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gender based water violence : cross cultural evidence of severe harm associated with water insecurity for women and girls

Tallman, P., Salmon □ Mulanovich, G., Archdeacon, N., Kothadia, A., Lopez Flores, L., Castañeda, K., Collins, S., Rusyidi, B. and Cole, S.

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Violence Against Women

“Gender-Based Water Violence”: Cross-Cultural Evidence for Severe Harm Associated with Water Insecurity for Women and Girls

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Manuscripts

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1 **TITLE:** “Gender-Based Water Violence”: Cross-Cultural Evidence for Severe Harm Associated
2 with Water Insecurity for Women and Girls

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4 **ABSTRACT:** We examined how study participants in Indonesia and Peru viewed the
5 relationship between water insecurity and women’s health via thematic analysis of semi-
6 structured interviews and focus groups. Participants reported that water insecurity led to vaginal
7 infections, miscarriage, premature births, uterine prolapse, poor nutrition, restricted educational
8 and economic opportunities, and intergenerational cycles of poverty. Participants in both
9 countries stated that extreme burdens associated with water insecurity should be categorized as
10 violence. Based on these findings, we developed the concept of “gender-based water violence,”
11 defined as the spectrum of stressors associated with water insecurity that are so severe as to
12 significantly threaten human health and wellbeing, particularly that of women and girls.

13
14 **Key words:** Water insecurity; gender-based violence; structural violence; slow violence;
15 reproductive health; maternal health.

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10 24 **MAIN BODY**

11 25 **Introduction**

12
13 26 Water insecurity is defined as the inability to access and benefit from affordable,
14 27 adequate, reliable, and safe water (Jepson et al., 2017). A growing body of literature documents
15 28 the adverse consequences of water insecurity for human wellbeing, nutrition, and health (cf.
16 29 Rosinger and Young, 2020). This includes a relationship between water insecurity and gender-
17 30 based violence (cf. Tallman et al., 2022).

18 31 The United Nations (1993) defines violence against women as “any act of gender-based
19 32 violence that results in, or is likely to result in physical, sexual or psychological harm or
20 33 suffering to women, including threats of such acts, coercion, or arbitrary deprivation of liberty,
21 34 whether occurring in public or in private life.” (pg. 2). Prior studies investigating the relationship
22 35 between water insecurity and gender-based violence focus on interpersonal violence with
23 36 attention to conventional categorizations of violence such as physical, economic, sexual, or
24 37 psychological violence. Yet there is an emerging recognition that water insecurity is linked to
25 38 “structural” and “slow” violence (Truelove & Ruszczyk, 2022; Willet, 2015; Nunbogu & Elliott,
26 39 2022), which is not attributable to a single person, but rather to structural injustices that are
27 40 distinctly gendered and unfold over longer periods of time.

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29 41 In this article, we develop the concept of “gender-based water violence,” which we define
30 42 as the spectrum of stressors associated with water insecurity that are so extreme as to
31 43 significantly threaten human health and wellbeing, particularly that of women and girls. As
32 44 evidence for this concept, we present findings from our research in Indonesia and Peru
33 45 documenting the wide range of harms associated with water insecurity that impact women and
34 46 girls cross-culturally.

47 Background

48 Water insecurity is associated with conventional forms of violence against women in
49 several ways. Failure to meet prescribed gender roles around water collection, or water-related
50 domestic tasks, is linked to physical and psychological intimate partner violence (Mushavi et al.,
51 2020). Women have been harassed and sexually assaulted while fetching water (Thompson et al.,
52 2011). Physical violence has erupted between individuals when waiting in queues for water
53 (Mukuhani & Nyamupingidza, 2014). And sexual coercion, such as pressure to engage in
54 transactional sex, has been perpetrated against women and girls vying to advance their chances
55 of securing water (Pommells et al., 2018).

