An Analysis of National HIV/AIDS Education Efforts Among 15-39 Year Olds and Health Care Workers Applying the Health Belief Model (HBM) in Six Cities in Sonsonate, El Salvador

Sarah Elizabeth Cates, DO

Dissertation submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education, Curriculum & Instruction

Kerry J. Redican – Chair
H. Dean Sutphin
Francine Anderson
Billie Lepczyk

January 27, 2009
Blacksburg, Virginia

Copyright 2009, Sarah Elizabeth Cates
An Analysis of National HIV/AIDS Education Efforts Among 15-39 Year Olds and Health Care Workers Applying the Health Belief Model (HBM) in Six Cities in Sonsonate, El Salvador

Sarah Elizabeth Cates, B.S., East Tennessee State University; D.O., Virginia College of Osteopathic Medicine

Abstract

This descriptive research used the Health Belief Model (HBM) to assess HIV/AIDS knowledge, perceived severity, perceived susceptibility, and behavioral practices within the population throughout the State of Sonsonate, El Salvador. Geographic Information Systems (GIS) was also utilized to display the results of this population study. The study population was composed of 15-39 year olds consisting of a total sample size of 1,500 (250 participants from each of the six cities). The basis of this study was to evaluate where this population fit within the Health Belief Model (HBM) and also to practically represent the results pictorially. Also, this information was collected so that the government of El Salvador could see and understand where their educational deficits existed so that future programs could be established to alleviate these discrepancies.

An instrument consisting of 65 items including demographics, knowledge, perceived severity, perceived susceptibility, and behavioral practices was used for the general population. The analysis of the data was two-fold using Geographic Information Systems (GIS) mapping and statistical analysis. GIS mapping was used to graphically pinpoint areas of knowledge deficit and misinformation about HIV/AIDS.

Results were based on a general population of 1,454. Various indices were created to show the level of knowledge or frequency of safe behavioral practices. The Perceived
Severity and Perceived Susceptibility sections were not aggregated into an index but rather treated as individual variables. An item analysis of the questionnaire found that on average the general population responded correctly to 78% of the knowledge questions. However, a total of 11 questions in the knowledge section had less 75% (n=385) of the general population answering correctly. Another 3 questions in the behavior section were also found to have less than 75% (n=385) indicating safe behavioral practices. Linear regression analyses were performed to explore correlations between the areas of demographics, knowledge level, perceived severity, and perceived susceptibility to safe behavior. GIS maps were created to pictorially show where this population’s deficiencies were in regard to the HBM. This research helped to pinpoint where this population fits within the construct of the Health Belief Model so that future educational efforts can be targeted in geographic areas with the greatest need. This will help to move this sample toward behavioral change.
Dedication

*I will lift my eyes to the mountains; from where shall my help come? My help comes from the Lord*  
*Psalm 121:1-2*

So many times during this process I clung to this verse for strength and help to follow this all through to completion. I acknowledge that if not for my faith in Jesus Christ, I would not have made it to this point. Thank you God for being with me every step of the way.

I dedicate this dissertation to the memory of my Dad and my Grandma who passed away before its completion. Grandma, you were always my biggest cheerleader. I know seeing me get through this would have just tickled you so much. I miss you.

Dad: I don’t know that you would have ever read it, but I know you would have bragged about this to everyone. This is for you . . . .  Sis.

A very special thank you goes to Mom who with me running all over the world multiple times to complete this project, was 100% supportive and encouraging throughout the whole process. I know it could not have been easy with me running all over the world, but Mom, you never let on, thanks. Thank you to the rest of my family, Matt, Kate, Mark, and Erin who were tremendous encouragers and steadfast supporters throughout all the craziness of completing this dissertation.
Professional Acknowledgements

I extend a sincere sense of thankfulness and gratitude to all of my committee members without whom this would not have been possible. To my Chair, Dr. Kerry Redican: thank you for the pep talks and the continual support every step of the way. A special thank you to Dr. Francine Anderson. I showed up countless times for pep talks and you never disappointed. Thank you for being an ongoing source of encouragement.

