

## International Journal of Geography, Geology and Environment

P-ISSN: 2706-7483

E-ISSN: 2706-7491

NAAS Rating (2026): 4.5

IJGGE 2026; 8(8): 25-32

[www.geojournal.net](http://www.geojournal.net)

Received: 03-06-2026

Accepted: 04-07-2026

### Kanchan Paira

1. Research Scholar, P.G.  
Department of Population  
Studies, Fakir Mohan  
University, Vyasa Vihar,  
Nuapadhi, Balasore, Odisha,  
India

2. Assistant Professor,  
Department of Geography,  
Hijli College, Kharagpur,  
Paschim Medinipur, West  
Bengal, India

### Moatula Ao

Associate Professor, School of  
Economics, University of  
Hyderabad, Hyderabad,  
Telangana, India

### Corresponding Author:

#### Moatula Ao

Associate Professor, School of  
Economics, University of  
Hyderabad, Hyderabad,  
Telangana, India

## Post-Traumatic Stress Disorder (PTSD) among women after a severe cyclonic storm: A psychometric analysis in Sagar Island, India

Kanchan Paira and Moatula AO

DOI: <https://www.doi.org/10.22271/27067483.2026.v8.i8a.845>

### Abstract

Present study examined the Post-Traumatic Stress Disorder (PTSD) among women of reproductive age-group after 'Remal' cyclonic storm in Sagar Island, West Bengal, India 2024. In India, there is a dearth of studies that focused on investigating the psychometric properties of Post-Traumatic Stress checklist (PCL)-5 in women after cyclonic storm. Primary data regarding mental stress were collected between June and July, 2024 from a sample of=420 women from Sagar Island which experiences the 'Remal' cyclonic storm in May 2024.. The study used PCL-5 that examines the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) symptoms of PTSD. Internal reliability were assessed by computing two indices, i.e., Cronbach's  $\alpha$  (.98) and Guttman's split-half (.97), revealing high reliability. The sample data were symmetrical, suggesting moderate level of PTSD among study participants. Results of current study sample demonstrated acceptable factor structure of PCL-5 and indicated good convergent scale validity (CSV) while comparing with other measures. The findings suggest that PCL-5 is evidently applicable in studies on natural disaster caused by climatic storm. Cognitive based interventions (including stress inoculation training, cognitive based therapy), Stepped-care approach, climate change resilience planning, proper monitoring, and surveillance through epidemiological surveys after the cyclonic storm would be useful for addressing PTSD among women

**Keywords:** PTSD, PCL-5, Reproductive women, Disaster, Cyclonic storm

### Introduction

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines Post-Traumatic Stress Disorder (PTSD) that are exposed to serious injury, sexual violence, or exposure to death, whether threatened or actual, in one or more of the mentioned ways: being in the direct presence of the event(s) occurred to others or direct experience of the traumatic event(s) <sup>[1]</sup>. Currently, the most commonly used PTSD tool is the Post-Traumatic Stress Disorder Checklist for DSM-5 (PCL) fifth edition of DSM-5, expressed by Weathers *et al* <sup>[2]</sup>. The PTSD symptoms are intertwined into four-factor structure: Criterion B (*Intrusion/re-experiencing*), Criterion C (*avoidance*), Criterion D (*negative alterations in cognition and mood*), and Criterion E (*alteration in arousal and reactivity*) <sup>[3]</sup>

The prevalence of PTSD is more among women than in men due to various reasons, such as: hormone abnormality and distressed life events i.e., sexual abuse <sup>[4]</sup>, childbirth experiences <sup>[5, 6]</sup>, the traumatic situations while providing care to vulnerable populations such as nursing personnel <sup>[1]</sup> and also among opioid use disorder treatment with insomnia <sup>[7]</sup>. Due to the emerging climate change crisis and the phenomena of natural disaster on humans, recently these methods on stress and anxiety have been used to understand the trauma caused by natural disaster situations such as floods and earthquakes <sup>[8, 9, 10]</sup> as natural disasters largely affects people both economically and psychologically resulting in anxiety and stress <sup>[11]</sup>. Disasters are classified as: Natural (floods, droughts, volcanic eruptions, earthquakes, heavy rains, snow, frost, and storms) and Man-made (radiological, biological, wars, migrations, chemical, and nuclear accidents, fires, and terrorist incidents) <sup>[12]</sup>, globally occurring 400 times annually, negatively affecting 800 million people to property loss, infrastructure damage, and resource destruction, while, 3 million deaths in last two decades <sup>[13]</sup>.