56 In the aforementioned cases, the violence occurs between individuals. However, it is
57 widely recognized that broader social arrangements can increase the risk of suffering among
58 subordinated and disadvantaged groups. This process is often referred to as “structural” or
59 “slow” violence, and has been used to reveal the biases in the institutional, political, and
60 economic processes that determine who gets water (Nunbogu and Elliot, 2021) and to draw
61 attention to the deteriorating daily grind associated with women’s water burden (Willett, 2015;
62 Truelove & Ruszczyk, 2022; Mawani et al., 2023). The “structural” and “slow” aspects of water
63 insecurity have the potential to negatively impact all people navigating water insecurity.
64 However, the severity of harm inflicted by water insecurity is differentially borne by women and
65 girls due to cultural norms that dictate water-related tasks as “women’s work” (Cole, 2017).

66 In this article, we draw on Based on analyze data from semi-interviews and focus
67 groupsstredience from our interdisciplinary project in Peru and Indonesia we to and find that
68 people in each country articulate a wide identify a spectrum of harms associated with water
69 insecurity, which we characterize as of “gender-based water violence.” Specifically, weWe use an

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10 70 emic perspective, or an insider’s perspective, as the starting point of our analysis (Markee 2013),
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12 71 drawing. Specifically, we draw on the words of local women and workers in healthcare,
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15 72 government, and non-governmental organizations to understand the range of harm associated
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17 73 with water insecurity and gender-based violence in Indonesia and Peru. While the larger project
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20 74 was designed to explore the interconnection between water insecurity and conventional forms of
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22 75 gender-based violence (psychological, physical, sexual, economic), local women's accounts of
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25 76 their experiences with water insecurity revealed consistent social and health concerns beyond
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28 77 these. While the project was designed to focus primarily on the connection between water
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30 78 insecurity and conventional forms of gender-based violence, the people with whom we worked
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33 79 in both We categorized their experiences into countries drew our attention to Water, Sanitation,
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35 80 and Hygiene (WASH)-related stressors, reproductive burdens, opportunity costs, and adverse
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37 81 biosocial effects on children, which are so severe that they should be considered violent.

82 **Materials and Methods**

83 **Research Settings: Tambogrande, Peru and East Sumba, Indonesia**

84 Tambogrande is a municipality in the region of Piura, on the northern coast of Peru.
85 According to the Municipality of Tambogrande (2021), about 60% of the population live in rural
86 areas, which are organized into 187 communities. Extensive irrigation systems enable agriculture
87 to be the most important economic activity. However, this area is ecologically categorized as
88 “dry forest” and deforestation, poor water management, inappropriate use of the soil,

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10 89 overgrazing, and demographic pressure have contributed to desertification. 85% of the rural
11 90 population does not have access to drinking water services (Municipality of Tambogrande,
12 91 2021).
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15 92 East Sumba is a district on the island of Sumba, East Nusa Tenggara Province, which is
16 93 the driest region of the Indonesian archipelago. The dry season regularly lasts from April to
17 94 November, but reports from the Jakarta Post in 2019 indicated this area went 249 days in a row
18 95 without rain. Agriculture is the primary source of livelihoods for the largely rural population of
19 96 250,000 people on the island. East Sumba is challenged by a high prevalence of extreme poverty,
20 97 low education, child malnutrition, and water scarcity (Barlow and Gondowarsito, 2009).
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27 99 **Study Design and Data Collection**

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29 100 As mentioned, the data for this paper were drawn from a The larger research project from
30 101 which these data were drawn is entitled, “***Removed for Anonymization***”. The mixed-
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32 102 methods study evaluated if water insecurity was a risk factor for gender-based violence cross-
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34 103 culturally. Semi-structured interviews were conducted with community members, health and
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36 104 water management practitioners, and other stakeholders in Sumba, Indonesia (n = 24) and
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38 105 Tambogrande, Peru (n = 51). Focus groups were also held with men and women, separately, in
39
40 106 both locations (approximately n = 10 participants in each focus group) and a multistakeholder
41 107 meeting (approximately n = 25 participants in each study setting) was used to present results to
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43 108 community members and receive feedback from local and regional stakeholders. Participants
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45 109 gave verbal consent through a form approved by the Institutional Review Boards of ***Removed
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47 110 for Anonymization***.

