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A comparative study of the influence of socio-environmental characteristics on psychosocial factors that trigger adoption of household water treatment in developing countries

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Household water treatment (HWT) is a simple technology to tackle this issue of non-potable drinking water at household level. Unfortunately, studies have showed that people do not use it regularly which diminishes the impact of HWT on health.

Our previous studies find that socio-environmental characteristics determines the water-related behavior via so-called psychosocial factors. However, there is a need to understand whether socio-environmental characteristics have similar effect on the psychosocial factors across regions and cultures. This comparative study aims to fill that knowledge gap.

We follow Risk – Attitude – Norm – Ability - Self regulation (RANAS) theory to model inter-relationships between socio-environmental and psychosocial variables. Bayesian Belief Network (BBN) based model is used to model the relationship between socio-environmental characteristics, psychosocial factors, and the use of HWT. Principal component analysis (PCA) and cluster analysis (CA) are used to determine similarity of the condition probability table (CPT) between the various case studies. A CPT corresponds a psychosocial variable and measures the strength of relationships between on the psychosocial variable and selected socio-environmental characteristics (education level, relative wealth index, accessibility, and health problem) that it is conditioned by in the BBN. Four household interview datasets, i.e. four case studies, are used in the comparative analysis: two from Indonesia and others from Nepal and Chad.

The PCA and CA analysis showed that two CPTs from Indonesia were quite similar to each other, while Nepal and Chad formed another cluster. However, the PCA scores explained 30.43% of the variance in the four datasets which implies that, socio-environmental characteristics have quite similar effect on shaping the people's perception regarding the adoption of HWT across different considered contexts. In general, better socio-environmental characteristics, e.g. better education or easier access to a product, result in higher levels of psychosocial factors, e.g. higher level of the perception of risk of getting health disease from drinking untreated water, resulting in higher probability of using HWT. Our results emphasize the importance of positive and supportive environment in order to change people's water-related behavior in developing countries.

Keywords: water-related behavior, socio-environmental characteristics, psychosocial factors, cluster analysis, principal component analysis, cluster analysis.