampling), which targets individuals and is particularly useful for taking responses from the survivors who had experienced major personal and economic losses, including family deaths, injuries, and destruction of properties or livelihoods.

Sampling Size: The sample for the study consists of 172 survivors, including those who are aged 25 years and above, with the purpose that they have experienced 3 major cyclones (1999 Super-cyclone, 2013 Phailin-cyclone, and 2019 Fani-cyclone) from the most affected districts (1999 Super-cyclone – Jagatsinghpur district, 2013 Phailin-cyclone – Ganjam district, and 2019 Fani-cyclone – Puri district) based on the exact landfall of the respective cyclones in Odisha.

Tools for data collection:

1. PTSD Checklist for DSM-5 (PCL-5): A standardized 20-item self-report to assess PTSD symptom severity across four domains: re-experiencing, avoidance, negative alterations, and hyperarousal.
2. A structured interview schedule consisting of demographic questions and items related to personal experiences during and after the cyclone.

Procedure for data collection: The data were collected through in-person interviews at the respondents' locations and community cyclone shelters. A pilot survey was also conducted to identify the most affected area. All ethical protocols, such as voluntary participation, confidentiality, and support from local youth for consent, were strictly followed.

Data Processing: Data were processed and entered into a secure database using IBM SPSS 27 version. Each participant's data was entered using the variables and personal codes.

Data analysis: The demographic data are analysed using mean and frequency, which summarize the PCL-5 scores, subscale scores, and demographic characteristics.

Calculation for PTSD:
Raw Score: Total sum of Re-experiencing or intrusion (Criterion-B) + sum of avoidance (Criterion-C) + sum of negative alterations (Criterion-D) + sum of hyperarousal (Criterion-E)
Mean Score: (Total Raw score) / (No. of PTSD items)

Table. 1. Symptoms descriptor:

Normal Range	Mean score ≥ 1.23
Mild range	Mean score < 1.23-1.64
Moderate range	Mean score 1.64 – 2.455
Severe	Mean score 2.455 – 3.265
Extremely Severe	Mean score < 3.265

Source: (Weather's et al., 2013).

RESULT

This section presents the statistical analysis of PTSD symptom severity among cyclone survivors in Odisha, comparing variables such as family loss, gender, age group, etc. PTSD severity scores were calculated from the PCL-5 scale, and hypothesis testing was conducted using independent sample t-tests and one-way ANOVA, with a significance level of $p < 0.05$.

Demographic information:
The quantitative sample consists of 172 cyclone survivors (47 with loss of a family member and 125 without loss of a family member), distributed across Jagatsinghpur, Ganjam, and Puri. The sample population varies, with a minimum age group of 25 and the maximum age going up to 75, with 52.33% male and 47.67% female participants.

Table. 2. Age group of the respondents:

Age group	n	Percentage
25-29	22	12.79%
30-34	12	6.98%
35-39	17	9.88%
40-44	17	9.88%
45-49	28	16.28%
50-54	25	14.53%
55-59	12	6.98%
60-64	15	8.72%
65-69	14	8.14%
70 & above	10	5.81%

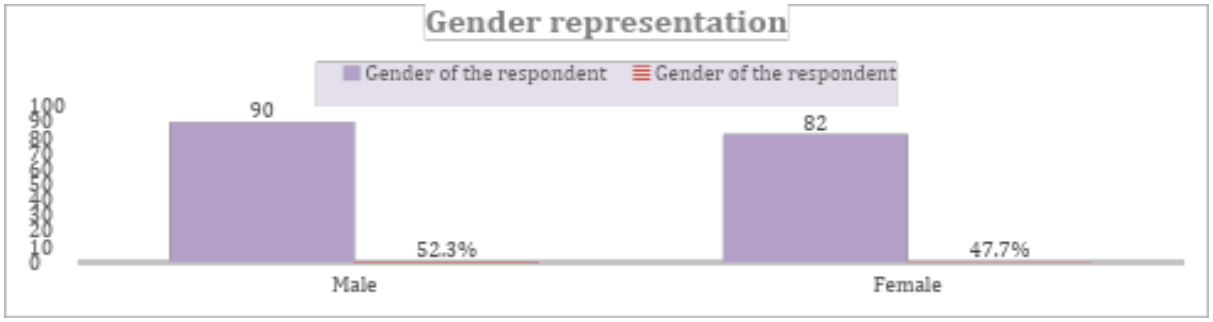

Figure 1: Represents the categorization of gender of the respondents.