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10 111 Prompts for the semi-structured interviews and focus groups were drafted by the
11 112 research team members in collaboration with the UK non-governmental organization, Oxfam,
12 113 and focused on the connection between water insecurity and women's health. For example, study
13 114 participants at both sites were asked about their thoughts on the causes and impacts of water
14 115 insecurity in the area, with a specific focus on the effects of water insecurity on the community,
15 116 families, and on women and other vulnerable groups. Questions included: Are there particular
16 117 health problems associated with water problems? Are the health problems associated with water
17 118 the same for men, women, and children? Does water insecurity impact family relationships?
18 119 Prompts were uniform across the study sites, however, interviews were semi-structured and there
19 120 was variation in follow up prompts by the enumerators depending on the trajectory of the
20 121 conversation.
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31 *Tambogrande, Peru*

32 124 ~~Tambogrande is a municipality in the Region of Piura, on the northern coast of Peru.~~
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34 125 ~~According to the Municipality of Tambogrande (2021), about 60% of the population live in rural~~
35 126 ~~areas, which are organized into 187 communities. Extensive irrigation systems enable agriculture~~
36 127 ~~to be the most important economic activity. However, this area is ecologically categorized as~~
37 128 ~~“dry forest” and deforestation, poor water management, inappropriate use of the soil,~~
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39 129 ~~overgrazing and demographic pressure have contributed to desertification. 85% of the rural~~
40 130 ~~population does not have access to drinking water services (Municipality of Tambogrande,~~
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43 131 ~~2021).~~
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46 132 *East Sumba, Indonesia*

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133 ——— East Sumba is a district on the island of Sumba, East Nusa Tenggara Province, which is
134 the driest region of the Indonesian archipelago. The dry season regularly lasts from April to
135 November, but reports from the Jakarta Post in 2019 indicated this area went 249 days in a row
136 without rain. Agriculture is the primary source of livelihoods for the largely rural population of
137 250,000 people on the island. East Sumba is challenged by a high prevalence of extreme poverty,
138 low education, child malnutrition, and water scarcity (Barlow and Gondowarsito, 2009).

139 *Approach to data analysis*

140 Data presented are derived from semi-structured interviews, focus group discussions, and
141 multi-stakeholder meetings conducted in Sumba, Indonesia and Tambogrande, Peru. The
142 salience of WASH-related deficiencies, reproductive burdens, opportunity costs, and negative
143 biosocial effects on children emerged through an inductive process (Woo, O'Boyle, and Spector
144 2017), whereby our semi-structured interviews and focus groups, which broadly centered on
145 women's health and water, revealed a consistent pattern of concern with these specific issues
146 among study participants. After the first reading of the transcripts, three of the researchers
147 (removed for anonymization) then used the Quotes from the participants were organized within
148 the general themes addressed in the larger project. After the authors reviewed the qualitative
149 data, additional categories were iteratively developed that reflected emergent themes in the
150 content such as challenges to hygiene and extreme reproductive burdens. The qualitative data
151 management software, Dedoose (Dedoose version 9.0.17) was used to identify these additional
152 categories in the primary data, and then relevant quotes from both study sites were inserted into
153 an Excel matrix that allowed for cross-cultural comparisons of the qualitative data. Common
154 categories of extreme stressors associated with water insecurity were identified through this

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10 155 ~~process and included WASH deficiencies, reproductive burdens, gendered opportunity costs, and~~
11 156 ~~adverse biosocial effects on children~~

13 157 **Results**

15 158 *WASH-related Deficiencies*

16 159 In Peru and Indonesia, study participants indicated that there was insufficient water for
17 160 bathing. For example, an Indonesian religious leader noted that, "The women here only take a
18 161 bath once a week. Thus, they are very susceptible to disease." (S01). In Peru, a government
19 162 official similarly commented that, "...there is not much water to bathe, for hygiene..." and further
20 163 expanded that, "Many cases of sexual violence have involved children and adolescents bathing in
21 164 irrigation channels. People see them and make nasty comments." (PG5). A community-based
22 165 representative in Peru further expressed that the children "get stomach pain and diarrhea as there
23 166 is not a lot of hygiene." (PCB5).

