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SHORT COMMUNICATION

Associations between water insecurity and depression among refugee adolescents and youth in a humanitarian context in Uganda: cross-sectional survey findings

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Background: Water insecurity is linked to poor mental health through intrapersonal, relational and community-based stressors. We examined water insecurity and depression among refugee youth in Bidi Bidi, Uganda.

Methods: We conducted a cross-sectional survey and multivariable ordinal logistic regression to examine associations between water insecurity and depression severity, adjusting for gender, resilience, social support and food insecurity.

Results: Among participants (n=115; mean age: 19.7 y, SD 2.3), 80.0% reported water insecurity and 18.3% had moderate/severe depression symptoms. Water insecurity was independently associated with higher levels of depression severity (adjusted OR: 5.61; 95% CI 1.20 to 26.30; p=0.03).

Conclusions: Findings suggest water insecurity was commonplace and associated with depression. Water insecurity could be integrated in refugee mental health promotion by policymakers and community-based programmers.

Keywords: depression, refugee, resource scarcity, Uganda, water insecurity, youth.

Introduction

There is emerging literature on the linkages between water insecurity—the inability to access sufficient, reliable and safe water for sanitation and well-being—and poor mental health.[1] There are several mechanisms through which water insecurity is theorised to cause distress and impact mental health, including through worry, feelings of social failure, uncertainty and deprivation, loss of opportunities and self-sufficiency and interpersonal conflict.[1] For instance, Wutich et al. identify seven potential mechanisms, including uncertainty, shame, frustration, social disconnection and feelings of injustice.[1] However, little is known of the associations between water insecurity and mental health among youth or refugees—or refugee youth at the nexus of these identities—living in low and middle income contexts. This is a notable gap, as refugee youth are disproportionately impacted by mental health challenges in part due to trauma, displacement and breakdown of family and social networks, in addition to contextual factors in resettlement such as poverty.[2]

With >1.5 million refugees, Uganda is the largest refugee-hosting nation in Africa[3] and a relevant context to examine water insecurity and linkages with depression among refugee youth. Prior research with non-refugee adults in Uganda documented geospatial clustering of water insecurity and depression symptom severity.[4] Here, we describe the association between water insecurity and depression among refugee youth living in Bidi Bidi

Refugee Settlement, Uganda, the second largest refugee settlement in the world and the largest in Africa with >240 000 residents, of whom >25% are aged 15–24 y.

Materials and Methods

This is a secondary analysis of a sexual and gender-based violence education comic book pilot study.[5] During the pilot study, we conducted a tablet-based, interviewer-administered, cross-sectional survey in March 2021 with refugee youth aged 16–24 y in Bidi Bidi recruited using convenience sampling by peer navigators, appropriate for pilot studies among hard to reach populations on stigmatised topics,[6] in collaboration with a community-based refugee agency. Inclusion criteria were: age 16–24 y; identifying as refugees; able to give informed consent; residing in Bidi Bidi refugee Zone 3; and speaking Juba Arabic, Bari or English. Outcome: depression was assessed using the nine-item Patient Health Questionnaire (PHQ-9)[7] (present study Cronbach's alpha=0.68) and categorised as a three-level ordinal variable (none/minimal [score 0–4], mild [score 5–9] and moderate/severe [score 10–27]). Exposure: water insecurity was assessed with the Household Water Insecurity Experiences scale,[8] including 11 of the 12 items (present study Cronbach's alpha=0.88; water insecure categorized as scores >10). Covariates, identified a priori informed by the existing literature on water insecurity and depression,[1] included other resource insecurity (food insecurity), coping resources (resilient coping, social support) and sociodemographic variables (gender). Resilient coping was assessed with the Brief Resilient Coping Scale[9] (present study Cronbach's alpha=0.61). Social support was assessed as having both parents alive, living with at least one parent and/or being married; this builds on conceptualisations of social support as a psychosocial resource in the context of interpersonal familial connections, social networks and functional support. Food insecurity was assessed with the question 'In the last 4 weeks, how often did you go to bed hungry because you didn't have enough to eat?' and dichotomised as food secure (never/rarely) or food insecure (sometimes/often/always). Sociodemographic variables, including gender, age, education level and country of origin, were collected.

Statistical analysis

We conducted bivariate analyses of water insecurity and depression using ordinal logistic regression followed by multivariable ordinal logistic regression to estimate the independent association between water insecurity and depression severity, adjusting for gender, resilience, social support and food insecurity. The proportional odds assumption was tested using the likelihood ratio test. Predicted probabilites for each level of depression were also estimated, holding all covariates at their means. All analyses were conducted in Stata 16.1 (StataCorp, College Station, TX, USA).