Figure 2: Represents the respondents categorization based on family loss and without loss from the cyclone.

Hypothesis 1: The impact of family loss from cyclones on PTSD

H_1: The prevalence of PTSD score will be highest among survivors who have experienced family loss during the cyclone.

Table. 3. Represents the raw and mean PTSD scores from the respondents who lost family members.

	Raw Score	**Mean Score**	**Descriptor**	**DSM-5 Criteria**
Total (0-80)	2559	2.72	Severe	Met Criteria
Re-experiencing (0-20)	610	2.59	Severe	Met Criteria
Avoidance (0-8)	219	2.33	Moderate range	Met Criteria
Negative alterations (0-28)	914	2.78	Severe	Met Criteria
Hyper-arousal (0-24)	816	2.89	Severe	Met Criteria

Table. 4. Represents the raw and mean PTSD scores from the respondents who didn't experience any family loss.

	Raw Score	**Mean Score**	**Descriptor**	**DSM-5 Criteria**
Total (0-80)	6418	2.56	Severe	Met Criteria
Re-experiencing (0-20)	2258	3.6	Extremely severe	Met Criteria
Avoidance (0-8)	634	2.54	Severe	Met Criteria
Negative alterations (0-28)	2286	2.61	Severe	Met Criteria
Hyper-arousal (0-24)	1911	2.55	Severe	Met Criteria

Tables 3 and **4** show the comparison values of PTSD between the two groups, from which it can be seen that the group with family loss has a total Mean score of 2.72, whereas the group without family loss has a total Mean score of 2.56.

T-test for independent samples of unequal size:

Group A: (family loss; n = 47): M = 2.72, SD = 0.41

Group B: (without family loss; n = 125): M = 2.56, SD = 0.39

By applying a t-test, t = 2.31, and the p-value = 0.023. Since $p < 0.05$, the result is statistically significant, i.e., survivors who experienced family loss reported significantly higher PTSD levels.

Hypothesis 2: The impact of age group on PTSD

H_2: The prevalence of PTSD will be significantly higher among the ageing population (commonly for the people between the age group of 50-75) as compared to prime adulthood (commonly for the people between the age group of 25-49).

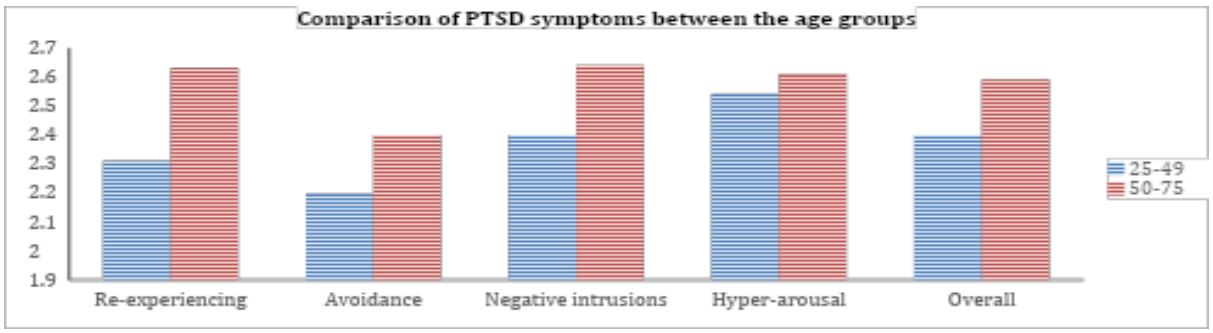

Figure 3: Represents the comparison of PTSD symptoms among the age groups.