The prevalence of traumatic stress symptoms post-disaster is around 3.8% in the world, according to World Mental Health Survey [14]. A long-term disaster impact on human is acute, chronic and the cumulative stress has a huge impact on as mental illness and post-traumatic stress disorders [15]. The Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC COP) in 2005 reported that a greater number of women die than men during natural disasters due to their incapability to swim or leave the house alone, as well as due to less warned [16]. In low and middle-income countries, women were found to be more vulnerable to disaster-related health outcomes than men [17, 18]. During disaster, women experienced higher risk for abuse, recorded higher mortality rates, mood disorders (e.g. depression and anxiety), childbirth-related complications (e.g. Bleeding), and post-disaster they face poor economic and mental health recovery [17, 19]. In coastal areas, women's vulnerability in terms of health, economic livelihood, marriage, and nutrition is common due to climatic instability [20]. Some studies reported that the effects on women's livelihood during cyclones are because of destruction of houses, crop failure, and loss of livestock [21]. In addition, reproductive health services of women i.e., ANC, care of newborn babies, pregnant mothers in labor [22, 23, 24], abortion, and treatment [25], also disrupted by disaster. Overall, climatic instability and vulnerability in women, both are interlinked [26, 20].

Sagar Island of India, which is the present study area, is also experiencing high storm surges, sea level rise, shoreline changes, regular land loss, embankment breaching, and changing land use [27, 28]. Furthermore, coastal flooding is also threatening in this region due to its impact on the loss of agricultural production, property damage, and loss of livelihood [29]. Almost all the villages of the island are prone to both coastal flooding and severe to very severe cyclones (e.g., Sidr, Aila, Fani, Bulbul and Amphan) which expose the inhabitant's livelihood at stake [2020].

No such studies have been conducted in assessing the psychometric properties of the PCL-5 in aftermath of disaster in India and specifically in Sagar Island of West Bengal. Therefore, considering the increasing rate of vulnerability due to these threats in Sagar Island, the study is an attempt to investigate on mental health issues using a standard questionnaire of PCL-5 among currently married women of reproductive age-group after the severe cyclonic storm 'Remal'. The specific aim was to examine the reliability and consistency of PCL-5, and construct validity through factor analysis and CSV employing correlations between PCL-5 and other measures of PTSD.

## 2. Material and methods

### 2.1 Profile of the Participants and sampling techniques

Primary data regarding mental stress were collected from Sagar Island of West Bengal, India, during June and July, 2024 using Kobo toolbox software for data collection. The target respondents were the currently married women in the reproductive age-group ( $N=420$ ), with a mean age  $33.09 \pm 7.30$  (SD) years. These women were engaged in all kinds of economic activities apart from Government and private Jobs, and experienced the impact of 'Remal' cyclone at their place of residence. For selection of the respondents, purposive sampling was employed with the criteria of selecting only one woman from each household. Overall, 16% ( $N=67$ ) of the women had completed higher secondary

or/and undergraduate or/and post-graduate studies, with 37.4% ( $N=157$ ) of them who finished a secondary education; 46.7 % ( $N=196$ ) participants finished primary school or/and junior high. About 93.3% ( $N=392$ ) of the women were Hindus and the rest 6.4% ( $N=27$ ) were Muslims. About 50.5% ( $N=212$ ) of them resides in Kaccha house; 37.9% ( $N=159$ ) in semi-pucca house; only 11.7% ( $N=49$ ) resides in pucca house. All the women were properly made aware about the study purpose, risks, and benefits. Verbal consent has taken before the initiation of face-to-face interaction process. Some of the respondents were excluded from survey during interaction who had cognitive level difficulties related to the understanding of psychometric tools. Additionally, the women taking drugs, or any psychotropic substances were excluded from our study according to DSM-5 rules to meet the PTSD criterion E.

