# Mental health outcomes following hydrological extreme weather events among Pacific Islanders: A Systematic Literature Review

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

Shanell Folger[a] & Susan Anenberg, PhD, MS[a]

[a] Department of Environmental and Occupational Health, The George Washington University Milken Institute School of Public Health

## Study Question

**"Does the prevalence of adverse mental health outcomes increase among Pacific Islanders after hydrological extreme weather events (HEWE)?"**

## Background

- Natural disasters can adversely affect physical health, mental health, and community health either directly or indirectly.
- Along with rising global temperatures, increases in severity of extreme weather events have been attributed to climate change.
- 7,348 disaster events have been reported globally since 2000, ~75% increase compared to between 1980-1999 (UNDRR, 2020).
- Occurrence of natural disasters are increasing in the Pacific Island countries (PICs) (Fig. 1) (IMF, 2018).
- PICs are among the most vulnerable to health risks related to climate related disasters

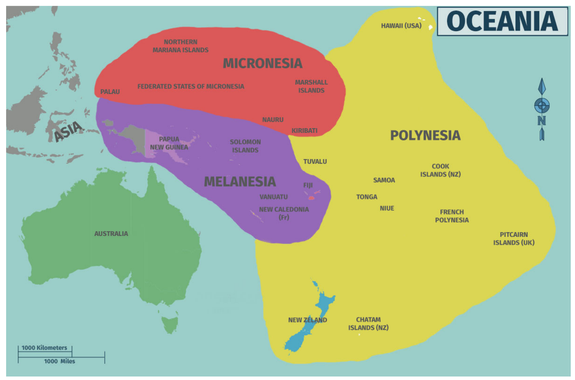


**Figure 1. Map showing the Pacific Island countries divided into three geographic regions.**

## PECO Statement

**Population:** Adults in Pacific Islands
**Exposure:** HEWEs
**Comparator:** Adults in Pacific Islands not exposed to HEWEs
**Outcome:** adverse mental health outcomes

## Methods

Followed the Navigation Guide methodology for conducting systematic literature review.

**Study Selection Criteria**:

- In English
- Peer-reviewed
- Original data
- Human studies
- ***Exposure terms***: cyclonic storms, floods, tsunamis, disasters, typhoon, hurricane, climate change
- ***Outcome terms***: mental health, mental disorders, psychological adaptation, psychological trauma, stress disorders, psychological stress
- Located in a PIC (excluding high-income countries)

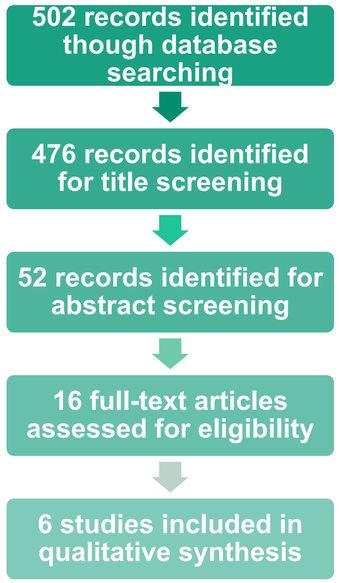


**Figure 2. Flowchart of literature search.**

**Risk of Bias Domains:**

- Recruitment
- Confounding
- Exposure Assessment
- Incomplete outcome data
- Selective reporting
- Other bias
- Conflict of Interest

**Quality of Evidence:**

- Rated as either "high," "moderate," or "low"

**Strength of Evidence:**

- Rated as either "sufficient," "limited," or "inadequate"

## Results

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Recruitment | | | | | | |
| Confounding | | | | | | |
| Exposure assessment | | | | | | |
| Incomplete outcome data | | | | | | |
| Selective reporting | | | | | | |
| Other bias | | | | | | |
| Conflict of interest | | | | | | |

Low risk
Probably low risk
Probably high risk
High risk

**Table 1. Assessment of risk of bias across the 6 studies based on specified domains.**

| Characteristics | Studies (n=6) |
|---|---|
| Study design | cross-sectional (n=5); case-control (n=1) |
| Time Frame | 1983 - 2016 |
| Data Collection | 29 days - 16 months following a HEWE* |
| Sample size | 39 - 2,291 |
| Location | American Samoa, Fiji, Solomon Islands, Tuvalu (n=2), Vanuatu |
| Exposures | cyclones, sea levels rises, tsunamis, wave damages (floods) |
| Outcome data | self-report: in-depth qualitative interviews (n=2); questionnaires (n=4) |
| Results | All reported presence of adverse mental health outcomes (e.g. changes in outlook of everyday life, direct threat to life, partial post-traumatic stress syndrome, distress, anxiety, and depression-like symptoms) |

**Table 2. Summary of study characteristics**
**** Asugeni et al. 2015 did not specify a data collection time frame***

**Risk of bias assessment:** **High** risk of bias across most studies for confounding and other potential bias (Table 1).

**Quality of Evidence:** Overall quality of evidence was **"Low"** for high risk of bias and indirectness

**Strength of Evidence:** Overall strength of evidence was **"limited"** for low quality of evidence and constrained confidence in association

## Study Question

I concluded that there was "limited" evidence for the association between HEWEs and adverse mental health outcomes among Pacific Islanders.

Findings from this review make it critical to highlight the mental health implications associated with natural disasters, and more broadly climate change, within the Pacific Islands where mental health services are underutilized, mental health needs remain unmet, and mental health is still stigmatized.

## Next Steps

- Include comparators (i.e. not exposed to HEWEs) to quantify effect size of HEWEs on mental health outcomes
- Quantifiable epidemiological data in PICs that are supplementary to qualitative studies
- Cultural competency and sensitivity on mental health
- Longitudinal studies to assess long term effects

## References

1. Asugeni, J. et al. (2015). https://doi.org/10.1177/1039856215609767.
2. Fairley, M. et al. (1986). https://doi.org/10.1017/S0033291700010412.
3. Gibson, K. et al. (2019). https://doi.org/10.1177/1363461519847057.
4. Gibson, K. et al. (2020). https://doi.org/10.1016/j.janxdis.2020.102237.
5. King, M. et al. (2013). https://doi.org/10.1001/dmp.2012.11.
6. Pomer, A. et al. (2019). https://doi.org/10.1007/s00737-019-00980-6.

## Acknowledgements

Special thanks to my culminating experience (CE) advisor Dr. Anenberg, CE course instructor Dr. Lance Price, and my CE peers for their immense expertise, support and guidance for the duration of conducting this systematic literature review.

## Next Steps

Shanell Folger
shanellnfolger@gwu.edu