From **Figure 3**, it can be seen that the comparison values of PTSD between the ageing and prime adulthood population, from which it can be seen that the ageing group has a total mean score of 2.59, whereas the prime adulthood group has a total Mean score of 2.4.

T-test for the independent samples between the two age groups:
Group A: (ageing population; n = 96): M = 2.59, SD = 0.37
Group B: (prime adulthood; n = 76): M = 2.40, SD = 0.43

By applying a t-test, t = 3.11, and the p-value = 0.002. Since $p < 0.05$, there is a statistically significant difference between the two age groups, i.e., the ageing population has significantly higher PTSD scores than the prime adulthood population.

Hypothesis 3: Gender groups and their impact on PTSD

H_3: The prevalence of PTSD will be significantly higher female the female population as compared to the male population from the overall cyclones.

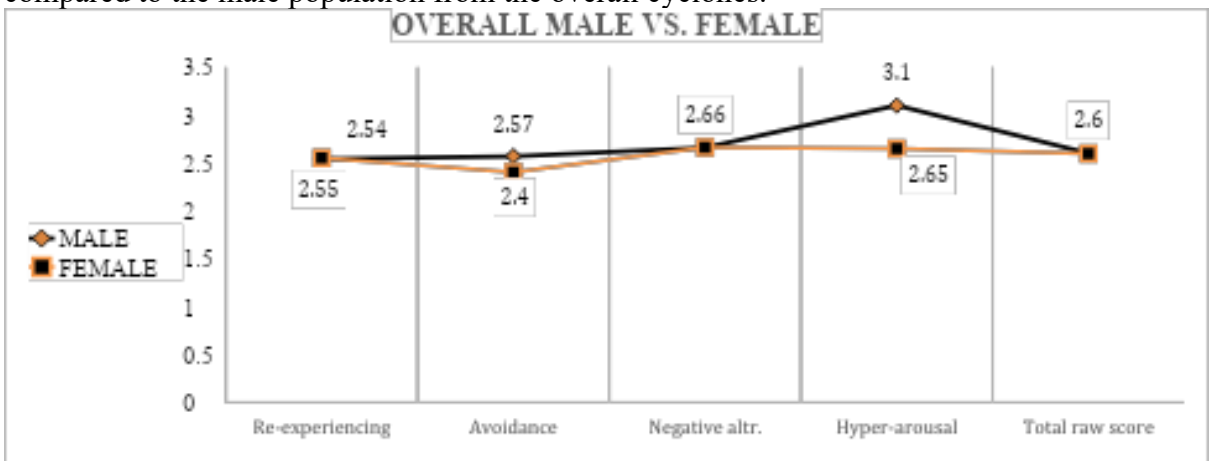

Figure 4: Compares the PTSD symptoms between the overall male and female population taken for the study.

From **Figure 4**, it can be seen that the comparison mean values of PTSD score is equal among both the population i.e., (2.6)

T-test for the independent samples between the two gender groups:
Group A: (male; n = 90): M = 2.60, SD = 0.40
Group B: (male; n = 82): M = 2.60, SD = 0.41
By applying the t-test, t = 0.00, and the p-value = 1.00. Since p > 0.05, there is no statistically significant difference in PTSD symptom severity between male and female survivors.

Hypothesis 4: PTSD severity across the 1999, 2013, and 2019 Cyclones.
H_4: The prevalence of PTSD symptoms overall should be higher among the survivors of the 1999 Super-cyclone as compared to the 2013, and the 2019 cyclone.