Results

Participants (n=115; mean age: 19.7 y, SD=2.3; women: 51.3%, men: 48.7%) were largely from South Sudan (n=114, 99.1%), had secondary education or higher (n=71, 61.7%) and reported high water insecurity (n=92, 80.0%) and food insecurity (n=68, 59.1%). One-third (n=33; 28.7%) of participants reported depressive symptoms, including 10.4% (n=12) with mild severity levels and 18.3% (n=21) with moderate/severe levels. After adjusting for gender, resilience, social support and food insecurity, water insecurity was associated with higher levels of depression severity (adjusted OR [aOR]: 5.61; 95% CI 1.20 to 26.30; p=0.03) (Table 1). This suggests that water insecure youth are >5.5-fold more likely to report mild depression than no depression or moderate/severe depression compared with mild depression. There was no evidence of violation of the proportional odds assumption. Water insecure youth had higher predicted probabilities of depression at every level of severity compared with water secure youth: mild severity levels (water insecure youth: 12.6% vs. 3.7%: water secure youth); moderate/severe levels (19.9% vs. 4.3%).

Conclusion

Building on the increasing evidence base that water insecurity is a resource scarcity linked to depression, our findings identify this association among refugee youth in the world's second largest refugee settlement. There is an important limitation to our study. By using convenience sampling our results may not be generalisable; future studies can employ non-random sampling with refugee youth. Yet the results of the association between water insecurity and depression corroborates prior research with non-refugees and provides the rationale for future studies on water insecurity-related health outcomes in humanitarian contexts. Ecosocial approaches that consider the embodiment of hazardous social and ecological environments can guide mental health promotion with youth in humanitarian contexts. Interventions may consider the urgent need to address resource scarcities such as water and food insecurity alongside initiatives that foster social support and resilience.

Authors' contributions: CHL, MO, SOL and PK contributed to study design. CHL, MO, ML, IB, SOL, NK and PK contributed to study implementation. ML and IB conducted data analysis and CHL, MO, IB, NS, SOL, NK and LT contributed to data interpretation. CHL led the manuscript writing and ML made major contributions to the writing. CHL, MO, ML, IB, LT, SOL, NK, NS and NK read and approved the final version of the paper.

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Competing interests: None to declare.

Table 1. Ordinal logistic regression for the association between water insecurity and depression (on a scale of 1: 'None/minimal', 2: 'Mild' and 3: 'Moderate/severe') among a sample of refugee youth (n=115) in Bidi Bidi Refugee Settlement, Uganda

	Unadjusted ordinal logistic regression			Adjusted* ordinal logistic regression		
	OR	95% CI	p	aOR*	95% CI	p
Water insecurity						
No	1.00	ref.	ref.	1.00	ref.	ref.
Yes	5.73	1.27 to 25.89	0.02	5.61	1.20 to 26.30	0.03
Gender						
Women	1.00	ref.	ref.	1.00	ref.	ref.
Men	1.12	0.51 to 2.49	0.78	1.02	0.44 to 2.40	0.96
Resilient coping score	0.77	0.60 to 0.98	0.04	0.78	0.61 to 1.01	0.06
Social support						
No	1.00	ref.	ref.	1.00	ref.	ref.
Yes	0.39	0.17 to 0.90	0.03	0.41	0.17 to 0.99	0.05
Food insecurity						
Never/rarely	1.00	ref.	ref.	1.00	ref.	ref.
Sometimes/ often/always	1.34	0.59 to 3.04	0.49	1.21	0.50 to 2.91	0.68

*adjusted for gender, resilience, social support, and food insecurity.

Ethical approval: Research ethics board approval for this study was provided by Mildmay Uganda Research Ethics Committee (ref: 0212–2019), Uganda National Council for Science and Technology (SS 5273) and the University of Toronto (ref: 37981).

Data availability: The data underlying this article cannot be shared publicly due to the ethical need to protect the privacy of youth that participated in the study. The data will be shared on reasonable request to the corresponding author.

References

1 Wutich A, Brewis A, Tsai A. Water and mental health. Wiley Interdiscip Rev Water. 7. Epub ahead of print September 1, 2020.

2 Logie CH, Okumu M, Mwima S, et al. Contextual factors associated with depression among urban refugee and displaced youth in Kampala, Uganda: findings from a cross-sectional study. Confl Health. 2020;14:45.

3 UNHCR. Global Trends in Forced Displacement. 2021, Publisher: United Nations High Commissioner for Refugees. Copenhagen, Denmark.

4 Cooper-Vince CE, Arachy H, Kakuhikire B, et al. Water insecurity and gendered risk for depression in rural Uganda: a hotspot analysis. BMC Public Health. 2018;18:1143.

5 Logie CH, Okumu M, Lukone SO, et al. Ngutulu Kagwero (agents of change): study design of a participatory comic pilot study on sexual violence prevention and post-rape clinical care with refugee youth in a humanitarian setting in Uganda. Glob Health Action. 14. Epub ahead of print 2021. doi:10.1080/16549716.2021.1940763.

6 Shaghaghi A, Bhopal RS, Sheikh A. Approaches to recruiting 'hard-to-reach' populations into re-search: a review of the literature. Heal Promot Perspect. 2011;1:86–94.

7 Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16:606–13.

8 Young SL, Boateng GO, Jamaluddine Z, et al. The Household Water InSecurity Experiences (HWISE) Scale: development and validation of a household water insecurity measure for low-income and middle-income countries. BMJ Glob Heal. 2019;4:e001750.

9 Sinclair VG, Wallston KA. The development and psychometric evaluation of the Brief Resilient Coping Scale. Assessment. 11. Epub ahead of print 2004. doi:10.1177/1073191103258144.