A Toilet or a Mobile Phone?: Exploring Interactions and Choices That Influence the Health of Mothers in Kenya Using Structural Equation Modeling

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LEARNING OBJECTIVES

• The learner will be able to describe how to apply Structural Equation Models to solve real-world challenges, such as gender data gaps in low income countries
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• The learner will be able to describe how to apply Structural Equation Models to solve real-world challenges, such as gender data gaps in low income countries.

• The learner will be able to apply the role of the nurse in different international sustainable development situations.
The Approach

1. Identify existing data gaps on gender equality
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2. Discuss statistical models that can generate new insight
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2. Discuss statistical models that can generate new insight

3. Share knowledge on new methodological approaches to address complex areas
Gender Data Gaps
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Currently very little is understood about...

1. The lives of females
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2. Challenges they encounter
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1. The lives of females

2. Challenges they encounter
This data would make it possible to...

1. Define and measure priorities to help establish policies promoting gender equality
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2. Monitor progress towards achieving goals
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3. Inform improved models (i.e., decision support tools) to help determine the size and nature of social and economic problems
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1. Define and measure priorities to help establish policies promoting gender equality
2. Monitor progress towards achieving goals
3. Inform improved models (ie decision support tools) to help to determine the size and nature of social and economic problems
4. Evaluate efficacy and cost-effectiveness of alternative policies
Structural Equation Modeling (SEM) is a tool that allows us to evaluate competing hypotheses in the absence of robust data sets.
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• By using SEM we can begin to understand the importance of gender inequality as well as evaluate the effectiveness of our early interventions.
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Structural Model
• The presence of toilets and mobile phones were regressed on the health of mothers.

• The analysis was performed using Mplus VERSION 7.11.
Figure 1: A model testing the hypothesis that “toilets are the most important intervention to protect health of mothers”.
Figure 2: A model testing the hypothesis that mobile phones positively influence both education and socio economic status
Figure 3: A model testing the hypothesis that the health of mothers is improved when toilets are added as an intervention into a community where mobile phones already exist.
The results of this study contradict campaigns that promote “toilets over cell phones.”
The approach used in this study allows nurse researchers to evaluate the benefits (or detriments) attributed to what is often viewed as a ‘helpful’ intervention (such as investing limited public health funding to install latrines in villages in developing countries).
• The SEMs do not clarify if the influence of mobile phones is due to household education or household socioeconomic status, and future work should evaluate these alternatives.
More broadly, the results of this study call into question the fundamental assumptions inherent in a needs based approach to sequential development (sensu Maslow’s Hierarchy).
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  • Due in part to its use of latent variables as well as path diagrams, Structural Equation Modeling (SEM) has been shown to be a useful statistical tool to evaluate social, economic, and health data. SEM is effective in estimating correlational relations using limited input data confined to a hypothetical, researcher-specified framework of relationship. The results of this study illustrated how demographics, infrastructure, and practices within the home have a significant effect on the health of mothers in Kenya.
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  • The results of this study are expected to inform public health policy decisions regarding future investments in toilets or mobile phone technological interventions, and to empower policy makers to consider the various environmental health factors and household demographics of target populations that policies are designed to impact. It is important for nurses to apply out-of-the-box thinking to create innovative solutions to community health challenges.
References

• Demographic and Health Surveys. Description of the Demographic and Health Surveys Individual Recode Data File. Measure DHS+, Version 1.0. Measure DHS+ 2008