24 167 The inability to maintain hygiene due to water scarcity was highly problematic for
25 168 maintaining vaginal health. A representative for a local organization in Peru stated that, "...many
26 169 women suffer from vaginal infections from water scarcity, because we cannot do our intimate
27 170 cleaning..." (PO04). In Indonesia, a woman reported that she went to the health clinic for
28 171 *keputihan*, or white vaginal discharge, usually related to an infection and that the midwife said,
29 172 "I have to use enough water when I clean my vagina." but she continued that "Sometimes we do
30 173 not have enough water to clean ourselves." (SV3).

31 174 Additionally, a participant recounted that, "Menstruation is very difficult. You're forced
32 175 to use drinking water to clean the vagina and can't afford to use it to clean anywhere else."
33 176 (SO10_2). Another Indonesian woman stated, "I get stressed when I don't have water during
34 177 menstruation. It makes us easily irritable." (SV1_2). Summing up these problems, an Indonesian

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178 religious leader stated, "Women are the most vulnerable group affected by the water scarcity.
179 This is because women need water more than men to support their reproductive functions such as
180 to clean up during menstruation, childbirth, and child care." (SR1).

181 ***Reproductive Burdens***

182 Participants in Peru and Indonesia also cited concerns regarding water collection and
183 pregnancy. In Peru, participants in a women's focus group recounted that women had miscarried
184 when attempting to carry water. As explained by a representative from a Peruvian local
185 organization, "If a pregnant woman lifts water during the first 1-3 months of pregnancy...there is
186 a potential for miscarriage...It's also dangerous when it's time to give birth, they are forced to
187 give birth early or prematurely." (PO9_2). In Indonesia, "We've often heard about children and
188 women, even pregnant ones, who get hurt and fall because of the steep and slippery conditions
189 along the way to fetch water." (SO3). An Indonesian woman who experienced this first
190 handfirsthand stated, "I still had to draw water until it was time to give birth. I fell near the
191 spring and I was taken to the hospital and gave birth to my child not being full term." (SV7_2).

192 Women also reported that water shortages affected birthing and the postpartum period. In
193 Peru, a woman explained, "I had to go with my buckets for the water after giving birth, and a few
194 days I felt something between my legs that fell. I went to the doctor and he said it had
195 prolapsed." (PV2), referring to the slipping of her uterus into the vaginal canal. In Indonesia
196 women reported that they had trouble securing water for sanitary births, with one participant
197 explaining, "When I gave birth, we bought the water." (SV9). As highlighted by an Indonesian
198 healthcare professional, if water is scarce during the birthing process, then "they do not have
199 enough water to clean themselves and are at risk for infection." (SH1).

200 ***Opportunity Costs***

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10 201 Opportunity costs are the missed opportunities when an individual engages in one
11 202 alternative over another. On the island of Sumba, "We need to spend around 3 hours to get water
12 203 back and forth from the water storage." (SV3). A local woman in Indonesia lamented that "too
13 204 much time is spent to carry water so it hampers other activities." She continued, "because water
14 205 is still an issue, I don't think I can do other productive activities while I am burdened with
15 206 getting water and taking care of domestic chores." (SV5).

16 207 Participants in both countries also highlighted how water insecurity prevents people from
17 208 eating properly and resisting disease. In Peru, a woman observed, "...when there is no water the
18 209 plants suffer. They die and it is our food..." (PV3). In Indonesia, a representative from a local
19 210 organization explained that "Because there is not enough water, they can't water vegetables,
20 211 hence the children don't get enough nutrition." (SO13_2). Finally, a large emphasis in Peru was
21 212 put on the ways that water acquisition caused children, particularly girls, to miss school.