### 2.2 Data collection procedures

The data was collected from the currently married women in the reproductive age. The respondents were informed about the possible impact of post-traumatic life events due to cyclonic storms and they were made well aware of the questions regarding PTSD check-list (PCL). Finally, PCL-5 was administered to the women who experienced the threat of 'Remal' cyclone after the occurrence of devastating severe cyclonic storm Remal [31]. The PTSD checklist is generally applied in adult populations ages 18+ according to DSM-5 rules, therefore, all the women included in our study are above 18 years of age.

### 2.3 Measures of PTSD

PCL-5 is a 20-item psychometric instruments that was initiated to determine all DSM-5 PTSD symptoms [2]. Responses were rated on a 5-point Likert scale of 0-4, with 0 signifying no experience of a symptom (not at all), 2 (a little bit), 3 (moderately), 4 (quite a bit) and 4 indicating severe experience (extremely) about traumatic life experiences [6, 32]. The PTSD scale is a cluster of four factors (intrusion/re-experiencing or B-item, avoidance or C-item, negative alterations in cognition and mood or D-item, and Alterations in arousal and reactivity or E-item), consisting of 20 items. Summing the scores of these items, the score of total symptom severity (range: 0 to 80) was obtained [2, 6, 32]. The provisional PTSD diagnosis was compiled by treating the score of each item as 2 or above as a symptom uphold, when there is a score of 1 or more in the categories of criteria-B (items 1-5) and criteria-C (items 6-7), and 2 or more in criteria-D (items 8-14) and criteria-E (items 15-20). Many studies on PCL-5 scale found that Cronbach's alpha ranged from .76 to .97 [6, 33, 34, 35, 36], and our study found the alpha values of .98.

### 2.4 Data Analysis

Reliability, multicollinearity, extreme skewness and large measurement errors for PCL-5 scale were examined first. KMO measure of Sampling adequacy and Bartlett's Test of Sphericity were also examined. Following these, reliability indices were performed. EFA was employed in order to inspect the factor's loadings, and a series of CFA models were performed to look at the latent structure as it is the best fit PTSD symptoms as calculated by the PCL-5 [6]. Raw score of each of the four criteria was examined to verify whether the criteria were meeting DSM-5 or not. SPSS

v21.0 and SPSS AMOS v26.0, two statistical data processing packages were used for data analysis.

### 3. Results

#### 3.1 Reliability coefficients and Descriptive statistics

Reliability and descriptive statistics of PCL-5 are exhibited in table 1. Internal reliability was examined by computing two different indices (i.e., Cronbach's  $\alpha$  coefficients & Guttman's split-half) of internal consistency, while the item-

to-scale homogeneity was evaluated by mean inter-item correlations. Present study followed a standard value <sup>[37]</sup> more than .70 for both forms of internal consistency coefficients. Cronbach's  $\alpha$  coefficients for four latent factors along with the total PCL-5, were found to be very good (from .85 to .98). Similarly, Guttman's split-half coefficients (from .85 to .97) were showing great internal consistency. The levels of PTSD among the women were moderate (see Appendix table 1), as the data were almost symmetrical.

**Table 1:** Reliability coefficients and Descriptive statistics for the PCL-5

| Scales (N = 420)                           | Mean  | SD   | Alpha | Split-half | N  |
|--------------------------------------------|-------|------|-------|------------|----|
| Intrusion/Re-experiencing                  | 2.11  | 1.22 | 0.95  | 0.91       | 5  |
| Avoidance                                  | 2.05  | 1.19 | 0.85  | 0.85       | 2  |
| Negative Alterations in Cognition and Mood | 2.08  | 1.17 | 0.96  | 0.95       | 7  |
| Alterations in Arousal and Reactivity      | 2.20  | 1.26 | 0.96  | 0.96       | 6  |
| Total PCL Score                            | 10.59 | 5.86 | 0.98  | 0.97       | 20 |

#### 3.2 Factors validity

PCL-5 items were examined to confirm whether the items are satisfactorily reliable, and whether the four factors were observed in the sample studied (table 2). Factors those had given values greater than one, been extracted, following Kaiser-Guttman criterion. PCA, with varimax axis rotation <sup>[38]</sup>, and Kaiser Normalization were performed. Initially, EFA was conducted in order to control the presence of weak items with unsatisfactory loadings, and PAF method was applied in order to produce initial values.