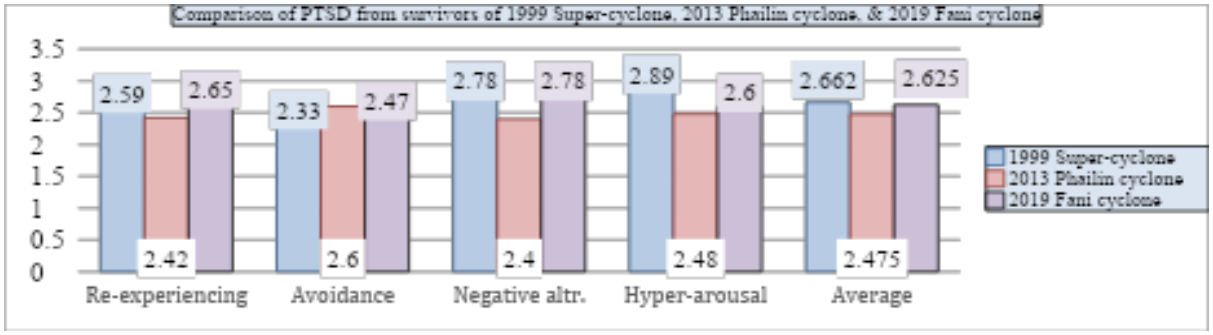

Figure 5: Comparison of PTSD from survivors of 1999 Super-cyclone, 2013 Phailin cyclone, & 2019 Fani cyclone.

From **Figure 5**, the overall mean values of PTSD are as follows: 1999 Super-cyclone (2.662), 2013 Phailin cyclone (2.475), 2019 Fani cyclone (2.625).

By using One-way ANOVA for statistical analysis, the results obtained are as follows:
Group 1: (1999, n = 47): M = 2.662; SD = 0.39
Group 2: (2013, n = 61): M = 2.475; SD = 0.42
Group 3: (2019, n = 64): M = 2.625; SD = 0.41

The F value obtained is F (2, 169) = 3.33, and the p-value = 0.038. Since p < 0.05, this result is statistically significant, and PTSD severity differs across the survivors, while the 1999 survivors have the highest severity symptoms.

Summary of obtained results:

Hypothesis	Description	Test	Obtained result	p-value
H_1	The PTSD symptoms severity is higher among the survivors who had family loss.	Independent samples t-test (unequal size)	t = 2.31	0.021
H_2	The PTSD symptoms severity is higher in ageing population (50-75) than prime adulthood (25-49)	Independent samples t-test	t = 3.11	0.0022

Hypothesis	Description	Test	Obtained result	p-value
H_3	The female survivors from the cyclone have higher PTSD than males.	Independent samples t-test	t = 0.00	1.00
H_4	PTSD severity across the 1999, 2013, and 2019 Cyclones.	One-way ANOVA	F (2, 169) = 3.33	0.038

DISCUSSION

The impact of family loss from cyclones on PTSD: The obtained results revealed that the survivors who had experienced loss of family members exhibit higher PTSD scores than those who did not, which aligns with global findings, i.e. bereavement intensifies trauma by disrupting emotional attachment, coping mechanisms developed by the individual, and societal support (Chan et al., 2016).

The impact of age group on PTSD: The ageing population (aged 50-75) had significantly higher PTSD scores compared to the prime adulthood (aged 25-49), which supports the hypothesis H_2. The factors may include health conditions, physical well-being, slower economic recovery, etc. The ageing population may also have had direct and repeated exposure to multiple cyclones over time.

Gender groups and their impact on PTSD: The obtained result showed that there is no significant difference in PTSD scores between male and female survivors, thus accepting the null hypothesis and rejecting the research hypothesis. The factors may include equal exposure to trauma and socio-economic vulnerability.

PTSD severity across the 1999, 2013, and 2019 Cyclones: The 1999 Super-cyclone survivors exhibit significantly higher PTSD symptoms than the 2013 Phailin cyclone and 2019 Fani cyclone survivors, supporting the H_4 Hypothesis. The factors may include lack of awareness, resource constraint, lack of preparedness, vast mortality, infrastructure collapse, absence of mental health facilities etc., which in contrast, disaster preparedness and mechanisms were slightly developed and improved during the 2013 and 2019 cyclones, likely reducing psychological distress.