22 213 *Negative Biosocial Effects on Children*

23 214 The link between water insecurity, malnutrition, and infections was highlighted as
24 215 particularly problematic for children. "When you don't have water, people do not understand that
25 216 it generates irreversible damage to children because they are constantly drinking untreated water.
26 217 They will have diarrhea and it will generate anemia and they are on the way to malnutrition. The
27 218 damage that it engenders in the brain will not allow [the child] to have the same chances as
28 219 others with a healthy childhood and if [the child] is in a circle of poverty it will be difficult to get
29 220 out of it." (PG22).

30 221 The circle of poverty is reinforced by missing school due to water fetching. A
31 222 representative from a local Peruvian organization noted that, "sometimes this situation of having
32 223 women managing water... girls drop their studies, because it is them who first have to prioritize

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224 [water] at home...or they have the responsibility of managing water before going to school.”

225 (PO6). She further articulated that these disparities are a form of violence, commenting that

226 when you “come home from school and you have to wash your dad's clothes, that's another type

227 of violence...you have to wash your father's and your brothers' clothes while the boys are

228 playing soccer outside." (PO6).

229 *Local Conceptualizations of Gender-Based Water Violence*

230 Local people articulated that the violence associated with water insecurity was broad and

231 that gender norms play a central role in the vulnerability of women and girls. A psychologist

232 from Peru told us:

233 “Water insecurity is latent violence, that is, it can be unleashed at any time and

234 with a worrying frequency, since in the hamlets where water is scarce, all

235 responsibility for its collection falls on the most vulnerable.... imposing

236 transgenerational power relations that have given rise to *machismo*..... And then

237 their non-compliance results in attacks on the physical and emotional integrity of

238 women and children. From many psychological interviews I have observed that

239 the assessment and recognition of violence are not adequate. Thus, a woman

240 would not consider a slap from her husband to be violence for not having

241 collected water, but would consider it a breach on her part, having internalized

242 this task as her duty.” (PO8).

243 A religious leader in Indonesia made similar statements:

244 “Because women must walk far away and sometimes into dangerous terrain that

245 can harm her, to get water, I think it is a form of physical abuse. They are forced

246 to do it despite the potential dangers they face. Especially during the rainy~~during~~

247 rainy season where the paths are very slippery. Frankly, we can say it as an abuse.

248 We know that in our community, when women do not collect water, they may be

249 at risk to experience verbal abuse or even physical violence. This is because the

250 existing practice and norms make women responsible for providing water.

251 Therefore, they will receive negative consequences when they fail to do so.”

252 (SR3).

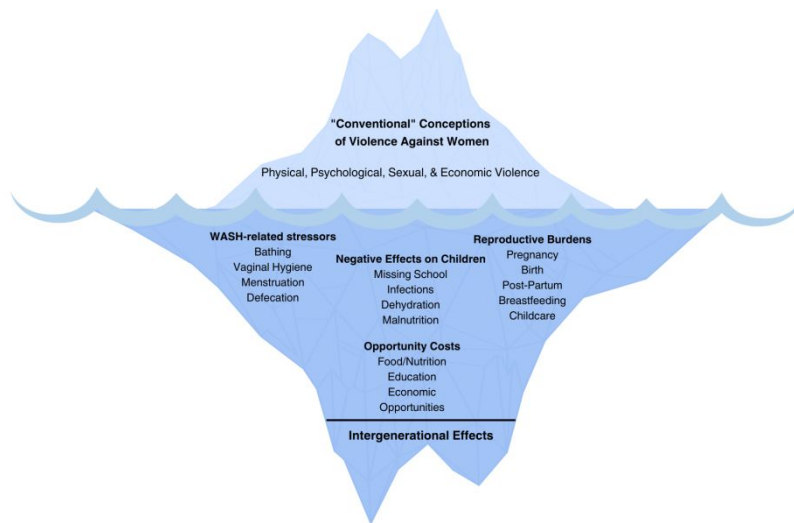
254 Discussion

255 The nascent literature suggests that water insecurity is associated with physical,
256 psychological, sexual, and economic violence against women and girls (cf. Tallman et al., 2022).