KMO (.98) suggests that the sample was acceptable for further analysis. BTS ( $\chi^2 = 10977.949$ ,  $df = 190$ ,  $p < .001$ ) suggests that the relationships of 20-items were ideal for factor analysis. Four factors were appeared to which 84.56% of the variance is attributed. The first factor (criteria-B), 'intrusion', explains 23.35% of total variance and, involving the current study sample, consists of 5 items (5 out of 6 of alterations in arousal and reactivity). The second factor (criteria-C), 'Avoidance', explains 22.79% of the total variance, consists of 6 items in this study sample (1 item of avoidance, 5 items of negative alterations in cognition and mood) differing from originally expected 2 items. The third factor (criteria-D), 'negative alterations in cognition and mood', explains 21.31% of the total variance, consists of 5 items (1 item of intrusion, 1 item of avoidance, 2 items of negative alterations in cognitions and mood, and 1 item of alterations in arousal and reactivity) in sample varying from originally expected 7 items. The fourth factor (criteria-E), 'alterations in arousal and reactivity', originally expected 6 items, explains 17.11% of the total variance and, consists of 4 items of intrusion. Analysis shows all items being satisfactorily loaded, however, intrusion, consisting of 5 items, not being recognized at all from this studied sample. Additionally, it is found that item 2- "Repeated, disturbing dreams of the stressful experience?" loads in the fourth factors with a higher value by .09 in the third. Subsequently,

item 4- "Feeling very upset when something reminded you of the stressful experience?" has a higher value by .09 in the third, comparing to the fourth factor. Next, item 12- "Loss of interest in activities that you used to enjoy?" loads in the second factor with a higher value of .009, comparing to the third, while item 14- "Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?" has a higher value by .08 in the second, comparing to the third factor. However, item 15- "Irritable behavior, angry outbursts, or acting aggressively?" a load in third factor has a higher value by .04, comparing to the second factor. Finally, item 16 "Taking too many risks or doing things that could cause you harm?" loads with a higher value by .11 in the first factor, comparing to the second factor. After removing the items loaded in two/three/four factors, it is found that the percentage of variance explained does not found to be significantly changed (the difference is 0.30%), hence, the structure of the factor remained as presented in table 2.

Subsequently, CFA was performed, and indices such as:  $\chi^2$  (chi-square),  $\chi^2/df$  (chi-square over degrees of freedom), GFI, RMSEA, CFI, TLI, AIC, and RMR (Table 3). Values over .90 indicate good model fit for TLI, CFI, and GFI <sup>[39]</sup>. As CFA can include error covariance <sup>[40]</sup>, present analysis allowed those error covariances to differ, for best-fitting model.

It is observed that the PCL-5 model with 20 questions,  $\chi^2 = 329.28$ ,  $df = 127$ ,  $p < .001$ , RMSEA = .062 (confidence intervals .054 -.070), RMR = .027, GFI = 1.00, CFI = .98, TLI = .97, AIC = 535.28, were satisfactorily confirmed by present study sample. Study found that PCL-5 correspond to the original extent contained in the scale (Fig 2). PCL-5 seems to function effectively for the reproductive age-group mother after climatic storm, as suggested by the CFA results.