A huge thank you goes to Dr. Mauro Iglesias. This project and dissertation never would have happened without your help in El Salvador. Thank you for making all the phone calls and facilitating the logistics to make this project possible. Thank you to the El Salvadorian government, specifically Dr. Rodrigo Simán and the Ministry of Health for allowing me to conduct this project in your beautiful country. A special thank you goes to Mrs. Ann Peton. You helped me so much and your guidance with the addition of GIS mapping into this project elevated this work to a higher level than I thought possible. I would not have been able to do that without you. Thank you so much.

To Dr. Joe, thank you for all of your support. You were instrumental in fostering my original interest and dedication to international medical work. You allowed me opportunities and showed me what could be done if only people would make an effort towards change. May God continue to bless your work as you strive to reveal His vision and His world to others.
# Table of Contents

Abstract ..............................................................................ii

Dedication...........................................................................iv

Professional Acknowledgements........................................v

Table of Contents...............................................................vi

List of Figures.....................................................................x

List of Tables.....................................................................xv

Chapter 1 Introduction

  Global impact of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS)..............................................1
  HIV in El Salvador..............................................................1
  Purpose of the Study........................................................4
  Research Questions Specific to the Study...........................5
  Significance of the Study....................................................5
  Delimitations......................................................................6
  Limitations.........................................................................7
  Definitions of Terms........................................................8
  Summary...........................................................................9

Chapter 2 Review of the Literature

  Introduction......................................................................11
  The Health Care System in El Salvador..............................12
  El Salvador’s Response to HIV/AIDS..................................13
  The Role of Mass media in HIV/AIDS Education.................17
Other HIV/AIDS Education Efforts.................................................................21
Learning Theories ..................................................................................23
The Health Belief Model (HBM) ...............................................................24
Validating the Health Belief Model .........................................................28
The Health Belief Model and HIV/AIDS ..................................................32
Contribution of the Study .................................................................36

Chapter 3 Methods

Introduction ..........................................................................................37
Research Questions Specific to the Study .................................................37
Methodology .........................................................................................38
Study Design .........................................................................................38
Sample ..................................................................................................39
Instrumentation ..................................................................................43
  Validity and Reliability .................................................................45
Procedures ..........................................................................................46
Analysis .............................................................................................51
Summary ..............................................................................................52

Chapter 4 Results

Introduction ..........................................................................................54
Analysis ................................................................................................55
Demographics and Exposure Statistics ................................................56
Research Question 1 .............................................................................58
Research Question 2 ............................................................................64
Descriptive Statistics ........................................................................................................... 64
Regression Analysis ............................................................................................................ 75
Research Question 3 ............................................................................................................. 86
Summary ............................................................................................................................ 106
Research Question 1 ......................................................................................................... 106
Research Question 2 ......................................................................................................... 107
Research Question 3 ......................................................................................................... 107

Chapter 5 Conclusions, Recommendations, and Summary

Introduction ....................................................................................................................... 108
Research Question 1 ....................................................................................................... 109
Conclusions ....................................................................................................................... 109
Recommendations ............................................................................................................. 110
Research Question 2 ....................................................................................................... 110
Demographics and Exposure to Media Affected Knowledge About HIV/AIDS
........................................................................................................................................... 111
  ○ Conclusions ............................................................................................................... 111
  ○ Recommendations .................................................................................................... 112
Demographics, exposure, and knowledge in turn effect how susceptible a person deemed to be to HIV/AIDS and how severe a problem he/she thought HIV/AIDS was .................................................................................................................. 113
  ○ Conclusions ............................................................................................................... 113
  ○ Recommendations .................................................................................................... 123
Demographics, exposure, knowledge, perceived susceptibility, and perceived severity all affected the safe or unsafe behavior of an individual.........126

  o  Conclusions.................................................................126
  o  Recommendations.......................................................128