257 However, as we examined this issue in Peru and Indonesia, it became clear that the conventional
258 conceptions of ~~water-related~~ violence related to water were the “tip of the iceberg” (Figure 1.0).

259 To describe the range of harms below the surface, we developed the concept of “gender-based
260 water violence,” defined as the spectrum of stressors associated with water insecurity that are so
261 extreme as to significantly threaten human health and well-being, particularly that of women and
262 girls. In our research, this included WASH-related stressors, reproductive burdens, opportunity
263 costs, and adverse biosocial effects on children, which ~~may~~ have syndemic and
264 intergenerational repercussions.

265 **Figure 1.0** – Conventional conceptions of violence against women are the “tip of the iceberg” of
266 “gender-based water violence”.



First, study participants in Peru and Indonesia reported a range of WASH-related stressors, such as having insufficient water to bathe or maintain vaginal/menstrual hygiene. Beyond the association between water insecurity and diarrhea (Rosinger, 2018), water has additional direct consequences for health. Collecting water from unclean open sources, such as ponds or lakes, contributes to urogenital schistosomiasis infection (Grimes et al., 2014). Infrequent bathing increases the risk for lice, pinworm, and scabies¹, and, during menstruation, increases the risk of vaginal and urinary tract infections (Das et al., 2015). These conditions can

¹ <https://www.cdc.gov/hygiene/disease/index.html>

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10 279 create stigma, shame, and fear from appearing unclean (Adams et al., 2021; Wutich et al., 2020).

11 280 Thus, we propose the conceptualization of WASH-related stressors as a form of violence due to
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13 281 the substantial physical and mental health consequences they pose, particularly for women.

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15 282 Second, water-related reproductive burdens likely contribute to morbidity and mortality in the
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17 283 maternal-child dyad. The United Nations estimates that a maternal death occurs every two
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19 284 minutes.² In Peru and Indonesia, study participants expressed concerns that carrying heavy water
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21 285 containers and sustaining injuries could lead to miscarriages and preterm birth. These concerns
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23 286 are found in other empirical literature, where women articulated that the intense physical
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25 287 exertion specific to water acquisition, caused miscarriage, ~~preterm~~pre-term birth, low birth
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27 288 weight, and excessive bleeding after birth (Collins et al. 2019). Furthermore, in Indonesia,
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29 289 women highlighted that they did not have enough water for sanitary births. Lacking adequate
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31 290 and/or safe water during birth creates a window for opportunistic infections for both mother and
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33 291 baby (Pommells et al., 2018; Truelove & Ruszczyk, 2022). Infections from birthing are one of
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35 292 the top causes of maternal death (Halder et al., 2015) and may be a direct result of water
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37 293 insecurity, though further work is needed to make these connections explicit.

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39 294 Study participants in Peru and Indonesia also indicated that the time devoted to water
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41 295 provision and storage was excessive and prevented them from investing their time in other
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43 296 productive activities. In Indonesia, women were unable to grow food, impacting food security
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45 297 and child nutrition. This finding supports prior work suggesting the bidirectionality of food and
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47 298 water insecurity (Brewis et al., 2020; [Krumdiek et al. 2016](#)) and the impacts of water insecurity
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49 299 on child nutrition (Schuster et al., 2020). In Peru, truancy among girls was brought on by the
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51 300 need to obtain water, creating life-long disadvantages in pursuing economic opportunities. These

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² <https://www.unfpa.org/maternal-health>

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301 types of water-related, gendered opportunity costs have been documented by scholars in a
 302 number of global studies (Cole, 2017; Truelove & Ruszczyk, 2022; Nunbogu & Elliott, 2022)
 303 and are a key example of preventing individuals from reaching their full potential. As stated by
 304 the United Nations (1993), violence can be defined as preventing individuals from reaching their
 305 full potential or arbitrarily depriving people of their liberty. Therefore, we conceptualize
 306 opportunity costs as a third domain of “gender-based water violence.”