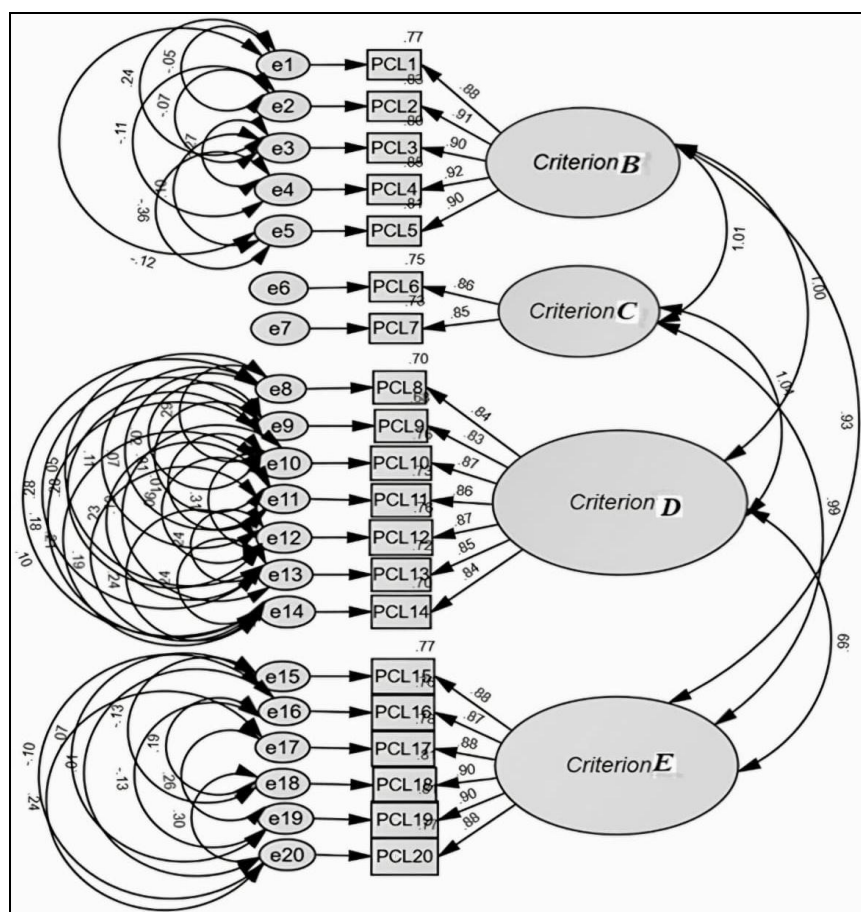
**Table 2:** Exploratory factor analysis for the 20 PCL-5 items

|    | Items (N=420)                                                                                                                                        | Factors |      |      |      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|------|
|    |                                                                                                                                                      | 1       | 2    | 3    | 4    |
| 1. | Repeated, disturbing, and unwanted memories of the stressful experience?                                                                             | .365    | .334 | .401 | .684 |
| 2. | Repeated, disturbing dreams of the stressful experience?                                                                                             | .428    | .440 | .426 | .522 |
| 3. | Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?            | .382    | .420 | .329 | .671 |
| 4. | Feeling very upset when something reminded you of the stressful experience?                                                                          | .352    | .339 | .600 | .510 |
| 5. | Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)? | .386    | .544 | .291 | .563 |
| 6. | Avoiding memories, thoughts, or feelings related to the stressful experience?                                                                        | .378    | .285 | .690 | .418 |

|     |                                                                                                                                                                                                                                   |      |      |      |      |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|
| 7.  | Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?                                                                                         | .380 | .645 | .354 | .367 |
| 8.  | Trouble remembering important parts of the stressful experience?                                                                                                                                                                  | .343 | .366 | .733 | .263 |
| 9.  | Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)? | .327 | .754 | .272 | .347 |
| 10. | Blaming yourself or someone else for the stressful experience or what happened after it?                                                                                                                                          | .365 | .369 | .634 | .427 |
| 11. | Having strong negative feelings such as fear, horror, anger, guilt, or shame?                                                                                                                                                     | .393 | .652 | .366 | .339 |
| 12. | Loss of interest in activities that you used to enjoy?                                                                                                                                                                            | .393 | .510 | .501 | .392 |
| 13. | Feeling distant or cut off from other people?                                                                                                                                                                                     | .411 | .628 | .418 | .286 |
| 14. | Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?                                                                                             | .395 | .542 | .459 | .338 |
| 15. | Irritable behavior, angry outbursts, or acting aggressively?                                                                                                                                                                      | .465 | .516 | .563 | .156 |
| 16. | Taking too many risks or doing things that could cause you harm?                                                                                                                                                                  | .567 | .454 | .426 | .274 |
| 17. | Being “superalert” or watchful or on guard?                                                                                                                                                                                       | .734 | .328 | .356 | .317 |
| 18. | Feeling jumpy or easily startled?                                                                                                                                                                                                 | .720 | .369 | .355 | .308 |
| 19. | Having difficulty concentrating?                                                                                                                                                                                                  | .691 | .349 | .407 | .299 |
| 20. | Trouble falling or staying asleep?                                                                                                                                                                                                | .763 | .345 | .256 | .353 |