Research Question 3.................................................................129
  Conclusions.................................................................129
  Recommendations...........................................................130

Summary ............................................................................131

References.................................................................133

Appendix A. Internal Review Board (IRB) Approval ..................137

Appendix B. Human Subjects Testing Course Certificate.............138

Appendix C. Human Subjects Informed Consent Form, English .......139
  Informed Consent Form, Spanish ...........................................143

Appendix D. Questionnaire Instrument, English (codes used in analysis).........146
  Questionnaire Instrument, Spanish ........................................149

Appendix E. Raw Data Sample.....................................................156

Appendix F. Descriptive Statistical Analysis ..................................159

Appendix G. GIS Maps.............................................................184
List of Figures

Figure 1: Land Map of El Salvador…………………………………………………………11
Figure 2: Brochure of campaign to educate about mother to child transmission……..14
Figure 3: Brochure decide to wait…………………………………………………………16
Figure 4: Diagram of Health Belief Model (HBM)………………………………………..27
Figure 5: Components of Health Belief Model in this study…………………………..27
Figure 6: New HIV cases by municipality in Sonsonate: January-June 2007….……..41
Figure 7: Knowledge (k) index distribution………………………………………………60
Figure 8: Frequency diagram for behavior (b) index……………………………………72
Figure 9: GIS map showing reading ability among study population…………………89
Figure 10: GIS map of the distribution of reported religious affiliations………………90
Figure 11: GIS map of education level among the general population…………………91
Figure 12: GIS map of ownership of a TV among the general population in the study…92
Figure 13: A zoomed in GIS map of the distribution of ownership of a TV among participants………………………………………………………………………………93
Figure 14: GIS map of participants’ response to question: You can get HIV/AIDS from insects…………………………………………………………………………………95
Figure 15: GIS map of the question: You can get HIV/AIDS through an open cut or wound…………………………………………………………………………………96
Figure 16: GIS map of the question: You can get HIV from kissing…………………..97
Figure 17: GIS map of the question: In your community, how severe a problem is HIV/AIDS?……………………………………………………………………….99
Figure 18: GIS map of the question: There is a good chance I will get HIV/AIDS within the next 5 years.

Figure 19: GIS map of the question: I am less likely than others to get HIV/AIDS.

Figure 20: GIS map of the question: In the past 6 months I have had vaginal intercourse without a condom.

Figure 21: GIS map of the question: I have had a HIV test.

Figure 22: GIS map of the question: It is safer not to have sexual intercourse at all than to have sexual intercourse using a condom.

Figure 23: GIS map of the question: I am afraid of getting AIDS.

Figure 24: GIS map of question: Age at first sex.

Figure 25: GIS map of age distribution.

Figure 26: GIS map of question: AIDS can be cured.

Figure 27: GIS map of question: AIDS is caused by a virus.

Figure 28: GIS map of question: AIDS is the scariest disease I know.

Figure 29: GIS map of question: AIDS is a health threat that I take seriously.

Figure 30: GIS map of question: AIDS weakens the body’s ability to fight off disease.

Figure 31: GIS map of question: My patients do not know how HIV is transmitted or prevented.

Figure 32: GIS map of question: My patients do not know how HIV is transmitted and prevented.

Figure 33: GIS map of questions: you can get HIV from insect bites and my patients do not know how HIV is transmitted and prevented.
Figure 34: GIS map of questions: you can get HIV from hugging or shaking hands and my patients do not know how HIV is transmitted or prevented……………………………………196

Figure 35: GIS map of questions: you can get HIV from forks or glasses and my patients do not know how HIV is transmitted and prevented……………………………………197

Figure 36: GIS map of questions: you can get HIV from oral sex and my patients do not know how HIV is transmitted and prevented……………………………………198

