Water Insecurity and Psychological and Psychosocial Well-being in Kenyan Informal Settlements

M. Georges [1,4,5] J. Beyene[1] E.A. Adams[2] P. Owuor[3] D. DiLiberto[1] G.O Boateng[4,5]
[1]McMaster University, Hamilton, Canada [2]University of Notre Dame, Notre Dame, IN, United States
[3]Wayne State University, Detroit, MI, United States [4]York University, Toronto, Canada
[5]Dahdaleh Institute for Global Health Research, Toronto, Canada

https://www.gehlab.com

Introduction

- Over 2.2 billion people do not have access to clean water and more than 375 million people live in informal settlements in sub-Saharan Africa.
- Within Kenyan informal settlements, unequal access to clean water can affect people's overall well-being, which is exasperated by socio-economic factors.
- Until recently, well-being has been measured through a single or a combination of single measures, leaving a gap for a holistic approach to examining well-being.
- Therefore, this study examines the effect of household water insecurity on psychological and psychosocial well-being of Kenyans living in slums and informal settlements.

Methods

Study Setting:

- Data were collected from three informal settlements in the Kisumu region of the Nyanza Province in Kenya (*N*=965)

Outcome Variable:

- Psychological well-being was assessed using the WHO-5 Well-being index.
- Psychosocial well-being was measured using the Keyes (1998) Social Well-Being Scales.

Predictor Variable:

- Household Water InSecurity Experience (HWISE) Scale
  - Measures an individual or household's experience with water insecurity.
  - Made up of 12 questions with a range of 0-36 that focus on one's experience with water use.

Additional Predictor Variables:

- Biosocial Factors
  - Age, ethnicity, gender of the household head
- Sociocultural Factors
  - SES, average monthly income, education level, marital status, number of people per house and under five, district of residence, religion and type of housing

Data Analysis:

- Descriptive: we determined the sample distribution for all outcome and control variables.
- Bivariate:
  - We treated psychological and psychosocial well-being as a continuous and binary variable, doing both linear and logistic regression at the bivariate level.
- Multivariate:
  - Using significant variables at p<0.05 at the bivariate level, two multivariable models were built, one treating psychological and psychosocial well-being as a continuous variable and the other treating psychological and psychosocial well-being as a binary variable.
- **Interaction Effect**: Following the multivariable analysis, an interaction effect was done between Water Insecurity and Average monthly income

CANADA RESEARCH CHAIRS
CHAIRES DE RECHERCHE DU CANADA

Results

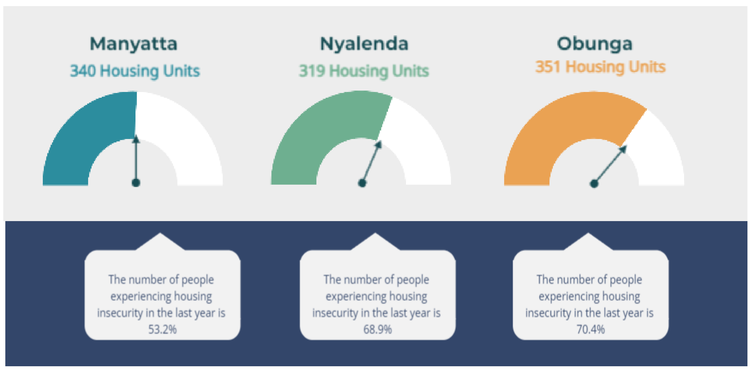

Figure 1: Number of people experiencing housing insecurity in the Manyatta, Nyalenda and Obunga informal settlements in the Kisumu region of the Nyanza Province in Kenya.

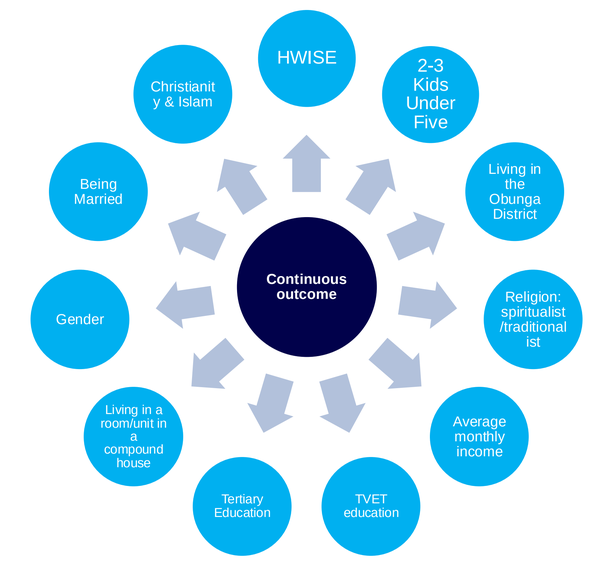

Figure 2: Bivariate analysis showing significant association between socio-demographic characteristics and psychological and psychosocial Well-Being, with outcome measures treated as continuous variables.