307 Finally, study participants reiterated that household water insecurity exerts multiple
 308 adverse biosocial effects on children, increasing their vulnerability to malnutrition and infection.
 309 We posit that these effects should be considered violent as they significantly constrain the
 310 biological and social development of children by increasing the risk of diarrhea, dehydration,
 311 malnutrition, food insecurity, and exposure to violence (Rhue et al., 2023; Rosinger, 2018;
 312 Brewis et al., 2020; Nounkeu et al., 2022; Choudhary et al., 2021; Krumdieck et al., 2017).
 313 These dynamics establish intergenerational patterns of violence and disadvantage (Pommells et
 314 al., 2018), which are likely mediated through social and biological pathways. Future research is
 315 needed to understand how “gender-based water violence” affects the maternal-child dyad,
 316 particularly during the “first 1000 days,” a sensitive time of development between conception
 317 and a child's second birthday (Gluckman et al., 2010).

318 Pushing forward conceptualizations of “gender-based water violence” and investigating
 319 the potential for this violence to have localized syndemic patterning (Singer et al., 2020; Brewis
 320 et al., 2022) and intergenerational effects (Rosinger, 2023) is imperative for understanding the
 321 range and depth of harm inflicted by water insecurity. For example, Rosinger and Young (2020)
 322 draw from the Developmental Origins of Health and Disease framework to postulate that water-
 323 related psychological stress during pregnancy could increase the risk of negative birth outcomes.

Commented [A1]: Rhue, S. J., Torrico, G., Amuzie, C., Collins, S. M., Lemaitre, A., Workman, C. L., ... & Stoler, J. (2023). The effects of household water insecurity on child health and well-being. *Wiley Interdisciplinary Reviews: Water*, e1666.

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10 324 including low birth weight, which may then increase risks of the next generation for chronic
11 325 disease outcomes later in life. The relationship between water insecurity and compromised
12 326 mental health is well-documented (Wutich et al., 2020) and this example demonstrates the
13 327 potential syndemic effects of water insecurity and child health outcomes. As we show in this
14 328 paper, women in Indonesia and Peru reported that the strain of carrying heavy water loads could
15 329 lead to preterm birth, potentially intersecting with water-related psychological stress, which also
16 330 increases these risks. As detailed by Brewis and colleagues (2022), *syndemic* interactions are
17 331 hyper-localized in the forms they take, yet little empirical data shows how these localizations
18 332 manifest. Mapping the multiple forms of “gender-based water violence” can support efforts to
19 333 quantitatively explore these risks in future work.

20 334 Yet much is left to be done to advance conceptualizations of “gender-based water
21 335 violence”. On a theoretical level, there are likely additional domains below the “tip of the
22 336 iceberg” (Figure 1.0) that should be considered and we hope that scholars will join us in
23 337 identifying what additional issues lay beneath the surface. There is also substantial space to map
24 338 the connections between conventional forms of violence, the domains of “gender-based water
25 339 violence,” articulated here, and more distal forms of “structural” and “slow” violence such as
26 340 patriarchy, water privatization, industrial prioritization, climate change and resource scarcity (see
27 341 Figure 2.0).

28 342 While a full exploration of these connections is beyond the scope of this paper, in both
29 343 Indonesia and Peru, patriarchal values, norms, and institutions shape gendered power dynamics,
30 344 water access, and governance (Lynch, 1991; Cole, 2017). For example, in East Sumba,
31 345 Indonesia, social organization is based on patrilocal clans, which means that when women marry
32 346 they “belong” to their husbands’ clan. This patrilocal structural organization disempowers