CONCLUSION

The present study aimed to address a specific problem, i.e., persistence of PTSD among the cyclone survivors, and compare them with individual groups based on loss of family member and without loss, survivors who faced several damages from 1999, 2013, and 2019 cyclones, the most vulnerable gender and age groups from the cyclones, employing a systematic approach to uncover the meaningful findings.

The findings show valuable trends that contribute to the existing body of knowledge available in the field. The study's merits in extracting specific outcomes from the vulnerable group who are neglected due to current environmental degradation and global warming practices. The concerned groups face significant challenges of rising sea levels and loss of land through coastal erosion.

This research enriches on mental health support and the psychological impact of such disasters, and requires attention from policymakers, mental health professionals, and community leaders. The long-term consequences of survivors are crucial in creating effective disaster response strategies and fostering community resilience against future cyclones.

Recommendations

- Recommendations for improvement in mental health access: As per the observation and findings most of the respondents were dissatisfied with the mental health support as it lacks in rural areas, as per their view the government focusses only on physical aids rather than psychological issues, the media portrays them differently as they need of food and financial assistance but rather the survivors require emotional support to rebuild the damages they have faced.
- To conduct regular mental health check-ups, especially for survivors with family loss, as PTSD symptoms may persist for years after the disaster.
- To support the aging groups (50-75) in evacuation plans, psychological care, financial recovery, livelihood support, and pensions.

Limitations

- The study focused on specific locations in Odisha, based on the severity of damage from the three major cyclones of 1999, 2013, and 2019, and the results can't be applied to all the cyclone-affected population.
- The PTSD symptoms were assessed through the DSM-5 questionnaire, which may be influenced by language barriers or underreporting due to stigma-related issues.
- Survivors of the 1999 Super-cyclone may have difficulty accurately recalling experiences from decades ago, affecting symptom reporting.
- Since the study was conducted at a single point in time, it cannot track how PTSD symptoms evolve over the years or determine causality between disaster exposure and mental health outcomes.
- The severity of each cyclone (1999 vs. 2013 vs. 2019) differed in destruction, mortality, and recovery resources, making direct comparisons challenging.

REFERENCES

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition). American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Annual Report on Natural Calamities 2021-22. (2022). [Annual]. Revenue and Disaster Management Department, Government of Odisha. https://srcodisha.nic.in/annualReport/4vP2yUSqANNUAL%20REPORT%20ON%20NATURAL%20CALAMITIES,2021-22.pdf

Anthes, R. A. (1982). *Tropical Cyclones: Their Evolution, Structure and Effects*. American Meteorological Society. https://doi.org/10.1007/978-1-935704-28-7

Cyclone Hazard Climatology. (2023). India Meteorological Department. https://rsmcnewdelhi.imd.gov.in/uploads/climatology/hazard.pdf

Galea, S., Brewin, C. R., Gruber, M., Jones, R. T., King, D. W., King, L. A., McNally, R. J., Ursano, R. J., Petukhova, M., & Kessler, R. C. (2007). Exposure to Hurricane-Related Stressors and Mental Illness After Hurricane Katrina. *Archives of General Psychiatry*, *64*(12), 1427–1434. https://doi.org/10.1001/archpsyc.64.12.1427

Galea, S., Nandi, A., & Vlahov, D. (2005). The Epidemiology of Post-Traumatic Stress Disorder after Disasters. *Epidemiologic Reviews*, *27*(1), 78–91. https://doi.org/10.1093/epirev/mxi003

Ghosh, S. (2019, June 8). In Odisha, Cyclone Fani survivors struggle with stress disorders, depression. *Scroll*. https://scroll.in/article/926158/in-odisha-cyclone-fani-survivors-struggle-with-stress-disorders-depression