**Table 3:** Confirmatory factor analysis of the PCL-5

|                |                 |
|----------------|-----------------|
| $\chi^2$       | 329.28          |
| $df$           | 127             |
| $P$            | <0.01           |
| $\chi^2/df$    | 2.59            |
| RMSEA [90% CI] | .062(.054-.070) |
| RMR            | .027            |
| GFI            | 1.00            |
| CFI            | .98             |
| TLI            | .97             |
| AIC            | 535.28          |

**Fig 2:** Confirmatory factor analysis outcomes: Graphic representation of PCL-5 models

### 3.3 Convergent Scale Validity

Although, the data were almost symmetrical, convergent scale validity (CSV) were assessed by performing the Spearman's correlations (Table 4). Correlations between scores of B, C, D, E criteria and total PCL-5 scores were examined to assess the associations of PCL-5 with PTSD

criteria. Study suggests strong significant correlations ranging from .861\*\* to .955\*\*, depicts that different kinds of traumatic events correlated very strongly positive ( $p < .001$ ) with PCL-5, which ascertained very good CSV of the present research sample.

**Table 4.** Bivariate Spearman rho correlations among PCL-5 factors and PTSD criteria

|                                             | Intrusion | Avoidance | Negative Alterations in Cognitions and Mood | Alterations in Arousal and Reactivity | PCL-5 Total Score |
|---------------------------------------------|-----------|-----------|---------------------------------------------|---------------------------------------|-------------------|
| Intrusion                                   | 1.00      |           |                                             |                                       |                   |
| Avoidance                                   | .898**    | 1.00      |                                             |                                       |                   |
| Negative Alterations in Cognitions and Mood | .902**    | .890**    | 1.00                                        |                                       |                   |
| Alterations in Arousal and Reactivity       | .873**    | .861**    | .880**                                      | 1.00                                  |                   |
| PCL-5 Total Score                           | .945**    | .923**    | .955**                                      | .937**                                | 1.00              |

\*\*Correlation is significant at the 0.01 level (2-tailed)

### 4. Discussion

The primary focus of the present study was to deconstruct the psychometric properties of PCL-5 after a cyclonic storm. This study will fill a significant research gap in the literature as there is no reliable and valid study done on PTSD among reproductive age-group married women caused by cyclonic storms. Globally, many studies have focused upon various issues such as: gender-based post-disaster risk of posttraumatic stress symptoms (PTSS) among older people [41], PTSD risk among students after Hurricane Katrina [42], PTSD symptoms experienced by flood [43, 44, 45], PTSD among firefighters and police officers [46] after natural disaster. But in our understanding, this is the first study in India that has focused on using the PCL-5 as a screening tool for estimating PTSD among reproductive age-group women, relating to any cyclonic storm.

This study used several indices such as: Cronbach's alpha ( $\alpha$ ) as well as Guttman's split-half coefficients, factors and item total correlations to find out the homogeneity and internal consistency of PCL-5 scale. Construct validity through exploratory factor analysis as well as CFA were performed for four-factor scale specified by DSM-5, pre-eminently, to evaluate the best fitting of four-factor model. In addition, spearman's correlation coefficient between the PCL-5 scores and PTSD criteria was examined for assessing the convergent scale validity (CSV).

Our study shows very high acceptable results for homogeneity and reliability of PCL-5. Current study indicates a very reasonable factor framework of PCL-5, and demonstrated good CSV. Cronbach's alpha ( $\alpha$ ) coefficient for total score of PCL-5 was found to be excellent (.98), comparing to other studies concerned with PTSD in other target population [6, 33, 34, 35, 36, 37]. Furthermore, our study found sufficient construct validity of PCL-5 with four-factor model by highlighting a number of differentiations in loadings of factors in EFA. The optimal cut-off score should be weighed carefully in practical appliance [6], therefore, our analysis avoids cut-off scores, because, a women with positive screening may need further inquiry to prove PTSD diagnosis.

The manifolds of PCL-5 was confirmed by applying EFA and CFA model, where the findings were found to be consistent with most of the general population-based research studies [47, 48]. The CSV also suggests strongly

positive and significant correlations with different kind of traumatic events and PCL-5, ranging from .861\*\* to .955\*\*. Our findings align with the reliability and convergent validity of some prior studies on other populations, such as studies on trauma-exposed US veterans [49], and college students [50], that eradicated good reliability and internal consistency; studies among female Filipino domestic workers [51], where, Cronbach's alpha observed very good convergent validity, very good scale reliability and high correlation with depression and direct trauma exposure; and studies on postpartum women in Greek during post-cesarean section [6], that demonstrated reasonable internal consistency, acceptable reliability and significant correlations among PCL-5 factors and PTSD criteria.