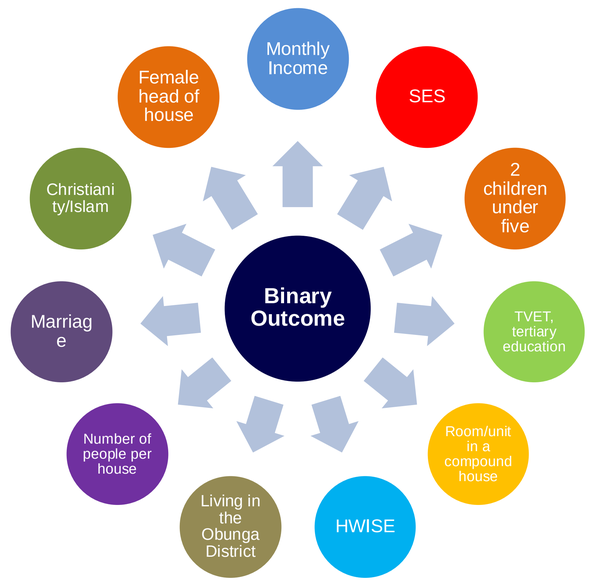

Figure 3: Bivariate analysis showing significant association between sociodemographic characteristics and psychological and psychosocial well-being with outcome measures treated as binary variables.

Table 1: The interaction effect of household water insecurity (HWISE) and Average Monthly Income in the Binary and Linear Analyses

Predictor Variables	Psychological Well-being	Social Well-being
Average Monthly Income#HWISE (b)(95% CI)	0.000 (-0.0003-0.0005)	0.000 (-0.009-0.0103)
Average Monthly Income#HWISE AOR(95% CI)	1.000 (0.999-1.000)	0.999 (0.999-1.000)
Notes: We adjusted for variables significant in the bivariate and linear analysis at p<0.05 and included in the multivariate analysis		

Results

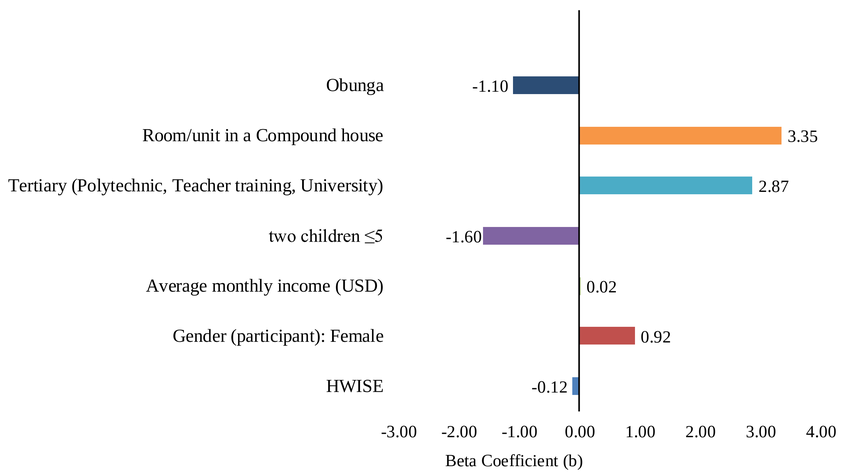

Figure 4: Predictor variables significant at the multivariable level in the linear analysis for Psychological well-being.

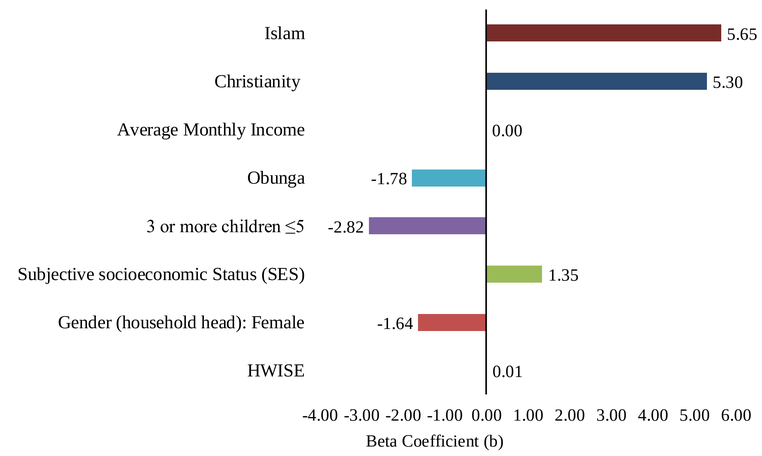

Figure 5: Predictor variables significant at the multivariable level in the linear analysis for Psychosocial well-being.

Conclusions

- Increase in household water insecurity is associated with lower psychological well-being.
- Higher water insecurity (HWISE) scores are associated with higher psychosocial well-being.
- **Psychosocial Wellbeing:** Religion was found to contribute to higher social well-being. Christianity and Islam were both significantly associated with better social well-being.
- Female-headed households and individuals cohabitating with a partner were associated with lower social well-being.
- **Psychological Well-being:** family dynamics, and the district in which one lives can affect their psychological well-being.
- Factors such as income, education and living in a compound house were associated with increased psychological well-being.
- Future policies should address challenges related to gender, socioeconomic challenges and the population district.

Funding and Contact Information

The project was funded by the Canada Research Chairs Programme in support of Dr. Godfred Boateng, Canada Research Chair in Global Health and Humanitarianism, Dahdaleh Institute For Global Health Research and The Helen Kellog Institute for International Studies, University of Notre Dame. This project was also completed as a requirement of the MSc. In Global Health at McMaster University.

Contact:
Mirianna Georges: georgm15@mcmaster.ca
Dr. Joseph Beyene: Beyene@mcmaster.ca
Dr. Ellis A. Adams: eadams7@nd.edu
Dr. Patrick Owuor: owuor@wayne.edu
Dr. Deborah DiLiberto: diliberd@mcma
Dr. Godfred Boateng: gboaten@yorku.ca

DAHDALEH INSTITUTE FOR GLOBAL HEALTH RESEARCH