Hollifield, M., Hewage, C., Gunawardena, C. N., Kodituwakku, P., Bopagoda, K., Weerarathnege, K., & International Post-Tsunami Study Group. (2008). Symptoms and coping in Sri Lanka 20–21 months after the 2004 tsunami. *British Journal of Psychiatry*, *192*(1), 39–44. https://doi.org/10.1192/bjp.bp.107.038422

Kar, N., Samantaray, N. N., Kar, S., & Kar, B. (2022). Anxiety, Depression, and Post-traumatic Stress a month after 2019 Cyclone Fani in Odisha, India. *Disaster Medicine and Public Health Preparedness*, *16*(2), 670–677. https://doi.org/10.1017/dmp.2020.368

Knutson, T., Camargo, S. J., Chan, J. C. L., Emanuel, K., Ho, C.-H., Kossin, J., Mohapatra, M., Satoh, M., Sugi, M., Walsh, K., & Wu, L. (2020). Tropical Cyclones and Climate Change Assessment: Part II: Projected Response to Anthropogenic Warming. *Bulletin of the American Meteorological Society*, *101*(3), E303–E322. https://doi.org/10.1175/BAMS-D-18-0194.1

Labarda, C. E., & Chan, C. S. (2018). Sleep disturbances, posttraumatic stress, and psychological distress among survivors of the 2013 Super Typhoon Haiyan. *Psychiatry Research*, *266*, 284–290. https://doi.org/10.1016/j.psychres.2018.03.019

Mental Health in Emergencies. (2023). Department of Mental Health and Substance Dependence, World Health Organization Geneva. https://iris.who.int/bitstream/handle/10665/67866/WHO_MSD_MER_03.01.pdf?sequence=1

Mishra, S., & Kar, D. (2016). Cyclonic Hazards in Odisha and its Mitigation. *Odisha Review*. https://magazines.odisha.gov.in/Orissareview/2016/Jan/engpdf/38-42.pdf

Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: A systematic review. *Psychological Medicine*, *38*(4), 467–480. https://doi.org/10.1017/S0033291707001353

Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 Disaster Victims Speak: Part I. An Empirical Review of the Empirical Literature, 1981–2001. *Psychiatry: Interpersonal and Biological Processes*, *65*(3), 207–239. https://doi.org/10.1521/psyc.65.3.207.20173

Odisha State Disaster Management Authority. (n.d.). State profile. Retrieved August 26, 2025, from https://www.osdma.org/state-profile/

Samuel, J. (2025, January 7). Why the Bay of Bengal is more prone to cyclones than the Arabian Sea – IPE Global. *South First: The Other Half of the India Story*. https://www.ipeglobal.com/why-the-bay-of-bengal-is-more-prone-to-cyclones-than-the-arabian-sea/

Scaramutti, C., Salas-Wright, C. P., Vos, S. R., & Schwartz, S. J. (2019). The Mental Health Impact of Hurricane Maria on Puerto Ricans in Puerto Rico and Florida. *Disaster Medicine and Public Health Preparedness*, *13*(1), 24–27. https://doi.org/10.1017/dmp.2018.151

Sen, A. (1999). *Development as freedom* (1st. ed). Knopf.

United Nations Office for Disaster Risk Reduction. (2017). Terminology on Disaster Risk Reduction. https://www.undrr.org/terminology

Van der Kolk, B. A. (2015). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Penguin Books.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., Schnurr, P. P., & others. (2013). *The ptsd checklist for dsm-5 (pcl-5)*.

Acknowledgment
The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest
The author(s) declared no conflict of interest.

How to cite this article: Nayak, R.R. & Patel, M. (2025). Green Victimology: Post-Traumatic Stress Disorder among Cyclone Victims with and without Family Loss in Odisha. *International Journal of Indian Psychology*, *13*(4), 1892-1904. DIP:18.01.172.20251304, DOI:10.25215/1304.172