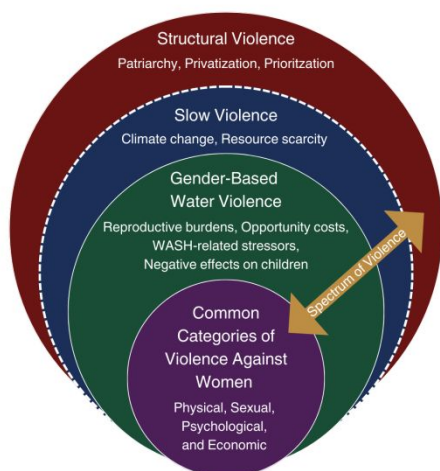
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10 347 women and sets the stage for physical and psychological violence related to water insecurity,
11 348 particularly between women and their in-laws. As one Sumbanese woman stated, “If I am late or
12 forget to fill the hot water container to make coffee, she [mother-in-law] will scold me for not
13 349 doing it. My mother-in-law got angry and screamed to my husband, ‘I am the one who takes care
14 of you! I gave you money to pay for your wife’s bellis (dowry)!’” (SV9).
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18 352 Many researchers have highlighted the centrality of culture in mediating the negative
19 psychological and biological effects of water insecurity (Brewis et al., 2020; Workman et al.,
20 353 2021) with specific attention to the ways that paying a dowry solidifies women as “property” and
21 354 serves as an excuse to abuse women when they cannot meet water-related domestic duties
22 355 (Karim et al., 2012). In Indonesia, these toxic dynamics are buttressed by laws such as Law No.
23 356 1 of 1974 regarding marriage, which stipulates that the husband is the head, protector, and
24 357 provider of the family and the wife is the household manager. These unequal power relations
25 358 “structurally” reinforce men and women’s roles both in domestic and public domains and
26 359 contribute to the “slow violence” of embodied and emotional struggles that women differentially
27 360 experience with water (Sultana 2011, Harris 2015, Cole 2017). We outline these connections
28 361 between these various levels of violence in Figure 2.0 with the hopes that other scholars will join
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30 363 us in further fleshing out these relationships using concrete and locally relevant examples.
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41 365 **Figure 2.0** - Conceptual model visualizing the spectrum of conventional forms of violence,
42 366 “gender-based water violence”, and more distal forms of “structural” and “slow” violence in
43 367 relation to water insecurity.
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In terms of methodological developments, substantial gains have been made in developing and refining cross-culturally validated tools to measure water insecurity (Jepson et al., 2017; Young et al., 2019). More work is needed to identify similar methods for measuring conventional forms of gender-based violence and to determine what key elements constitute “gender-based water violence” and how they can also be quantitatively assessed. Such methodological developments can follow from a fuller exploration and adoption of the concept of “gender-based water violence.”

Conclusion

Viewing the relationship between water insecurity and gender-based violence as being limited to interpersonal violence and falling under conventional domains of sexual, physical, psychological, and economic violence misses much of the severe harm wrought by “structural” and “slow” violence associated with water insecurity. As girls and women struggle to navigate a water-insecure world, we see the concept of “gender-based water violence” as a needed push to

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383 convey a “sense of both brutality and intent” (Mukherjee et al., 2011, pg. 572) associated with
384 water insecurity and the reality that water-related violence can, and must, be stopped.

385 To do so, scholars and practitioners must continue to develop understandings of “gender-
386 based water violence” and to push for research and interventions that address the full spectrum of
387 harm engendered by water insecurity. This is particularly important for international
388 organizations focusing on water and social protection such as the United Nations (especially for
389 SDG 5 on promoting gender equality and SDG 6 on promoting clean water and sanitation for
390 all), global funders (e.g. USAID, Bill and Melinda Gates Foundation etc.) and implementing
391 partners (e.g., -OXFAM, Save the Children, etc.), as the current focus on conventional forms of
392 violence obscures the range of harm that results from water insecurity. Without a more complete
393 framing of what constitutes “gender-based violence,” implementing, monitoring, evaluation, and
394 learning activities will miss the level of social protection that water interventions may yield.

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396 **Removed for Anonymization**

397 **Declaration of Competing Interests**

398 The authors have no competing interests to report.

399 **Data Availability Statement**

400 The data that support the findings of this study are available from the corresponding author upon
401 reasonable request.

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