Figure 37: GIS map of question: I am careful about who I have sex with………………199

Figure 38: GIS map of question: Owns a TV…………………………………………..200

Figure 39: GIS map of question: Using a condom during sex can lower the risk of getting AIDS…………………………………………………………………………………………201

Figure 40: GIS map of question: I counsel my patients about HIV/AIDS…………202

Figure 41: GIS map of question: In comparison to others of same age and sex, my likelihood of getting HIV…………………………………………………………………203

Figure 42: GIS map of question: HIV is transmitted through an open cut or wound…..204

Figure 43: GIS map of question: Individual risk of getting HIV…………………………205

Figure 44: GIS map of gender………………………………………………………………..206

Figure 45: GIS map of educational level……………………………………………………207

Figure 46: GIS map of question: There is a good chance I will get AIDS within the next 5 years………………………………………………………………………………………208

Figure 47: GIS map of question: Have HIV/AIDS educational materials in my clinic..209

Figure 48: GIS map of question: I have had an HIV test………………………………210

Figure 49: GIS map of question: I have HIV/AIDS patients…………………………211
Figure 50: GIS map of question: You can get AIDS from sharing forks or glasses with a person who has AIDS…………………………………………………………………..212

Figure 51: GIS map of question: You can get HIV from insect bites…………………..213

Figure 52: GIS map of question: You can get HIV from kissing…………………………214

Figure 53: GIS map of question: you can HIV through an open cut or wound ………215

Figure 54: GIS map of question: I know how to have safe sex..............................216

Figure 55: GIS map of question: I am less likely than others to get AIDS .............217

Figure 56: GIS map of marital status........................................................................218

Figure 57: GIS map of question: The number of HIV positive people will increase in this community over the next 5 years .................................................................219

Figure 58: GIS map of question: you can get HIV from insect bites and my patients know how HIV is transmitted and prevented .................................................................220

Figure 59: GIS map of question: You can get HIV from kissing and my patients know how HIV is transmitted and prevented .................................................................221

Figure 60: GIS map of owns a radio .........................................................................222

Figure 61: GIS map of question: In the past 6 months, I have had sex without a condom ........................................................................................................223

Figure 62: GIS map of questions: People get sick with AIDS a few days after being infected ........................................................................................................224

Figure 63: GIS map of question: People in my neighborhood are likely to have HIV........................................................................................................225

Figure 64: GIS map of perceived severity of HIV/AIDS ........................................226

Figure 65: GIS map of reading ability .................................................................227
Figure 66: GIS map of religion .................................................................228

Figure 67: GIS map of question: Someone I know is likely to get AIDS................229

Figure 68: GIS map of question: A vaccine is available to prevent AIDS...............230
List of Tables

Table 1: Descriptive Statistics of Demographics and Exposure Variables.................57
Table 2: Descriptive statistics for the physician population.................................58
Table 3: Descriptive statistics for the knowledge (k) index.................................60
Table 4: Knowledge (k) index by municipality or town.......................................61
Table 5: Questions with low, correct response rates and their percentages.............62
Table 6: Response to physician section of questions...........................................63
Table 7: Perceived severity/perceived susceptibility questions and means..............66
Table 8: Tabulation of question: How many sexual partners have you had in the last 3 months?.................................................................67
Table 9: Tabulation of question: How many sexual partners have you had in the last year?.................................................................68
Table 10: Tabulation of question: How often do you drink alcohol?.......................69
Table 11: Tabulation of question: How old were you the first time you had sex?.....70
Table 12: Tabulation of safe behavior questions..................................................71
Table 13: Combined chart of behavior questions and marital status .......................73
Table 14: Combined totals comparing behavior with monogamy..........................74
Table 15: Regression of knowledge (k) index with demographics/exposure variables....76
Table 16: Significant correlations for perceived severity and perceived susceptibility variables.................................................................81
Table 17: Regression of the behavior (b) index with demographics/exposure, knowledge (k) index, and perceived severity and perceived susceptibility.........................83