### 5. Strengths and limitations of the study

Present study has numerous strengths. The first and most important strength lies in the contribution to literature by including the analysis of PTSD for DSM-5 among women of reproductive age (15-49 years) after any Cyclonic Storm. Such evidence-based research is tremendously effective, particularly in providing a prospective framework for further investigations on PTSD symptoms after any cyclonic storm. Second, this study provides an ample scope to understand that PCL-5 is a suitable and valid screening tool for estimating PTSD symptoms, after any cyclonic storm. Furthermore, this study will play an exceptional role in formulating a future scope of analysis on household level specific causes and possible remedies of mental stress. Despite these strengths, some limitations of the study were also identified. Symmetrical skewness of the data indicated moderate levels of PTSD among the women. Although, acceptable results were achieved by the current analysis, but, further micro-level studies that scrutinize gold standard measures for convergent validation, determination of optimal cut-off score, as well as the major reasons behind PTSD symptoms after cyclonic storm, can provide more evidence and detailed explanation.

### 6. Conclusion

Present study has deconstructed the psychometric properties of the PTSD among currently married women in the reproductive age after the severe cyclone 'Remal'. Study found a moderate level of PTSD among the study women.

The government of West Bengal has taken various short, mid and long-term measures involving emergency medical care, disease surveillance and mental health, upgrading capacity building for health care and improved access to essential medicine, shelter house building, strengthening primary healthcare and sustainable power solutions for health facilities, which are collectively making an effort to cut down the level of trauma among study participants. But, there is definitely a need for proper surveillance, supplies of food and essential medicine as well as proper inspection from ground zero level especially during any cyclonic storm. There is also a lack of adaptive measures such as: cognitive based interventions (including stress inoculation training, cognitive based therapy), crisis counseling, and primary care interventions that would be beneficial for community-based behavioral interventions. Stepped-care approach, climate change resilience planning, proper monitoring, and surveillance through epidemiological surveys after a cyclonic storm is most needed for addressing psychological wellbeing of the women.

### Declarations

### Acknowledgement

We sincerely acknowledge all the faculties of the Department of Population Studies, Fakir Mohan University, Odisha for their concomitant support, and we also acknowledge the study participants for their voluntary participation in this study.

### Authors' contribution

Both the authors have contributed to the conception and designing of the study. Materials and methods preparation, data collection and analysis were performed by the corresponding author. The first draft of the manuscript was written by the corresponding author. The first draft of the manuscript was checked and necessary modification was done by the second author. Both the authors read and approved the final manuscript.

### Conflict of Interest

The authors have declared that no competing interests exist.

### Funding

The authors received no special funding for this work.

### Ethical approval

Present study was approved by the Departmental Ethics committee (DEC) of Fakir Mohan University. Approval letter no:FMU/PS/83A<sup>(9)</sup>/2024, dated 01.03.2024. All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

### Consent for Publication

The authors confirm that this paper has not been either previously published or submitted simultaneously for publication elsewhere.

### Informed Consent

The authors also attest and affirm that verbal informed consent had been taken from the participants in the study

and they were properly made aware and informed about the study purpose, risks, and benefits.

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**Appendix table 1: Provisional PTSD diagnosis**

|                                                    | Raw Score | Mean ± SD | Descriptor | DSM-5 Criteria |
|----------------------------------------------------|-----------|-----------|------------|----------------|
| Intrusion/Re-Experiencing (0-20)                   | 10.53     | 2.11±1.22 | Moderate   | Criteria met   |
| Avoidance (0-8)                                    | 4.09      | 2.05±1.19 | Moderate   | Criteria met   |
| Negative Alterations in Cognitions and Mood (0-28) | 14.53     | 2.08±1.17 | Moderate   | Criteria met   |
| Alterations in Arousal and Reactivity(0-24)        | 13.20     | 2.20±1.26 | Moderate   | Criteria met   |
| Total (0-80)                                       | 42.36     | 2.12±5.86 | Moderate   | Criteria met   |